JAHANGIR
TUTORIALS

FINANCIAL MANAGEMENT

MARATHON

— CAFM —

MOST EXPECTED QUESTIONS

By

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★ ALL INDIA 13TH RANK HOLDER ★

CAFM MARATHON

INDEX

Lessons Covered

Paper Pattern – Financial Management (CAFM)

- **Financial Management** carries **40 Marks** in the CAFM Examination.
- In **Part B**, **Question 5** is a compulsory question carrying **20 Marks**.
- Thereafter, students get an option to attempt either **Question 6** or **Question 6A**.
- **Question 6 / 6A** also carries **20 Marks**.
- **Question 6A** is a **Theory-Based Question** consisting of **4 Questions of 5 Marks each**.
- Hence, students must prepare the **Theory Portion thoroughly** along with practical problems to score well in the examination.

JAHANGIR TUTORIALS

Financial Management

By Prof. Fatema Kagalwala (CS, LLB, MCom)

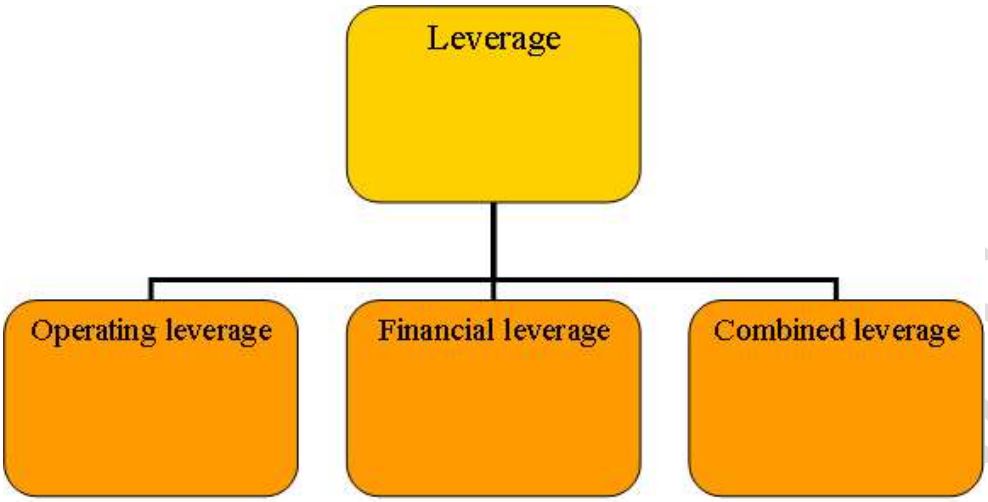
LEVERAGES

Introduction

- Leverage refers to relationship between two variables where a unit change in one variable (independent factor) will bring a consequent change in another variable.

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

- In finance, it shows the relationship between Sales and Profit.
- Since an 10% increase in sales does not bring about a 10% increase in Profit.
- It is due to fixed cost; the fixed cost remains same regardless of the operations as sales increase the fixed cost does not increase.
- Leverage calculates the speed at which profit changes due to involvement of fixed cost.
- Higher the Fixed cost, higher will be the leverage and thus higher change in profit.
- Companies use Fixed Cost to magnify/leverage their earning.
- Leverage simply means to magnify/amplify/boost /elevate/accelerate.
- It is a tool/technique that amplifies an investors profit/loss.
- It is a powerful tool if used responsibly.
- For example, if
  Sales up by 1% Profit also increases by 4%. Therefore, leverage is 4.
  Thus, if sales go up by 5% Profit will also increase by 20 % since leverage is 4.
- However, if sales drop by 1% profit will also fall by 4%.
- Therefore, High leverage also mean High risk.
- It must therefore be used very carefully by companies.
- Thus,
  High Fixed cost = High leverage = High Risk.
- Here, fixed costs mean costs that do not rise and fall with changes in firm's sales.
- Firms have to pay these fixed costs whether business conditions are good or bad.



Types of leverages

1) Degree of operating leverage:

- Operating leverage can be defined as company's ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes (EBIT).
- Rent, insurance premium, salary of executives is some of the examples.
- Degree of Operating Leverage (DOL) is a relationship between the % changes in EBIT with % change in sales.
- The degree of operating leverage may be defined as percentage change in the profits resulting from a percentage change in the sales.

$$DOL = \frac{\text{Percentage change in EBIT}}{\text{Percent change in Sales}}$$

OR

$$DOL = \frac{\text{Contribution}}{\text{EBIT}}$$

- Larger the Degree of Operating Leverage larger is the change in earnings.
- It is a measure of business risk.
- Interpretations:
  For example, if DOL is 1.33 times indicate that the EBIT is more sensitive with respect to change in sales.
  If sales increase by 10% then the EBIT will increase by 13.3%. Similarly, if sales decrease by 10% then the EBIT will also decrease by 13.3%.

2) Degree of Financial leverage

- Financial leverage is defined as "the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share".
- The use of long-term fixed interest-bearing debt and preference share capital along with share capital is called financial leverage or trading on equity.
- Financial leverage may be favourable or unfavourable depends upon the use of fixed cost funds.
- Favourable financial leverage occurs when the company earns more on the assets purchased with the funds, then the fixed cost of their use. Hence, it is also called as positive financial leverage.
- Unfavourable financial leverage occurs when the company does not earn as much as the funds cost. Hence, it is also called as negative financial leverage.
- If the firm has no fixed financial charges, then the change in the shareholders' wealth would be identical to that of the change in EBIT.
- Whenever the percentage change in EPS resulting from a given percentage change in EBIT is greater than the percentage change in EBIT, financial leverage exists.
- **This means that as long as the DFL is greater than 1, there is financial leverage.**
- Degree of Financial leverage (e.g. Interest and preference dividend)

$$DFL = \frac{NPBIT}{NPBT}$$

OR

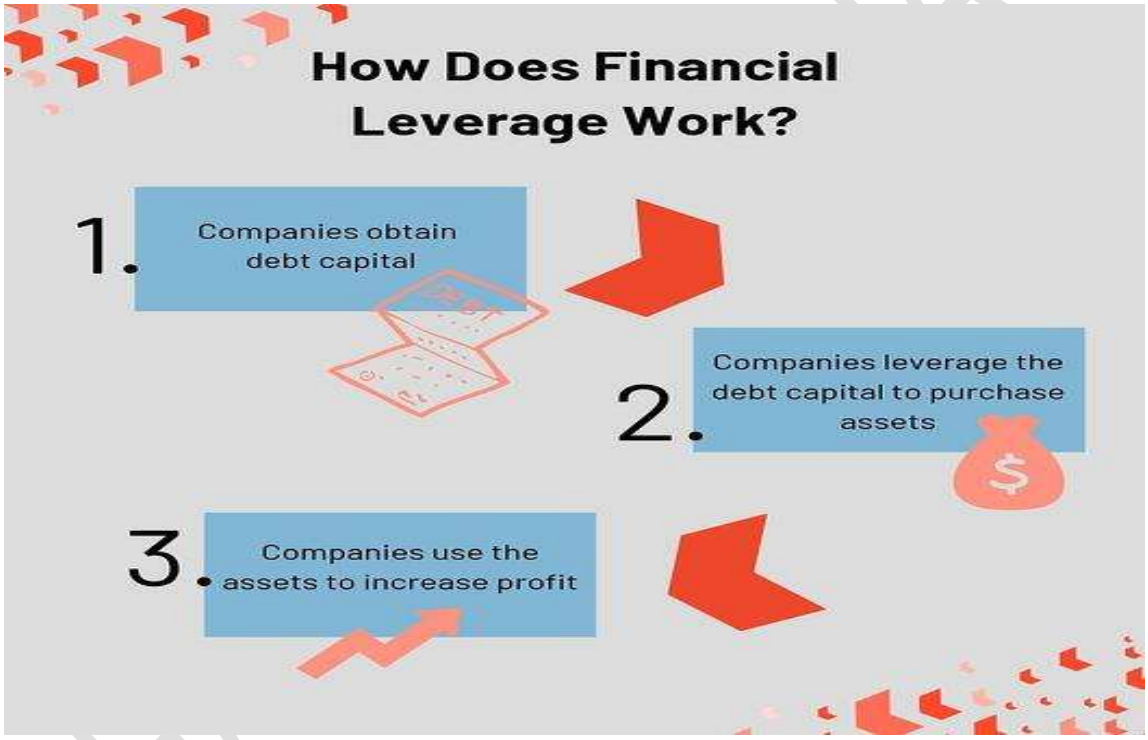
$$DFL = \frac{\%\text{ change in EBT (Or EPS)}}{\%\text{ change in EBIT}}$$

- Some company's might not have financial leverage.

Eg. Just Dial Ltd, Oracle Financial Services Software Ltd, Gillette India Limited, Castrol India Limited, Balaji Telefilms Limited, ACC Ltd, Infosys. (2016 updated).

Financial gearing is a fair-weather friend

- A fair-weather friend means a person who is dependable in good times but is not in times of trouble.
- A high financial leverage has a positive impact on EPS and consequently MPS.
- However, a high financial leverage may at the same time prove to be risky if EBIT is not sufficient to cover the interest expense.



3) Degree of Combined Leverage

- It reflects the combined impact of operating and financial leverage on the firm.
- High operating leverage and high financial leverage will cause total leverage to be high.
- The opposite will also be true.
- The relationship between operating leverage and financial leverage is multiplicative rather than additive.
- The relationship between the degree of combined leverage (DCL) and the degrees operating leverage (DOL) and financial leverage (DFL) is given by:
- Degree of Combined leverage

$$DCL = DOL \times DFL$$

OR

$$DCL = \frac{C}{NPBT}$$

OR

$$DCL = \frac{\%\ \text{change in EPS}}{\%\ \text{change in sales}}$$

Combined Leverage:

Combined leverage is combination of both the leverages.

Combined Leverage = Operating Leverage X Financial Leverage

or

$$\textbf{Combined Leverage} = \frac{EBIT}{EBT} \times \frac{Contribution}{EBIT}$$

or

$$\textbf{Combined Leverage} = \frac{Contribution}{EBT}$$

Profit Volume (PV) Ratio

- It indicates the relationship between contribution and sales.
- The Profit Volume (PV) Ratio is the ratio of Contribution over Sales.
- It measures the Profitability of the firm and is one of the important ratios for computing profitability.
- The Contribution is the extra amount of sales over variable cost.
- Contribution itself is profit.
- It is referred as contribution since it contributes to recover fixed cost.
- If there is no Fixed cost contribution itself is profit.
- PV = C/S x 100
- Sound financial health of a company is reflected by a sound PV ratio.
- If sales is 100 and PV ratio is 60% it would mean contribution is 60 and VC is 40.
- By purchasing latest machinery, a reduction in the variable cost p.u. can be achieved.
- For doing business analysis P/V ratio is an invaluable tool.

INCOME STATEMENT

Sales	XX
Less: Variable expenses	(XX)
Contribution	XX
Less: Fixed expenses	(XX)
EBIT	XX
Less: Interest	(XX)
NPBT	XXX
Less: tax	(XX)
NPAT	XXX
No Of shares	XX
EPS	XXX

1. A simplified income statement of Zenith Ltd is given below:

ZENITH LTD
Income statement for the year ended 31st march,1998

Sales	10,50,000
Variable cost	7,67,000
Fixed cost	75,000
EBIT	2,08,000
Interest	1,10,000
Taxes (30%)	29,400
Net income	68,600

Calculate and interpret the following:

i.) Degree of operating leverage:
ii.) Degree of financial leverage: and
iii.) Degree of combined leverage.

Answers:

DOL =1.36 times
DFL=2.12 times
DCL=2.88 times

2. You are required to prepare their income statements.

The following information is related to Sunrise Ltd.:

Sales	4,00,000
Less: Variable expenses 35%	1,40,000
Contribution	2,60,000
Less: Fixed expenses	1,80,000
EBIT	80,000
Less: Interest	10,000
Taxable income	70,000

You are required to submit the following to management of the company:

i.) What percentage will taxable income increase, if the sales increase by 6%? Use combined leverage. (2 marks)
ii.) What percentage will EBIT increase, if there is a 10% increase in sales? Use operating leverage. (1 mark)
iii.) What percentage will taxable income increase, if EBIT increases by 6%? Use financial leverage. (1 mark)

Q.3. Income Statement

Sales	=	10,50,000
– VC	=	– 7,67,000
Contri	=	283000
– Fix. Exp	=	– 75000
NPBIT	=	208000
– Interest		– 110000
NPBT		98000

$$DOL = \frac{\text{Contri}}{\text{EBIT}} = \frac{283000}{208000} = 1.36 \text{ times}$$

$$DFL = \frac{\text{NPBIT}}{\text{NPBT}} = \frac{208000}{98000} = 2.12 \text{ times}$$

$$DCL = DOL \times DFL = 2.88 \text{ times.}$$

Type 2 → Using Leverage to calculate Increase / decrease profit.

Q.5

Partial Loss

(i) DCL = Contri / NPBT

= 260000 / 70000

= 3.714 times

Working Notes

Sales		NPBT.
1%		3.714
6%		?

= 22.284%

∴ if Sales ↑ by 6%, NPBT ↑ by 22.284%.

(ii) DOL = Contri / NPBIT.

= 260000 / 80000

= 3.25 times.

Sales		NPBIT
1%		3.25
10%		?

= 32.5%

∴ if Sales ↑ by 10%, NPBIT will ↑ by 32.5%.

(iii) DFL = NPBIT / NPBT

= ~~1.14~~

= 80000 / 70000

= 1.14 times

NPBIT		NPBT
1%		1.14
6%		?

6.84%.

∴ if NPBIT ↑ 6% then NPBT ↑ by 6.84%.

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COST OF CAPITAL

Introduction

- Company raises funds through various sources to carry on its business operations.
- It wants to know how much it would cost to raise that money. This is called cost of capital.
- It is the required rate of return that a firm must achieve in order to cover the cost of generating funds in the marketplace.
- It is used to evaluate new projects of a company as it is the minimum return that investors expect for providing capital to the company, thus setting a benchmark that a new project has to meet.
- Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.
- If a firm fails to earn return at the expected rate, the market value of the shares will fall and it will result in the reduction of overall wealth of the shareholders
- It is the merely a hurdle rate.
- It is the minimum rate of return.
- The funds deployed in an entity could either be borrowed or owned funds.
- These funds have certain cost attached to them.
- It is important to ascertain the cost to decide whether to take up a particular project or not.
- The cost of capital is used by company as a minimum bench mark for its yield.

  Eg.) If the cost of capital is 10% and the return on the project is 12%,
  The project can be accepted.

  However, if the cost of capital is 10% and the return is 8%
  The project will not be taken up.

  The capital raised could be through

Owned	Borrowed
a. equity	a. debentures
preference	b. loan

Purpose of Evaluating the cost of capital

Illustration

A company started business with Rs 10 lacs

Source	Amount	Cost	
Equity Capital	5 lacs	20%(ke)	1,00,000
Debt 10 %	3 lacs	10%(Kd)	30,000
12 % Preference shares	2 lacs	12%(kp)	24,000
Total	10 lacs		1,54,000

So, the company has to pay 1,54,000 (cost) to get capital of Rs. 10 lacs.

Therefore, the Overall cost

$$Ko = \frac{\text{Cost}}{\text{Capital}}$$

$$= \frac{1,54,000}{10 \text{ lacs}}$$

$$= 15.4\ \%$$

OR

It can also be calculated as under

Source	Amount	Weight	Cost	WACC
Equity Capital	5 lacs	0.5	20%(ke)	10
Debt 10 %	3lacs	0.3	10%(Kd)	3
12 % Preference shares	2 lacs	0.2	12%(kp)	2.4
Total	10 lacs		WACC	15.4%

So, project which yield above the cost should only be accepted.

If a project has a ROCE of 12% it should be rejected.

The cost of capital is calculated before starting the project.

Cost of Debt (Kd)

- Cost of Debt refers to the cost of long-Term debentures/bond.
- Cost of Debt is calculated after tax because interest payments are tax deductible for the firm. Cost of capital is denoted by the term Kd.
- Kd after taxes = Kd (1 – tax rate).
- Debenture holders help company to gain a tax benefit as Interest is deducted before charging tax hence cost of debt becomes = Int – tax benefit.
- The debt has an implicit as well as explicit cost.
- The implicit cost arises when the company raises finances in the form of debt.
- Since the fixed interest obligations increases, the company's financial risk also increases.
- The explicit cost of debt is termed as the effective cost of debt.
- Since the interest is allowable for tax purposes, the cost of debt is generally expressed with reference to its after-tax cost.

Calculation of Cost of Debt

$$Kd = \frac{Int - tax}{M.price}$$

$$Or \quad \frac{Int\ (1-tax)}{M.price}$$

a) If life of debt is given

$$Kd = \frac{Int(1-tax) + \frac{RV-SV}{n}}{\frac{RV+SV}{2}}$$

2.) Cost of preference shares (Kp)

- It is the capital where the fixed amount of dividend is paid with prior claim to that of equity shareholders.

$$Kp = \frac{P.Div + DDT}{M.price}$$

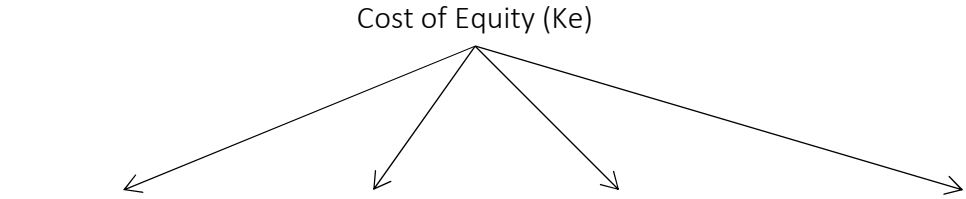
If life of preference share is given

$$Kp = \frac{D + \frac{RV-SV}{n}}{\frac{RV+SV}{2}}$$

3) Cost of Equity(Ke)

- Equity Capital is the money invested by the promoters in the firm. The return which promoters get is of two kinds:
  - Periodic Payments in the form of dividends. This is an explicit return.
  - The capital appreciation which they might get by selling the shares at the increase in the market value of the shares.
- This return is an implicit return. The market value is an indicative measure of the return to the investors when they wish to redeem their investment
- The cost of equity capital is the minimum rate of return that a company must earn on the equity financed portion of its investments in order to maintain the market price of the equity share at the current level.
- The cost of equity capital is rather difficult to estimate because there is no definite commitment on the part of the company to pay
- dividends.
- However, there are various approaches for computing the cost of equity capital.

They are as follows -



Dividend	Earning	Dividend +Growth	CAPM
DPS (D1)	EPS	DPS + g	Rf+B(Rm-Rf)
Price (Po)	Price (Po)	Price (Po)	

4.) Cost of Reserves

- Opportunity cost=Cost of reserves
- The cost of retained earnings or internal funds within a capital structure is similar to the cost of common stock, since it is a component of equity..
- Generally, the cost of retained earnings is slightly less than the cost of common stock.
- When deciding how to finance a new project, companies would minimize the distribution of dividends to shareholders and retain the capital. This follows with the so-called "pecking order" of financing whereby companies prefer internal sources of capital to external sources of capital.
- Moreover, internal financing is generally thought to be less expensive for the firm than external financing, because the firm does not have to incur transaction/floatation costs to obtain it, nor does it have to pay the taxes associated with paying dividends.
- If Opportunity cost is not given then,
  Kr=Ke (since reserves is a component of equity)

Note-

- Price means for new issue= issue price-flotation cost.
- For existing issue it will be Market price.
- Flotation cost= underwriting cost, advertisement expenses, printing cost at time of IPO.

Weighted average cost of capital

Composite / total cost of capital = Cost of debt +
cost of equity +
cost of preference share +
cost of retained earnings

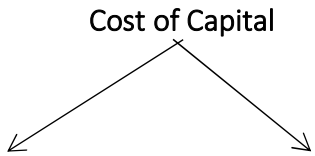
Now, weighted average cost of capital means
Calculating the cost of each source/component
(i.e. equity, preference debt) ,
According to their weights in the capital structure.
Thus,
WACC= WeCe + WpCp + WdCd(1-t)

Where,
W= weight of each source of capital
C= cost of each source of capital

Eg)

Given:	Value	Cost
Equity	2 Lakh	10%
Preference	3 Lakh	8%
Debentures	1 Lakh	6%
Loan	1 Lakh	5%
Reserves	3 Lakh	3%

Source	Amount	Weight	Cost	Weighted Cost
Equity	2,00,000	0.2	10%	2%
Preference	3,00,000	0.3	8%	2.4%
Debentures	1,00,000	0.1	6%	0.6
Loan	1,00,000	0.1	5%	0.5
Reserves	3,00,000	0.3	3%	0.9
Total	**10,00,000**		**WACC**	**6.4%**



Book value method	Market value method
(Calculated at book value/face value)	(calculated on market price i.e. No. of shares x market price of each share)

Type 1 - Basics

Q.1. A company wants to issue New 12% debentures of Rs. 100 Face value and Tax 25% at
a) Par
b) 20% Premium
c) 20% discount
d) 10% Discount, 5% floatation Cost.
Calculate Kd.

Q.2. Company has existing Debentures of Rs. 100 currently traded at Rs. 125.
Coupon rate – 15%
Tax- 20%. Calculate Kd.

Q.3. Preference shares of Rs. 50
Market Price – Rs. 75
Coupon Rate – 15%
Tax – 20%
a) Calculate Kp
b) Also, Calculate Kp, if there is DDT of 10%.

