

Chapter 4

Cost of Capital

Q1. What do you understand by the term cost of capital?

Answer:

- ✓ Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt-holders) to the business as a compensation for their contribution to the total capital.
- ✓ When an entity (corporate or others) procured finances from either sources as listed above, it has to pay some additional amount of money besides the principal amount.
- ✓ The additional money paid to these financiers may be either one off payment or regular payment at specified intervals.
- ✓ This additional money paid is said to be the cost of using the capital and it is called the cost of capital.
- ✓ This cost of capital expressed in rate is used to discount/ compound the cash flow or stream of cash flows.
- ✓ Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return' etc.
- ✓ It is used as a benchmark for:
 - Framing debt policy of a firm
 - Educating Capital budgeting decisions.

Q2. What is the significance of the cost of capital?

Answer:

The cost of capital is important to arrive at correct amount and helps the management or an investor to take an appropriate decision. The correct cost of capital helps in the following decision making:

- ✓ **Evaluation of investment options:**
 - The future cash flows from available investment options are converted into the present value of benefits by discounting them with the relevant cost of capital.

- Different investment option may have different cost of capital hence it is very important to use the cost of capital which is relevant to the options available.
- Here Internal Rate of Return (IRR) is treated as cost of capital for evaluation of two options (projects).
- ✓ **Performance Appraisal:**
 - Cost of capital is used to appraise the performance of a particular project or business.
 - The performance of a project or business is compared against the cost of capital which is known here as cut-off rate or hurdle rate.
- ✓ **Designing of optimum credit policy:**
 - While deciding whether to appraise the credit period the cost of allowing credit period is compared against the benefit/ profit earned by providing credit to customer of segment of customers.
 - Here cost of capital is used to arrive at the present value of cost and benefits received.

Q3. Explain Explicit & Implicit cost of capital?

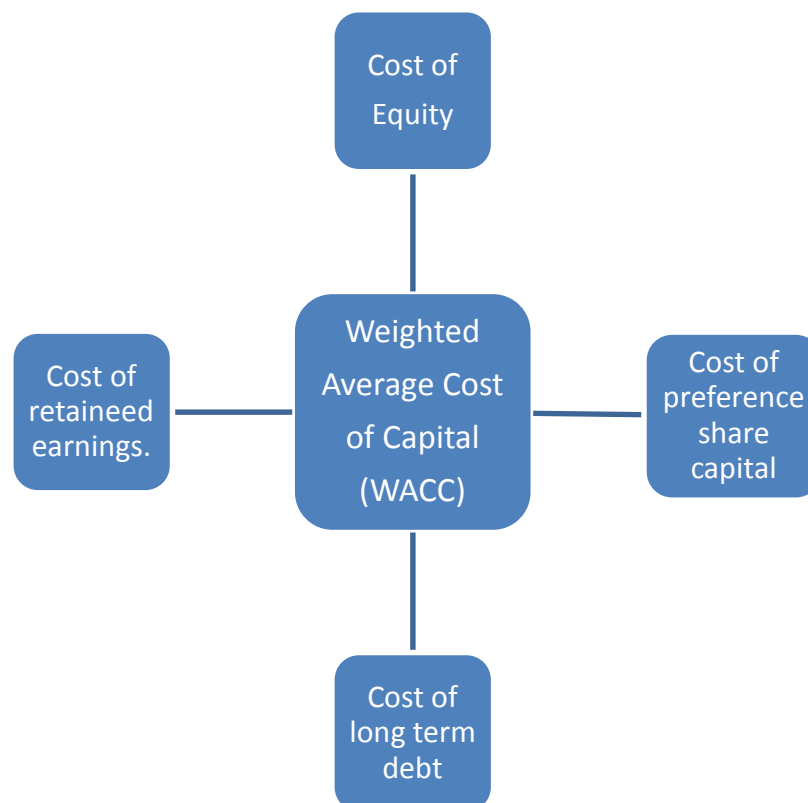
Answer:

- ✓ The cost of capital can either be explicit or implicit.
- ✓ **Explicit cost of capital:**
 - The cash outflow of an entity towards the utilization of capital which is clear and obvious is termed as **explicit** cost of capital.
 - These outflows may be interest payment to debenture holders, repayment of principal amount to financial institution or payment of dividend to shareholders etc.
- ✓ **Implicit cost of capital:**
 - On the other hand implicit cost is the cost which is actually not a cash outflow but it is an opportunity loss of foregoing a better investment opportunity by choosing an alternative option.
 - For example:
 - An entrepreneur for example, uses its bank deposits which earns interest @ of 9% p.a. for the business purpose.

- Using its bank deposits for business purpose means forgoing interest earnings from the bank on this deposit.
 - The cost of capital in this case will be 9% interest that could have been earned by not investing the deposit for the business purpose.
 - This opportunity loss of 9% is called implicit cost capital or opportunity cost.
- ✓ The two factors which are considered to determine the cost of capital are:
- i. Source of Finance
 - ii. Reciprocal payment of the using finance.

Q4. Provide a diagrammatic representation of different sources of finance.

Answer:



Q5. What are the features of debentures/bonds?

