UNIT-4

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LEARNING OBJECTIVES

- Explain the general concept of the opportunity cost of capital
- Distinguish between the project cost of capital and the firm's cost of capital
- Learn about the methods of calculating component cost of capital and the weighted average cost of capital
- Recognize the need for calculating cost of capital for divisions
- Understand the methodology of determining the divisional beta and divisional cost of capital
- Illustrate the cost of capital calculation for a real company

Cost of Capital

- Viewed from all investors' point of view, the firm's cost of capital is the rate of return required by them for supplying capital for financing the firm's investment projects by purchasing various securities.
- The rate of return required by all investors will be an *overall rate of return — a weighted rate of return*.

Cost of Capital
Introduction and Significance

- Cost of capital is an extremely important input requirement for capital budgeting decision.
- Without knowing the cost of capital no firm can evaluate the desirability of the implementation of new projects.
- Cost of capital serves as a benchmark for evaluation.

Opportunity Cost Of Capital

- The basic determinant of cost of capital is the expectations of the suppliers of capital.
- The expectations of the suppliers of capital are dependent upon the returns that could be available to them by investing in the alternatives.
- The returns provided by the next best alternative investment is called opportunity cost of capital. This could serve as basis for cost of capital.

Cost of Debt

- Cost of Perpetual/ Irredeemable Debt
  - Issued at Par
  - Issued at discount or premium
  - After tax cost of debt = r_d (1-T)

$$P_o = \frac{C_t}{r_d} \quad \text{or} \quad r_d = \frac{C_t}{P_o}$$

- Cost of redeemable debt

  A) YTM (Yield to Maturity) or trail and error method
  - Before tax
  - After tax

$$P_o = \sum_{t=1}^{N} \frac{C_t}{(1+r_d)^t} + \frac{R}{(1+r_d)^N}$$

Cost of Debt

B) Shortcut method

- Before tax
- After tax

$$I + 1/n\,(RV-NP)$$

$$\frac{}{\tfrac{1}{2}\,(RV+NP)}$$

- For a bond paying 11% coupon annually and redeemable after three years at Rs 105 that sells for Rs 95. Tax rate is 40%.

$$95 = \frac{11x0.6}{1+r_d} + \frac{11x0.6}{(1+r_d)^2} + \frac{11x0.6}{(1+r_d)^3} + \frac{105}{(1+r_d)^3}$$

Problem

- A 5 year Rs.100 debenture of a firm can be sold for a net price of Rs. 95.90. the coupon rate of interest is 14%. And the debentures will be redeemed at 5% premium on maturity. The firm’s tax rate is 35%. Compute YTM and after tax cost of debenture.

- A company issue Rs 10,00,000 , 10% redeemable debentures at a discount of 5%. The cost of flotation amount to Rs. 30,000. the debentures are redeemable after 5 years. Calculate before and after tax cost of debt assuming a tax rate of 50%.

Cost Of Preference Capital

- Preference capital is in between pure debt and equity that explicitly states a fixed dividend.
- The dividend has claim prior to that of equity holders.
- But unlike interest on the debt the dividend on preference capital is not tax deductible.
- Cost of preference capital, r_p is determined by equating its cash flows to market price. **No adjustment for tax is required**.

- Cost of Irredeemable Pref. Shares

$$P_o = \frac{D_t}{r_d} \quad \text{or} \quad r_d = \frac{D_t}{P_o}$$

- Cost of redeemable Pref. Shares

$$P_o = \sum_{t=1}^{N} \frac{D_t}{(1 + r_p)^t} + \frac{R}{(1 + r_p)^N}$$

- A company issues 10,000, 10% preference shares of Rs. 100 each. Cost of issue is Rs 2 Per share. Calculate cost of Preference Shares if these shares are issued
- At par
- At a premium of 10%.
- At a discount of 5%.

Practical Problems

- A firm has issued Preference shares of the face value of Rs. 100 with the promised dividend of Rs. 12 per annum after incurring a flotation cost of 2%.

A) What is the cost of preference share to the firm? Assume that the firm will continue to have the same level of Pref capital for times to come.

B) after a year the Preference share marketed at Rs. 100 face vale is trading in the market price of Rs. 90. Do you think the cost of pref share has changed.

- A company issues 10,000 10% Preference shares of Rs. 100 Each redeemable after 10 years at a premium of 5%. The cost of issue is Rs. 2 per year. Calculate cost of preference capital.