Q.4. Face Value Rs. 100
Company expects to give dividend of Rs. 8 and company will grow at 7% p.a. Calculate Ke.

Q.5. Face Value Rs.100.
Market Price Rs. 90
D0= 10
D1=10.5. Find Ke.

Q.6. D0= Rs.10
G=5%
Market Price= Rs.105
Calculate Ke.

Q.7. A company wants to issue debentures of Rs.100 each carrying interest 10% and its life is 10years.
Tax is 30%.
Calculate Kd of the debentures if-
a) Issued at 10% discount and Redemption will be at par.
b) Issued at 10% premium and Redemption will be at par.

MV weights

Q.8. Determine the weighted average cost of capital using

i. Book value weights and

ii. Market value weights.

Book Value Structure	RS.
Debentures (Rs. 100 per debenture)	8,00,000
Preference shares (Rs.100 per share)	2,00,000
Equity share (Rs. 10 per share)	10,00,000
	20,00,000

Recent Market Prices are

Debentures	Rs. 110 per debenture
Preference shares	Rs. 120 per share
Equity shares	Rs. 22 per share

Cost of each component is as under:

Kd = 7.04%

Ke= 17%

Kp = 14.87%

Answers:

(i) As per Book value weights WACC is 12.803%

(ii) As per Market value weights WACC is 14.21%

Q. 9 WACC

A & Co. has the following capital structure:

10% Debentures	-	Rs. 3,00,000
10% preference shares	-	Rs. 2,00,000
Equity 5,000 shares of Rs. 100 each		Rs.5,00,000
Total		10,00,000

The equity shares of the company are quoted at Rs.102 and the company is expected to declare a dividend of Rs. 9 per share.

Assuming tax rate applicable to the company at 50%. Calculate WACC.

Answer: WACC 7.91%

PAST EXAM QUESTION

June 2024

1. Magma Ltd. is a manufacturing industry which has a mix of equity and debt to finance its business. The company is growing at a considerable rate prompting the management to go for expansion. The company is considering various alternatives to raise funds for the same.

The capital structure of Magma Ltd. is as follows :

Particulars	Amount (₹)
12% Debentures (first issue)	3,00,000
13% Debentures (second issue)	2,00,000
10% Cumulative Preference Shares	2,50,000
Equity Shares (Face Value of ₹ 10 per share)	6,00,000
Retained Earnings	1,50,000

Additional Information:

(1) Equity shares are sold in the market at ₹ 25 per share. The company is contemplating the declaration of dividend of ₹ 3 per share at the end of the current financial year. The company has a practice of paying all earnings in the form of dividend.

(2) ₹ 100 per debenture (first issue) redeemable at par has 2% floatation cost and 8 years of maturity. The market price per debenture is ₹ 120.

(3) The second issue of debentures (₹ 100 each) is redeemable after 5 years and are currently selling at ₹ 90 per debenture.

(4) ₹ 100 per preference share redeemable at par has 3% floatation cost and 10 years of maturity. The market price per preference share is ₹ 108.

(5) The tax rate applicable to the company is 30%.

(6) The shareholder's tax liability may be assumed as 25% whereas the capital gain tax is 20%.

The CFO of the company is keen at understanding the cost of capital. Accordingly, you are appointed to complete the following tasks :

(1) Find out the weighted average cost of capital using :

(a) Book value weights.

(b) Market value weights.

(2) Further the company also intends to know the market price of the equity shares at the end of the current year using MM approach along with citing the assumptions of the theory.

(3) Assuming the company has sales of ₹ 20 lakh, variable cost of ₹ 12 lakh and fixed cost of ₹ 5 lakh (excluding of interest), calculate operating leverage, financial leverage and combined leverage.

Q.2 Dec 2023

The following is an extract from the financial statement of XYZ Ltd

	(₹ in lakh)	(₹ in lakh)
Operating Profit	105	
Less : Interest on debentures	33	72
Less : Income Tax (30%)		21.6
Net profit		50.4
Equity share capital (shares of 10 each)	200	
Reserves and surplus	100	
15% non-convertible debentures (of ₹ 100 each)	220	520

The market price per equity share is ₹ 12 and per debenture ₹ 93.75. Calculate:

(i) EPS

(ii) Percentage cost of capital to the company for the debenture funds and the equity.

Prof. Fatema .K

LESSON — COST OF CAPITAL

⇓

from co. point of view.

⇓

Capital of Business

⇓

to run a business

⇓

Sources of Capital.

- Own
  - (a) Equity
  - (b) Preference
    - ↓ Dividend ⇒ cost.
- Borrowed.
  - (a) Debentures
  - (b) Loan.
    - ↓ Interest → cost

eg. Cost of Capital (COC) = 10%.
Return on Investment (ROI) = 12%.
} accept the project

COC = 10%
ROI = 8%
} reject the project.

∴ hurdle rate | minimum bench mark

cost = ROI.

(*) Combination of Sources of capital.

↓

Overall COC = K_o

↓ ↓ ↓ ↓

① K_e ② K_p ③ K_d ④ K_r

↓ ↓

Cost of equity. Cost of PSC

↓

$\frac{\text{Pref Dividend + DDT}}{P_o}$

↓ ↓ ↓

Dividend Approach. (a) Growth Approach. (b) EPS. (c)

↓

$\frac{D_1}{P_o}$ $\frac{D_1}{P_o} + G$ $\frac{EPS}{P_o}$.

(*) (P_o → MP today)

③ Cost of Debt → $K_d = \frac{\text{Interest}}{\text{Capital}} = \frac{\text{Interest}(1-TR)}{P_o}$.

Debt tax benefit → in payment of interest

eg.

	Co A (Debt)	Co B. (No Debt)
NPBIT.	100	100
- Int-	(20)	-
NPBT	80	100
- Tax @ 50%.	(40)	(50)
NPAT	40	50.

(4) Cost of Reserves → Surplus fund.

↓

eg Co. has Rs 10 lacs.

↓

This could be Invested.

↓

opportunity lost / opp. cost.

∴ R&S → belong to ESHs.

∴ $K_r = K_e$.

(*) Dividend or Interest is always on FV.

(*) P_0 → Market Price.

(*) Price should exclude all other cost

eg → processing cost, floating cost, etc.

Prof. Fatema K

Questions:

Type 1 → Basic.

Q.1. $K_d = \frac{\text{Interest}\,(1-TR)}{P_0}$

a) $= \frac{12\,(1-25\%)}{100} \times 100$

$= \frac{12\,(1-0.25)}{100}$

$= 9\%$

b) $= \frac{12(1-0.25)}{120}$ → 100 + 20% (Prem.)

$= 7.5\%$

c) $= \frac{12(1-0.25)}{80}$ → 100 − 20% (Disc)

$= 11.25\%$

d) $= \frac{12\,(1-0.25)}{85.5 - (100-10\%-5\%)}$

$= 10.52\%$

Q.2. $K_d = \frac{\text{Interest}(1-TR)}{P_0}$

$= \frac{15\ (1-0.20)}{125}$

$= 9.6\%$

Q.3. $K_p = \frac{\text{Pref Div} + DDT}{MP}$

a) $= \frac{7.5 + 0}{75}$ (15% on 50)

$= 10\%$

b) $= \frac{7.5 + (10\% \text{ of } 7.5)}{75}$

$= \frac{7.5 + 0.75}{75}$

$= 11\%$

Q.4

$$K_e = \frac{D_1}{P_0} + g$$

$$= \frac{8}{100} + 7\%$$

$$= \left(\frac{8}{100} \times 100\right) + 7\%$$

$$= 8\% + 7\%$$

$$= 15\%$$

Imp Note: Calculate either in percentage or in decimals

Q.5 Growth $= D_1 - D_0$

$= 10.5 - 10$

$= 0.5$

$\therefore$ Growth $= \frac{0.5}{10} \times 100 = 5\%$

$$K_e = \left(\frac{10.5}{90} \times 100\right) + 5\%$$

$= 11.67 + 5$

$= 16.67\%$

Q6. $D_1 = 10.5 \rightarrow (10 + \text{Growth} = 10 + 5\%)$

$\therefore Ke = \frac{10.5}{105} + 5\%$

$= 10\% + 5\%$

$= \underline{15\%}$

Q.7. (a) $Kd = \frac{Int(1-TR) + \frac{RV-IP}{n}}{\frac{RV+IP}{2}}$

$= \frac{10(1-0.30) + \frac{100-90}{10}}{\frac{100+90}{2}}$

$= \frac{7+1}{95} \times 100 = \underline{8.42\%}$

(b) $= \frac{10(1-0.30) + \frac{100-110}{10}}{\frac{100+110}{2}}$

$= \frac{7-1}{105}$

$= \frac{6}{105} \times 100 = \underline{5.71\%}$

Prof. Fatema K

Type 3 → MV Weights.

Q.11.

(i) Book Value Weights.

Sources	Amt	Wgts	cost %	WACC
Debenture	800000	0.40	7.04	2.816
Preference	200000	0.10	14.87	1.487
Equity	10,00,000	0.50	17	8.5
Total	20,00,000		WACC	12.803%

WACC = 12.803%.

(ii) Market Value Weights

Sources	* Amt	Wgts	cost %	WACC
Debenture	880000	0.2651	7.04	1.87
Preference	240000	0.0723	14.87	1.075
Equity.	2200000	0.6627	17	11.2659
Total	3320000		WACC	14.21%.
WACC =	14.21%			

* Amt = no. of Shares/debent x Market Price p.s.

Q.9.

Sources	Amt	Wgt	Cost %	WACC
Debenture	300000	0.30	5	1.5
Preference	200000	0.20	10	2
Equity	500000	0.50	8.82	4.41
Total	1000000		WACC →	7.91

Notes:

$$K_d = \frac{Int\,(1-TR)}{P_0} = \frac{10(1-0.50)}{100 \rightarrow \text{Assumed}} \times 100$$

$$= 5\%.$$

$$K_p = \frac{Pref\ Div + DDT}{P_0} = \frac{10+0}{100}$$

$$= 10\%.$$

$$K_e = \frac{D_1}{P_0} = \frac{9}{102}$$

$$= 8.82\%.$$

$\therefore$ WACC = 7.91%.

COST OF CAPITAL

PAST EXAM QUESTIONS

(1) To find WACC

$$K_d = \frac{Int\,(1-TR) + \frac{RV-SV}{n}}{\frac{RV+SV}{2}}$$

$$K_d \text{ (first issue)} = \frac{12(1-0.30) + \left(\frac{100-98}{8}\right)}{\frac{100+98}{2}}$$

$$= \frac{8.4 + 0.25}{99}$$

$$= \boxed{0.087}$$

$$kd \text{ (second issue)} = \frac{13(1-0.30) + \left(\frac{100-100}{5}\right)}{\frac{100+100}{2}}$$

$$= \frac{9.1 + 0}{100}$$

$$= \boxed{0.091}$$

$$K_p = \frac{\text{Pref Div} + \left(\frac{RV - SV}{n}\right)}{\frac{RV + SV}{2}}$$

$$= \frac{10 + \left(\frac{100 - 97}{10}\right)}{\frac{100 + 97}{2}}$$

$$= \frac{10 + 0.3}{98.5}$$

$$= \boxed{0.1046}$$

$$K_e = \frac{D_1}{MPS}$$

$$= \frac{3}{25}$$

$$= \boxed{0.12}$$

$$K_e = \frac{D_1(1 - T_1)}{MPS(1 - T_2)}$$

T_1 = Maugind Tax Rate

T_2 = CG Tax.

$$= \frac{3(1 - 0.25)}{25(1 - 0.20)}$$

$$= \frac{2.25}{20} = \boxed{0.1125}$$

(i) WACC (BV weights).

Source	Amt	wgts	Cost	WACC.
Equity Shares	600000	0.4	0.12	0.048
10% PSC	250000	0.167	0.1046	0.0175
12% Debn	300000	0.2	0.087	0.0174
13% Debn	200000	0.133	0.091	0.0121
RE	150000	0.1	0.1125	0.0113
	15,00,000	1.000		0.1063

WACC = 10.63%

(ii) WACC (MV weights)

	Sources	Amt	wgts	Cost	WACC
(60000×25)	Equity Shares	1500000	0.61	0.12	0.0732
(2500×108)	10% PSC	270000	0.11	0.1046	0.0115
(3000×120)	12% Debn	360000	0.146	0.087	0.0127
(2000×90)	13% Debn	180000	0.073	0.091	0.0066
	RE	150000	0.061	0.1125	0.0069
		2460000	1.000		0.1109

WACC = 11.09%

(iii) MP of equity share at end of the current year.

$K_e = \frac{D_1}{P_0}$

mm → $P_1 = P_0(1+k_e) - D_1$
$= 25(1+0.12) - 3$
$= 28 - 3 = 25$

$P_0 = \frac{D_1}{K_e} = \frac{3}{0.12} = 25/-$

(iv) Assumptions of mm Hypothesis Theory.

(v) Calculation of Leverage.

Particulars	Amt
Sales	2000000
− VC	1200000
Contri	800000
− FC	500000
NPBIT	300000
− Int (36000 + 26000)	62000
NPBT	238000
− Tax @ 30%	71400
PAT	166600

$DOL = \frac{Contri}{NPBIT} = \frac{800000}{300000} = 2.67$

$DOF = \frac{NPBIT}{NPBT} = \frac{300000}{238000} = 1.26$

$DCL = DOL \times DFL = 2.67 \times 1.26$
$= 3.36$

(2) In the books of XYZ Ltd:

(i) $EPS = \frac{PAT.}{no.\ of\ eq.\ shares} = \frac{5040000}{2000000}$

$= Rs\ 2.52\ p.s.$

(ii) $K_e = \frac{EPS}{MP} = \frac{2.52}{12} \times 100 = \boxed{21\%}$

(iii) $K_d(BV) = \frac{Int(1-TR)}{P_0} = \frac{15(1-0.30)}{100}$

$= \boxed{10.5\%}$

(iv) $K_d(mv) = \frac{Int(1-TR)}{mp} = \frac{15(1-0.30)}{93.75}$

$= \boxed{11.20\%}$

COST OF CAPITAL

Cost of Debenture Capital – When Life is Given

Formula

$$K_d = \frac{I(1-T) + \frac{(MV-NP)}{n}}{\frac{(MV+NP)}{2}} \times 100$$

Where ,

- **I** = Annual Interest (Coupon Rate × Face Value)
- **NP** = Net Proceeds (Issue Price − Issue Expenses)
- **MV** = Maturity / Redemption Value
- **n** = Number of years (life of debenture)
- **T** = Tax rate

Important Notes

- Issued at Discount → reduces **NP**
- Issued at Premium → increases **NP**
- Issue Expenses → reduce **NP**
- Redeemed at Premium → increases **MV**
- Interest on debentures is tax-deductible, hence **after-tax cost is considered**

Illustration 1

Question

SK Company issued 10,000 ten-year 8% Debentures of ₹100 each at 4% discount.
Redeemable after 10 years at 5% premium.
Cost of issue = 2%, Tax rate = 50%.

Calculate Kd

Solution

Step 1: Annual Interest
I = 8% × 100 = ₹8

Step 2: Net Proceeds
Issue price = 100 − 4 = 96
Issue expenses = 2
NP = 96 − 2 = ₹94

Step 3: Maturity Value
MV = 100 + 5 = ₹105

Step 4: Apply Formula

$$K_d = \frac{8(1-0.5) + \frac{(105-94)}{10}}{\frac{(105+94)}{2}} \times 100$$
$$= \frac{4 + 1.1}{99.5} \times 100$$
$$= \frac{5.1}{99.5} \times 100 = 5.13\%$$

Final Answer

After-Tax Cost of Debenture = 5.13%

Illustration 2

Question

SK Company issued 1,000 10% Debentures of ₹100 each at 5% premium.
Maturity period = 10 years.
Cost of issue = 2%, Tax rate = 50%.

Calculate Kd

Solution

Step 1: Annual Interest
I = 10% × 100 = ₹10

Step 2: Net Proceeds
Issue price = 100 + 5 = 105
Issue expenses = 2
NP = 105 − 2 = ₹103

Step 3: Maturity Value
MV = ₹100

Step 4: Apply Formula

$$K_d = \frac{10(1-0.5) + \frac{(100-103)}{10}}{\frac{(100+103)}{2}} \times 100$$
$$= \frac{5 - 0.3}{101.5} \times 100$$
$$= \frac{4.7}{101.5} \times 100 = 4.63\%$$

Final Answer

After-Tax Cost of Debenture = 4.63%

Cost of Preference Capital – When Life is Given

When Life of Preference Shares is Given

Formula

$$K_p = \frac{D + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}}$$

Where ,

- **D** = Annual preference dividend

- **RV** = Redemption value
- **NP** = Net proceeds (issue price − flotation cost)
- **N** = Number of years (life of preference shares)

Illustration

A company issues preference shares with the following details:

- Face Value = ₹100
- Dividend Rate = 10%
- Net Proceeds (NP) = ₹95
- Redemption Value (RV) = ₹100
- Life (N) = 5 years

Step 1: Calculate Dividend

$$D = 10\% \text{ of } 100 = ₹10$$

Step 2: Apply Formula

$$K_p = \frac{10 + \frac{(100-95)}{5}}{\frac{(100+95)}{2}}$$

Step 3: Solution

$$\frac{(100-95)}{5} = 1$$
$$K_p = \frac{10+1}{97.5} = \frac{11}{97.5}$$
$$K_p = 11.28\%$$

Final Answer

Cost of Preference Shares (K_p) = 11.28%

Cost of Retained Earnings – When Personal Income Tax , Brokerage and Capital Gains Tax are Given

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Formula

$$K_r = \frac{\text{DPS} \times (1 - T_1) \times (1 - \text{B})}{\text{MP} \times (1 - T_2)}$$

Where,

- **DPS (Dividend per Share):** Income that shareholder would have received if profits were distributed
- **MP (Market Price):** Amount required to invest in shares
- **T_1 (Personal Income Tax):** Tax on dividend income
- **T_2 (Capital Gains Tax):** Tax on gains from investment
- **B (Brokerage):** Cost incurred while reinvesting

Explanation

If the company distributes profits:

1. The shareholder receives **dividend (DPS)**
2. Pays **personal income tax (T_1)** on dividend
3. Reinvests the amount and incurs **brokerage (B)**
4. Earns return, but on sale pays **capital gains tax (T_2)**

Therefore:

- The **actual income available** is reduced by **T_1 and B** → reflected in the numerator
- The **effective value of investment** is impacted by **capital gains tax (T_2)** → reflected in the denominator

---

Interpretation

$$K_r = \frac{\text{Net income available after dividend tax and brokerage}}{\text{Effective investment adjusted for capital gains tax}}$$

Conclusion

When both personal income tax and capital gains tax are given, cost of retained earnings is calculated by adjusting dividend for tax and brokerage, and investment for capital gains tax, to determine the true opportunity cost to shareholders.

Illustration

Cost of Reserves

Illustration

A company has the following data:

- **Dividend per share (DPS)** = ₹10
- **Market price per share (MP)** = ₹100
- **Personal income tax on dividend (T_1)** = 20%
- **Capital gains tax (T_2)** = 10%
- **Brokerage (B)** = 5%

Calculate the Cost of Retained Earnings (K_r).

Solution

Step 1: Apply Formula

$$K_r = \frac{DPS \times (1 - T_1) \times (1 - B)}{MP \times (1 - T_2)}$$

Step 2: Substitute Values

$$K_r = \frac{10 \times (1 - 0.20) \times (1 - 0.05)}{100 \times (1 - 0.10)}$$

Step 3: Solve

$$10 \times 0.80 \times 0.95 = 7.6$$

$$100 \times 0.90 = 90$$

Step 5: Final Calculation

$$K_r = \frac{7.6}{90} = 0.0844 = 8.44\%$$

Final Answer

Cost of Retained Earnings (K_r) = 8.44%

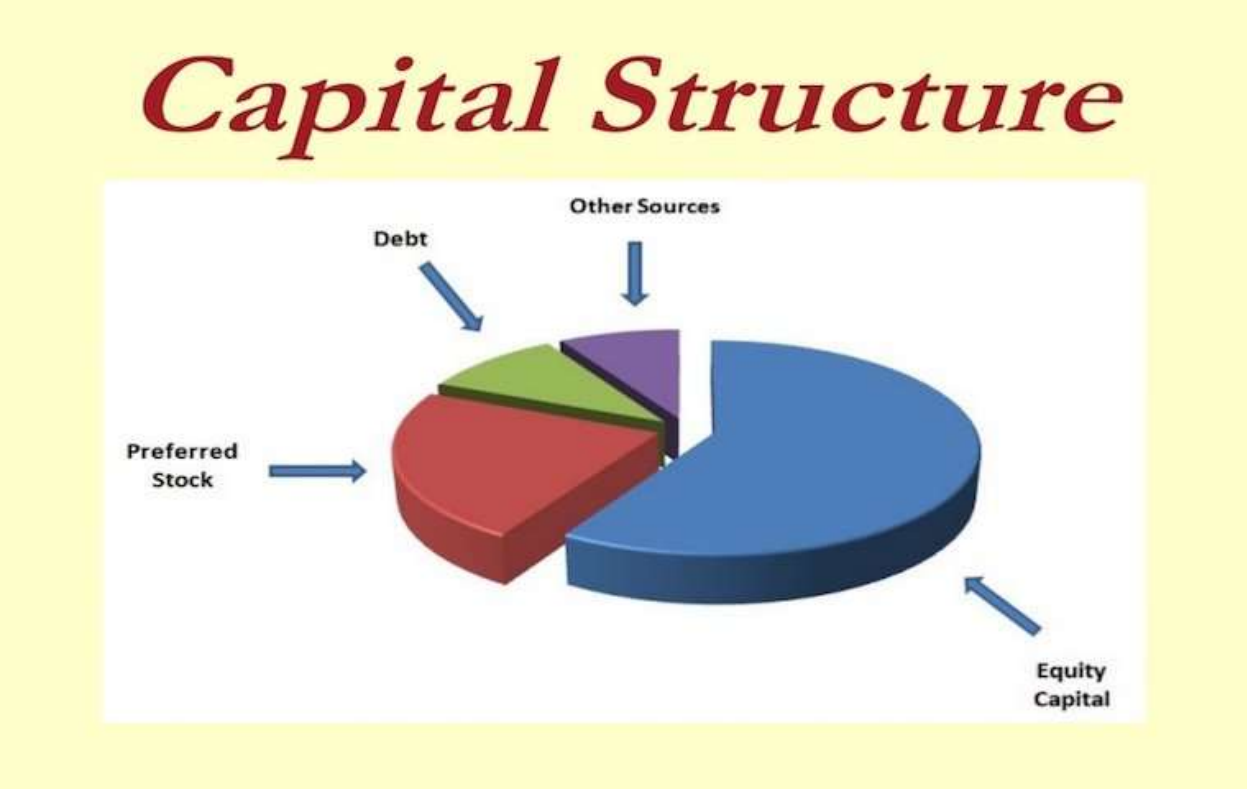
After adjusting for **dividend tax, brokerage, and capital gains tax**, the shareholder effectively earns **8.44%**, which becomes the **cost of retained earnings for the company**.