Answer:

Following are the different features of debentures/bonds:

- ✓ Face Value:
 - Debentures or Bonds are denominated with some value, called as the face value of the debenture.
 - Interest is always calculated on the face value of the debentures.
 - E.g. If a company issue 9% Non- convertible debentures of ₹ 100 each, this means the face value is ₹100 and the interest @ 9% will be calculated on this face value.
- ✓ Interest (Coupon) Rate:
 - Each debenture bears a fixed interest (coupon) rate (except Zero coupon bond and Deep discount bond).
 - Interest (coupon) rate is applied to face value of debenture to calculate interest, which is payable to the holders of debentures periodically.
- ✓ Maturity period:
 - Debentures or Bonds has a fixed maturity period for redemption.
 - However, in case of irredeemable debentures maturity period is not defined and it is taken as infinite.
- ✓ Redemption Value:
 - Redeemable debentures or bonds are redeemed on its specified maturity date.
 - Based on the debt covenants the redemption value is determined.
 - Redemption value may vary from the face value of the debenture.
- ✓ Benefit of tax shield:
 - The payment of interest to the debenture holders are allowed as expenses for the purpose of corporate tax determination.
 - Hence, interest paid to the debenture holders save the tax liability of the company.
 - Saving in the tax liability is also known as tax shield.

Q6. Based on redemption (repayment of principal) on maturity, how can we classify debt?

Answer:

Based on redemption, we can classify debt into following:

- i. Irredeemable debts and
- ii. Redeemable debts.

Q7. Explain cost of Irredeemable Debentures.

Answer:

- ✓ The cost of debentures which are not redeemed by the issuer of the debenture is known as irredeemable debentures.
- ✓ Cost of debentures not redeemable during the life time of the company is calculated as below:

$$\text{Cost of Irredeemable Debentures}(K_d) = \frac{1}{NP} (1 - t)$$

Where,

K_d = Cost of debt after tax

I = Annual Interest payment

NP = Net proceeds of debentures or current market price

t = Tax rate

Q8. How will you calculate the cost of Redeemable Debentures, using approximation method?

Answer:

The cost of redeemable debentures will be calculated as below:

$$K_d = \frac{1(1 - t) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}}$$

Where,

K_d = Cost of debt after tax

I = Annual interest payment

NP = Net proceeds of debentures or current market price

t = Tax rate

Q9. How will you calculate cost of debt using Present Value Method?

Answer:

- ✓ The cost of redeemable debt(K_d) can be calculated by discounting the relevant cash flows using internal rate of return (IRR).

- ✓ Here YTM is the annual return of an investment from the current date till maturity date. So, YTM is the internal rate of return at which current price of a debt equals to the present value of all cash flows.

Q10. Explain amortization of bonds.

Answer:

- ✓ A bond may be amortized every year i.e. principal is repaid every year rather than at maturity.
- ✓ In such a situation, the principal will go down with annual payments and interest will be computed on the outstanding amount. The cash flows of the bonds will be uneven.
- ✓ The formula for determining the value of a bond or debenture that is amortized every year is as follows:

$$V_B = \frac{C_1}{1+K_d} + \frac{C_2}{1+K_d} + \dots + \frac{C_n}{(1+K_d)^n}$$

$$V_B = \sum_{t=1}^n \frac{C_t}{(1+K_d)^t}$$

Q11. Explain how you will explain the cost of convertible debentures.

Answer:

- ✓ The calculation of cost of convertible debentures is very much similar to the redeemable debentures.
- ✓ Holders of the convertible debentures have the option to either get the debentures redeemed into cash or get specified numbers of companies shares in lieu of cash.
- ✓ While determining the redeemable value of the debentures, it is assumed that all the debenture holders will choose the option which has the higher value and accordingly it is considered to calculate cost of debt.

Q12. Explain the cost of preference share capital with reference to the tax benefits for a company. Also mention the categories into which preference share capital can be classified.

Answer:

- ✓ The preference share capital holders are paid dividend at a specified rate on face value of preference shares.
- ✓ Payment of dividend to the preference shareholders is not mandatory but they are given priority over the equity shareholder.
- ✓ The payment of dividend to the preference shareholders are not charged as expenses but treated as appropriation of after tax profit.
- ✓ Hence, dividend paid to preference shareholders does not reduce the tax liability to the company.
- ✓ Like the debentures, Preference share capital can be categorized as redeemable and irredeemable.

Q13. Explain the meaning of the term “redeemable preference shares”. Also express cost of redeemable preference share mathematically.

Answer:

- ✓ Preference shares issued by a company which are redeemed on its maturity are called redeemable preference shares.
- ✓ While calculating cost of redeemable preference share it is important to remember that dividends paid to the preference shareholders are not tax deductible.
- ✓ Cost of preference capital is calculated as follows:

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

Where,

K_p = Cost of redeemable preference shares

PD = Annual preference dividend

RV = Redemption value of preference shares

NP = Net proceeds on issue of preference shares

n = Life of preference shares

- ✓ The cost of redeemable preference share also equates to present value of the future dividends and principal payments.

Q14. Explain the meaning of the term “irredeemable preference shares”. Also express cost of redeemable preference share mathematically.

