UNIT 10 COST OF CAPITAL

Structure

10.0 INTRODUCTION

Businesses are all about profitability and require identification of right sources of funds to meet the day to day financial needs of the firm. This involves a careful assessment of various sources where the cost of capital remains the least return rate for generating business revenues for meeting investor's expectations. The investors may choose their investments in the firm in form of equity shares, debentures, term specified loans or a combination of the above. It remains a major factor in ascertaining the company's sound capital structure. Designated with the role of finance manager, one should prioritize on the cost of capital and the chosen medium or vehicle of financing yielding the expected rate of return thus resulting in minimize the wealth of shareholders.

10.1 OBJECTIVES

After studying this unit, you should be able to:

- Explain the "concept of cost of capital";
- Understand various sources of finance and their implied costs;
- Recognise cost of capital and its importance to business;
- Identify "the opportunity cost of capital"
- Understand "cost of weighted average concept and the cost of capital"; and

- Realize "the concept of weighted Marginal cost of capital".

This chapter focuses on cost of different sources of finance, such as cost of debt, cost of equity, etc. It also explains significance of cost of capital, opportunity cost of capital, and the concept of weighted average cost of capital. It also talks about weighted marginal cost of capital schedule.

10.2 IDENTIFYING COMPONENTS OF COST OF CAPITAL

The cost remains one of the crucial determinant while identifying and selecting 'source of finance'. Thus it can be defined as "the rate of discount which equates the present value of the expected payments to that source of finance with the net proceeds received from that source of finance". This is elaborated under:

10.2.1 Cost of Debentures

"Cost of capital for debt may be defined as the returns expected by the potential investors of debt securities of the firm. The cost of a debenture is the discount rate that equates the net proceeds from issue of debentures to the expected cash outflows in the form of interest and principal repayments"
i.e.,

$$P = \sum_{t-1}^{n} \frac{\mathrm{I}(1-t)}{(1+k_d)^t} = \frac{F}{(1+\ k_d)^n}$$

Where,

K_d	=	Post-tax cost of debenture capital,
I	=	Annual interest payment per debenture
t	=	Corporate tax rate,
F	=	Redemption price per debenture
P	=	Net amount realised per debenture, and
n	=	Maturity Period

We can also calculate cost of debenture using short cut method

$$k_d = \frac{\mathrm{I}(1-t) + \frac{F-p}{n}}{\frac{F+P}{2}}$$

Example 1

ABC Limited issues 15% debentures of face value Rs.100 each, redeemable at the end of 7 years at coupon rate premium of five percent. In case the company gets Rs.95 for each debenture while the rate of corporate tax rate remains 50%, evaluate the cost of the debenture for ABC ltd.?

Solution

Given I = Rs.15, t = 0.5, P = Rs.95, n = 7 years; and F = Rs.105,

$$k_d = \frac{15(1-0.5) + \frac{105-95}{7}}{\frac{105+95}{2}} = 8.92\%$$

10.2.2 Cost of Term Loans

It stands equated to the interest rate multiplied by (1 – Tax rate). The Interest earned on term loans is also liable for taxation.

$k_t = I(1 - t)$

Where,

I = Interest rate,

t = Tax rate

10.2.3 Cost of Preference Capital

It (k) is defined as "that discount rate which equates the proceeds from preference capital issue to the payments associated with the same i.e., dividend payment and principal payments". This can be understood for the below formula:

$$P = \sum_{t=1}^{n} \frac{D}{(1+k_n} + \frac{F}{(1+k_p)^n}$$

Where,

k_p = Cost of preference capital,

D = Preference dividend per share payable annually,

F = Redemption price,

P = Net amount realized per share; and

n = Maturity period.

An approximation formula given below can also be used.

$$k_p = \frac{D + \frac{F-P}{n}}{\frac{F+P}{2}}$$

Example 2

XYZ Ltd., issues 15% preference shares of the face value Rs.100 each redeemable post a period of ten years. If the resultant per share amounts to INR 95, evaluate cost of preference capital?