JAHANGIR TUTORIALS

Financial Management

By Prof. Fatema Kagalwala (CS, LLB, MCom)

CHAPTER 3 - CAPITAL STRUCTURE



Meaning of Capital Structure

- Capital structure means **the break-up of the capital employed by a firm.**
- The capital employed consists of both the owners' capital and the debt capital provided by the lenders.
- Capital Structure of a firm is a reflection of the overall investment and financing strategy of the firm.
- It shows how much reliance is being placed by the firm on external sources of finance and how much internal accruals are being used to finance expansions etc.

Various kinds of capital structure

1. Horizontal Capital Structure

- In a Horizontal capital structure, **the firm has zero debt** components in the structure mix.
- The structure is quite stable.
- Expansion of the firm takes in a lateral manner, i.e. through equity or retained earning only.
- The absence of debt results in the lack of financial leverage.
- **Probability of disturbance of the structure is remote.**

2. Vertical Capital Structure

- In a vertical capital structure, the base of the structure **is formed by a small amount of equity share capital.**
- This base serves as the foundation on which the super structure of preference share capital and debt is built.
- **The incremental addition in the capital structure is almost entirely in the form of debt.**
- Quantum of retained earnings is low and the dividend pay-out ratio is quite high.
- In such a structure, the **cost of equity capital is usually higher than the cost of debt.**
- The **high component of debt in the capital structure increases the financial risk of the firm and renders the structure unstable.**
- The firm, because of the **relatively lesser component of equity capital, is vulnerable to hostile takeovers.**

3. Pyramid shaped Capital structure

- A pyramid shaped capital structure **has a large proportion consisting of equity capital and retained earnings which have been ploughed back into the firm over a considerably large period of time.**
- The cost of share capital and the retained earnings of the firm is usually lower than the cost of debt.
- This structure is indicative of **risk averse conservative firms**.

4. Inverted Pyramid shaped Capital Structure
   - Such a capital structure has a small component of equity capital, reasonable level of retained earnings but an ever-increasing component of debt.
   - All the increases in the capital structure in the recent past have been made through debt only.
   - Such a capital structure is highly vulnerable to collapse.

Significant of capital structure

1. It reflects the firm's strategy
2. It is an indicator of the risk profile of the firm
3. It acts as a tax management tool
4. It helps to improve the image of the firm

OPTIMAL CAPITAL STRUCTURE

- Optimal capital structure is that mix of debt and equity which maximizes the value of the firm or minimizes the cost of capital.
- In other words, optimal capital structure is that mix of debt and equity at which the weighted average cost of capital, K, is minimized and the value of the firm is maximized.
- The term optimal capital structure means a particular arrangement of various components of the structure which is just in tune with the both the long term and short-term objectives of the firm.
- A combination less or more than the optimal combination would be less than satisfying.
- Hence a sub-optimal combination would affect the achievement of the goal of maximisation of the shareholders' wealth.
- An optimal capital structure is the best debt-to-equity ratio for a firm that maximizes its value.
- The optimal capital structure for a company is one which offers a balance between the ideal debt-to-equity range and minimizes the firm's cost of capital.
- In theory, debt financing generally offers the lowest cost of capital due to its tax deductibility. However, it is rarely the optimal structure since a company's risk generally increases as debt increases.
- The optimal capital structure is an ideal situation which can function as the benchmark of performance for a firm.
- For designing such a structure, one would need the following information:
  – The requirement of capital of the firm
  – Availability of different components
  – Cost of these components
  – Rate of return from investment

CAPITAL STRUCTURE THEORIES

There are basically three approaches to capital structure decision:

a. Net Income Approach
b. Net Operating Income Approach
c. Modigliani Miller Approach

EBIT - EPS Analysis

- One widely used to mean of examining the effect of leverage is to analyse the relationship between earnings before interest and taxes (EBIT) and earnings per share (EPS).
- The use of EBIT – EPS analysis indicates to management the projected EPS for different financial plans.
- Generally, management wants to maximise EPS if doing so also satisfies the primary goal of financial management - maximisation of the owner's wealth as represented by the value of business, i.e. the value of firm's equity.
- If the firm attempts to use excessive amounts of debt, shareholders who are risk - averters) may sell their shares, and thus its price will fall.
- While the use of large amount of debt may result in higher EPS, it may also result in a reduction in the price of the firm's equity.
- The optimum financial structure for a firm (that is, the use of debt in relationship of equity and retained earnings as sources of financing) should be the one which maximises the price of the equity.
- Thus, EBIT –EPS analysis is an effective method in analysing the effect of leverage.

Questions

In this topic, we evaluate

i. Various options to raise money and
ii. Select the option that gives the maximum benefit to equity shareholders.

Type 1

- ✓ Present capital structure will be given,
- ✓ Additional funds are to be raised,
- ✓ Choosing the correct option to raise funds
- ✓ i.e. whether from
    a) Equity or
    b) Debentures, or
    c) Preference share or
    d) Mixture of the above.

1. ABC ltd has equity capital of Rs. 5,00,000 (face value Rs. 100) [i.e. 5,000 equity shares currently].

   To meet the expenditure of an expansion programme,
   The company wishes to raise Rs. 3,00,000. It is having 4 alternatives sources to raise funds.
   Option:
   I. To have full money from equity shares and
   II. To have Rs. 1 lakh from equity and 2 lakhs from borrowings @10% p.a.
   III. Full money from borrowings @10% p.a.
   IV. Rs. 1 lakh in equity and 2 lakhs from preference shares @ 8% p.a.
   The company is having present NPBIT earnings of Rs. 1,50,000.
   Corporate tax rate @ 50%.
   Suggest suitable option to raise funds. The company wants the same return as earlier.

Answer:

EPS as per option I is Rs.15 per share
EPS as per option II is Rs.18.33 per share
EPS as per option III is Rs.21 per share
EPS as per option IV is Rs.17.33 per share

Type 2

EBIT-EPS Indifference Point

It is that level of EBIT where EPS would remain same.

Formula

EPS 1 = EPS 2

$$\frac{(EBIT - Int)(1\text{-}tax) - Pd}{n} = \frac{(EBIT - Int)(1\text{-}tax) - Pd}{n}$$

2. A new project requires capital outlet of Rs. 300 lakhs.The required funds can be raised either by
   i.) Fully by equity shares of Rs. 100 each or
   ii.) Equity shares of value of Rs. 200 lakhs @ 100 each and by loan of Rs. 100 lakhs @15% Interest.
   Tax rate 50%.
   Calculate the figure of profit before tax, that would keep equity investors indifferent to the two options.
   Verify your answer by calculating EPS.

Answer: EBIT is RS 45,00,000

Market Value of Firm (MVf)

These theories specified by different authors has 3 common assumptions:

i.) No Tax
ii.) No Growth
iii.) Only 2 sources:
   a. Debt and
   b. Equity.

Mvf = MVe+ MVd

$$Mvf = \frac{\text{Np for Equity}}{Ke} + \frac{\text{Total Interest}}{Kd}$$

$$\text{And } Ko = \frac{EBIT}{Mvf}$$

3. Assuming No Tax,
   Interest Kd = 12.5%
   Calculate MV of the firm A, B, C and D from the following data:

Firm	EBIT	Interest	Equity Capitalization rate
A	3,00,000	30,000	12%
B	4,00,000	70,000	15%
C	6,00,000	3,00,000	15%
D	7,00,000	3,40,000	18%

Also, determine the weighted cost of capital of each firm.

Answers: Market Value of A is 24,90,000, of B is 27,60,000 of C is 44,00,000 and of D is 47,20,000

WACC or Ko of A is 12.048%, B is 14.49%, C is 13.64% and D is 14.83%

Type

Market Value of Firm (MVf) As Per Net Income Approach and Net Operating Approach and other models.

4. Company X and Company Y are in the same risk class and identical in all aspects except that Company X uses debt while Company Y does not.
   Levered Company has Rs. 9 lakhs debentures carrying 10% rate of Interest.
   Each company earns 20% before interest and taxes on their total Assets of Rs. 18 lakhs.
   Tax @ 50%.
   Ke is an all-equity company is 18%.
   Calculate Value of Both Companies As per NOI and NI approach.

Answers:

As per NOI approach Market Value of X is Rs.20,00,000 and Market Value of Y is Rs.20,00,000

As per NI Approach Market Value of X is Rs.24,00,000 and Market Value of Y is Rs.20,00,000

PAST EXAM QUESTION

Dec-2024

Q.1 Metadex Ltd. is a clean-tech start-up focused on affordable solar energy solutions for urban households. Founded by two engineers, Amit and Sumit, in 2021, the company developed a new solar panel design that is highly efficient and affordable. The journey begins with Amit, an engineer working in a traditional energy company. For years, Amit had seen the damaging environmental impact of fossil fuels and the inefficiency of the power grid. Concerned about climate change and driven by the desire to make a difference, he started researching alternative energy solutions. Solar energy stood out as an abundant and clean source of power that remained underutilized, especially in underserved communities. In 2020, Amit quit his job and partnered with his college friend—Sumit, an expert in renewable energy policy and a software engineer. Their vision is to revolutionize the energy industry by making solar power accessible to middle-income families across the globe.

Starting the company was tough. The team faced numerous challenges, including high upfront costs for solar panels, stiff competition from larger energy companies, and difficulties in navigating government regulations. They initially struggled to secure funding, as many investors were sceptical of renewable energy start-up, thinking the market was oversaturated or too slow to provide returns.

Early-stage solar hardware companies often require significant capital for research, development, and manufacturing, making it a tough sell to investors looking for faster returns. The company navigated through the initial stages of challenges. They developed a robust marketing plan to target eco-conscious communities, partnering with influencers in the sustainability space and running ads on social media. The team scaled their operations by working with local solar panel manufacturers, reducing costs, and creating jobs in the communities they served.

Currently in the expansion process, Metadex needed around ₹15 lacs to scale up production and penetrate further in the market. Amit and Sumit decided to explore alternative fundraising options that would allow them to keep control of their company and align with their longterm vision.

The firm's condensed Balance sheet for the current year is as follows :

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Share Capital (₹10)	8,00,000	Fixed Assets	9,00,000
Reserves & surplus	₹ 2,00,000	Current Assets	6,00,000
10% Debentures of ₹100 each	4,00,000		
Current Liabilities	1,00,000		
Total	15,00,000	Total	15,00,000

Currently Earnings Before Interest and Tax (EBIT) = ₹8,00,000. Tax Rate 50%. Current Market Price per equity share ₹25, market value of debt equals its book value and cost of equity is 14%.

The financial advisors of Metadex Ltd. is assigned the task to calculate :

(i) the value of the firm and overall cost of capital before infusion of funds.

(ii) the Economic Value Added and Market Value Added.

The company has proposed to issue 8% 5000 Preference shares of ` 100 each and for the balance ₹ 10 lacs, it is considering two alternatives.

Alternative 1 : Raise 90% of funds required by issuing equity shares at current market price and the remaining by issuing 8% redeemable Debentures of ₹ 100 at par.

Alternative 2 : Raise 80% of the funds by issuing 9% Debentures of ₹ 100 at par and redeemable at a premium of 10% after 10 years and the balance by issuing Equity shares at 33.3333% premium.

Again, the financial advisor is asked to :

(i) Draft the final Capital Structure

(ii) Calculate the Earnings Per Share and Financial Leverage. (20 Marks)

Dec-2024

Q.2 A company has an EBIT of ₹ 10,00,00,000 and belongs to a risk class of 15% i.e., its overall cost of capital is 15%. What is the cost of equity capital if it employs 10% debt to the extent of 30%, 40% or 50% of total capital of ₹ 50,00,00,000/- Assume net operating income approach applies.

(5 Marks)

Q.3 -June 2025

A new project requires outlay of Rs.800 lakhs. The amount maybe raised through issue of equity shares of ` 400 each or by issuing equity shares of value Rs.600 lakhs and loan of Rs.200 lakhs at 14% interest.

Assuming income tax rate at 25%, calculate EBIT levels that would keep equity investors indifferent to the two options. (5Marks)

LESSON — CAPITAL STRUCTURE

(1) What is Capital Structure?

↓

it is the Capital Employed

↓ CE.

↓

Break-up of CE

↓

eg — Rs 50 Lakhs is CE

↓ ↓ ↓

Equity → 25 lacs

PSC → 5 lacs

Debenture → 20 lacs.

(2) Whether this structure is **optimal** to give better EPS or Market Price

↓

investors are happy.

↓

it will also stabilise PE ratio.

(3) For EPS → Income Statement is needed.

NPBIT *	xx
− Int	(xx)
NPBT	xx
− Tax	(xx)
NPAT	xx
− Pref. Div	(xx)
NP for ESHs	xx
÷	
÷ no. of eq. Shares	xx
EPS →	xx

(4)

	CE	NPBIT	ROCE
(i) Existing	11ac	10000	NPBIT / CE × 100
	+		
	11ac.		= 10%
(ii) Revised	2lacs.	* 20000	10%
			↓
			ROCE remains the same.

TYPE : 1

Q.1

Particulars	Option I	Option II	Option III	Option IV
Revised NPBIT	240000	240000	240000	240000
- Interest	-	- 20000	- 30000	-
NPBT	240000	220000	210000	240000
- Tax @ 50%	-120000	-110000	-105000	-120000
NPAT	120000	110000	105000	120000
- Pref. Divid	-	-	-	-16000
NP for ESHs	120000	110000	105000	104000
No. of eq. Shrs	8000 (5000+3000)	6000 (5000+1000)	5000	6000 (5000+1000)
∴ EPS	Rs 15/-	Rs 18.33/-	Rs 21/-	Rs 17.33/-
	3lac only equity	11ac equity 21ac debt	3lac only debt	11ac equity 21ac PSC

∴ Option III must be selected since EPS is highest.

	Capital Empl.	NPBIT	ROCE
Present	500000	150000	30%
			↓
Revised	800000	240000	30%

$$ROCE = \frac{NPBIT}{CE}$$

$$30\% = \frac{NPBIT}{800000}$$

∴ NPBIT = 240000

Type 2 – EBIT-EPS Indifference Point.

Q.5 The investors will be indifferent to the two options when, ~~EPS~~

EPS of Option 1 = EPS of option 2

(Equity) (Loan).

$$\frac{(EBIT - Int)(1 - TR) - Pd}{n} = \frac{(EBIT - Int)(1 - TR) - PD}{n}$$

$$\frac{(EBIT - 0)(1 - 0.50) - 0}{3\ lacs} = \frac{(EBIT - 15,00,000)(1 - 0.50) - 0}{2\ lacs}$$

$$\frac{0.50\,EBIT}{300000} = \frac{0.50\,EBIT - 750000}{200000}$$

$$\frac{0.50\,EBIT}{300000} \times 200000 = 0.50\,EBIT - 750000$$

$$2 \times 0.50\,EBIT = 3(0.50\,EBIT - 750000)$$

$$1\,EBIT = 1.5\,EBIT - 2250000$$

$$2250000 = 1.5\,EBIT - 1\,EBIT$$

$$\frac{2250000}{0.5} = EBIT$$

$$\therefore \boxed{EBIT = 4500000}$$

Type 4 — Market value of Firm.

$$Mvf = Mve + Mvd$$

$$\downarrow$$

$$\frac{\text{NP for Equity}}{Ke} + \frac{\text{Total Interest}}{Kd}$$

$$Ko = \frac{EBIT}{Mvf.}$$

Q.10

Particulars	A	B	C	D.
NBIT	300000	400000	600000	700000
− Interest	−30000	−70000	−300000	−340000
NP for ESHs	270000	330000	300000	360000
Ke	12%	15%	15%	18%
Mve	2250000	22,00,000	20,00,000	20,00,000
Kd	12.5%	12.5%	12.5%	12.5%
Mvd	24,0000	560000	24,00000	27,20,000
Mvf (Total) (mve + mvd)	24,90,000	27,60,000	44,00,000	47,20,000
$Ko = \frac{NPBIT}{mvf} \times 100$	12.048%	14.49%	13.64%	14.83%

Q.13 (a) NOI Approach → K_o is constant

Particulars	Co. X (Levered)	Co. Y (Equity)
Debt	900000 @10%	–
Equity	900000	18,00,000
	18,00,000	1800000
NPBIT [20% of 18 Lacs]	360000	360000
– Interest	–90000	–
NP for ESHs	270000	360000
$K_e = \frac{\text{NP for ESHs}}{\text{Mve}}$	24.54%	18%
Mve = Mvf – Mvd	11,00,000	20,00,000
K_d	10%	~~10%~~
Mvd	900000	–
$Mvf = \frac{\text{NPBIT}}{K_o}$	20,00,000	20,00,000
K_o	18%	18%

(b) Net Income Approach — NI — Ke is constant.

Particulars	Co. X (Levered)	Co. Y (Equity)
Debt	900000 @10%	—
Equity	900000	1800000
	1800000	1800000
NPBIT [20% of 18lacs]	360000	360000
− Interest	− 90000	—
NP for ESHs	270000	360000
Ke	18%	18%
Mve = NP for ESHs / Ke	15,00,000	20,00,000
Kd	10%	—
Mvd	9,00,000	~~2000000~~
Mvf = Mve + Mvd	24,00,000	20,00,000
Ko = NPBIT / Mvf	15%	18%

CAPITAL STRUCTURE
PAST EXAM QUESTIONS.

1. In the books of Metadex Ltd.

(i)

Particulars	Working	Amt.
EBIT		800000
Less: Interest	10% on 400000	40000
PBT		760000
Less: Tax @ 50%		380000
PAT (Shareholder's earnings)		380000
Market value of equity Mve	PAT / Ke	2714286
Market value of debt Mvd	Interest. / kd	400000
Mvf	Mve + Mvd	3114286
K_o = EBIT. / Mvf.	800000 / 3114286 x 100	25.69%

(ii) Economic Value Added (EVA)

= NOPAT − (WACC × CE)

Capital Employed = Fixed Asset + Working Capital

= 900000 + 500000

= 1400000

EVA = 380000 − (25.69% × 1400000)

= 380000 − 359660

= 20340.

Market Value Added (MVA)

= MV of equity shares

Less : Total Shareholders equity

XX

Add : MV of Debt.

Less : BV of Debt.

MV of ES	= 80000 × 25 =	2000000
Total SH E	= 800000 + 200000 =	(1000000)
	↓ R&S.	10,00,000
+ MV of Debt		400000.
− BV of Debt		− 400000
MVA.	⇒	1000000.

5 (iii) Capital Structure Plans.

Capital	Alternative I	Alternative II
Equity Share Capital (WN-1)	1160000	950000
8% Pref. Shares (Rs 100)	500000	500000
Reserves & Surplus (WN-2)	740000	250000
10% Redeemable Deben (Rs 100)	400000	400000
8% Debentures (Rs 100)	100000	–
9% Debentures (Rs 100)	–	800000
Total.	2900000	2900000

WN-1 : ESCapital → Alt I

existing = 800000

Fresh issue = 360000 → 900000 / 25 = 36000 shares of Rs 10 each.

1160000

WN-2 : ~~R&S~~ ESCap – Alt – II

existing = 800000

Fresh Issue = ~~150~~000 → 200000 / 13.33 = 15000 shares of Rs 10 each.