Answer:

- ✓ The cost of irredeemable preference shares is similar to calculation of perpetuity.
- ✓ The cost is calculated by dividing the preference dividend with the current market price or net proceeds from the issue.
- ✓ The cost of irredeemable preference share is as below:

$$K_p = \frac{PD}{P_0}$$

Where,

K_p = Cost of irredeemable preference shares

PD = Annual Preference dividend

P_0 = Net proceeds in issue of preference shares

Q15. How will you describe the cost of equity share capital with respect to a company?

Answer:

- ✓ It may prima facie appear that equity capital does not carry any cost. But this is not true.
- ✓ The market share price is a function of return that equity shareholders expect and get. If the company does not meet their requirements, it will have an adverse effect on the market share price.
- ✓ Also, it is relatively the highest cost of capital.
- ✓ Due to relative higher risk, equity shareholders expect higher return hence, the cost of capital is also high.
- ✓ In simple words, cost of equity capital equates to the present value of expected dividends with the market share price.

Q16. Mention the different methods employed to compute the cost of equity share capital.

Answer:

The different methods employed to compute the cost of equity share capital are explained as below:

- i. Dividend Price Approach

- ii. Earning/Price Approach
- iii. Realized Yield Approach
- iv. Capital Asset Pricing Model (CAPM)

Q17. Explain Dividend Price Approach

Answer:

- ✓ This is also known as **Dividend Valuation Model**.
- ✓ This model makes an assumption that the market price of a share is the present value of its future dividends stream.
- ✓ As per this approach the cost of equity is the rate which equates the future dividends to the current market price.
- ✓ Here, cost of equity capital is computed by dividing the expected dividend by market price per share.
- ✓ The Dividend price approach can be further sub-categorized into following:
 - i. Dividend Price Approach with Constant Dividend
 - ii. Dividend Price Approach with Constant Growth

Q18. Explain the dividend price approach with constant dividend and dividend price approach with constant growth.

Answer:

A. Dividend Price Approach with Constant Dividend:

- ✓ In this approach dividend is constant, which means there is no-growth or zero growth in dividend.
- ✓ The cost of equity can be calculated as follows:

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

Where,

K_e = Cost of equity

D = Expected Dividend

P_0 = Market Price of equity (ex-dividend)

B. Dividend Price Approach with Constant Growth:

- ✓ As per this approach the rate of dividend **growth** remains constant.

- ✓ Where earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:

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

Where,

$D_1 = D_0(1 + g)$, that is, next expected dividend

P_0 = Market Price of equity (ex-dividend)

g = Constant growth rate of dividend

Note:

In case of newly issued equity shares where floatation cost is incurred, the cost of equity share with an estimation of constant dividend growth is calculated as below:

$$K_e = \frac{D_1}{P_1 - F} + g$$

Where,

F = Flotation cost per share

Q19. Explain the Earnings/Price Approach.

Answer:

- ✓ This approach co-relates the earnings of the company with the market price of its share.
- ✓ Accordingly, the cost of equity share capital would be based upon the expected rate of earnings of a company.
- ✓ The argument is that each investor expects a certain amount of earnings, whether distributed or not from the company in whose shares he invests.
- ✓ Thus, if an investor expects that the company in which he is going to subscribe for shares should have at least a 20% rate of earning, the cost of equity share capital can be construed on this basis.
- ✓ Suppose the company is expected to earn 30% the investor will be prepared to pay ₹150 ($\frac{30}{20} \times 100$) for each share of ₹100
- ✓ It is given by the following:

$$K_e = \frac{E}{P}$$

Where,

K_e = Cost of Equity

E = Current Earnings per share

P = Market share price

- ✓ Practically earnings do not remain constant and the price of equity shares is also directly influenced by the growth rate in earnings.
- ✓ Hence the above formula needs to be modified to reflect the growth element

$$K_e = \frac{E}{P} + g$$

Where,

K_e = Cost of Equity

E = Current Earnings per share

P = Market share price

g = Annual Growth rate of earnings

Q20. Briefly explain the different methods used to calculate “g” (annual growth rate of earnings.)

Answer:

The calculation of ‘g’ (the growth rate) is an important factor in calculating cost of equity share capital. Generally two methods are used to determine the growth rate (g), which is discussed below

i. Average Method:

- ✓ It is calculated as below:

$$\text{Current Dividend } (D_0) = D_n(1 + g)^n$$

Or,

$$\text{Growth rate}(g) = \sqrt[n]{\frac{D_0}{D_n}} - 1$$

Where,

D_0 = Current Dividend

D_n = Dividend in n years ago

ii. Gordon's Growth Model:

- ✓ Gordon's growth model attempts to derive a future growth rate.
- ✓ As per this model increase in the level of investment will give rise to an increase in future dividends.
- ✓ It can be calculated as below:

$$\text{Growth } (g) = b \times r$$

Where,

r = rate of return on fund invested

b = earnings retention ratio/rate*

*Proportion of earnings available to equity shareholders which is not distributed as dividend.

Note:

Trick: Growth rate can also be found as follows:

Step 1 : Divide D_0 by D_n , find out the result, then refer the FVIF table

Step 2 : Find out the result found at Step-I in corresponding year's row

Step 3: See the interest rate for the corresponding column. This is the growth rate.

Q21. Explain realized yield approach.