Solution

Given that D = Rs. 15, F = Rs. 100, P = Rs.95 and n = 10 years

$$k_p = \frac{15 + \frac{100-95}{10}}{\frac{100+95}{2}} = 15.9\%$$

10.2.4 Cost of Equity Capital

Several approaches like the Dividend Forecast Approach, Capital Asset Pricing Approach, Earnings-Price Ratio Approach, and the Bond Yield Plus Risk Premium Approach are developed for estimating the cost of equity capital.

Dividend Forecast Approach

According to the dividend forecast approach, "the intrinsic value of an equity stock is equal to the sum of the present values of the dividends associated with it", i.e.:

$$P_e = \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t}$$

Where,

P_e = Price per equity share,
D_t = Expected dividend per share at the end of one year, and
k_e = Rate of return required by the equity shareholders

Example 3

The market price per share for a year is INR 14/- and the expected DPS is INR 14 and is poised to grow at nine percent per annum. Calculate the cost of the equity capital to the enterprise?

Solution:

Given that D_i = Rs.14, P. = Rs.136, g = 9%

The cost of equity capital (k_e) will be:

$$k_e = \frac{D_1}{P_e} + g = \frac{14}{136} + 0.09 = 19.29\%$$

Capital Assets Pricing Model Approach

This approach identifies the cost of equity be mentioned by the following equational statement:

$k_i = R_r + \beta_i (R_m - R_f)$

Where,

k_i = return required on security i,
R_f = Risk-free rate of return,
β_i = Beta of security i; and
R_m = Rate of return on market portfolio.

The CAPM describes the relationship between the required rate of return or the cost of the capital and the non-diversifiable or relevant risk, of the firm as reflected in its index of non-diversifiable risk i.e., Beta.

For example, Risk-free rate of return arrives to be ten percent. The firm's beta is 1.5 and the return on the market portfolio is 12.5%. We would be evaluating the cost of equity, using the CAPM model is calculated as follows:

$$k_i = 10\% + [1.5 \times (12.5\% - 10\%) = 13.75\%.$$

Bond Yield plus Risk Premium Approach

The logic behind this approach is that the return required by the investors is directly based on the risk profile of a company. This risk profile is adequately reflected in the return earned by the bondholders. Yet, since the risk borne by the equity investors is higher than that of the bondholders, the return earned by them should also be higher. Hence, this return is calculated as:

Yield on the long-term bonds of the company + Risk premium.

This risk premium is a very subjective figure, which is arrived at after considering the various operating and financial risks faced by the firm.

Earnings Price Ratio Approach

This approach postulates, the cost of equity can be calculated as:

E_1/P
Where,

E_1 = Expected EPS for the next year; and
P = Current market price per share.

E_1 can be arrived at by multiplying the current EPS by (1 + Growth rate).

10.2.5 Cost of Retained Earnings and Cost of External Equity

Earnings of a firm can be reinvested or paid as a dividend to the shareholder. If the firm retains part of its earnings for future growth of the firm, the shareholder demands compensation from the firm for using that money. As a result, the cost of retained earnings simply represents a shareholder's expected return from the firm's common stock.

i.e., $K_r = K_e$

It is always lower to the cost of fresh issuance of common stock due to the absence of floating costs involved at the time of new issue.

Cost of external equity comes into the picture when there is an involvement of various floatation costs while seeking equity. It is the minimum return rate a firm must get on the net funds generated while matching to the expectations of the investor's sought demand of returns. The Dividend capitalization model, can be understood with the below mentioned equational formula while evaluating cost of external equity:

$$K_e' = \frac{D_1}{P_{0\,(1-f)}} + g$$

Where,
K_e' = Cost of external equity,
Di = Dividend expected at the end of year1,
P_0 = Current market price per share,
g = Constant growth rate applicable to dividends; and
f = Floatation costs as a percentage of the current market price.

Since other approaches doesn't factor the floatation costs, the following formula meets the criterion (though on approximation):

$$K_e' = k_e/(1-f)$$

Where,
k_e = Rate of return required by the equity investors,
K_e' = Cost of external equity; and

f = Floatation costs as a percentage of the current market price.

Example 4

Sigma Limited acquired/obtained INR one crore as retained earnings and another one crore as external equity arising from fresh issuance of equity shares. The expected rate of return by the equity investors is 20% while the cost of external equity issuance is six percent? Calculate the "cost of retained earnings and the cost of external equity"?