950000

WN 2 : R&S – Alt I.		Alt II	
Existing =	200000	Existing =	200000
+ Fresh SP =	540000 (36000 × 15)	Fresh SP = (15000 × 3.33..)	50000
	740000.		250000

(iv) Financial Leverage

Particulars	Alt I	Alt II
NPBIT.	800000	800000
Less: Interest (WN)	48000	112,000
NPBT	752000	688000
Less: Tax @ 50%	376000	344000
PAT	376000	344000
Less: Pref. Dividend	40000	40000
(A) Earnings avail for EShs	336000	304000
(B) No. of equity shares (WN)	116000	95000
EPS = A / B.	2.90	3.20
Fin. Leverage = NPBIT / NPBT. ↓ w/o Pref Div.	1.06	1.16
Fin. Lev. with Pref. dividend		
~~NPBIT / NPBT. — Pref Div. / (1-t). / 1.06~~	~~1.06~~	
NPBIT. / NPBT − Pref Div / 1-TR.	1.19	1.32

WN1 → Int Alt I = 10% on 400000 = 40000
+ 8% on 100000 = 8000 48000

Int Alt II = 10% on 400000 = 40000
+ 9% on 800000 = 72000 112000

2. Calculation of Cost of equity share capital based on Net operating Income Approach.

Particulars	Level of Debt Capital		
	30%	40%	50%
NPBIT (A)	10,00,00,000	10,00,00,000	10,00,00,000
K_o	15%	15%	15%
Value of firm $V = \frac{EBIT}{K_o}$	66,66,66,667	66,66,66,667	66,66,66,667
Total Capital	50,00,00,000	50,00,00,000	50,00,00,000
Value of Debt (D)	15,00,00,000	20,00,00,000	25,00,00,000
Value of equity ($E = V - D$)	51,66,66,667	46,66,66,667	41,66,66,667
Interest rate	10%	10%	10%
Interest Debt (B)	1,50,00,000	2,00,00,000	2,50,00,000
NP avail for ESHs. (A-B)	8,50,00,000	8,00,00,000	7,50,00,000
$K_e = \frac{NP \text{ for ESHs}}{\text{value of equity}}$	16.45%	17.14%	18.00%

CAPITAL STRUCTURE – PAST EXAM QUESTIONS

Q.3. Formula: Indifference Point.

$$\frac{(EBIT - Int)(1-TR) - Pd}{\text{no. of eq. shares}} = \frac{(EBIT - Int)(1-TR) - Pd}{\text{no. of eq. shares}}$$

Plan I = Plan II

Plan I	Plan II
= Rs 800 Lakhs ES capital. Rs 400 per share.	Rs 600 Lakhs as ES capital – Rs 400 p. share
∴ no. of shares = 200000	∴ no. of shares = 150000
	Loan amount = 200 lakhs @ 14% ∴ Int = 28 lakhs.
TR = 25%	

$$\frac{(EBIT - 0)(1-0.25)}{2} = \frac{(EBIT - 28)(1-0.25)}{1.5}$$

$$\frac{EBIT - 0.25EBIT}{2} = \frac{0.75EBIT - 21}{1.5}$$

$$1.5\,(0.75\,EBIT) = 2\,(0.75EBIT - 21)$$

$$1.125\,EBIT = 1.5EBIT - 42.$$

$$1.125EBIT - 1.5EBIT = -42$$

$$-0.375\,EBIT = -42$$

$$EBIT = \frac{42}{0.375}$$

$$\boxed{EBIT = 112 \text{ lakhs.}}$$

EVA AND MVA

ECONOMIC VALUE ADDED (EVA)

Meaning:
Economic Value Added (EVA) is a measure of **real economic profit**. It shows whether a company is generating returns **higher than its cost of capital**.

In simple terms:
It indicates **value created for shareholders** after covering the full cost of funds (both debt and equity).

Formula of EVA

Economic Value Added (EVA) – Formula

EVA = NOPAT − (Cost of Capital × Capital Employed)

Where:

- **NOPAT (Net Operating Profit After Tax)**
  = Operating Profit after tax (before interest)
- **Cost of Capital**
  = Weighted Average Cost of Capital (WACC)
- **Capital Employed**
  = Total funds invested in business

(Capital Employed = Equity Share Capital + Preference Share Capital + Reserves & Surplus + Long-term Debt)

Alternatively :

Capital Employed = Total Assets − Current Liabilities

Interpretation

- **EVA > 0:** Value is created
- **EVA = 0:** No value created (just covering cost)
- **EVA < 0:** Value destroyed

BALANCE SHEET

Balance Sheet of _____ Ltd. as on _____

Liabilities	**Amount (₹)**	**Assets**	**Amount (₹)**
Equity Share Capital	XX	Fixed Assets	XX
Reserves & Surplus	XX	Current Assets	XX
Debentures	XX		
Current Liabilities	XX		
Total	XXX	**Total**	XXX

Capital Employed

Meaning
Capital Employed includes **only long-term funds** so **Current Liabilities are excluded**.

Computation of Capital Employed

Capital Employed (Liability Approach)
Capital Employed = Equity Share Capital + Reserves & Surplus + Debentures − Current Liabilities

---

Capital Employed (Asset Approach)
Capital Employed = Fixed Assets + (Current Assets − Current Liabilities)

or

Capital Employed = Fixed Assets + Working Capital

Working Capital (WC)
Working Capital = Current Assets − Current Liabilities

Conclusion
Capital Employed includes **only long-term funds**, therefore **Current Liabilities are excluded**.

Illustration

XYZ Ltd. has the following financial information:

- **Earnings Before Interest and Tax (EBIT):** ₹ 6,00,000
- **Tax Rate:** 40%
- **Equity Share Capital:** ₹ 5,00,000
- **Reserves & Surplus:** ₹ 2,00,000
- **Preference Share Capital:** ₹ 1,00,000
- **Long-term Debt:** ₹ 2,00,000
- **Weighted Average Cost of Capital (WACC):** 12%

Calculate **Economic Value Added (EVA)**.

Solution

Formula:

EVA = NOPAT − (Cost of Capital × Capital Employed)

Working Notes (WN)

WN 1: Calculation of NOPAT

NOPAT = EBIT × (1 − Tax Rate)
= ₹ 6,00,000 × (1 − 0.40)
= ₹ 6,00,000 × 0.60
= **₹ 3,60,000**

WN 2: Calculation of Capital Employed

Capital Employed = Equity + Preference + Reserves + Debt

= ₹ 5,00,000 + ₹ 1,00,000 + ₹ 2,00,000 + ₹ 2,00,000
= **₹ 10,00,000**

WN 3: Capital Charge

Capital Charge = WACC × Capital Employed

= 12% × ₹ 10,00,000
= **₹ 1,20,000**

Calculation

EVA = ₹ 3,60,000 − ₹ 1,20,000
= ₹ 2,40,000

Final Answer

Economic Value Added (EVA) = ₹ 2,40,000

Interpretation

Since **EVA > 0**, the company is **generating returns higher than its cost of capital**, thereby **creating value for shareholders**.

MARKET VALUE ADDED (MVA)

Meaning
Market Value Added (MVA) represents the **total wealth created for shareholders since inception of the company**.
It measures the difference between the **market value of the firm** and its **book value (capital invested)**.

Formula
MVA = Market Value of Company − Book Value of Company

---

1. Market Value of Company (MV of Co.)
MV = Market Value of Equity + Market Value of Preference Shares + Market Value of Debt

Where:

Market Value of Equity
= Number of Shares × Market Price per Share

Market Value of Preference Shares
= Market Price of Preference Shares × Number of Preference Shares
(If not given, take Book Value of Preference Shares)

Market Value of Debt
= Market Price of Debt × Number of Debentures
(If not given, take Book Value of Debt)

---

2. Book Value of Company (BV of Co.)
BV = Equity Share Capital + Preference Share Capital + Reserves & Surplus + Debt

Where:

Book Value of Equity
= Share Capital + Reserves & Surplus

Book Value of Preference Shares
= Preference Share Capital (as per Balance Sheet)

Book Value of Debt
= Debentures / Loans (as per Balance Sheet)

Interpretation
MVA > 0: Company has **created wealth for investors**

MVA = 0: Company has **just covered invested capital**
MVA < 0: Company has **destroyed investor wealth**

Conclusion
MVA shows whether the company's **market value exceeds the total capital invested**, including **equity, preference share capital, reserves, and debt**, thereby indicating **long-term shareholder value creation**.

Illustration

ABC Ltd. has the following financial information:

- Equity Share Capital (₹10 each): ₹ 5,00,000
- Reserves & Surplus: ₹ 2,00,000
- 10% Debentures: ₹ 3,00,000
- Number of Equity Shares: 50,000
- Current Market Price per Share: ₹ 20
- Market value of debt is equal to its book value

Required:

Calculate **Market Value Added (MVA)**.

Solution

Formula:

MVA = Market Value of Company − Book Value of Company

Working Notes (WN)

WN 1: Market Value of Company (MV)

Market Value of Equity
= 50,000 × ₹20
= **₹ 10,00,000**

Market Value of Debt
= ₹ 3,00,000

Total Market Value (MV)
= ₹ 10,00,000 + ₹ 3,00,000
= **₹ 13,00,000**

WN 2: Book Value of Company (BV)

Equity Share Capital = ₹ 5,00,000
Reserves & Surplus = ₹ 2,00,000
Debt = ₹ 3,00,000

Total Book Value (BV)
= ₹ 5,00,000 + ₹ 2,00,000 + ₹ 3,00,000
= **₹ 10,00,000**

Calculation

MVA = ₹ 13,00,000 − ₹ 10,00,000
= **₹ 3,00,000**

Final Answer

Market Value Added (MVA) = ₹ 3,00,000

Interpretation

Since MVA is positive, the company has **created wealth for shareholders**.

CAPITAL BUDGETING
REVISION SOLUTIONS

Q1. Machine Cost = 50000

(*) Method I : Inflow Outflow method.

Total inflow - outflow
(30000 x 3) - 50000
90000 - 50000 = 40000 → Net Profit

Rule: Accept the project as NP is positive.

(*) method II. : Payback Period (PBP).

Year	Inflow	Cumulative
1	30000	30000
2	30000	60000
3	30000	90000

Initial Investment = 50000
(-) Recd in 1st year = (30000)
Bal in 2nd year = 20000

30000 - 12ms = 8ms. PBP = 1yr 8ms
20000 - ?

Rule: If it falls within the PBP stated by management → accept the project.

(*) Method III B : Benefit Cost Ratio.

$$BCR = \frac{\text{Inflow}}{\text{Outflow}} = \frac{90000}{50000} = 1.8 \text{ times}$$

Rule: BCR > 1 → accept the project.

(*) NPV Method: Net Present Value.

In this method of inflows & outflows will be brought to their present values & then decision will be taken.

PV_0 = Rs 50000 $\quad \frac{1}{1.10} = = = \quad (1+10\% = 1.1)$

↓

Year	Inflow	Prf @ 10%	Pv Inflow
1	30000	0.9091	27273
2	30000	0.8264	24792
3	30000	0.7513	22539
			74604

Total PV Inflow - PV_0

74604 − 50000

= 24604.

Since NP is positive, accept the project.

(*) Discounted Payback Period

Year	Inflow	Cumulative
1	27273	27273
2	24792	52065
3	22539	74604

Initial investment = 50000
- Recd in 1st year = (27273)
Bal. in 2nd year = 22727

24792 — 12ms
22727 — ? 11 months.

∴ PBP = 1 year 11 months.

(*) Profitability Index

$$\frac{\text{Pv Inflow}}{\text{Pv Outflow}} = \frac{74604}{50000}$$

= 1.493 times.

Q.2. Total outflow = PM = 10 lacs.
+ WC = 2 lacs.
12 lacs.

Cash flow before tax (CFBT) = Sales
- Expenses.
XX.

Year	Qty.	SP(@100)	VC@50	FC	CFBT
1	5000	500000	250000	20000	230000
2	8000	800000	400000	20000	380000
3	10000	1000000	500000	20000	480000
4	12000	1200000	600000	20000	580000

Bal. Tax 20%.

Year	CFBT (80%)	Depn (20%)	CFAT	Disc@10%	Pv Inflow
1	230000	200000	224000	0.9091	203638
2	380000	200000	344000	0.8264	284281
3	480000	200000	424000	0.7513	318551
4	580000	200000	504000	0.6830	344232
		Sale	280000	0.6830	191240
		WC	200000	0.6830	136600
				Total =	1478,542

Total Inflow for 4th year
Inflow + Sale + WC = 672072

WN for Depreciation.

Cost of P&M = 10,00,000 × 20%.
= 200000 p.a.

WN for Sale of P&M.

Cost of P&M	=	10,00,000
(-) Depn (4 yrs)	=	(800000)
WDV	=	200000
(-) Sale value	=	(3 00000)
Profit	=	100000

Profit tax @ 20% = 20000.

∴ Amt actual recd on Sale of P&M
= 300000 − 20000
= 280000

NPV = Inflow − Outflow
= 1478542 − 1200000
= 278542.

Since NPV is positive, we will accept the project.

Q.3. Pv Outflow = $350000 \cdot \frac{1}{1.08}$

Year	CFAT	Pvf@8%	Pv Inflow
1			
2	100000	3.3121	331210.
3			
4			

331210 Inflow

∴ NPV = −350000 Outflow

(18790)

IRR : Internal Rate of Return is that Pv factor @ which NPV = 0.

Step 1 : max 2% can be taken.

Step 2 : Obtain one positive NPV & one negative NPV.

Pv factor @ 6%

Year	CFAT	Pv @6%	Pv Inflow
1			
2	100000	3.4651	346510
3			
4			

NPV = 346510 − 350000 = (3490)

Pv factor @4%

Year	CFAT	Pvf@4%	Pv Inflow
1			
2	100000	3.6299	362990
3			
4			

NPV = 362990 − 350000 = 12990

Pvf		Amt
2↓		16480 (3490 + 12990)
?		3490

$$\frac{3490 \times 2}{16480} = 0.423$$

6% − 0.423 = 5.577%

Q.4. Pv Outflow = 500000 + 100000 (wc)

= 600000

Depn = $\frac{500000 - WDV}{\text{no. of yrs.}}$

= $\frac{500000 - 50000}{5}$

= $\frac{450000}{5}$ = 90000

∴ Tax benefit on Dep = 90000 x 40%

= 36000

Year	Revenue	Rent	CFBT.
1	315000	12000	303000
2	182000	12000	170000
3	136000	12000	124000
4	185000	12000	173000
5	192000	12000	180000

Rent of premises = 1000pm x 12

= 12000.

Years	CFBT @60%	Depn @40%	CFAT	Pvf. @12%	PVCFAT
1	303000	36000	217800	0.8929	194474
2	170000	36000	138000	0.7972	110114
3	124000	36000	110400	0.7118	78583
4	173000	36000	139800	0.6355	88843
5	180000	36000	144000	0.5674	81706
		Sale (Asset)	50000	0.5674	28370
		WC	100000	0.5674	56740
				Total	638730

(A) NPV → Total Inflow = 638730

(-) Outflow = -600000

(A) NPV = 38730

(*) WN for sale of asset

Cost of asset = 500000

(-) Dep (5 yrs) = -450000

WDV = 50000

∴ Sale = 50000

Profit/Loss = 0

(B) Payback Period:

Year	CFAT	Cumulative CFAT
1	217800	217800
2	138000	355800
3	110400	466200
4	139800	606000
5	144000	900000
	+ 100000	
	+ 50000	

Initial Investment 600000
(-) Recd in 3rd yr (cum.) -466200
Bal recd in 4th yr = 133800

4th yr → 139800 — 12
133800 — ? → $\frac{133800 \times 12}{139800}$

3 years + 11.48 months

C] Discounted Payback Period.

Initial Investment 600000
(-) Recd in ~~4th~~ years -(471914)
bal recd in 5th year = 128086.

166816 — 12ms = 9.214ms
128086 — ?

4 years + 9.2 ms.

D] Profitability Index = $\frac{\text{Pv Inflow}}{\text{Pv Outflow}}$

$= \frac{638730}{600000}$

$= \boxed{1.0645 \text{ times}}$

E] IRR - Internal rate of return.

Year	CFAT	Pvf @14%.	Pv Inflow @14%.	Pvf @16%.	Pv Inflow @16%.
1	217800	0.8772	191054	0.8621	187765
2	138000	0.7695	106191	0.7432	102562
3	110400	0.6750	74520	0.6407	70733
4	139800	0.5921	82775	0.5523	77212
5	144000	0.5194	74794	0.4761	68558
WC	100000	0.5194	51940	0.4761	47610
Sales	50000	0.5194	25970	0.4761	23805
			607244		578245.

NPV @ 14% = 607244 - 600000 = 7244.

NPV @ 16% = 578245 - 600000 = (21755).

Pvfactor		Diff.	
2% ↑	X	↓ 29000	[7244 + 21755].
?		↑ 7244	

$\frac{7244 \times 2}{29000} = 0.4996.$

$\therefore$ IRR = 14 + 0.4996 *

$= \boxed{14.4996\%}$

PAST EXAM QUESTIONS.

Q.1 Option M.

Year	Cash Inflow	Puf @ 15%	Pv Inflow
1	152000	0.870	132240
2	236000	0.756	178416
3	700000	0.658	460600
4	500000	0.572	286000
5	357000	0.497	177429
		Total	1234685

NPV = 1234685 − 1500000 = −265315

Option N.

Year	Cash in flow	Puf @ 19%	Pv Inflow
1	345000	0.840	289800
2	725000	0.706	511850
3	800000	0.593	474400
4	300000	0.499	149700
5	1000000	0.419	419000
		Total =	1844750

NPV = 1844750 − 1500000 = 344750.

Due to higher NPV in option N — investor will prefer option N.

Q.2.

Equipement A.

NPV = Cash inflow x Pvf @11% - Outflow
= 20000 (4.231) - 75000
= 84620 - 75000
= Rs 9620.

Profitability Index = $\frac{\text{Pv Inflow}}{\text{Outflow}}$
= $\frac{84620}{75000}$
= 1.128

Equipement B.

NPV = Cash Inflow x Pvf @11% - Outflow
= (14000 x 4.231) - 50000
= 59234 - 50000
= Rs 9234

Profitability Index = $\frac{\text{Pv Inflow}}{\text{Outflow}}$
= $\frac{59234}{50000}$
= 1.185

NPV of A is to be preferred over B, but as per PI Project B is preferred. If firm has 75000 funds to invest - then project A should be adopted. this will increase the shareholder wealth to extent of Rs 9620 instead of Rs 9234 of project B.

(i) Pv Outflow = 5,75,00,000/-

(ii) Appropriate Discount rate is:

Acceptable return = 15%.

+Risk premium = 3%.

18%.

(iii) Calculation of NPV.

Year	Cash Inflow	DCF@18%.	Pv Inflow.
1	1,75,00,000	0.85	1,48,75,000
2	1,95,00,000	0.72	1,40,40,000
3	1,90,00,000	0.61	1,15,90,000
4	2,85,00,000	0.52	1,48,20,000
5	2,40,00,000	0.44	1,05,60,000
		Total =	6,58,85,000

∴ NPV = Pv Inflow - Pv Outflow

= 65885000 - 57500000

= 8385000/-

Since the project has positive NPV of 8385000/- project can be accepted.

Date ____
Page ____

(iv) Pay Back Period.

Year	Cash Inflow	Cum. Cash Inflow
1	17500000	17500000
2	19500000	37000000
3	19000000	56000000
4	28500000	84500000
5	24000000	108500000

Initial Investment = 57500000
(-) Recd in 3yrs = -56000000
Bal in 4th year. 1500000

~~12m~~ 1 year × 28,500,000 = 0.52
? 15,00000

∴ Payback Period = 3.05 years

(v) Post Payback Profitability = Total cash Inflow − Investment Outflow

= 108500000 − 57500000
= 5,10,00,000

(vi) Post Payback Profitability Index = $\frac{\text{Post Payback Profitability}}{\text{Investment Outlay}}$

= $\frac{51000000}{57500000} \times 100$

= 88.70%

(vii) Discounted Payback Period:

Year	Pv Inflow	Cum. Pv Inflow
1	14875000	14875000
2	14040000	28915000
3	11590000	40505000
4	14820000	55325000
5	10560000	65885000.

Initial Investment = 57500000
(-) Recd in 4th yr = -55325000
Bal in 5th year 21,75,000

1yr — 10560000 = 0.21
? 21750000

∴ Discounted PBP = 4.21 years.

NPV of the Government project with application of certainty eo-efficients.

Year	Cash Inflow	Cov	Certain Cflows	Pvf @15%	Pv Inflow
1	17500000	0.9	15750000	0.87	13702500
2	19500000	0.88	17160000	0.76	13041600
3	19000000	0.85	16150000	0.66	10659000
4	28500000	0.81	23085000	0.57	13158450
5	24000000	0.65	15600000	0.50	7800000
			Total Pv Inflow =		58361550

∴ NPV = Pv Inflow − Pv Outflow

= 58361550 − 57500000

= 861550

As the NPV is yet positive, project can be accepted.

JAHANGIR TUTORIALS

Financial Management

By Prof. Fatema Kagalwala (CS, LLB, MCom)

CAPITAL BUDGETING

Introduction

It is a planning for capital assets with the object of minimizing cost and maximization of profits. Since these decisions have a long-term implication and involve large amount of funds these are taken by the top-level management of the company. Capital budgeting refers to long-term planning for proposed capital outlays and their financing. Thus, it includes both raising of long-term funds as well as their utilisation. It may, thus, be defined as the "firm's formal process for acquisition and investment of capital."

NEED FOR CAPITAL INVESTMENT
The following factors give rise to the need for capital investments: (a) Wear and tear of old equipment's. (b) Obsolescence. (c) Variation in product demand necessitating change in volume of production. (d) Product improvement requiring capital additions. (e) Learning-curve effect. (f) Expansion. (g) Change of plant site. (h) Diversification.
(i) Productivity improvement.