Answer:

- ✓ According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future.
- ✓ It computes cost of equity based on the past records of dividends actually realized by the equity shareholders.

- ✓ This approach provides a single mechanism of calculating cost of equity, but it has unrealistic assumptions like risks faced by the company remains same; the shareholders continue to expect the same rate of return; and the reinvestment opportunity cost (rate) of the shareholders is same as the realized yield.
- ✓ If the earnings do not remain stable, this method is not practical.

Q22. Briefly explain the different groups of risk to which a security is exposed.

Answer:

A security is exposed to different risks. These risks can be classified into two groups as below:

i. Unsystematic Risk:

- ✓ This is also called company specific risk as the risk is related with the company's performance.
- ✓ This type of risk can be reduced or eliminated by diversification of the securities portfolio.
- ✓ This is also known as diversifiable risk.

ii. Systematic Risk:

- ✓ It is the macro-economic or market specific risk under which a company operates.
- ✓ This type of risk cannot be eliminated by the diversification hence, it is non-diversifiable.
- ✓ The examples are inflation, Government policy, interest rate etc.

Q23. Explain why a company should be concerned solely with non-diversifiable risk. Also state how they are assessed.

Answer:

- ✓ Diversifiable risk can be eliminated by an investor through diversification; however the non-diversifiable risk is the risk which cannot be eliminated.
Therefore a business should be concerned as per CAPM method, solely with non-diversifiable risk.

- ✓ The non-diversifiable risks are assessed in terms of beta coefficient (b or β) through fitting regression equation between return of a security and the return on a market portfolio.

Q24. How will you calculate the cost of equity capital under the CAPM approach? Also explain the idea behind taking such formula.

Answer:

- ✓ The cost of equity capital under the CAPM approach can be calculated as below:

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

Where,

K_e = Cost of equity capital

R_f = Risk free rate of return

β = Beta Coefficient

R_m = Rate of return on market portfolio

$(R_m - R_f)$ = Market Premium

- ✓ The idea behind CAPM is that investors need to be compensated in two ways- time value of money and risk.
- ✓ The time value of money is represented by the risk-free rate in the formula and compensates the investors for placing money in any investment over a period of time.
- ✓ The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk.
- ✓ This is calculated by taking a risk measure (beta) which compares the returns of the asset to the market over a period of time and compares it to the market premium.
- ✓ The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium.
- ✓ If this expected return does not meet or beat the required return, then the investment should not be undertaken.

Q25. What are the short-comings of CAPM approach?

Answer:

- ✓ The short-comings of CAPM approach are explained as below:

- a) Estimation of betas with historical data is unrealistic; and
 - b) Market imperfections may lead investors to unsystematic risk.
- ✓ Despite these shortcomings, the CAPM is useful in calculating cost of equity, even when the firm is suffering losses.

Q26. What is the basic factor for determining the cost of equity share capital?

Answer:

- ✓ The basic factor behind determining the cost of equity share capital is to measure the expectation of investors from the equity shares of that particular company.
- ✓ Therefore, the whole question of determining the cost of equity shares hinges upon the factors which go into the expectations of particular group of investors in a company of a particular risk class.

Q27. Explain the meaning of cost of retained earnings with respect to a company.

Answer:

- ✓ Retained earnings involve cost. It is the opportunity cost of dividends foregone by shareholders.
- ✓ The cost of retained earnings is often used interchangeably with the cost of equity, as cost of retained earnings is nothing but the expected return of the shareholders from the investment in shares of the company.
- ✓ However, sometime cost of retained earnings remains below the cost of equity due to saving in floatation cost and existence of personal tax.
- ✓ The Cost of Retained Earnings (K_s) is calculated as below:
 - A. In absence of any information on personal tax (t_p):
Cost of Retained earnings(K_s) = Cost of Equity shares(K_e)
 - B. If there is any information on personal tax (t_p):

$$K_s = K_e - t_p$$

Q28. Explain the meaning of floatation cost.

Answer:

- ✓ The new issue of a security (debt or equity) involves some expenditure in the form of underwriting or brokerage fees, legal and administrative charges, registration fees, printing expenses etc.
- ✓ The sum of all these cost is known as floatation cost.
- ✓ This expenditure is incurred to make the securities available to the investors.
- ✓ Floatation cost is adjusted to arrive at net proceeds for the calculation of cost of capital.

Q29. Explain Effective Interest Method.

Answer:

- ✓ Effective Interest is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial asset or financial liability to the gross carrying amount of a financial asset or to the amortized cost of a financial liability.
- ✓ When calculating the effective interest rate, an entity shall estimate the expected cash flows by considering all the contractual terms of the financial instrument (for example, prepayment, extension, call and similar options) but shall not consider the expected credit losses (ECL).
- ✓ The calculation includes all fees and points paid or received between parties to the contract that are an integral part of the effective interest rate, transaction costs, and all other premiums or discounts.
- ✓ There is a presumption that the cash flows and the expected life of a group of similar financial instruments can be estimated reliably.
- ✓ However, in those rare cases when it is not possible to reliably estimate the cash flows or the expected life of a financial instrument (or group of financial instruments), the entity shall use the contractual cash flows over the full contractual term of the financial instrument (or group of financial instruments).'