Solution:

Cost of retained earnings:

$k_r = k_e$ i.e., 20%.

Cost of external equity raised by the company:

Now,

$$K_e' = \frac{k_e}{1-f} = \frac{0.20}{1-.06} = 21.28\%$$

Check Your Progress A

i) A Titan Ltd., issues 10% debentures of face value Rs.100 each and realizes Rs.90 per debenture. The dentures are redeemable after 12 years at a premium of 8%. Company is paying income tax @45%. Calculate cost of debt.

.

ii) Tata Consultancy Services Ltd., has 12% redeemable preference share, which are redeemable at par on ending 10 years post issuance. Expenses towards underwriting would be 4%. Face value is Rs.100. What is the effective cost of preference share capital?

10.3 CONCEPT OF WEIGHTED AVERAGE COST OF CAPITAL

The weighted arithmetic average of the cost of different financial resources that a company uses is termed as its cost of capital. Ascertaining WACC involves following defined process:

i) Identifying the implied cost of the various sources of finance. (A)
ii) Evaluate the corresponding weights with the available sources of finance.(B)
iii) Multiply A and B and add these weighted costs.

To illustrate the calculation of the weighted average cost of capital, let us consider the following illustration:

Example 5

Perfect Ltd., has the following capital structure:

(Rs. in lakh)

Equity Capital (10 lakh shares at par value)	120
12% preference capital (10,000 shares at par value)	20
Retained earnings	110
14% Non-convertible Debentures (70,000 debentures at par value)	80
14% term loan from APSFC	90
Total	420

Each share's market price is INR 28/-. Expected dividend per share is INR 3/- and would grow at nine percent. Issued preference shares can be redeemed post 8 years at par and are currently quoted at Rs.80 per share on the stock exchange. The debentures are redeemable after 6 years at par and their current market quotation is INR 95 per share. The firm's applicable tax rate is fifty percent. Calculate WACC?

Solution

We will adopt a three-step procedure to solve this problem.

Step 1: We shall define the symbols k_e, k_r, k_p, k_d and k_i to denote the costs of equity, retained earnings, preference capital, debentures, and term loans respectively.

$$k_e = \frac{D_+}{P_0} + g = \frac{3.00}{28} + 0.09 = 0.197$$

$$k_r = k_e = 0.917$$

$$k_p = \frac{D + \frac{F-p}{n}}{\frac{F+P}{2}} = \frac{14 + \frac{100-80}{8}}{\frac{100+80}{2}} = 0.183$$

$$k_d = \frac{1(1-t) + \frac{F-p}{n}}{\frac{F+P}{2}} = \frac{12(1-0.5) + \frac{100-95}{6}}{\frac{100+90}{2}} = 0.072$$

$k_i = 1(1\text{-}t) = 0.15(1\text{-}05) = 0.075$

Step 2: Determine the weights associated with various sources of finance.

The weights can be used on (i) Book values of the sources of finance in the firm's capital structure, (ii) assigning weights (on the present value) to the firm's various sources of finance, and (iii) appropriating the planned financing in the capital budget for the next period.

As done previously, we would work on symbols of W_e, W_r W_p W_d and W_i while assigning weights of the various sources of finance.

$$W_e = \frac{120}{420} = 0286$$

$$W_r = \frac{110}{420} = 0.262$$

$$W_p = \frac{20}{420} = 0.048$$

$$W_d = \frac{80}{420} = 0.190$$

$$W_i = \frac{90}{420} = 0.214$$

Step 3:

WAC = $W_ek_e + W_rk_r + W_pk_p + W_dk_d + W_ik_i$

= $(0.286 \times 0.197) + (0.262 \times 0.197) + (0.048 \times 0.183) + (0.190 \times 0.072) + (0.214 \times 0.075)$

WAC = 0.147 or 14.7%.