IMPORTANCE OF CAPITAL BUDGETING
Capital budgeting decisions are of paramount importance in financial decision. So it needs special care on account of the following reasons:

(1) Long-term Implications: A capital budgeting decision has its effect over a long time span and inevitably affects the company's future cost structure and growth. A wrong decision can prove disastrous for the long-term survival of firm. It leads unwanted expansion of assets, which results in heavy operating cost to the firm. On the other hand, lack of investment in asset would influence the competitive position of the firm. So the capital budgeting decisions determine the future destiny of the company.
(2) Involvement of large amount of funds: Capital budgeting decisions need substantial amount of capital outlay. This underlines the need for thoughtful, wise and correct decisions as an incorrect decision would not only result in losses but also prevent the firm from earning profit from other investments which could not be undertaken.
(3) Irreversible decisions: Capital budgeting decisions in most of the cases are irreversible because it is difficult to find a market for such assets. The only way out will be to scrap the capital assets so acquired and incur heavy losses.
(4) Risk and uncertainty: Capital budgeting decision is surrounded by great number of uncertainties. Investment is present and investment is future. The future is uncertain and full of risks. Longer the period of project, greater may be the risk and uncertainty. The estimates about cost, revenues and profits may not come true.
(5) Difficult to make: Capital budgeting decision making is a difficult and complicated exercise for the management. These decisions require an overall assessment of future events which are uncertain. It is really a marathon job to estimate the future benefits and cost correctly in quantitative terms subject to the uncertainties caused by economic-political social and technological factors.

KINDS OF CAPITAL BUDGETING DECISIONS

Generally, the business firms are confronted with three types of capital budgeting decisions

- the accept-reject decisions;
- mutually exclusive decisions; and
- capital rationing decisions.

(a) Accept-reject decisions: Business firm is confronted with alternative investment proposals. If the proposal is accepted, the firm incur the investment and not otherwise. Broadly, all those investment proposals which yield a rate of return greater than cost of capital are accepted and the others are rejected. Under this criterion, all the independent prospects are accepted.

(b) Mutually exclusive decisions: It includes all those projects which compete with each other in a way that acceptance of one precludes the acceptance of other or others. Thus, some technique has to be used for selecting the best among all and eliminates other alternatives.

(c) Capital rationing decisions: Capital budgeting decision is a simple process in those firms where fund is not the constraint, but in majority of the cases, firms have fixed capital budget. So large number of projects compete for these limited budget. So the firm ration them in a manner so as to maximise the long run returns. Thus, capital rationing refers to the situations where the firm have more acceptable investments requiring greater amount of finance than is available with the firm. It is concerned with the selection of a group of investment out of many investment proposals ranked in the descending order of the rate of return.

COMPARISON OF NET PRESENT VALUE AND INTERNAL RATE OF RETURN APPROACH

The net present value and internal rate of return, two widely used methods are the species of the same genus i.e. Discount cash flow method, yet they are different from each other on various points. The broad points of difference between the two are as follows: Points of Differences

1. Interest Rate: Under the net present value method rate of interest is assumed as the known factor whereas it is unknown in case of internal rate of return method.

2. Reinvestment Axiom: Under both the methods, it is assumed that cash inflows can be re-invested at the discount rate in the new projects. However, reinvestment of funds, at cut-off rate is more possible than internal rate of return. So net present value method is more reliable than internal rate of return method for ranking two or more projects.

3. Objective: The net present value method took to ascertain the amount which can be invested in a project so that its expected yields will exactly match to repay this amount with interest at the market rate. On the other hand, internal rate of return method attempts to find out the rate of interest which is maximum to repay the vested fund out of the cash inflows.

Points of Similarities

IRR will give the same results as NPV in terms of acceptance or rejection of investment proposals in the following circumstances:

1. Projects having conventional cash flows i.e. a situation where initial investment (outlay or cash outflow) is followed by series of cash inflows.

2. Independent Investment Proposals: Such proposal, the acceptance of which does not exclude the acceptance of others.

In capital budgeting calculations, sensitivity analysis changes one assumption or estimate at a time to see how the results change. For example, a business may expect to earn Rs. 500, Rs. 1,000 and Rs. 1,000 in the first three years of a project. If the business makes an initial investment of Rs. 2,500, it will recoup its expenses in three years. However, the project may perform better than expected, generating Rs. 2,000 yearly in its second and third year. The business will then break even in two years.

Questions

1. Suppose a machine cost Rs 50,000.
It is expected to provide the following cash inflows at the end of the year –

Year	Cash Inflows
1	30,000
2	30,000
3	30,000

Should we accept the project? PV factor is 10%

Answers:
(i) Discounted Net Present Value = 24,604
(ii) Discounted pay Back period = 1 year and 11 months
(iii) Profitability Index = 1.50 times

2. A company gives the following details .
Investment required in

P&M	Rs. 10 lacs,
Working capital	Rs. 2 lacs
Depreciation	20% SLM
Salvage	3 lacs
Tax	20%
Selling price	Rs. 100
Variable cost	Rs. 50
Fixed Cost	Rs. 20,000

Year	Qty
1	5,000
2	8,000
3	10,000
4	12,000

Calculate NPV and its viability assuming interest rate is 10%.

3. Outflow Rs 3,50,000
Life 4 years
Cfat = 1,00,000 p.a.
Pvf = 8% COST OF CAPITAL / EXTERNAL RATE OF RETURN

Calculate IRR. INTERNAL RATE OF RETURN

4. X ltd is planning a capital expenditure of Rs 5,00,000 in a new project.
The new project will also require a working capital of Rs 1,00,000.
Depn on capital expenditure is to be provided in such a way that the capital cost is written down to Rs 50,000 at the end of 5 years which is also its market value at the end.
The new project will require use of existing premise which is currently rented out for 1,000 per month.
The expected revenues from the project are as follows –

Year	Revenue
1	3,15,000
2	1,82,000
3	1,36,000
4	1,85,000
5	1,92,000

The company's cost of capital is 12% and it is subject to tax 40%.

You are required to calculate

a) NPV
b) PBP
c) Discounted PBP
d) P/I
e) Project IRR

PAST EXAM QUESTIONS

Q.1 June 2024

(a) An investor is considering purchase of a new investment for ₹ 15,00,000. The Investor has two options – Option M and Option N and their expected cash inflow are as below :

Year	Option M (Amount in ₹)	Option N (Amount in ₹)
1	1,52,000	3,45,000
2	2,36,000	7,25,000
3	7,00,000	8,00,000
4	5,00,000	3,00,000
5	3,57,000	10,00,000

The investor has a target return of 12%. Risk premium rates are 3% for Investment Option M and 7% for Investment Option N.

Discount factors	10.00%	12.50%	15.00%	18.00%	19.00%
1	0.909	0.889	0.870	0.847	0.840
2	0.826	0.790	0.756	0.718	0.706
3	0.751	0.702	0.658	0.609	0.593
4	0.683	0.624	0.572	0.516	0.499
5	0.621	0.555	0.497	0.437	0.419

Which investment should be preferred?

Q. 2. Dec 2023

Equipment A has a cost of ₹ 75,000 and net cash flow of ₹ 20,000 per year for six years.

A substitute equipment B would cost ₹ 50,000 and generate net cash flow of ₹ 14,000 per year for six years. The required rate of return of both equipments is 11 per cent.

Calculate :

— Net Present Value and Profitability Index for the both equipments.

— Which equipment should be accepted and why ?

Present Values of Rupee 1 at 11% are :

Year	*1*	*2*	*3*	*4*	*5*	*6*
PV of ₹ 1	*0.901*	*0.812*	*0.731*	*0.659*	*0.593*	*0.535*

Question 3:

Vishal is a Mechanical Engineer with over three decades of experience. After completion of his graduation, he has worked in the global oil and gas industry for various companies as an employee. Given his vast experience in the energy sector; Vishal is often invited to various conferences on the oil and gas industry. One such conference was on "Areas of opportunities common to all include the India growth story" given the demographic dividend and energy independence. Vishal recognizes the huge potential of the oil and gas sector in India and sets up an engineering and construction company M/s. Mid-Stream & Co., based in Kolkata. The first bid for the project is a gas pipeline for a Government Company. The initial outlay for the project is Rs. 5,75,00,000. The duration of the project is five years. The expected cash inflows from the project are given below :

Year	₹
1	1,75,00,000
2	1,95,00,000
3	1,90,00,000
4	2,85,00,000
5	2,40,00,000

The acceptable rate of return for M/s. Mid-Stream & Co. is 15%. Anuja, CFO of M/s. Mid-Stream & Co. recommends a risk premium of 3% over and above the acceptable rate of 15% given the risky nature of the project. Vishal estimates duration to recover the initial cost of the project. Anuja mentions that it would be prudent to use discounted cash flows for such calculations.

A risk management perspective also would involve a more conservative approach in terms of Cash Flow estimation. Anuja mentions that the firm needs to make more conservative estimates of cash flow using the Certainty Equivalent technique with a discount rate of 15% to be used. Cash Flows from Government project with Certainty Coefficients :

Year	₹	Certainty Coefficients
1	1,75,00,000	0.90
2	1,95,00,000	0.88
3	1,90,00,000	0.85
4	2,85,00,000	0.81
5	2,40,00,000	0.65

Calculate : (i) NPV of gas pipeline bid for the Government Company. Give your recommendation regarding acceptability of the project. (7 marks)

(ii) Payback period, post payback profitability index and discounted payback period. (7 marks)

(iii) NPV of the Government project, after application of Certainty Coefficients. (6 marks)

CAPITAL BUDGETING

Question

Vishal is a Mechanical Engineer with over three decades of experience. After completion of his graduation, he has worked in the global oil and gas industry for various companies as an employee. Given his vast experience in the energy sector, Vishal is often invited to various conferences on the oil and gas industry. One such conference was on **"Areas of opportunities common to all include the India growth story"** given the demographic dividend and energy independence.

Vishal recognizes the huge potential of the oil and gas sector in India and sets up an engineering and construction company **M/s. Mid-Stream & Co.**, based in Kolkata.

The first bid for the project is a gas pipeline for a Government Company. The initial outlay for the project is **₹ 5,75,00,000**.

The duration of the project is **five years**. The expected cash inflows from the project are given below:

Year	Cash Inflow (₹)
1	1,75,00,000
2	1,95,00,000
3	1,90,00,000
4	2,85,00,000
5	2,40,00,000

The acceptable rate of return for **M/s. Mid-Stream & Co.** is **15%**.

Anuja, CFO of **M/s. Mid-Stream & Co.**, recommends a risk premium of **3%** over and above the acceptable rate of **15%** given the risky nature of the project.

Vishal estimates duration to recover the initial cost of the project. Anuja mentions that it would be prudent to use discounted cash flows for such calculations. A risk management perspective also would involve a more conservative approach in terms of cash flow estimation. Anuja mentions that the firm needs to make more conservative estimates of cash flow using the **Certainty Equivalent Technique** with a discount rate of **15%** to be used.

Cash Flows from Government Project with Certainty Coefficients:

Year	Cash Flow (₹)	Certainty Coefficient
1	1,75,00,000	0.90
2	1,95,00,000	0.88
3	1,90,00,000	0.85
4	2,85,00,000	0.81
5	2,40,00,000	0.65

Calculate:

(i) NPV of gas pipeline bid for the Government Company. Give your recommendation regarding acceptability of the project.
(7 marks)

(ii) Payback period, post payback profitability index and discounted payback period.
(7 marks)

(iii) NPV of the Government project, after application of Certainty Coefficients.
(6 marks)

Present Value Factors are given below:

Years	PV Factor @ 15%	PV Factor @ 18%
0	1.00	1.00
1	0.87	0.85
2	0.76	0.72
3	0.66	0.61
4	0.57	0.52
5	0.50	0.44

Answer

(i) NPV of Gas Pipeline Project

Step 1: Initial Outlay

Initial Investment = **₹ 5,75,00,000**

Step 2: Discount Rate

Acceptable Return = 15%
Add: Risk Premium = 3%
Discount Rate = 18%

Explanation: Risk is considered by increasing the discount rate.

Step 3: Present Value of Cash Inflows

Year	DF @ 18%	Cash Flow (₹)	PV (₹)
1	0.85	1,75,00,000	1,48,75,000
2	0.72	1,95,00,000	1,40,40,000
3	0.61	1,90,00,000	1,15,90,000
4	0.52	2,85,00,000	1,48,20,000
5	0.44	2,40,00,000	1,05,60,000

Total PV of Inflows = ₹ 6,58,85,000

Step 4: NPV

NPV = PV of Inflows – Initial Investment
= ₹ 6,58,85,000 – ₹ 5,75,00,000
= **₹ 83,85,000**

Conclusion

NPV is **positive**, hence **project is acceptable**.

(ii) Payback Period and Related Measures

Step 1: Payback Period

Year	Cash Inflow (₹)	Cumulative (₹)
1	1,75,00,000	1,75,00,000
2	1,95,00,000	3,70,00,000
3	1,90,00,000	5,60,00,000
4	2,85,00,000	8,45,00,000

Recovery happens in **Year 4**

Payback Period
= 3 + (₹ 15,00,000 / ₹ 2,85,00,000)
= **3.05 years**

Explanation: Time taken to recover initial investment.

Step 2: Post Payback Profitability

= ₹ 10,85,00,000 – ₹ 5,75,00,000
= **₹ 5,10,00,000**

Step 3: Post Payback Profitability Index

= ₹ 5,10,00,000 / ₹ 5,75,00,000
= **88.70%**

Step 4: Discounted Payback Period

Year	Discounted Inflow (₹)	Cumulative (₹)
1	1,48,75,000	1,48,75,000
2	1,40,40,000	2,89,15,000
3	1,15,90,000	4,05,05,000
4	1,48,20,000	5,53,25,000
5	1,05,60,000	6,58,85,000

Recovery happens in **Year 5**

Discounted Payback Period
= 4 + (₹ 21,75,000 / ₹ 1,05,60,000)
= **4.21 years**

Explanation: Considers time value of money.

(iii) NPV using Certainty Equivalent Method

Step 1: Adjust Cash Flows

Year	Cash (₹)	Coefficient	Certain Cash (₹)
1	1,75,00,000	0.90	1,57,50,000
2	1,95,00,000	0.88	1,71,60,000
3	1,90,00,000	0.85	1,61,50,000
4	2,85,00,000	0.81	2,30,85,000
5	2,40,00,000	0.65	1,56,00,000

Explanation: Cash flows are reduced to reflect certainty.

Step 2: Discount @ 15%

Year	Certain Cash (₹)	DF	PV (₹)
0	(5,75,00,000)	1.00	(5,75,00,000)
1	1,57,50,000	0.87	1,37,02,500
2	1,71,60,000	0.76	1,30,41,600
3	1,61,50,000	0.66	1,06,59,000
4	2,30,85,000	0.57	1,31,58,450
5	1,56,00,000	0.50	78,00,000

Total PV = ₹ 5,83,61,550

Step 3: NPV

= ₹ 5,83,61,550 – ₹ 5,75,00,000
= **₹ 8,61,550**

Conclusion

NPV is **positive**, hence **project is acceptable**.

Final Summary

- **NPV @ 18%** = ₹ 83,85,000
- **NPV (Certainty Method)** = ₹ 8,61,550

Both are positive → **Project should be accepted**

Question

Tara & Co. ("The Company") is a **private sector electrical engineering company** that is in existence for the past four decades. **Mr. Bhushan** is the founder of the company and is the existing **Chairman and Managing Director**. **Geeta** is a **finance professional** and brings rich experience to the company. Currently, Geeta is the **Chief Financial Officer (CFO)** of the Company.

Tara & Co. is engaged in **manufacturing, installation and maintenance of low voltage electricity cables**. Their main customer base is **Government and private sector electric utilities**. The Company prefers taking **short-term projects** with **fast turnaround and payment cycles**.

Geeta is of the opinion that a **change in strategy** is required. The Company should consider bidding for **long-term projects** which have potential for **higher return on invested capital**, **assured cash flows** and **known existing clients**.

Four such projects are identified by the marketing team. The Company has the capacity to undertake **all the four projects** if they meet the required criteria.

- **Cut-off rate of return = 18%**
- **Payback period should not exceed 6 years**

Key Financials

Proposal	Investment (₹ in crore)	Annual Net Cash Inflows (after tax before depreciation) (₹ in crore)	Service Life (Years)	PVF @ 18%
A	300	73	11	6.18
B	850	95	18	19.67
C	925	125	12	7.29
D	250	38	10	5.23

The marketing team of Tara & Co. also has a plan to expand in **foreign territories**. There are a number of **goodwill projects** being undertaken by the **Government of India** for smaller nations. The marketing team has selected **two projects** for application.

Both the projects are being financed by the **Government of India** and are **identical**. However, Geeta feels that the project that has **less risk embedded in cash flows** should be selected.

Proposal X

Cash Inflow (₹ crore)	Probability
4,000	0.2
8,000	0.3
12,000	0.4
16,000	0.1

Proposal Y

Cash Inflow (₹ crore)	Probability
4,000	0.1
8,000	0.4
12,000	0.2
16,000	0.3

Initial capital deployment is necessary given that additional projects will be executed in future. An investment of **₹ 1,000 crore** is estimated. The initial investment will be financed by:

- **25% Equity**
- **75% Debt**

The **interest cost = 14% per annum**
The **income tax rate = 15%**

Required
(a) Rank the proposals A to D according to **Payback Period**. Which proposals can be accepted?
(5 marks)
(b) Rank the proposals A to D according to **Present Value Index Method (i.e. Profitability Index)**. Which proposals can be accepted?
(5 marks)
(c) Calculate the **Coefficient of Variation** for **Proposal X and Proposal Y**.
(8 marks)
(d) Which proposal is **riskier** and which proposal should be **accepted**?
(2 marks)

Answer a
Ranking of Proposals according to Payback Period
Formula:
Payback Period = Investment / Annual Net Cash Inflows

Proposal	Investment (₹ in crore)	Annual Net Cash Inflows (After tax before depreciation) (₹ in crore)	Payback Period	Rank
A	300	73	**4.11 years**	**I**
B	850	95	**8.95 years**	**IV**
C	925	125	**7.40 years**	**III**
D	250	38	**6.58 years**	**II**

Conclusion
Only **Proposal A** can be accepted, since the **payback period exceeds six years** for all the other proposals.

Answer b)

Ranking of Proposals according to NPV Index / Present Value Index Method

Formula:

Present Value of Cash Inflows = Annual Net Cash Inflow × PVF @ 18%

Profitability / NPV Index = PV Inflows / PV Ouflows

Proposal	Investment (₹ in crore)	Annual Net Cash Inflows (₹ in crore)	PVF @ 18%	PV of Cash Inflows (₹ in crore)	NPV Index	Rank
A	300	73	6.18	**451.14**	**1.50**	**II**
B	850	95	19.67	**1,868.65**	**2.20**	**I**
C	925	125	7.29	**911.25**	**0.99**	**III**
D	250	38	5.23	**198.74**	**0.79**	**IV**

Conclusion

Proposal B and **Proposal A** can be accepted, as their **NPV Index is above 1**.

Answer c

Project X

Proposal	Cash Inflow (X)	Probability (P)	Difference from average cash flows	$(X - \bar{X})^2$	$P (X - \bar{X})^2$
X	4,000	0.2	-6000	360,00,000	72,00,000
	8,000	0.3	-2000	40,00,000	12,00,000
	12,000	0.4	2000	40,00,000	16,00,000
	16,000	0.1	6000	360,00,000	36,00,000
Total (X)			**10000 (Mean $\bar{X}$)**		**136,00,000 (Variance)**

Average = 40000/4=10000

Project Y

Proposal	Cash Inflow (X)	Probability (P)	Difference from average cash flows	$(X - \bar{X})^2$	$P (X - \bar{X})^2$
Y	4,000	0.1	-6000	360,00,000	36,00,000
	8,000	0.4	-2000	40,00,000	16,00,000
	12,000	0.2	2000	40,00,000	8,00,000
	16,000	0.3	6000	360,00,000	108,00,000
Total (Y)			**10000(Mean $\bar{X}$)**		**168,00,000 (Variance)**

Standard Deviation

- **Proposal X** $= \sqrt{136,00,000} = 3688$
- **Proposal Y** $= \sqrt{168,00,000} = 4099$

Coefficient of Variation

- **Proposal X**

$$= \frac{3688}{10{,}000} \times 100 = 36.88\%$$

- **Proposal Y**

$$= \frac{4099}{10{,}000} \times 100 = 40.99\%$$

Answer 5(d)

- **Proposal X CV = 36.88%**
- **Proposal Y CV = 40.99%**

Conclusion

- **Proposal Y is riskier**
- **Proposal X should be accepted**

Final Summary

- **Payback Period Ranking:** A, D, C, B
- **Only Proposal A is acceptable** under Payback Period method.
- **NPV Index Ranking:** B, A, C, D
- **Proposals B and A are acceptable** under NPV Index method.
- **Coefficient of Variation:**
  - Proposal X =36.88%
  - Proposal Y = 40.99%
- **Proposal Y is riskier**, therefore **Proposal X should be accepted**.