Types Of Equity Capital

- Equity capital is classified as
  1) **Internal**: the profits that are not distributed but retained by the firm in funding the growth, is referred as internal equity, and
  2) **External**: equity capital raised afresh to fund, is called external equity
- And external equity may have cost differential on account of
  - Floatation cost associated with raising fresh equity,
  - Inability to deploy external equity instantaneously,
  - Under-pricing of fresh issue.

Cost Of Equity Capital

- Cost of equity capital is most difficult to determine because
  - It is not directly observable
  - There is no legal binding to pay any compensation, and
  - It is not explicitly mentioned.

- **Does this mean that cost of equity is zero**?

Approaches
Cost Of Equity

- Cost of equity is determined by
  - Dividend capitalization approach
  - CAPM based approach.

- Both approaches are driven by market conditions and measure the cost of equity in an indirect manner.

- The price to be used in any of the model is the market determined.

Dividend Capitalization Approach

- Dividend capitalization approach determines the cost of equity by equating the stream of expected dividends to its market price.

  For constant dividend cost of equity is equal to dividend yield.

$$P_0 = \frac{D_1}{(1+r_e)} + \frac{D_2}{(1+r_e)^2} + \frac{D_3}{(1+r_e)^3} + \frac{D_4}{(1+r_e)^4} \ldots\ldots\ldots\ldots$$

$$\text{if dividend is constant i.e. } D_1 = D_2 = D_3 = \ldots\ldots = D$$

$$\text{Then } P_0 = \frac{D}{r_e}; \text{ or } r_e = \frac{D}{P_0} = \text{Dividend Yield}$$

For constant growth of dividend at 'g'

$$P_0 = \frac{D_1}{(1+r_e)} + \frac{D_1(1+g)}{(1+r_e)^2} + \frac{D_1(1+g)^2}{(1+r_e)^3} + \frac{D_1(1+g)^3}{(1+r_e)^4} \ldots\ldots\ldots\ldots$$

$$\text{then } P_0 = \frac{D_1}{r_e - g}; \text{ or } r_e = \frac{D_1}{P_0} + g$$

- A company has been in operational for the last 15 Years and its shares in the stock market are currently trading at 120. the most recent dividend by the firm was 10 per share. Historically the dividend of the company has been growing at 10% but a majority of financial analysts are of the option that the firm would grow at 12% P.A. Find out the cost of equity
- From management analysis
- From analyst analysis

Cost of equity

- The shares of a company are selling at Rs. 40 per share and it had paid a dividend of Rs 4 Last year. The investor's market expects a growth rate of 5% per year.
- Compute the company's equity cost of capital.
- If the anticipated growth rate is 7%, calculate the indicated market price per share.