10.4 FACTORING WEIGHTED MARGINAL COST OF CAPITAL

While ascertaining the concept for cost of capital, we presumed the risk profile and financing policy of the firm remain as such. But practically, it differs, as WACC tend to escalate with the more financing levels explored. The schedule depicting the inter-relationship in additional financing and WACC is termed as "Weighted marginal cost of capital (WMCC) schedule" which includes the below-mentioned process towards its determination:

i. Cost estimation for each individual financing source (with estimation of distinct usage levels of usage).

ii. Post ascertaining the ratio of different sources of finance in the new capital structure, calculate the levels of total new financing at which the cost of various sources would change. These levels, known as 'breaking points', be calculated as:

Breaking Point on Account of a Source

$$= \frac{\text{Total new financing from that source at the breaking point}}{\text{Proportion of that financing source in the capital structure}}$$

iii. Find WACC for various ranges of total financing between the breaking points.

iv Tabulate WACC for each level of total new financing.
This would be the 'weighted marginal cost of capital (WMCC) schedule'.

Example 6

JB Ltd. Company wants to harness its equity, preference and debit capital as per the tabulated in the following extents:

Equity	:	0.45
Preference	:	0.05
Debt	:	0.50

The cost of the abovementioned finance sources at varied usage levels of finance can be evaluated as follows:

Source of Equity	Range of New Financing from Source (Rs. In Lakh)	Cost %
Equity	0-10	15.00
	10-30	16.50
	30 and above	18.00
Preference	0-1	14.50
	1 and above	15.00
Debt	0-15	7.50
	15-40	8.00
	40 and above	8.40

Prepare WMCC Schedule.

Calculation of Breaking Point

Source of Finance	Cost%	Range of New Financing (Rs. In lakh)	Breaking Point (Rs. In lakh)	Range to Total New Financing (Rs. In lakh)
Equity	15.00	0-10	10/0/45= 22.22	0-22.22
	16-50	10-30	30/0.45= 66.67	22.22-66.67
	18.00	30 and above	-	66.67 and above
Preference	14.50	0-1	1/0.05 =20/00	0-20.00

	15.00	1 and above	15.00	20.00 and above
Debt	7.50	0-15	15/0.05 = 3000	0-30.00
	8.00	15-40	40/0.5 = 80.00	30.00-80.00
	8.40	4 and above	-	80.00 and above

WACC for Various Ranges of Total New Financing

Range of Total New Financing (Rs. In lakh)	Source of Finance	Proportion	Cost (%)	Weighted Cost (%)
0-20.00	Equity	0.45	15.00	6.750
	Preference	0.05	14.50	0.725
	Debt	0.50	7.50	3.750
	WACC			11.225
20.00-22.22	Equity	0.45	15.00	6.750
	Preference	0.05	15.00	0.750
	Debt	0.50	7.50	3.750
	WACC			11.250
22.22-30.00	Equity	0.45	16.50	7,425
	Preference	0.05	15.00	0.750
	Debt	0.50	7.50	3.750
	WACC			11.925
30.00-66.67	Equity	0.45	16.50	7.425
	Preference	0.05	15.00	0.750
	Debt	0.50	8.00	4.000
	WACC			12.175
66.67-80.00	Equity	0.45	16.50	8.100
	Preference	0.05	15.00	0.750
	Debt	0.50	7.50	4.000
	WACC			12.850
Above 80.00	Equity	0.45	18.00	8,100
	Preference	0.05	15.00	0.750
	Debt	0.50	7.50	4,200
	WACC			13.050

WMCC Schedule

Range of Total New Financing (Rs. in Lakh)	WMCC (%)
0-20.00	11.225
20.00-22.22	11.250
22.22-30.00	11.925
30.00-66.67	12.175
66.67-80.00	12.850
Above 90.00	13.050

10.5 SIGNIFICANCE OF COST OF CAPITAL

It is a much significant account and financial instrument used to evaluate business investment opportunity costs and thereby increasing the planned investments. It is also correlated with the opportunity cost for investing in a firm. A careful assessment of such business decisions would make the investor make better informed decisions in investing for a higher profitability probabilities.