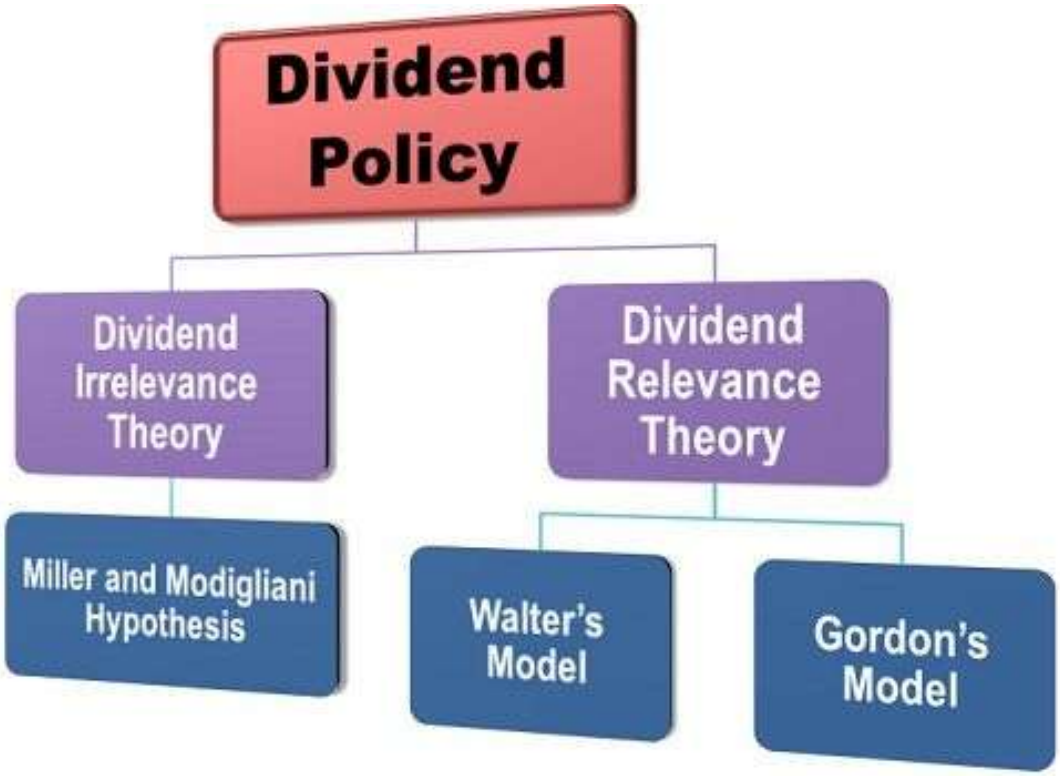
JAHANGIR TUTORIALS

Financial & Strategic Management

(Module 2 Paper 8)

By Prof. Fatema Kagalwala (CS, LLB, MCom)

DIVIDEND POLICY



Introduction

Divined Policy determines how much dividend Is to be paid out of earnings.

Various Policy/Approaches/models

i.) Dividend Relevant Model (i.e. Dividend Policy of a company has an impact on the share valuation.
   a. Walter Model
   b. Gordon Model

ii.) Dividend Irrelevant Model (i.e. Dividend Policy has no effect on the price of a share.)
   c. Modigliani and Miller Model

Walter Model

Prof. James Walter propounded the theory.

According to him,

a. If r > K, company should give Least dividend,
b. If r < K, company should give Maximum Dividend,
c. If r = k, company can give any proportion of dividend.

According to Walter, only if the company follows the above 3 rules, the share price would be Maximum.

To prove his point, he gave the following formula:

$$\text{Price} = \frac{D + \frac{r\,(E-D)}{K}}{K}$$

Where,

P= Market Price of share,
D=Dividend per share,
r=internal rate of return/ return on equity
k=Outside rate of return/cost of capital
E= Earnings Per share

Q.1.

Details	A	B	C
Internal rate of return (r)	15%	5%	10%
Cost of Equity Capital (k)	10%	10%	10%
EPS	Rs. 8	Rs. 8	Rs. 8

Calculate Price,
When Dividend Pay-out ratio is
i.) 50% ii) 75% and iii) 25%
Use Walter Model to determine Price.

Answers:

(i) When D/P ratio is 50%
Price of A is Rs.100, B is Rs.60 & Cis Rs.80 per share

(ii) When D/P ratio is 75%
Price of A is Rs.90, B is Rs.70 & Cis Rs.80 per share

(iii) When D/P ratio is 25%
Price of A is Rs.110, B is Rs.50 & Cis Rs.80 per share

Gordon's Growth Model

According to him,

a. If r > K, company should retain maximum,
b. If r < K, company should retain minimum amount,
c. If r = k, company can retain any amount.

According to him, only if the company follows the above 3 rules, the share price would be Maximum.

To prove his point, he gave the following formula:

$$\text{Price} = \frac{E(1-b)}{Ke-br}$$

Where,

E= EPS
b= balance transferred to reserves
r=Return on equity
Ke= Cost of equity
Br= Growth rate

Q.2. Calculate the Market Price of a share of ABC ltd under

i.) Walter Model and
ii.) Gordon Growth Model

EPS= Rs. 5
DPS= Rs. 3
Cost of capital = 16%
Internal rate of return = 20%
Retention ratio = 50%.

Answers:

Price as per Walter Model is Rs.34.375 per share
Price as per Gordon Model is Rs.41.67 per share

Q.3. Ke= 15%
EPS= Rs. 30
r = 14% / 15% / 16%
You are required to calculate Market price of a share as per Gordon's Model if -

i.) b=40%
ii.) b=60% and
iii.) b=80%

Answers:

(i) When b is 40% and r is 14%
Price of the share is rs.191.49

(ii) When b is 40% and r is 15%
Price of the share is rs.200

(iii) When b is 40% and r is 16%
Price of the share is rs.209.31

(iv) When b is 60% and r is 14%
Price of the share is rs.181.82

(v) When b is 60% and r is 15%
Price of the share is rs.200

(vi) When b is 60% and r is 16%
Price of the share is rs.222.22

(vii) When b is 80%% and r is 14%
Price of the share is rs.157.89

(viii) When b is 80% and r is 15%
Price of the share is rs.200

(ix) When b is 80% and r is 16%
Price of the share is rs.272.73

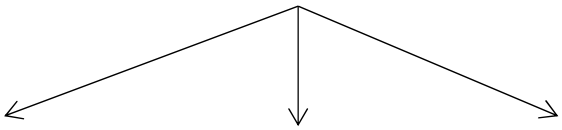
Modigliani and Miller Model

Dividend Irrelevance Theory

According to M&M Payment of Dividend is irrelevant in deciding the share price. According to him, the value of the company whether dividend is declared or not remains the same.

Company's market value will be the same regardless of the Dividend Payment.

To prove this, he has given the following 3 equations



$P1 = P0 (1+ Ke) – D1$ $\quad m = \frac{I – E – nD1}{P1}$ $\quad npo = \frac{(n+m)P1 – I + E}{1+Ke}$

Q.4. Following are the details of ABC ltd,

K= 10% (capitalization rate)

1,00,000 shares of Rs. 100 each. They are contemplating declaration of a dividend of Rs. 6 per share at the end of the year.

Answer the following points-

i.) What is the price at the end of the year if dividend is not declared?

ii.) What is the price at the end of the year if dividend is declared?

iii.) Assuming the firm has a net income/earning of Rs. 10 lakhs and makes New investment of Rs. 20 lakhs how many new shares must be issued.

Anwers :

(i) Price if Dividend not declared = rs.110

(ii) Price if Dividend Declared = rs.104

(iii) New share to be issued Approx 100 lacs new shares must be issued

PAST EXAM QUESTION

Q.1 June 2024

(a) ABD Limited has provided the following information :

Earnings per share = ₹ 25

Dividend per share = ₹ 9

Cost of capital = 12%

Internal rate of return (IRR) on investment = 16%.

You are required to compute the market price per share using :

(a) Gorden's formula

(b) Walter's formula.

Q.2 Dec 2023

1. 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%.

   You are requested to calculate market price of the share at the end of the year, if

   (i) Dividend is not declared.

   (ii) 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

Q.3- June 2025

(a) Win Some Ltd. is contemplating issue of shares for an expansion project :

Market Capitalization Rate	15%
Number of shares outstanding at the beginning of FY	1,00,000
Share price at the beginning of FY	₹ 120
Dividend expected to be declared	₹ 2 per share
Expected net income	₹ 50,00,000
New investment	₹ 1,00,00,000

Assuming that Modigliani Miller's approach (theory of irrelevance of dividend to market value) is followed, you are required to calculate :

(i) Total number of shares at the end of FY.

(ii) The market value of the shares at the end of FY. (5 marks)

Prof. Fatema. K

✓ LESSON – DIVIDEND POLICY

(1) Introduction: Dividend

⇓

Distribution of Profits

eg → EPS = Rs 10.

Dividend	Retaining
= 40%	= 60%
↓	↓
Rs 4/-	Rs 6/-

Is : 40% Dividend most appropriate?

⇓

affects the market price.

∴ Best Dividend Policy?

(2) Dividend Relevance theory.

Walter's model	Gordon's model.

(3) Formula as per **Walter's model.**
↓
Distribution of Profits

r = Internal rate of return → RoE
k = outside rate of return. → CoC.

In case, if $r > k$ → Least dividend
$r < k$ → max. "
$r = k$ → any proportion.

$$\therefore P = \frac{D + \frac{r(E-D)}{k}}{k}$$

(4) Derivation of the above formula: -

$$Ke = \frac{D_1}{P_0} + g$$

$$P_0 = \frac{D_1}{k} + \frac{r(E-D)}{k}$$

Say $r = 20$ $EPS = 10$
$k = 10$ $Div = 6$.
$\therefore RE = 4$.

Prof. Fatema K

(1) WALTER's MODEL

Q.1

	A	B	C
	$r = 15\%$	$r = 5\%$	$r = 10\%$
	$k = 10\%$	$k = 10\%$	$k = 10\%$
	EPS = 8	EPS = 8	EPS = 8
D/P = 50% = 4	$\frac{4 + \frac{15\%(8-4)}{10\%}}{10\%}$	$\frac{4 + \frac{5\%(8-4)}{10\%}}{10\%}$	$\frac{4 + \frac{10\%(8-4)}{10\%}}{10\%}$
	$= \frac{4+6}{10\%}$	$= \frac{4+2}{10\%}$	$= \frac{4+4}{10\%}$
	= Rs 100 ↑	= Rs 60 ↑	= Rs 80 ↑
D/P = 75% = 6	$\frac{6 + \frac{15\%(8-6)}{10\%}}{10\%}$	$\frac{6 + \frac{5\%(8-6)}{10\%}}{10\%}$	$\frac{6 + \frac{10\%(8-6)}{10\%}}{10\%}$
	$= \frac{6+3}{10\%}$	$= \frac{6+1}{10\%}$	$= \frac{6+2}{10\%}$
	= Rs 90 ↑	= Rs 70 ↑	= Rs 80 ↑
D/P = 25%	$\frac{2 + \frac{15\%(8-2)}{10\%}}{10\%}$	$\frac{2 + \frac{5\%(8-2)}{10\%}}{10\%}$	$\frac{2 + \frac{10\%(8-2)}{10\%}}{10\%}$
	$= \frac{2+9}{10\%}$	$= \frac{2+3}{10\%}$	$= \frac{2+6}{10\%}$
	= Rs 110 ↑	= Rs 50 ↑	= Rs 80 ↑

(2) Gordon's Growth Model: → Retention of Profits.

if $r > k$ → retain max / Least Div.
if $r < k$ → retain min / max Div
$r = k$ → retain any amount.

Formula → $P = \frac{E(1-b)}{ke - br}$

E = EPS
b = bal. trans. to resr.
r = return on equity.
ke = Cost of equity.
br = growth ~~rate~~ rate

Deriving the formula.

$$Ke = \frac{D_1}{P_0} + g.$$

EPS = 10
D (40%) B (60% retained.)

$$Ke - g = \frac{D_1}{P_0}.$$

$$P_0 = \frac{D_1}{Ke - g} \rightarrow [EPS - b]$$

$$= \frac{E(1-b)}{ke - br}.$$

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As Per Gordon's model.

Q.5

$K = 16\%$ EPS = Rs 5.

$r = 20\%$ DPS = Rs 3

$D/P = 50\% \rightarrow$ bal. retained = 50%.

$$\text{Price} = \frac{E(1-b)}{ke - br}$$

$$= \frac{5(1-0.50)}{0.16 - (50\% \times 20\%)}$$

$$= \frac{5(0.5)}{0.16 - (0.50 \times 0.20)}$$

$$= \frac{2.5}{0.16 - 0.1}$$

$$= \frac{2.5}{0.06}$$

$$= \text{Rs } 41.67/-$$

Proj. Faremak.

Q.5: As per Walter's model.

$$P = \frac{D + \frac{r(E-D)}{k}}{k}$$

$$= \frac{3 + \frac{20\%(5-3)}{16\%}}{16\%}$$

$$= \frac{3 + 2.5}{16\%}$$

$$= \text{Rs } 34.375/-$$

Prof. Fatema K

	$r = 14\%$	$r = 15\%$	$r = 16\%$
Q.6:	$K_e = 15\%$	$K_e = 15\%$	$K_e = 15\%$
	EPS = Rs 30	EPS = Rs 30	EPS = Rs 30

$$P = \frac{E(1-b)}{K_e - br}$$

$B = 40\%$	$= \frac{30(1-40\%)}{15\% - (40\% \times 14\%)}$	$= \frac{30(1-0.40)}{0.15-(0.40\times0.15)}$	$= \frac{30(1-0.40)}{0.15-(0.40\times0.16)}$
	$= \frac{18}{0.15-0.056}$	$= \frac{18}{0.15-0.06}$	$= \frac{18}{0.15-0.064}$
	= Rs 191.49 ↑	= Rs 200 ↑	= Rs 209.31 ↑
$B = 60\%$	$= \frac{30(1-0.60)}{0.15-(0.60\times0.14)}$	$= \frac{30(1-0.60)}{0.15-(0.60\times0.15)}$	$\frac{30(1-0.60)}{0.15-(0.60\times0.16)}$
	$= \frac{12}{0.15-0.084}$	$\frac{12}{0.15-0.09}$	$\frac{12}{0.15-0.096}$
	= Rs 181.82 ↑	Rs 200 ↑	Rs 222.22 ↑
$B = 80\%$	$= \frac{30(1-0.80)}{0.15-(0.80\times0.14)}$	$\frac{30(1-0.80)}{0.15-(0.80\times0.15)}$	$\frac{30(1-0.80)}{0.15-(0.80\times0.16)}$
	$= \frac{6}{0.15-0.112}$	$\frac{6}{0.15-0.12}$	$\frac{6}{0.15-0.128}$
	= Rs 157.89 ↑	Rs 200 ↑	Rs 272.73 ↑

Prof. Fatema K

3) Modigliani & Miller Model.

↓

Dividend Irrelevance theory.

↓

$P_1 = P_0(1+ke) - D_1$

P_1 → Price of share when dividend declared.

P_0 → old price.

ke → capitalisation rate.

D_1 → dividend.

$m = \frac{I-(E-nD_1)}{P_1}$

m = new shares to be issued.

I = investment.

E = earnings.

n = existing no. of shares

D_1 → dividend.

$npo = \frac{(n+m)P_1 - I+E}{1+ke}$

Value of firm.

npo → existing no. of shares x P_0.

m → new shares.

P_1 → new price

I → investment.

E → earning.

Ke → cap. rate.

Prof. Farema K

Q.7. Given: $K_e \rightarrow CR \rightarrow 10\%$.

$D_1 = Rs\ 6/-$

$n = 1,00,000$

$P_0 = Rs\ 100$

$I = 20$ lacs.

(I) Dividend is declared.

(i) Price.

$$P_1 = P_0 (1 + k_e) - D_1$$

$$= 100 (1 + 0.10) - 6$$

$$= 110 - 6$$

$$= Rs\ 104 \text{ p.s.}$$

(ii) new no. of shares required to be issued.

$$m = \frac{I - (E - nD_1)}{P_1}$$

$$= \frac{20,00,000 - [10,00,000 - (100000 \times 6)]}{104}$$

$$= \frac{20,00,000 - [10,00,000 - 600000]}{104}$$

$$= \frac{20,00,000 - 400000}{104}$$

$$= \frac{16000000}{104} \approx 15385 \text{ new shares.}$$

(iii) Marketvalue of the firm.

$$npo = \frac{(n+m)P_1 - I + E}{1+ke}$$

$$= \frac{(100000 + 15385)104 - 2000000 + 1000000}{1 + 10\%}$$

$$= \frac{110000040}{1.10}$$

$$= 10,0,0,0,036 \simeq 100 \text{ Lakhs.}$$

(II) Dividend is not declared.

(i) Peice.

$$P_1 = P_0(1+ke) - D_1$$

$$= 100\ (1 + 10\%) - 0$$

$$= 100\ (1.10)$$

$$= \underline{\underline{Rs\ 110}}\ \text{p.s.}$$

(ii) new shares required to be issued:

$$m = \frac{[I - (E - nD_1)]}{P_1}$$

$$= \frac{[20,00,000 - [10,00,000 - (100000 \times 0)]}{110}$$

$$= \frac{20,00,000 - 10,00,000}{110}$$

$$= \frac{1000000}{110} \approx 9091 \text{ shares.}$$

(iii) market value of the firm

$$npo = \frac{(n+m)P_1 - I + E}{1 + Ke}$$

$$= \frac{(100000 + 9091)110 - 20lac + 10lacs.}{1 + 10\%}$$

$$= \frac{120,00,010 - 10,00,000}{1.10}$$

$$= 100,00,009$$

$$\approx 100 \text{ Lakhs.}$$

DIVIDEND POLICY

PAST EXAM QUESTIONS

1. Given : $D_1 = 9$ EPS = Rs 25
$K = 12\%$ IRR = 16%

(a) Gordon model.

$$P = \frac{E(1-b)}{Ke - br} \qquad b = 64\%$$

$$= \frac{25(1-0.64)}{0.12 - (0.64 \times 0.16)}$$

$$= \frac{9}{0.12 - 0.1024}$$

$$= \text{Rs } 511.36 \text{ p.s.}$$

(b) Walter model.

$$P = \frac{D + \frac{r(E-D)}{K}}{K}$$

$$= \frac{9 + \frac{0.16(25-9)}{0.12}}{0.12}$$

$$= \frac{9 + 21.33}{0.12}$$

$$= 252.78 \text{ Rs p.s.}$$

2. MM theory

(i) Price when Dividend not Declared.

$$P_1 = P_0(1+k_e) - D_1$$
$$= 100(1+0.12) - 0$$
$$= 100(1.12)$$
$$= 112$$

(ii) Price when Dividend is declared.

(a) $P_1 = \cancel{112} P_0(1+k_e) - D_1$
$$= 100(1+0.12) - 10$$
$$= 112 - 10$$
$$= 102$$

(b) new shares required $= \frac{I - (E - nD_1)}{P_1}$

$$= \frac{10,00,000 - [500000 - (10000 \times 10)]}{102}$$

$$= \frac{1,000,000 - 400000}{102}$$

$$= \frac{600000}{102}$$

$$= 5883 \text{ shares.}$$

DIVIDEND POLICY PAST EXAM Q's.

Q.3. $K_e = 15\%$, $n = 100000$ shares, $P_0 = 120$, $D_1 = 2$

$E = Rs\ 50,00,000$, $I = 100,00,000$

$$P_1 = P_0(1+k_e) - D_1$$
$$= 120(1+15\%) - 2$$
$$= 136 \text{ p.s.}$$

$$m = \frac{I - [(E - nD_1)]}{P_1}$$
$$= \frac{100,00,000 - [5000000 - (100000 \times 2)]}{136}$$
$$= \frac{100,00,000 - 48,00,000}{136}$$
$$= 38235 \text{ shares.}$$

~~Market value~~ Total no. of shares at end of the year = $100000 + 38235 = 138235$.

∴ Market value of shares at end of the year = 138235×136

$= 18,79,9960$

$= 1,87,99,960$ Rs

DIVIDEND POLICY

Question

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%**.

You are requested to calculate the **market price of the share at the end of the year**, if:

(i) **Dividend is not declared**.

(ii) **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.

(5 marks)

Answer

Given

- **Cost of Equity (Ke) = 12%**
- **Number of Shares (n) = 10,000 shares**
- **Face Value per Share** = ₹ 100
- **Current Market Price (P_0) = ₹ 100**
- **Net Profit (E) = ₹ 5,00,000**
- **Expected Dividend (D_1) = ₹ 10 per share**
- **Total Investment (I) = ₹ 10,00,000**

Computation of Market Price per Share

(i) When no dividend is declared ($D_1 = 0$)

MM Formula:
$P_0 = (P_1 + D_1) / (1 + Ke)$

$100 = (P_1 + 0) / 1.12$

$P_1 = 100 \times 1.12$
$P_1 =$ **₹ 112**

(ii) When dividend is declared (D_1 = ₹ 10)

$100 = (P_1 + 10) / 1.12$

$P_1 + 10 = 112$

$P_1 = 112 - 10$
P_1 = **₹ 102**

(iii) Calculation of Funds Required for Investment (MM Model)

Earnings (E) = ₹ 5,00,000

Dividend Distributed
= 10,000 × ₹ 10
= **₹ 1,00,000**

Retained Earnings (Internal Funds)
= 5,00,000 − 1,00,000
= **₹ 4,00,000**

Total Investment Required (I) = ₹ 10,00,000

External Funds Required
= 10,00,000 − 4,00,000
= **₹ 6,00,000**

Number of New Shares to be Issued

Δn = Funds Required / Price at end (P_1)

$\Delta n = 6,00,000 / 102$
Δn = **5,882.35 shares**

Therefore, **Number of New Shares = 5,883 shares (approx.)**

Final Answers

- **(i)** Market Price (No Dividend) = **₹ 112**
- **(ii)** Market Price (With Dividend) = **₹ 102**
- **(iii) New Shares to be Issued = 5,883 shares**

JAHANGIR TUTORIALS

Financial Management

By Prof. Fatema Kagalwala (CS, LLB, MCom)

SECURITY ANALYSIS

Introduction

- Security Analysis means the entire process of estimating return and risk for individual securities.
- It involves analysis of various attributes of a security with a view to determine its value for investment decisions.