Earning based approach

- Cost of equity = EPS/ MP

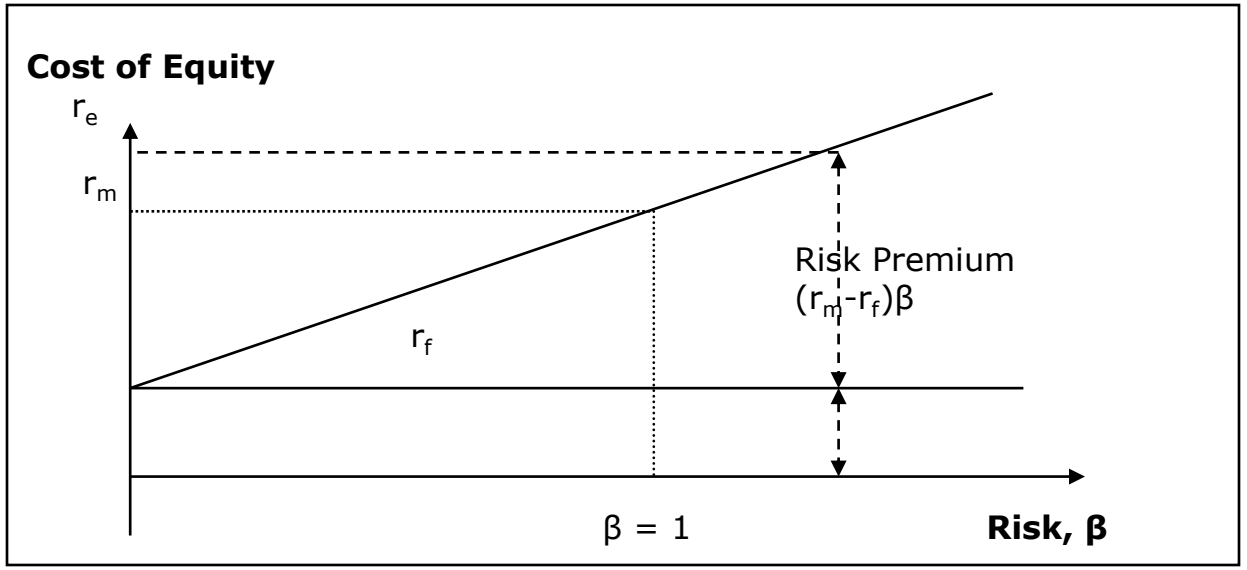
Cost Of Equity
CAPM Approach

- CAPM based determination of cost of equity considers the risk characteristics that dividend capitalization approach ignores.
- Determinants of cost of equity under CAPM based approach include three parameters;
  - the risk free rate, r_f = expected return on risk free securities
  - the market return, r_m and = expected risk on the market
  - β, as measure of risk= expected risk of the project

Cost Of Equity
CAPM Approach

- β,the primary determinant of risk governs the cost of equity.

$$r_e = r_f + \beta \times (r_m - r_f)$$



Practical Problem

- A company is a listed at stock exchange and the current price of its share is Rs. 200. the earnings and dividend had been growing at 10% and the last dividend was 12. The beta of the firm is estimated at 1.20 the expected market return is 16% while the returns in govt. securities are prevailing at 6%.

Cost Of External Equity

Issuing of shares includes the cost like merchant bankers, underwriting commission etc.

If floatation cost is 5% of the issue price and cost of internal equity determined either through DDM or CAP-M is 16% then the cost of fresh equity shall be 16.84% (16/0.95).

$$r_e \text{ for external equity} = \frac{\text{Cost of internal equity}}{(1-f)} = \frac{1}{(1-f)}\frac{D_1}{P_0} + g$$

Example

The share of a company is currently selling for Rs 100. It wants to finance its capital expenditures of Rs 100 million either by retaining earnings or selling new shares. If the company sells new shares, the issue price will be Rs 95. The dividend per share next year, DIV_1, is Rs 4.75 and it is expected to grow at 6 per cent. Calculate (*i*) the cost of internal equity (retained earnings) and (*ii*) the cost of external equity (new issue of shares).

$$k_e = \frac{\text{Rs } 4.75}{\text{Rs } 100} + 0.06 = 0.0475 + 0.06 = 0.1075 \text{ or } 10.75\%$$

The cost of external equity can be calculated as follow:

$$k_e = \frac{\text{Rs } 4.75}{\text{Rs } 95} + 0.06 = 0.05 + 0.06 = 0.11 \text{ or } 11\%$$

Example: EPS

- A firm is currently earning Rs 100,000 and its share is selling at a market price of Rs 80. The firm has 10,000 shares outstanding and has no debt. The earnings of the firm are expected to remain stable, and it has a payout ratio of 100 per cent. What is the cost of equity?
- We can use expected earnings-price ratio to compute the cost of equity. Thus:

$$k_e = \frac{\text{Rs } 10}{\text{Rs } 80} = 0.125 \text{ or } 12.5\%$$

Example

- Suppose in the year 2002 the risk-free rate is 6 per cent, the market risk premium is 9 per cent and beta of L&T's share is 1.54. The cost of equity for L&T is:

$$k_{L\&T} = 0.06 + 0.09 \times 1.54 = 0.1986 \approx 20\%$$

THE WEIGHTED AVERAGE COST OF CAPITAL

- The following steps are involved for calculating the firm's WACC:
  - Calculate the cost of specific sources of funds
  - Multiply the cost of each source by its proportion in the capital structure.
  - Add the weighted component costs to get the WACC.

$$k_o = k_d(1-T)w_d + k_d w_e$$

$$k_o = k_d(1-T)\frac{D}{D+E} + k_e\frac{E}{D+E}$$

- WACC is in fact the weighted marginal cost of capital (WMCC); that is, the *weighted average cost of new capital given the firm's target capital structure.*

Calculate WACC

Sources of funds	Amount	After tax cost
Debt	15,00,000	5
Preference	12,00,000	10
Equity	18,00,000	12
Retained earning	15,00,000	11

- Continuing with the last example, if the firm has 18000 equity shares of Rs. 100 each outstanding and the current market price is rs 300 per share. Calculate the market value weighted average cost of capital.

Type of capital	Proportional	Before tax cost of capital
Equity capital	25	24.44
Preference capital	10	27.29
Debt	50	7.99
Retained earnings	15	24.44

Before tax and after tax
Tax rate is 55%.