The term may also be understood as "an amount of return, an investment could have garnered if that investment was executed". Basically, it is the opportunity cost of the capital had the same amount be deployed or invested in some other venture opportunity. It can be the "real cost of capital, the amount of money that could have been earned by choosing one investment over the other". It is also defined as "the financing costs a company has to pay when borrowing money, using equity financing, or selling bonds to fund a big project or investment." Since it depends on case to case basis, it is denominated as the cost of capital, expressed as an annual interest rate, such as 7%."

Milton H. Spencer defined it as "the minimum required rate of return which a firm requires as a condition for undertaking an investment'. **Ezra Solomon** defined it as "'minimum required rate of earnings or the cut-off rate of capital expenditure'.

According to **L. J. Gitman** "The cost of capital is the rate of return a firm must earn on its investment so the market value of the firm remains unchanged".

Large investments like installing a power plant, replacing new machinery with the old one, etc. the cost of capital symbolizes the return rate a firm may earn, had it purchased or made investment in an alternative option with similar risk. Like buying an ancillary unit for backward integration of business operations. Due to this reason, few economist professionals consider cost of capital equated with opportunity cost for a firm investing financial capital for a significant business project or investment.

Cost of capital remains an important accounting and financial management tool used by many corporate professionals for comparing and making better informed and logical decisions, which ensure better returns on their investments. This facilitates them allocate funds with better yields.

Significance of Cost of Capital

Investment Evaluation: core function of evaluating cost of capital is calculating a project on attractiveness. This evaluation is multi perspectived i.e the cost of capital can be worked using various methods to assess it as "cut-off rate". A project may be invested if the resultant arising rate of return is greater than the cost of capital. So the latter becomes a pre-requisite for deriving an optimum investment call.

Designing Debt Policy: By now, we have understood the importance of Cost of capital as crucial factor in deciding an investment and financing policy decision. We know that there exists a proportionate distribution of debt and equity in the capital structure which advocates for a firm's ideal capital structure supportive to investor's returns as it is guided by the objective of cost of capital minimization of firm. A higher equity and low debt typically stands attractive as leverage capability can be used to deploy cash later, whenever required.

Project Appraisal: The cost of capital also serves as a preferred tool to decide on the project acceptability. So while comparing two or more projects on investment decisions, the one with the higher internal rate of return (IRR) than the cost of capital, is considered worth investing. The asset composition (fixed and current assets) too are determined by the cost of capital.

While understanding the cost of capital it is worth acknowledging the two forms of capital the first being the implicit cost while the other is explicit cost.

- **Implicit cost**. Is similar to the opportunity cost. It is the ascertained cost arrived for an investment opportunity but not invested in (for not deemed fit or the alternative

being better option). In the cost of capital model, it may be considered as "opportunity costs not earned".

- **Explicit cost**. This is the cost which firms practically invest as capital investments. This is paid back to the investors and shareholders as appreciation in the share price, dividend paid.

Accounting professionals frequently use the cost of capital tool for evaluating the cost of project financing or similar investment decisions. On the lower side, any investments made by an investor or firm must have a minimum return rate which is in accordance to the shareholders and lenders expectations. Any return lower than that would make them loose their interest in the project investment. In other words, the cost of capital represents a benchmark which any investment opportunity must yield or exceed in form of financial returns.

Cost of Capital Examples

We would be in a position to understand this important financial tool. Let us take it in exemplary form, involving two situations:

Cost of Capital for Investing: From the perspective of investing, it is the difference between the investment made and what is not made. Obviously, both the investment proposals are carefully evaluated on the cost of capital aspect and thereafter only the investment decision in one is made. Let's take the case of a stock market investor or trader or may be a real estate investor and they want to invest ten lakh in a business opportunity. We reiterate here that "the opportunity cost is the difference between any profit actually earned, and the profit that could have been earned." Here, let's put that the investor earned a 5% profit on the actual investment (Opportunity "A") but could have earned 8% on the investment opportunity not chosen (Opportunity "B".) The difference between the profit earned on Opportunity "A" and Opportunity "B" (3%) is the actual cost of capital.

Cost of Capital for Business: We all understand that the overall objective of business pertaining to the cost of capital, is seeking to better the rate of return. Lucrative business proposals always hold the key and it even it makes good investment proposals loose over excellent ones. It's about prioritization where the investments are pulled out when the returns tend to weaken or better worth project investments become available. Such investments also

consider the risk exposure and the ones with lesser risks are typically preferred. In accounting terms, firms evaluate cost of capital on return rate it earns on investments made.