Question Bank

PART 1

Capital Asset Pricing Model

Introduction

The Capital Asset Pricing Model (CAPM) was developed by William Sharpe in 1964.

It describes the relationship between systematic risk and expected return for assets, typically stocks.

Formula

Expected Return = Rf + β (Rm-Rf)

Type 1 (CAPM Basics)

Expected Return = Rf + β (Rm-Rf)
Compare the Expected Return with the Actual Return and then decide whether to Buy/Sell whether overvalued or undervalued.

Q.1. There are 4 Portfolio Managers who have created their own Portfolio.
Rm=10%
Rf=6%
Select Best Portfolio Manager-

Manager	B	Actual Return
A	1.5	11%
B	0.8	10%
C	2.2	14%
D	1.8	13%

Q.2. Rf=10%
Rm=15%

Stock	Actual Return	β
A	17%	1.3
B	14.5%	0.8
C	15.5%	1.1
D	18%	1.7

On the basis of these expectations, which stocks are overvalued and which are undervalued.

Q.3. XYZ stock has a Beta (β) of 0.95, and an expected return of 13.585%. The Market has Expected return (Rm) of 14.014%.

a. What is Rf?
b. What is risk premium for Market Portfolio?
c. If Actual Return on Market at the end of the Year turns out to be 17%, what return would you now expect from the stock.

Type

Expected Return = Rf + β (Rm – Rf)

Or

Ke = Rf + β (Rm – Rf)

(i.e. expectation of equity / cost of equity shareholders)

And then for finding the current Price (Po),
Apply Dividend + Growth Model, i.e.

$$Ke = \frac{D1}{Po} + g$$

Alternatively, this model can also be stated

$$P_0 = \frac{D1}{Ke - g}$$

Q.4. Rf = 4%
Rm-Rf = 6%
β=0.7
D0 = 3
G = 5% (therefore, D1 = D0 + g
= 3 + 5% i.e. 3.15)
Calculate expected Market Price, If Actual Market Price is Rs. 34, what investment action should be taken.

Q.5. An investor is holding 1,000 shares of X ltd,
Presently, dividend is being paid by the company is Rs. 2 per share and share is being sold at Rs. 25 per share in the Market.
Rf= 12%
Market Premium= 6%

β=1.4
Expected Growth Rate = 5%
In view of the above factors whether investor should buy/hold/sell the share.

Q.6. A Portfolio manager has 3 stocks in his portfolio. Following information is available in respect of his portfolio –

Company	Investment	β (beta)
X ltd	6,00,000	1.3
Y ltd	3,00,000	1.4
Z ltd	1,00,000	0.9

Expected return on market Portfolio is 15% and Risk-free rate of interest is 6%.
On basis of CAPM, compute the following-

i.) Expected return of portfolio and
ii.) Expected β (beta) of portfolio.

Type – Calculation of Rm and other similar sums

Q.7. Your client is holding following securities as a proxy of market portfolio:

Particulars	Purchase Price	Dividends	Expected MP after 1 year	B
1. Co A	8,000	800	8,200	0.80
2. Co B	10,000	800	10,500	0.70
3. Co C	16,000	800	22,000	0.50
4. PSU Bonds	34,000	3,400	32,300	1

Assume risk free rate of 15%. Calculate expected rate of return in each case using CAPM if shares are held for 1 year.

PAST EXAM QUESTIONS

June 2024

1. Share price of P Limited was trading at the following prices at NSE on various trading sessions:

Trading Session	Share Price of P Limited (₹)
1	4344
2	4254
3	4211
4	4308
5	4487
6	4213
7	4240
8	4112
9	4061
10	4414
11	4030
12	4336
13	4230
14	4392

Calculate RSI from the above data. Comment if share is overbought.

Relative Strength Index (RSI)

Trading Session	Share Price in `	Gain in `	Loss in `
1.	4344	-	-
2.	4254	-	90
3.	4211	-	43
4.	4308	97	-
5.	4487	179	-

6.	4213	-	274
7.	4240	27	-
8.	4112	-	128
9.	4061	-	51
10.	4414	353	-
11.	4030	-	384
12.	4336	306	-
13.	4230	-	106
14.	4392	162	-
		1124/6 ` **187.33**	1076/7 ` **153.71**

$$RS = \frac{\text{Average Gain in Per Day}}{\text{Average Loss in Per Day}} = \frac{187.33}{153.71} = 1.219$$

RSI = 100 - (100/1+RS) = 100 - (100/1+1.219) = 54.93

An RSI reading of 70 or above indicates an overbought situation whereas a reading of 30 or below indicates an oversold condition. Hence, the share is not overbought as RSI is below 70.

2. What is Systematic Risk ? Describe its types

Systematic Risk

Systematic risk is due to the influence of external factors on an organization. Such factors are normally uncontrollable from an organization's point of view. Systematic risk is a macro in nature as it affects a large number of organizations operating under a similar stream or same domain. It cannot be planned by the organization. In this way economic, political and sociological changes are sources of systematic risk.

For example, if an economy moves into recession or if there is a political upheaval, it will cause the prices of nearly all the securities, whether bond or equity to decline. Firms with high systematic risk tend to be those whose sales, profits and stock prices follow the general trend in the level of economic or stock market activity. These may include companies that deal in basic industrial goods like automobile manufactures.

Types of systematic risk:

1. **Interest rate risk**

   Interest-rate risk is the variation in the single period rates of return caused by the fluctuations in the market interest rate. It particularly affects debt securities as they carry the fixed rate of interest.

2. Market risk

   Market risk is associated with consistent fluctuations seen in the trading price of any particular shares or securities. It arises due to rise or fall in the trading price of listed shares or securities in the stock market.

3. Purchasing power or inflationary risk

   Purchasing power risk is also known as inflation risk. It is so, since it emanates (originates) from the fact that it affects a purchasing power adversely. It is not desirable to invest in securities during an inflationary period.

3. What is Price Rate of Change and Advance-Decline Ratio ?

Price Rate of Change

The Price Rate of Change (ROC) is a momentum-based technical indicator that measures the percentage change in price between the current price and the price a certain number of periods ago. The ROC indicator is plotted against zero, with the indicator moving upwards into positive territory if price changes are to the upside, and moving into negative territory if price changes are to the downside.

A rising ROC above zero indicates an uptrend in security prices whereas a falling ROC below zero indicates a downtrend in security prices

The Ratio of number of stocks that increase to the number of stocks that have declined. If the ratio is

Formula for Price Rate of Change (ROC)

$$\text{ROC}\ (\%) = \left(\frac{\text{Current Price} - \text{Historical Price}}{\text{Historical Price}}\right) \times 100$$

- **Current Price**: The most recent closing price of the stock.
- **Historical Price**: The closing price from a specified number of periods in the past.

The Advance-Decline Ratio (A/D Ratio) is a market breadth indicator that compares the number of stocks rising in price (advances) to those falling (declines) over a given period.

- When the A/D Ratio > 1, it means more stocks are advancing than declining, indicating strong overall market sentiment and a potential bullish trend.
- When the A/D Ratio < 1, more stocks are declining than rising, signaling weakness and a likely bearish trend.
- A declining A/D Ratio, even during market rallies, may hint at loss of momentum and a possible trend reversal.

Key Use: Traders and analysts use this ratio to assess the breadth of market movements—whether gains or losses are broadly supported or limited to a few stocks. It's a useful tool for confirming market trends or warning of potential shifts in direction.

Formula:

$$\text{Advance-Decline Ratio} = \frac{\text{Number of Advancing Stocks}}{\text{Number of Declining Stocks}}$$

Dec 2023

4. What do you mean by Aroon Indicator ? Explain.

Ans - Aroon Indicator:

The Aroon indicator is a technical indicator that is used to identify trend changes in the price of an asset, as well as the strength of that trend. In essence, the indicator measures the time between highs and the time between lows over a time period. The idea is that strong uptrends will regularly see new highs, and strong downtrends will regularly see new lows. The indicator signals when this is happening, and when it isn't.

The indicator consists of the "Aroon up" line, which measures the strength of the uptrend, and the "Aroon down" line, which measures the strength of the downtrend. The Aroon indicator was developed by Tushar Chande in 1995.

Formulas of the Aroon Indicator:

Aroon up = 25-Period Since 25 period High / 25 * 100
Aroon down =25-Period Since 25 period low / 25 * 10

Explain Hamada Equation and also calculate Hamada coefficient using following information. A company has a debt to equity ratio of 0.65 : 1.00, a tax rate of 35% and an unlevered beta of 0.80.

Ans - Answer 6A(ii)

The Hamada equation is the method of analyzing a firm's cost of capital as it uses additional financial leverage. It draws upon the Modigliani-Miller theorem on capital structure. The higher the beta equation, the higher the risk associated with the firm.

ß L= ßU [1+ (I -t) (D/E)]

= 0.80 [1 + (I-.35) (.65)]

1.138, Hence, the leveraged beta is 1.138.

It means that the financial leverage of the company increases the overall risk by the beta amount of 0.338= (I.138-.80). Therefore, as the beta of the coefficient rises, the associated risk of having higher debt also rises.

Prof. Fatema K

TYPE 1.

$$CAPM = R_f + \beta (R_m - R_f)$$

Q.1. Given: $R_m = 10\%$

$R_f = 6\%$

$\therefore R_m - R_f = 4\%$

Manager A $ER = 6\% + 1.5(4)$

$= 6\% + 6\%$

$= 12\%$

$AR = 11\%$

Since $ER > AR \rightarrow$ Overestimated / Overvalued.

Manager B $\rightarrow ER = 6\% + 0.8(4)$

$= 6\% + 3.2\%$

$= 9.2\%$

$AR = 10\%$

$ER < AR \rightarrow$ undervalued / Accept.

Manager C $\rightarrow ER = 6\% + 2.2(4)$

$= 6\% + 8.8\%$

$= 14.8\%$

$AR = 14\%$

$ER > AR \rightarrow$ Reject / Overvalued.

Manager D → ER = 6% + 1.8(4)
= 6% + 7.2%
= 13.2%
AR = 13%
Since ER > AR → Reject / Overvalued.

∴ Manger B is the best.

Note: Expected Return > Actual Return = overvalued.

Expected Return < Actual Return = Undervalued.

Prof. Fatema K

Given: $R_f = 10\%$, $R_m = 15\%$ $\therefore R_m - R_f = 5\%$)

Q.2

	Expected Return	Actual Ret.	Comments
A)	$10\% + 1.3(5\%)$ $= 16.5\%$	17%	Accept as undervalued.
B)	$10\% + 0.8(5\%)$ $= 14\%$	14.5%	Accept, undervalued.
C)	$10\% + 1.1(5\%)$ $= 15.5\%$	15.5%	Accept, correctly valued
D)	$10\% + 1.7(5\%)$ $= 18.5\%$	18%	Reject, Overvalued

Q.3 Given: $\beta = 0.95$

$ER = 13.585\%$

$R_m = 14.014\%$

a] $ER = R_f + \beta(R_m - R_f)$

$13.585 = R_f + 0.95(14.014 - R_f)$

$13.585 = R_f + 13.3133 - 0.95R_f$

$13.585 - 13.3133 = 0.05 R_f$

$\frac{0.2717}{0.05} = R_f$

$R_f = 5.434\% \approx \underline{5.5\%}$

b] Risk premium $= R_m - R_f$

$= 14.014 - 5.5$

$= \underline{8.514\%}$

c] If $R_m = 17\%$, $ER = ?$

$ER = 5.5\% + 0.95(17\% - 5.5\%)$

$= 5.5\% + 0.95(11.5)$

$= 5.5\% + 10.925\%$

$= \underline{16.425\%}$

Prof. Fatema K

Type III

Q.10

As per CAPM model

$$K_e = R_f + \beta(R_m - R_f)$$

$$= 4\% + 0.7(6\%)$$

$$= 8.2\%$$

$$K_e = \frac{D_1}{P_0} + g$$

$$8.2\% = \frac{(D_0 + g)}{P_0} + g$$

$$8.2\% = \frac{(3 + 5\%)}{P_0} + 5\%$$

$$8.2\% = \frac{3.15}{P_0} + 5\%$$

$$8.2\% - 5\% = \frac{3.15}{P_0}$$

$$\frac{3.2\%}{3.15} = \frac{P_0}{} \quad P_0 = \frac{3.15}{3.2\%}$$

$\therefore P_0 = ₹ 98.43/-$ → Fundamental Price.

If Actual MP = ₹ 34 → Invest.

Q.11

$$K_e = R_f + \beta (R_m - R_f)$$

$$= 12\% + 1.4 (6\%)$$

$$= 20.4\%$$

$$K_e = \frac{D_1}{P_0} + g$$

$$20.4\% = \frac{D_0 + g}{P_0} + g$$

$$20.4\% = \frac{(2 + 5\%)}{P_0} + 5\%$$

$$20.4\% - 5\% = \frac{2.1}{P_0}$$

$$\therefore P_0 = \frac{2.1}{15.4\%}$$

$$P_0 = ₹ 13.64 \quad \text{(Fundamental Price)}$$

Actual MP = ₹ 25 → Sell the shares.

Q.15

Co.	Investments	Weights.
X	600000	0.6
Y	300000	0.3
Z	100000	0.1.
Total	1000000	

Betas of Stocks = Betas of Portfolio.

$\beta p = (WA\beta A) + (WB\beta B) + (WC\beta C)$

$= (0.6 \times 1.3) + (0.3 \times 1.4) + (0.1 \times 0.9)$

$= 0.78 + 0.42 + 0.09$

$= 1.29.$

$ER = Rf + \beta p (Rm - Rf)$

$= 6\% + 1.29(15\% - 6\%)$

$= 6\% + 11.61\%$

$= 17.61\%$

TYPE V – Calculation of Rm & other Similar sums.

Rate of Return (RoR) = $\frac{\text{Dividend + Capital Gains}}{\text{Investment}}$

RoR = Market return = Rm.

Q.16. Client's RoR = $\frac{\text{Dividend + CG}}{\text{Investment}}$

$= \frac{5800 + (73000 - 68000)}{68000}$

$Rm = 15.88\%$

1) ER of Co A = $15\% + 0.80\,(15.88\% - 15\%)$
$= 15.704\%$

2) ER of Co B = $15\% + 0.70\,(0.88\%)$
$= 15.616\%$

3) ER of Co C = $15\% + 0.50\,(0.88\%)$
$= 15.44\%$

4) ER of PSU Bonds = $15\% + 1\,(0.88\%)$
$= 15.88\%$

Avg RoR = $\frac{\Sigma ER}{\text{no. of sec}} = \frac{62.64}{4} = 15.66\%$

WORKING CAPITAL

Question

XYZ Ltd. is a company manufacturing **standardized chandeliers**. The segment they deal in is more or less an **oligopolistic kind of market** with **mediocre market potential**. The demand of their product had been **wavering in past**, but owing to increasing **economic level of middle class in India**, the **Board of Directors** is confident of **brighter days in future**. On **1st April, 2023**, the **Board of Directors of the company** is desirous of knowing the amount of **Working Capital** that will be required to meet the **planned level of operations** during the year **2023–24**. Following details have been provided in this regard:

Issued Share Capital: ₹ 2 Crore
10% Debentures: ₹ 50 Lakh
Fixed Assets (1st April, 2023): ₹ 1.25 Crore

Production and sales during the year **2023–24** is expected to average out to **500 units per month**.

During the previous year, the **ratios of cost to selling price**, which are also likely to be maintained in current year as well, were as follows:

Raw Materials: 60%
Direct Wages: 10%
Overheads: 20%

Following additional information has been provided in this regard:

(1) **Raw materials and components** are expected to remain in store for an average period of **two months** before being issued to **assembly and production**.

(2) Each unit of product is expected to be in process for **15 days** (**Work-in-Progress period**).

(3) **Finished goods** stay in warehouse for an average period of **1 month** before being dispatched to **customers**.

(4) **Suppliers of raw material components** extend an average **credit of 1.5 month** (**Creditors period**).

(5) **80% sales are credit** and though **credit extended to customers is two months**, average **credit collection period is 75 days** (**Debtors period**).

(6) On an average, **overheads of 2 weeks remain outstanding** (**Outstanding expenses**).

(7) **Selling price per unit** is ₹ **5,000**.

(8) **Work-in-progress cost** involves **100% of material** and **50% of labour and overheads**.

(9) **Sundry debtors** to be valued at **cash cost**. Entire **overhead cost is assumed to be cash cost**.

(10) **One year** is equal to **360 days or 52 weeks**.

(11) Assuming **production and sales follow a constant pattern**.

You are required to:

(a) Prepare an estimate of **working capital required** by the company for the ensuing year. Add **10% of your calculated figure for contingencies**.
(10 marks)

(b) Prepare a **forecast of Profit/Loss Account** for the ensuing year.
(5 marks)

(c) Prepare a **forecasted Balance Sheet** at the end of ensuing year.
(5 marks)

Answer (a)
Statement of Estimated Working Capital of XYZ Ltd.

Particulars		**Amount (₹)**
Current Assets:		
Inventory		
Raw Material = 6000 × 3000 × 2/12		30,00,000
Work-in-Process = 6000 × (3000 + 250 + 500) × 15/360		9,37,500
Finished Goods = 6000 × (3000 + 500 + 1000) × 1/12		22,50,000
Total Inventory		**61,87,500**
Sundry Debtors = (6000 × 80%) × (3000 + 500 + 1000) × 75/360		45,00,000
Total Current Assets		**1,06,87,500**
Less: Current Liabilities	**Amount (₹)**	
Sundry Creditors = 6000 × 3000 × 1.5/12	(22,50,000)	
Outstanding Overheads = 6000 × 1000 × 2/52	(2,30,769)	
Balance	**82,06,731**	
Add: **10% for contingencies**	8,20,673	
Estimated Working Capital Required	**90,27,404**	

Working Notes

(i) Annual Production
= 500 × 12
= **6000 units**

(ii) Per Unit Cost

- **Raw Material** = 5000 × 60% = **₹ 3000**
- **Direct Wages** = 5000 × 10% = **₹ 500**
- **Overheads** = 5000 × 20% = **₹ 1000**

Answer (b)
Forecasted Profit and Loss Account of XYZ Ltd.

Particulars	**Amount (₹)**	**Particulars**	**Amount (₹)**
To Material and Components	1,80,00,000	By Sales	3,00,00,000
To Direct Labour	30,00,000		
To Overheads	60,00,000		
To Gross Profit c/d	30,00,000		
Total	**3,00,00,000**	**Total**	**3,00,00,000**

Particulars	**Amount (₹)**	**Particulars**	**Amount (₹)**
To Interest on Debentures	5,00,000	By Gross Profit b/d	30,00,000
To Net Profit c/d	25,00,000		
Total	**30,00,000**	**Total**	**30,00,000**

Answer (c)
Forecasted Balance Sheet of XYZ Ltd.

Liabilities	**Amount (₹)**	**Assets**	**Amount (₹)**
Share Capital	2,00,00,000	Fixed Assets	1,25,00,000
Profit and Loss A/c	25,00,000	**Net Current Assets**	**1,50,00,000**
10% Debentures	50,00,000	Inventory:	
		Raw Material	30,00,000

Liabilities	Amount (₹)	Assets	Amount (₹)
		Work-in-Process	9,37,500
		Finished Goods	22,50,000
		Total Inventory	**61,87,500**
		Add: Debtors	50,00,000
		Add: Cash / Bank	62,93,269
Total	**2,75,00,000**	**Total**	**2,75,00,000**

Notes

1. **Debtors on selling price**
   = (6000 × 80%) × 5000 × 75/360
   = **₹ 50,00,000**
2. **Cash / Bank Balance** is the **balancing figure**.
3. **Cash / Bank Balance**
   = Total Current Assets – Total Inventory – Debtors
   = 1,74,80,769 – 61,87,500 – 50,00,000
   = **₹ 62,93,269**
4. If a student shows **Creditors** and **Outstanding Overheads** on the **liability side**, in that case the total of the balance sheet will be **₹ 2,99,80,769**.
5. Candidates solving the above question by **any format**, whether **vertical or horizontal**, may be awarded marks.

Abbreviations

- **CA** = Current Assets
- **CL** = Current Liabilities
- **O/S Overheads** = Outstanding Overheads

Question

Two components **A** and **B** are used as follows:

Particulars	Component A	Component B
Normal Usage	3,000 units	3,000 units
Maximum Usage	4,500 units	4,500 units
Minimum Usage	1,500 units	1,500 units
Re-order Quantity	20,000 units	40,000 units
Re-order Period	4 to 6 weeks	2 to 4 weeks

Calculate:

1. Re-order Level
2. Maximum Level
3. Minimum Level
4. Average Inventory

Answer

Explanation

Inventory levels are calculated to ensure that sufficient stock is available for production and that excess stock is avoided. The calculations are based on usage, re-order quantity, and re-order period.