Q30. Give some practical application of EIR method.

Answer:

- ✓ For floating (variable)-rate financial assets or financial liabilities, periodic re-estimation of cash flows to reflect the movements in the market rates of interest alters the effective interest rate.
- ✓ If the floating (variable)-rate financial asset or financial liability is recognized initially at an amount equal to the principal receivable or payable on maturity, re-estimating the future interest payments normally has no significant effect on the carrying amount of the asset or the liability.
- ✓ So, depending on Materiality an appropriate approach for amortisation can be determined.
- ✓ If the amount of transaction costs, premiums or discount is not significant the straight line amortisation can be done.
- ✓ If the amounts are significant EIR rate, for amortizing these amounts may be applied.

Q31. What is weighted average cost of capital?

Answer:

- ✓ WACC is also known as the overall cost of capital of having capitals from the different sources as explained above.
- ✓ WACC of a company depends on the capital structure of a company.
- ✓ It weighs the cost of capital of a particular source of capital with its proportion to the total capital.
- ✓ Thus, weighted average cost of capital is the weighted average after tax costs of the individual components of firm's capital structure. That is, the after tax cost of each debt and equity is

calculated separately and added together to a single overall cost of capital.

Q32. Explain the areas weighted average cost of capital is majorly used.

Answer:

- ✓ The weighted average cost of capital for a firm is of use in two major areas:-
 1. In consideration of the firm's position.
 2. Evaluation of proposed changes necessitating a change in the firm's capital.
- ✓ Thus, a weighted average technique may be used in a quasi-marginal way to evaluate a proposed investment project, such as the construction of a new building.

Q33. Briefly explain the steps used to calculate weighted average cost of capital.

Answer:

The steps used to calculate weighted average cost of capital have been explained as below:

Step 1: Calculate the total capital from all the sources. (i.e. Long term debt capital + Pref. Share Capital + Equity Share Capital + Retained Earnings)

Step 2: Calculate the proportion (or %) of each source of capital to the total capital, (i. e. $\frac{\text{Equity Share Capital (for example)}}{\text{Total Capital (as calculated in Step1 above)}}$)

- Step 3: Multiply the proportion as calculated in Step 2 above with the respective cost of capital
(i.e. $K_e \times$ Proportion (%) of equity share capital (for example) calculated in Step 2 above)
- Step 4: Aggregate the cost of capital as calculated in Step 3 above. This is the WACC. (i.e. $K_e + K_d + K_p + K_s$ as calculated in Step 3 above)

Q34. Mention the different uses of weighted average cost of capital?

Answer:

- ✓ Securities analysts employ WACC all the time when valuing and selecting investments.
- ✓ In discounted cash flow analysis, WACC is used as the discount rate applied to future cash flows for deriving a business's net present value.
- ✓ WACC can be used as a hurdle rate against which to assess return on investment capital performance.
- ✓ Investors use WACC as a tool to decide whether or not to invest.
- ✓ The WACC represents the minimum rate of return at which a company produces value for its investors.

Example: Let's say a company produces a return of 20% and has a WACC of 11%. By contrast, if the company's return is less than WACC, the company is shedding value, which indicates that investors should put their money elsewhere. Therefore, WACC serves as a useful reality check for investors.

Q35. Mention some of the problems in determining weighted average cost of capital.

Answer:

- ✓ There are some problems in determination of weighted average cost of capital.
- ✓ These mainly relate to:-
 1. Computation of equity capital and

2. Assignment of weights to the cost of specific source of financing. Assignment of weights can be possible either on the basis of historical weighting or marginal weighting.

Q36. “There is a choice of weights between the book value (BV) and market value (MV).” Explain this statement with respect to cost of capital.

Answer:

While using weights we have a choice between the book value & market value as explained below:

1. Book Value (BV):

- ✓ These weights are operationally easy and convenient.
- ✓ While using BV, reserves such as share premium and retained profits are included in the BV of equity, in addition to the nominal value of share capital.
- ✓ Here the value of equity will generally not reflect historic asset values, as well as the future prospects of an organization.

2. Market Value (MV):

- ✓ Market value weights are more correct and represent a firm’s capital structure. It is preferable to use MV weights for the equity.
- ✓ While using MV, reserves such as share premium and retained profits are ignored as they are in effect incorporated into the value of equity.
- ✓ It represents existing conditions and also takes into consideration the impacts of changing market conditions and the current prices of various securities.
- ✓ Similarly, in case of debt MV is better to be used rather than the BV of the debt, though the difference may not be very significant.

Q37. Briefly explain the concept of Marginal cost of capital. Also explain why the problem of choosing weights does not arise in the case of marginal cost of capital.

Answer:

- ✓ The marginal cost of capital may be defined as the cost of raising an additional rupee of capital.
- ✓ Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds.
- ✓ Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights.
- ✓ The marginal weights represent the proportion of funds the firm intends to employ.
- ✓ Thus, the problem of choosing between the book value weights and the market value weights does not arise in the case of marginal cost of capital computation.

Q38. How is the marginal cost of capital calculated?

Answer:

- ✓ To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal component costs.
- ✓ When a firm raises funds in proportional manner and the component's cost remains unchanged, there will be no difference between average cost of capital (of the total funds) and the marginal cost of capital.
- ✓ The component costs may remain constant up to a certain level of funds raised and then start increasing with amount of funds raised.