Sources of funds	Rs (Million)
Equity capital (10 million shares @ 10)	100
Preference capital, 11%(1,00,000 @ 100)	10
Debentures @13.5% (5,00,000 @100)	50
Term loans	80
Retained Earnings	10

The next expected dividend per share is Rs 1.50. the dividend per share is expected to grow at the rate 7%. The market price per share is Rs. 20. Preference stock, redeemable after 10 years is currently selling for Rs. 75 per share. Debentures, redeemable after 6 years are selling for Rs 80 per debenture. The interest rate for term loan is 12%.The tax rate for the company @50%.

Calculate the weighted average cost of capital

a) book value

b) market value

- *EVERYTHING TO BE CALCULATED ON FACE VALUE: INTEREST AND DIVIDEND*
- *REMEMBER THE FORMULAS WELL*
- *DEFINITIONS*
- *DON'T GET CONFUSED WITH RETAINED EARNINGS AND TERM LOANS*

- A company has been maintaining a capital structure based on market value proportions of 25:15:60 for debt, Preference and equity capital which it believes is optimal. The 10% debt of company is selling at 20% discount to the face value and 12% preference shares is selling at par. Company is growing at 15% P.A had paid the dividend of Rs 4 per share in the pervious year, and its share of the face value of 10 is trading at 60. company has a reserve of 25 per share. The tax payable by the firm is 40%. What is the WACC for company on book value and market value weights.

Dividend Decisions

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Meaning

The tern dividend refers to that part to that part pf profits of a company which is distributed by the company among its shareholders.

It is the reward of the shareholders for investments made by them in the shares of the company.

Dividend policy and significance of dividend policy

It refers to the policy that the management formulates in regard to earnings for distribution as dividends among shareholders. it determines the division of earnings between payments to shareholders and retained earnings.

Significance of dividend policy

- The firm has to balance between the growth of the company and the distribution to the shareholders
- It has a critical influence on the value of the firm
- It has to also to strike a balance between the long term financing decision(company distributing dividend in the absence of any investment opportunity) and the wealth maximisation

Contd.....

- The market price gets affected if dividends paid are less.
- Retained earnings helps the firm to concentrate on the growth, expansion and modernisation of the firm
- To sum up, it to a large extent affects the financial structure, flow of funds, corporate liquidity, stock prices, growth of the company and investor’s satisfaction.

Factors influencing the dividend decision

- Stability of earnings
- Financing policy of the firm
- Liquidity of funds
- Dividend policy of competitive firms
- Past dividend rates
- Debt obligation
- Ability to borrow
- Growth needs of the company
- Profit rates
- Legal requirements
- Policy of control
- Corporate taxation policy
- Tax position of shareholders
- Effect of trade policy
- Attitude of the investor group

Stability of dividends/ regularity

It is the desirable policy of the management to distribute the shareholders a certain percentage of earnings as a reward for their investment. It may not always relate to the earnings of the company.

Dividend practices:

- Constant dividend per share
- Constant percentage of net earnings
- Small constant dividend per share plus extra earnings
- Dividend as a fixed percentage of market value

Significance of stability of dividend

- Confidence among shareholders
- Investors desire for current income
- Institutional investor’s requirement
- Stability in market prices of shares
- Raising additional finances
- Spreading of ownership of outstanding shares
- Reduces the chances of loss of control
- Market for debentures and preference shares.

Forms of Dividend

- Scrip Dividend
- Bond Dividend
- Property Dividend
- Cash Dividend
- Debenture Dividend
- Bonus share or Stock dividends
- Optional Dividend

Objectives of stock dividend

- Conservation of cash
- Lower rate of dividend
- Financing expansion programmes
- Transferring the formal ownership of surplus and reserves to the shareholders
- Enhanced prestige
- Widening share market
- True presentation of earning capacity

Merits of Stock dividend

- <u>To the company</u>

1. Maintenance of liquidity position
2. Satisfaction of shareholders
3. Economical issue of capitalisation
4. Remedy for under capitalisation
5. Enhance prestige
6. Widening the share for market
7. Finance for expansion programmes
8. Conservation of control

- <u>To the shareholders</u>

1. Increase in their equity
2. Marketability of shares increases
3. Increase in income
4. Increase demand for shares

Demerits of stock dividend

- <u>To the company</u>

1. Increase in the capitalisation of the company
2. It results in more liability
3. Denies other investors to shareholders
4. Management control not diluted it may lead to fraud

- <u>To the shareholder</u>

1. It lowers the market value
2. Shareholders prefers cash dividend
3. EPS also falls