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1. Re-order Level

Formula:
Re-order Level = Maximum Usage × Maximum Re-order Period

Component	Calculation	Re-order Level
A	4,500 × 6	**27,000 units**
B	4,500 × 4	**18,000 units**

---

2. Maximum Level

Formula:
Maximum Level = Re-order Level + Re-order Quantity – (Minimum Usage × Minimum Re-order Period)

Component	Calculation	Maximum Level
A	27,000 + 20,000 – (1,500 × 4)	**41,000 units**
B	18,000 + 40,000 – (1,500 × 2)	**55,000 units**

---

3. Minimum Level

Formula:
Minimum Level = Re-order Level – (Normal Usage × Normal Re-order Period)

Component	Calculation	Minimum Level
A	27,000 – (3,000 × 5)	**12,000 units**
B	18,000 – (3,000 × 3)	**9,000 units**

---

4. Average Inventory

Method 1

Formula:
Average Inventory = Minimum Level + ½ Re-order Quantity

Component	Calculation	Average Inventory
A	12,000 + ½ × 20,000	**22,000 units**
B	9,000 + ½ × 40,000	**29,000 units**

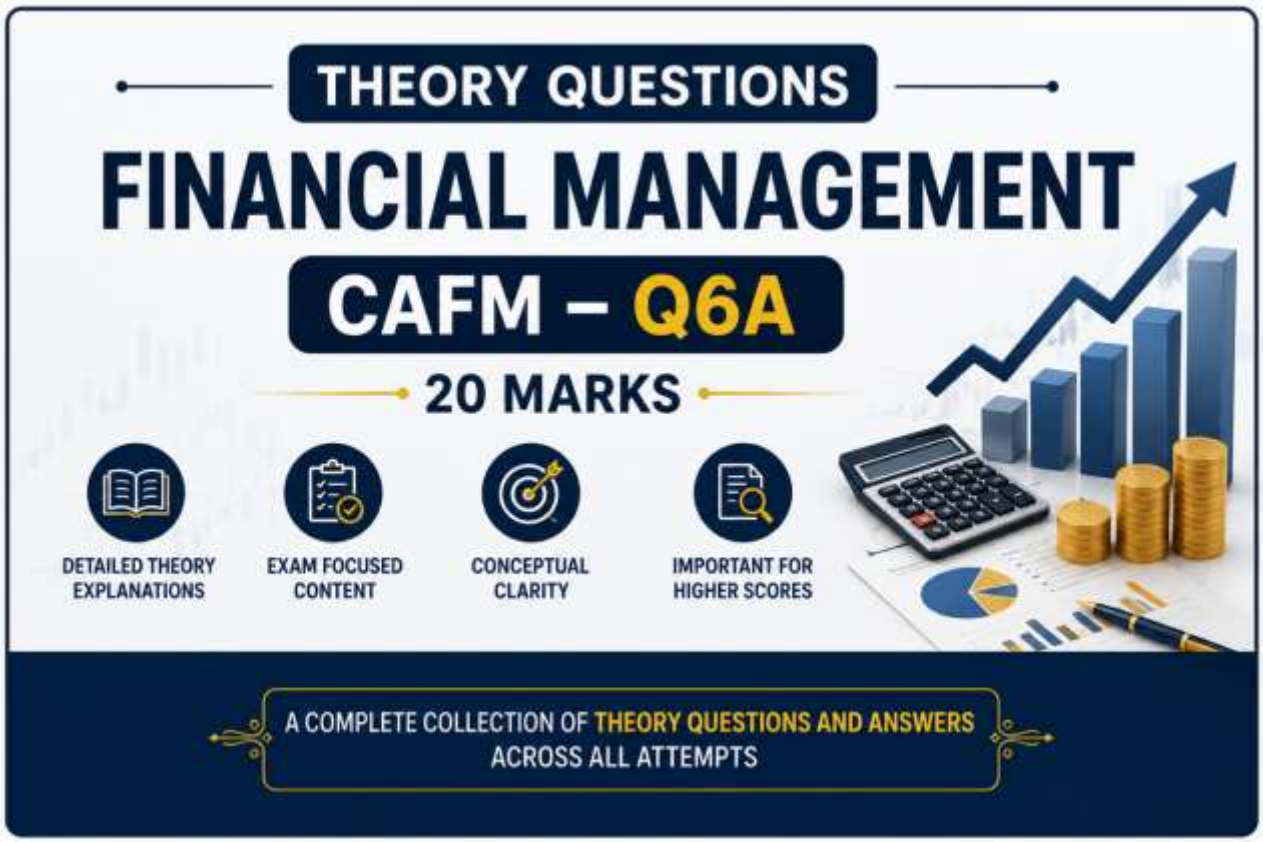
Or Method 2

Formula:
Average Inventory = (Minimum Level + Maximum Level) / 2

Component	Calculation	Average Inventory
A	(12,000 + 41,000) / 2	**26,500 units**
B	(9,000 + 55,000) / 2	**32,000 units**

Conclusion

Thus, the **Re-order Level, Maximum Level, Minimum Level, and Average Inventory** for Components A and B have been calculated. These levels help the business maintain proper stock, avoid shortages, prevent excess inventory, and ensure smooth production operations.



Important Note:
In **CAFM Part B – Financial Management**, **Question 6A** is a **Theory Question** carrying **20 Marks**, consisting of **4 Questions of 5 Marks each**. Students must prepare the **Theory Portion thoroughly** along with **Practical Problems** to score well in the examination.

DECEMBER 2025 – Questions and Answers

Total: 20 Marks

Question 6A

(i) What is the Rule of 69 in the context of the doubling period? Mention any two benefits and two limitations of this rule.

(5 Marks)

Answer

According to the **Rule of 69**, the doubling period is calculated as:

$$\text{Doubling Period} = 0.35 + \frac{69}{\text{Interest Rate}}$$

Example:
If the interest rate is 10%, then:

Doubling Period = 0.35 + (69 ÷ 10) = **7.25 years**

Benefits of Rule of 69

1. It assumes continuous compounding, which is suitable in equity valuation.
2. It gives results very close to those obtained using financial calculators.
3. It is simple and easy to calculate.
4. Even non-finance persons can use it easily.

Limitations of Rule of 69

1. It is difficult to explain the logic behind the number 69.
2. It is mainly applicable to continuously compounding securities like equity shares.
3. The formula may not provide accurate results at very low interest rates.
4. It ignores dividend income received on equity shares.

(ii) Classify the following risks as Systematic and Unsystematic Risks

(5 Marks)

Answer

Systematic Risks

1. Changes in laws and regulations
2. Interest rate hikes
3. Changes in foreign policy
4. Volatility in currency values
5. Tax reforms

Unsystematic Risks

1. Foreign government expropriating assets of a specific company
2. Recall of products by a company
3. Entry of a new competitor into the market
4. Fraudulent financial statements prepared by a company
5. Employee walkout due to union action

(iii) Discuss the concept of Relative Strength Index (RSI).

(5 Marks)

Answer

The **Relative Strength Index (RSI)** is a momentum indicator used in technical analysis. It measures the speed and magnitude of recent price changes in a security to identify overbought or oversold conditions.

RSI is displayed on a scale from 0 to 100 and was developed by **J. Welles Wilder Jr.**

Interpretation of RSI

- RSI above 70 indicates an **overbought** condition.
- RSI below 30 indicates an **oversold** condition.

RSI helps traders identify:

- Trend reversals
- Buy and sell signals
- Corrective pullbacks

Formula of RSI:

$$RSI = 100 - \frac{100}{1 + RS}$$

Where,

$$RS = \frac{\text{Average Gain Per Day}}{\text{Average Loss Per Day}}$$

(iv) What is the Hamada Equation in terms of Capital Structure?

(5 Marks)

Answer

The **Hamada Equation** explains the relationship between financial leverage and the beta of a firm. It extends the Modigliani-Miller theory and shows how leverage affects the systematic risk of a company.

The higher the levered beta, the higher the financial risk of the firm.

Important Features

1. It analyses the cost of capital with additional financial leverage.
2. It is based on the Modigliani-Miller theorem.
3. It measures the impact of debt on the risk profile of a company.

Formula of Hamada Equation:

$$\beta_L = \beta_U \left[1 + (1 - T)\left(\frac{D}{E}\right)\right]$$

Where:

- βL = Levered Beta
- βU = Unlevered Beta
- T = Tax Rate
- D/E = Debt-Equity Ratio

JUNE 2025 – Questions and Answers

Total: 20 Marks

Question 6A

(i) Write a short note on Common Size Financial Statements.

(5 Marks)

Answer

A **Common Size Financial Statement** presents each line item as a percentage of a common base figure. It helps in analysing the financial performance of a company over a period of time and also enables comparison with other companies.

Common size statements help in identifying trends and relationships which may not be visible in raw financial statements.

Common Size Balance Sheet

In a common size balance sheet, **total assets** are generally taken as the base figure.

It helps in analysing:

- Debt position of the company
- Liquidity position
- Inventory levels
- Working capital utilisation
- Extent of dependence on acquisitions through goodwill

Common Size Income Statement

In a common size income statement, **total sales** are taken as the base figure.

It helps in calculating:

- Gross profit margin
- Operating profit margin

- Net profit margin

Thus, common size statements are useful tools for financial analysis and peer comparison.

(ii) What is the rationale of Stable Dividend Policy?

(5 Marks)

Answer

Most companies adopt a **stable dividend policy** because it provides confidence and certainty to investors.

Rationale of Stable Dividend Policy

1. **Investors prefer stable dividends**
   Many shareholders, especially retired persons, depend upon dividend income for meeting their regular expenses.
2. **Reduction in investor uncertainty**
   Stable dividends reduce uncertainty among investors and may increase market value of shares.
3. **Preference by institutional investors**
   Institutional investors generally prefer companies having a consistent dividend payment record.
4. **Helps in raising external finance**
   Companies with stable dividend policies enjoy greater investor confidence and can raise funds more easily.

(iii) How can Financial Leverage lead to improvement in EPS?

(5 Marks)

Answer

Financial Leverage refers to the use of fixed financial cost funds such as debentures and preference share capital to increase the earnings available to equity shareholders.

It magnifies the effect of changes in EBIT on Earnings Per Share (EPS).

Meaning of Financial Leverage

$$\text{Financial Leverage} = \frac{\text{Operating Profit (EBIT)}}{\text{Profit Before Tax}}$$

Degree of Financial Leverage

$$\text{Degree of Financial Leverage} = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in EBIT}}$$

Favourable Financial Leverage

When the return earned on borrowed funds is greater than the fixed financial cost, EPS increases. This is known as **positive or favourable leverage**.

Unfavourable Financial Leverage

When earnings are insufficient to cover the fixed financial cost, EPS decreases. This is known as **negative or unfavourable leverage**.

Thus, proper use of borrowed funds can improve EPS and shareholder returns.

(iv) What are Safety Stocks in Working Capital Management?

(5 Marks)

Answer

Safety Stock refers to the additional inventory maintained by a firm to meet unexpected increases in demand or delays in supply.

Demand and supply conditions cannot always be predicted accurately. Therefore, firms maintain safety stock to avoid stock-out situations.

Importance of Safety Stock

1. Prevents disruption in production
2. Ensures continuous supply to customers
3. Helps maintain smooth business operations
4. Protects the firm against uncertainties

Costs Involved in Safety Stock

1. Opportunity Cost of Stock-outs

If inventory is insufficient:

- Production may stop
- Customer orders may not be fulfilled
- Loss of goodwill may arise

2. Carrying Cost

Maintaining excessive safety stock increases:

- Storage costs
- Insurance costs
- Capital blocking

Hence, firms must maintain an optimum level of safety stock balancing both costs.

DECEMBER 2024 – Questions and Answers

Total: 20 Marks

Question 6A

(i) Write a short note on Present Value of Annuity.

(5 Marks)

Answer

The **Present Value of an Annuity** refers to the current value of a series of future annuity payments discounted at a specified rate of return.

It is based on the principle of **Time Value of Money**, which states that money received today is worth more than the same amount received in future.

Key Points

1. It helps determine the present worth of future annuity payments.
2. A higher discount rate reduces the present value of the annuity.
3. It helps compare lump sum receipts with periodic annuity payments.

Formula of Present Value of Annuity

$$P = PMT \times \frac{1 - \left(\frac{1}{(1+r)^n}\right)}{r}$$

Where:

- P = Present Value of Annuity
- PMT = Amount of each annuity payment
- r = Discount Rate
- n = Number of periods

(ii) What are Primary Trends in terms of the Dow Theory related to Technical Analysis?

(5 Marks)

Answer

Technical Analysis is the method of forecasting security prices through analysis of past price and volume data.

The **Dow Theory**, developed from Dow Jones principles, explains different market trends.

Primary Trend

A **Primary Trend** is the major movement of the market which generally lasts from one to three years.

It represents the overall direction of the market and influences all secondary and minor trends.

Types of Primary Trends

1. Bullish Phase

In a bullish trend:

- Market prices move upward overall.
- After every fall, the next rise is higher than the previous peak.

2. Bearish Phase

In a bearish trend:

- Market prices generally decline.
- Temporary rises are followed by sharper declines.

Thus, the primary trend is considered the most important trend in technical analysis.

(iii) Define Risk Adjusted Discount Rate and Certainty Equivalent Technique.

(5 Marks)

Answer

Risk Adjusted Discount Rate (RADR)

RADR is the discount rate used for risky investments. It is calculated by adding a risk premium to the risk-free rate of return.

It is also known as the **Varying Discount Rate Method**.

Formula of RADR

$$RADR = \text{Risk Free Rate} + \text{Risk Premium}$$

Projects having higher risk are discounted at a higher rate because of greater uncertainty in expected returns.

Certainty Equivalent Technique

Under this method, risky cash flows are converted into certain cash flows by applying a certainty equivalent coefficient.

Formula

$$\text{Certainty Equivalent Coefficient} = \frac{\text{Riskless Cash Flows}}{\text{Risky Cash Flows}}$$

This method reduces expected cash flows to conservative levels before discounting them.

(iv) What is the connection between Risk and Leverage in terms of Capital Structure?

(5 Marks)

Answer

Risk refers to the possibility that actual future returns may differ from expected returns.

In capital structure, risk is broadly classified into:

1. Business Risk

Business risk arises due to day-to-day operational activities of the firm such as:

- Purchase decisions
- Manufacturing expenses
- Administrative expenses

These factors affect the operating profits or EBIT of the company.

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2. Financial Risk

Financial risk arises because of the use of fixed interest-bearing debt in the capital structure.

When a company uses debt financing:

- Interest becomes a fixed obligation
- Earnings available to shareholders fluctuate more

Thus, higher leverage increases financial risk because debt obligations must be paid irrespective of profits.

JUNE 2024

Question 6A

(i) "The concept of negative working capital is a sign of strong bargaining power." Comment and explain with an example.

(5 Marks)

Answer

Negative working capital refers to a situation where **current liabilities exceed current assets**.

Generally, negative working capital may indicate financial difficulties or liquidity problems. However, in some businesses, it can also indicate **strong bargaining power and managerial efficiency**.

Companies having:

- Fast inventory turnover
- Immediate cash sales
- Longer credit periods from suppliers

may successfully operate with negative working capital.

Such businesses generate cash quickly before payments to suppliers become due.

Advantages of Negative Working Capital

1. Indicates efficient working capital management
2. Reduces requirement of additional funds
3. Improves return on capital employed
4. Reflects strong bargaining power with suppliers

Example

Suppose Walmart purchases DVDs from Warner Bros. on 30 days credit.

Before the payment becomes due:

- Walmart supplies the DVDs to stores
- Sells them to customers
- Generates cash and profit

Thus, the company earns revenue before making payment to suppliers. This reflects strong bargaining power and high managerial efficiency.

(ii) What is Systematic Risk? Describe its types.

(5 Marks)

Answer

Meaning of Systematic Risk

Systematic Risk arises due to external factors affecting the entire market or economy. These risks are uncontrollable from the company's point of view and affect a large number of businesses.

Examples include:

- Economic recession
- Political instability
- Inflation
- Changes in government policies

Companies whose sales and profits move with the overall economy generally face higher systematic risk.

Types of Systematic Risk

1. Interest Rate Risk

This risk arises due to fluctuations in market interest rates. It mainly affects debt securities carrying fixed rates of interest.

2. Market Risk

Market risk refers to fluctuations in stock prices caused by overall market movements.

3. Purchasing Power or Inflation Risk

This risk arises because inflation reduces the purchasing power of money, thereby reducing real returns from investments.

(iii) What is Price Rate of Change and Advance-Decline Ratio?

(5 Marks)

Answer

Price Rate of Change (ROC)

The **Price Rate of Change (ROC)** is a momentum-based technical indicator that measures the percentage change between the current price and the price prevailing a certain number of periods earlier.

Interpretation

- ROC above zero indicates an upward trend
- ROC below zero indicates a downward trend
- ROC near zero indicates consolidation

Formula

$$ROC = \frac{\text{Closing Price}_{p} - \text{Closing Price}_{p-n}}{\text{Closing Price}_{p-n}} \times 100$$

Where:

- Closing Pricep = Current closing price
- Closing Pricep−n = Closing price n periods earlier

Advance-Decline Ratio

The **Advance-Decline Ratio** measures the ratio between:

- Number of stocks whose prices increased, and
- Number of stocks whose prices declined

Interpretation

- Ratio greater than 1 indicates a bullish trend
- Declining ratio signals weakening market trend

(iv) What is Economic Value Added and Market Value Added? Under what conditions will EVA increase?

(5 Marks)

Answer

Economic Value Added (EVA)

Economic Value Added (EVA) represents the excess profit earned by a company after covering the cost of capital employed in the business.

It measures the value created for shareholders.

Formula of EVA

$$EVA = NOPAT - (\text{Cost of Capital} \times \text{Capital Employed})$$

Where:

- NOPAT = Net Operating Profit After Tax

EVA will increase when:

1. Operating profits increase without additional capital employed
2. Additional investments generate returns higher than the cost of capital
3. Unproductive capital is reduced or liquidated

Market Value Added (MVA)

Market Value Added (MVA) represents the difference between the market value of the company and the capital invested by shareholders and debt holders.

Formula of MVA

$$MVA = V - K$$

Where:

- V = Market value of the firm
- K = Total capital invested in the firm

A positive MVA indicates that the company has created wealth for investors.

DECEMBER 2023 – Questions and Answers

Question 6A

(i) What do you mean by Aroon Indicator? Explain.

(5 Marks)

Answer

The **Aroon Indicator** is a technical analysis indicator used to identify:

- Trend changes in the price of an asset, and
- Strength of the trend.

It measures the time taken between:

- Recent highs, and
- Recent lows

during a specified period.

The indicator is based on the idea that:

- Strong uptrends frequently create new highs
- Strong downtrends frequently create new lows

The Aroon Indicator was developed by Tushar Chande in 1995.

Components of Aroon Indicator

1. Aroon Up

It measures the strength of an upward trend.

Formula

$$\text{Aroon Up} = \frac{25 - \text{Periods Since 25-Period High}}{25} \times 100$$

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2. Aroon Down

It measures the strength of a downward trend.

Formula

$$\text{Aroon Down} = \frac{25 - \text{Periods Since 25-Period Low}}{25} \times 100$$

A higher Aroon Up indicates a strong bullish trend, whereas a higher Aroon Down indicates a strong bearish trend.

(ii) Explain Hamada Equation and calculate Hamada Coefficient.

(5 Marks)

Answer

The **Hamada Equation** is used to analyse the impact of financial leverage on the beta and risk of a company.

It is based on the **Modigliani-Miller Theory of Capital Structure**.

The equation shows that:

- Higher debt increases financial leverage
- Higher leverage increases beta and overall risk of the company

Formula of Hamada Equation

$$\beta_L = \beta_U \left[1 + (1 - t)\left(\frac{D}{E}\right)\right]$$

Where:

- βL = Levered Beta
- βU = Unlevered Beta
- t = Tax Rate
- D/E = Debt-Equity Ratio

Calculation

Given:

- Debt-Equity Ratio = 0.65 : 1
- Tax Rate = 35%
- Unlevered Beta = 0.80

Substituting in the formula:

$$\beta_L = 0.80[1 + (1 - 0.35)(0.65)]$$

Leveraged Beta

$$\beta_L = 1.138$$

Thus, the leveraged beta is **1.138**.

The increase in risk due to leverage is:

1.138 − 0.80 = **0.338**

Hence, higher financial leverage increases the overall risk of the company.

(iii) What is meant by Annuity Due and Ordinary Annuity?

(5 Marks)

Answer

Ordinary Annuity

In an **Ordinary Annuity**, payments are made at the **end of each period**.

Examples

- Loan repayments
- Mortgage payments
- Bond interest payments
- Dividend payments

Annuity Due

In an **Annuity Due**, payments are made at the **beginning of each period**.

Difference between Annuity Due and Ordinary Annuity

Basis	**Ordinary Annuity**	**Annuity Due**
Timing of Payment	End of each period	Beginning of each period
Present Value	Lower	Higher
Benefit	Payer benefits	Receiver benefits

The present value of annuity due is higher because payments are received earlier due to the **Time Value of Money** principle.

(iv) Briefly explain the emerging roles of Financial Manager.

(5 Marks)

Answer

The role of a **Financial Manager** is to ensure:

- Liquidity
- Profitability
- Efficient management of assets and funds

The Financial Manager performs both decision-making and staff functions.

Emerging Roles of Financial Manager

1. Forecasting cash flows
2. Raising funds for the business
3. Managing internal flow of funds
4. Facilitating cost control
5. Assisting in product pricing decisions
6. Forecasting profits
7. Measuring required rate of return
8. Managing assets efficiently
9. Managing funds effectively

Thus, the financial manager plays a vital role in achieving financial stability and growth of the business.