Practical Questions

Cost of Debt

1. Five years ago, Sona Limited issued 12% irredeemable debentures at ₹103, a ₹3 premium to their par value of ₹100. The current market price of these debentures is ₹94. If the company pays corporate tax at a rate of 35% what is its current cost of debenture capital?
2. A company issued 10000, 10% debentures of ₹100 each on 1.4. 2010 to be matured on 1.4.2015. The company wants to know the current cost

of its existing debt and the market price of the debentures is ₹80. Compute the cost of existing debentures assuming 35% tax rate.

3. A company issues ₹10,00,000, 12% debentures of ₹100 each. The debentures are redeemable after the expiry of fixed period of 7 years. The company is in 35% tax bracket.

Required

- (i) Calculate the cost of debt after tax, if debentures are issued at
- Par
 - 10% discount
 - 10% premium
- (ii) If brokerage is paid at 2%, what will be the cost of debentures, if issue is at par?
4. Deleted

Cost of Preference Shares

5. If Reliance Energy is issuing preferred stock at ₹100 per share, with a stated dividend of ₹12, and a floatation cost of 3% then, what is the cost of preference share?
6. XYZ & Co. issues 2,000 10% preference shares of ₹100 each at ₹95 each. Calculate the cost of preference shares.
7. Referring to the earlier question but taking into consideration that if the company proposes to redeem the preference shares at the end of 10th year from the date of issue. Calculate the cost of preference share?

Cost of Equity

8. A company has paid dividend of ₹1 per share (of face value of ₹10 each) last year and it is expected to grow @ 10% next year. Calculate the cost of equity if the market price of share is ₹55.

9. Calculate the cost of equity of H Ltd. whose risk free rate of return equals 10%. The firm's beta equals 1.75 and the return on the market portfolio equals to 15%.

Cost of Retained Earnings

10. ABC Co. provides the following details

$$D_0 = \text{Rs. } 4.19$$

$$P_0 = \text{Rs. } 50$$

$$G = 5\%$$

Calculate the cost of retained earnings based on DCF method

11. ABC Company provides the following details

$$R_f = 7\%$$

$$b = 1.20$$

$$R_m - R_f = 6\%$$

Calculate the cost of retained earnings based on CAPM method.

Weighted Average Cost of Capital

12. Calculate the WACC using the following data by using

- a. Book value weights
- b. Market value weights

The capital structure of the company is as under:

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

The market prices of these securities are:

Debture: ₹105 per debenture

Preference: ₹110 per preference share

Equity: ₹24 each

Additional Information

- (1) ₹100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10 year maturity.
- (2) ₹100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10 year maturity.

(3) Equity share has ₹4 floatation cost and market price ₹24 per share.

The next year expected dividend is ₹1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.

Corporate tax rate is 50%

13. Determine the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information:

Sources	Book Value	Market Value
	(₹)	(₹)
Equity shares	1,20,00,000	2,00,00,000
Retained earnings	30,00,000	—
Preference shares	9,00,000	10,40,000
Debentures	36,00,000	33,75,000

Additional information:

- i. Equity: Equity shares are quoted at ₹130 per share and a new issue priced at ₹125 per share will be fully subscribed; flotation costs will be ₹5 per share.
 - ii. Dividend: During the previous 5 years, dividends have steadily increased from ₹10.60 to ₹14.19 per share. Dividend at the end of the current year is expected to be ₹15 per share.
 - iii. Preference shares: 15% Preference shares with face value of ₹100 would realize ₹105 per share.
 - iv. Debentures: The Company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2%.
 - v. Tax: Corporate tax rate is 35%. Ignore dividend tax.
14. Gamma Limited has in issue 5, 00,000 ₹1 ordinary shares whose current ex-dividend market price is ₹1.50 per share. The company has just paid a dividend of 27 paise per share, and dividends are expected to continue at this level for some time. If the company has no debt capital, what is the weighted average cost of capital?**[Home Work]**

15. Answer the followings:

SK Limited has obtained funds from the following sources, the specific cost are also given against them:

Source of funds	Amount (₹)	Cost of Capital
Equity Shares	30,00,000	15%
Preference Shares	8,00,000	8%
Retained Earnings	12,00,000	11%
Debentures	10,00,000	9%(before tax)

You are required to:

Calculate the WACC. Assume that corporate tax rate is 30%.

16. You are required to determine the weighted average cost of capital of a firm using (i) book value weights and (ii) market value weights.

The following information is available for your perusal:

Present book value of the firm's capital structure is:

Debenture of ₹100 each	8,00,000
Preference shares of ₹100 each	2,00,000
Equity shares of ₹10 each	10,00,000
	20,00,000

All these securities are traded in the capital markets. Recent Prices are:

Debentures @ 110, Preference shares @ ₹120 and equity shares @

22. Anticipated external financing opportunities are as follows:

- ₹100 per debenture redeemable at par: 20 years maturity 8% coupon rate, 4% floatation costs, sale price ₹100
- 100 preference share redeemable at par: 15 years maturity, 10% dividend rate, 5 % floatation costs, sale price ₹100
- Equity shares: ₹2 per share floatation costs, sale price ₹22.

In addition, the dividend expected on the equity share at the end of the year is ₹2 per share; the anticipated growth rate in dividends is 5% and the firm has the practice of paying all its earnings in the form of dividend. The corporate tax rate is 50% **[Home Work]**

Marginal Cost of Capital

17. ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2010.

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

The company share has a market price of ₹23.60. Next year dividend per share is 50% of year 2010 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS(₹)	Year	EPS (₹)
2001	1.00	2006	1.61
2002	1.10	2007	1.77
2003	1.21	2008	1.95
2004	1.33	2009	2.15
2005	1.46	2010	2.36

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

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

- a. Calculate after tax:
 - i. Cost of new debt
 - ii. Cost of new preference shares
 - iii. New equity share (consuming new equity from retained earnings)
 - b. Calculate marginal cost of capital when no new shares are issued.
 - c. How much can be spent for capital investment before new ordinary shares must be sold. Assume that retained earnings for next year's investment are 50 percent of 2010.
 - d. What will the marginal cost of capital when the fund exceeds the amount calculated in (C), assuming new equity is issued at ₹20 per share?
18. XYZ Ltd. has the following book value capital structure:

Equity capital (in shares of ₹10 each, fully paid up at par)	₹15crores
11% Preference Capital (in shares of ₹100 each, fully paid up at par)	₹1crore

Retained Earnings	₹20crore
13.5% Debentures (of ₹100 each)	₹10crore
15% Term Loans	₹12.5crore

The next expected dividend on equity shares per share is ₹3.60; the dividend per share is expected to grow at the rate of 7%. The market price per share is ₹40

Preference stock, redeemable after ten years, is currently selling at ₹75 per share. Debentures, redeemable after six years, are selling at ₹80 per debenture.

The Income tax rate for the company is 40%

(i) Required:

Calculate the weighted average cost of capital using:

- (a) Book value proportions and
- (b) Market value proportions

(ii) Define the weighted marginal cost of capital schedule for the company, if it raises ₹10crores next year, given the following information:

- (a) The amount will be raised by equity and debt in equal proportions
- (b) The company expects to retain ₹1.5crores earnings next year
- (c) The additional issue of equity shares will result in the net price per share being fixed at ₹32
- (d) The debt capital raised by way of term loans will cost 15% for the first ₹2.5crores and 16% for the next ₹2.5crores.

19. JKL Ltd. has the following book- value capital structure as on March 31, 2003

Equity share capital (2, 00,000 shares)	40, 00,000
11.5% preference shares	10, 00,000
10% debentures	30, 00,000
	80, 00,000

The equity share of the company sells for ₹20. It is expected that the company will pay next year a dividend of ₹2 per equity share, which is expected to grow at 5% p.a. forever. Assume a 35% corporate tax rate.

Required:

- (i) Compute weighted average cost of capital (WACC) of the company based on the existing capital structure.
 - (ii) Compute the new WACC, if the company raises an additional ₹20lakhs debt by issuing 12% debentures. This would result in increasing the expected equity dividend to ₹2.40 and leave the growth rate unchanged, but the price of equity share will fall to ₹16 per share.
 - (iii) Comment on the use of weights in the computation of weighted average cost of capital. **[Home Work]**
20. Z Ltd's operating income (before interest and tax) is ₹9, 00,000. The firm's cost of debt is 10% and currently employs ₹30, 00,000 of debts. The overall cost of capital of the firm is 12%
Required: Calculate cost of equity.
21. Y Ltd. retains ₹7, 50,000 out of its current earnings. The expected rate of return to the shareholders, if they had invested the funds elsewhere is 10%. The brokerage is 3% and the shareholders come in 30% tax bracket. Calculate the cost of retained earnings.
22. ABC Ltd. wishes to raise additional finance of ₹20lakhs for meetings its investment plans. The company has ₹4,00,000 in the form of retained earnings available for investment purposes. The following are the further details:
- Debt equity Ratio 25:75
 - Cost of debt at the rate of 10% (before tax) up to ₹2,00,000 and 13%(before tax) beyond that.
 - Earnings per share ₹12
 - Dividend payout 50% of earnings.
 - Expected growth rate in dividend 10%
 - Current Market price per share, ₹60
 - Company's tax rate is 30% and shareholder's personal tax rate is 20%

Required:

- i. Calculate the post-tax average cost of additional debt.
- ii. Calculate the cost of retained earnings and cost of equity.
- iii. Calculate the overall weighted average (after tax) cost of additional finance.

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

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

You are required:

- a) To determine the pattern for raising the additional finance.
- b) To determine the post-tax average cost of additional debt.
- c) To determine the cost of retained earnings and cost of equity, and
- d) Compute the overall weighted average after tax cost of additional finance.

24. Beeta Ltd. has furnished the following information

Earnings per share	₹4
Rate of tax	30%
Dividend pay-out ratio	25%
Growth rate of dividend	8%
Market Price per share	₹40

The company wants to raise additional capital of ₹10 lakhs including debt of ₹4lakhs. The cost of debt (before tax) is 10% up to ₹2lakhs and 15% beyond that.

Compute the after tax cost of equity and Debt and the weighted average cost of capital. **[Home Work]**

25. The capital structure of MNP Ltd. is as under:

9% Debenture	₹2, 75,000
11% Preference Shares	₹2, 25,000
Equity shares (face value: Rs.10 per share)	₹5, 00,000

Additional Information:

- ₹100 per debenture redeemable at par have 2% floatation cost and 10 years of maturity. The market price per debenture is ₹105.
- ₹100 per preference share redeemable at part have 3% floatation cost and 10 years of maturity. The market price per preference share is ₹106.
- Equity share has ₹4 floatation cost and market price per share of ₹24. The next year expected dividend is ₹2 per share with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividends.
- Corporation income tax rate is 35%

Required: Calculate weighted average cost of capital (WACC) using market value weights.

26. PQR Ltd. has the following capital structure on October 31, 2010

Equity share capital (2,00,000 shares of ₹10 each)	20,00,000
Reserves and surplus	20,00,000
12% Preference Shares	10,00,000
9% Debentures	30,00,000
	<u>80,00,000</u>

The market price of equity share is ₹30. It is expected that the company will pay next year a dividend of ₹3 per share, which will grow at 7% forever. Assume 40% income tax rate.

You are required to compute WACC using market value weights. **[Home Work]**

27. The following is the capital structure of Simons Company Ltd. as on 31.12.2015:

Equity shares : 10,000 shares (of ₹100 each)	10,00,000
10% Preference Shares (of ₹100 each)	4, 00,000
12% Debentures	<u>6, 00,000</u>

 20, 00,000

The market price of the company's share is ₹110 and it is expected that a dividend of ₹10 per share would be declared for the year 2016. The dividend growth rate is 6%:

- i. If the company is in the 50% tax bracket, compute the weighted average cost of capital.
- ii. Assuming that in order to finance an expansion plan, the company intends to borrow a fund of ₹10lakhs bearing 14% rate of interest, what will be the company's revised weighted average cost of capital? This financing decision is expected to increase dividend from ₹10 to ₹12 per share. However the market price of equity share is expected to decline from ₹110 to ₹105 per share.

28. ABC Limited has the following book value capital structure:

Equity Share Capital (150 million shares, ₹10 par)	₹1,500 million
Reserves and Surplus	₹2,250 million
10.5% Preference Share Capital (1 million shares, ₹100 par)	₹100 million
9.5% Debentures (1.5 million debentures, ₹1000 par)	₹1,500 million
8.5% Term Loans from Financial Institutions	₹500 million

The debentures of ABC Limited are redeemable after three years and are quoting at ₹981.05 per debenture. The applicable income tax rate for the company is 35%.

The current market price per equity share is ₹60. The prevailing default-risk free interest rate on 10-year GOI Treasury Bonds is 5.5%. The average market risk premium is 8%. The beta of the company is 1.1875.

The preferred stock of the company is redeemable after 5 years is currently selling at ₹98.15 per preference share.

Required:

- i. Calculate weighted average cost of capital of the company using market value weights.
- ii. Define the marginal cost of capital schedule for the firm if it raises ₹750 million for a new project. The firm plans to have a target debt to value ratio of 20%. The beta of new project is 1.4375. The debt

capital will be raised through term loans. It will carry interest rate of 9.5% for the first 100 million and 10% for the next ₹50 million.

29. The R&G Company has following capital structure at 31st March 2004, which is considered to be optimum:

	₹
13% debenture	3,60,000
11% preference share capital	1,20,000
Equity share capital (2,00,000 shares)	19,20,000

The company's share has a current market price of ₹27.75 per share. The expected dividend per share in next year is 50 percent of the 2004 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue:

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EPS(₹)	1.0	1.120	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773

The company can issue 14 per cent new debenture. The company's debenture is currently selling at ₹98. The new preference issue can be sold at a net price of ₹9.80, paying a dividend of ₹1.20 per share. The company's marginal tax rate is 50%.

- i. Calculate the after tax cost (a) of new debts and new preference share capital, (b) of ordinary equity, assuming new equity comes from retained earnings.
 - ii. Calculate the marginal cost of capital.
 - iii. How much can be spent for capital investment before new ordinary share must be sold? Assuming that retained earnings available for next year's investment are 50% of 2004 earnings.
 - iv. What will be marginal cost of capital (cost of fund raised in excess of the amount calculated in part (iii) if the company can sell new ordinary shares to net ₹20 per share? The cost of debt and of preference capital is constant. **[Home Work]**
30. The capital structure of a company as on 31st March, 2009 is as follows:
- | | |
|---|-------------|
| Equity capital: 6,00,000 equity shares of ₹100 each | 6 crores |
| Reserve and surplus | 1.20 crores |

12% debenture of ₹100 each 1.80 crores
For the year ended 31st March, 2009 the company has paid equity dividend @24%. Dividend is likely to grow by 5% every year. The market price of equity share is ₹600 per share.
Income-tax rate applicable to the company is 30%.

Required:

- i. Compute the current weighted average cost of capital.
- ii. The company has plan to raise a further ₹3 crore by way of long-term loan at 18% interest. If loan is raised, the market price of equity share is expected to fall to ₹500 per share. What will be the new weighted average cost of capital of the company? **[Home Work]**