10.6 OPPORTUNITY COST OF CAPITAL

This type of cost is defined as "the incremental return on investment that a business foregoes when it elects to use funds for an internal project, rather than investing cash in a marketable security." So, in case when the projected return on an internal investment is lower than expected return from a marketable security, the investor would prefer to opt out of one would not invest in the internal opportunity and may move for other security option.

Example of the Opportunity Cost of Capital

The company wants to go for expansion with a new manufacturing facility. The top management of the company projects to earn a 10% on the long term perspective for a 10 crore investment. The management has another investment option where that can invest the same money in the existing manufacturing plant where they can put investments in stocks on which the long term yield is 12%. So, it is lucrative to opt for the second option of investing in stocks.

The concept requires careful assessment as it has large ramifications. The investment projects requires estimating the variations in returns as the returns may be delayed but lucrative. This increases the risk for the long term investments where the investor may tend to deviate to the other alternatives for deployment of the available funds. Taking the above cited example again, the top management officials may be confident of giving 10% return from the extended manufacturing capacity, while there can be significant uncertainty from 'variability of returns' on stock investments which may give negative returns initially at the time of investment consumption. So, it opens up a new direction to be evaluated for the opportunity cost of capital. It should also be noted that "this uncertainty can be quantified by assigning a probability of occurrence to different return on investment outcomes, and using the weighted average as the most likely return." The investment decision banks with the top management but what requires to be learnt from the example that the uncertainty in the No matter how the issue is addressed, the main point is that is to be learnt here is that the uncertainty in calculating the opportunity cost of capital requires many perspectives and lot of authentic and relevant information to be factored in rather than a plain calculation on a piece of paper.

10.7 LET US SUM UP

The company carries a liability to satisfy the investors with the return on their investments to the company. This cost of capital for firm attributes to a "least rate of return that it must earn on its investments in order to satisfy various categories of investors". According to **L. J. Gitman** "the cost of capital is the rate of return a firm must earn on its investment so the market value of the firm remains unchanged". This concept stands much helpful in following tasks:

(i) Investment evaluation (ii) Designing debt policy and (iii) Project appraisal

Cost of capital are of two types: (i) **Implicit cost** may be equated above placed opportunity cost. (ii) **Explicit cost** is the one which firms may practically deploy as capital investments and ensuring investor returns as appreciated stock price or handsome dividend payouts to the investors and shareholders. **The opportunity cost of capital** "is the incremental return on investment that a business foregoes when it elects to use funds for an internal project, rather than investing cash in a marketable security."

The important components of capital structure are: Equity Capital, Preference Capital, Debentures and Term Loans.

The cost of a debenture is defined "as the discount rate which equates the net proceeds from issue of debentures to the expected cash outflows in the form of interest and principal repayments." The cost of the term loans is calculated as the interest rate multiplied by (1 – Tax rate). Cost of a redeemable preference share (k_o) is defined as "discount rate which equates the proceeds from preference capital issue to the payments associated with the same".

As per constant dividend model, cost of equity is calculated as:

$$K_e = D/P$$

As per constant dividend growth model, cost of equity is calculated as:

$$K_{e} = \frac{D_1}{P} + g$$

As per CAPM, cost of equity is calculated as:

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

10.8 KEY WORDS

Book Value Weights: It is the percentage of financing provided by different sources as measured by their book values from the company's balance sheet.

Capital Structure: It is the composition of a firm's long-term financing consisting of equity, preference capital, and long-term debt.

Cost of Capital: "The minimum rate of return the firm must earn on its investments in order to meet investor's expectations who stand important to arrange funds for company and it is often measured as the weighted arithmetic average of the cost of various sources of finance tapped by the firm".

Cost of Debt: is defined as "the rate that has to be received from an investment in order to achieve the required rate of return for the creditors."

Cost of Preferred Stock is defined as "the rate of return that must be earned on the preferred stockholders' investment to satisfy their required rate of return."

Floatation Costs: These include the legal, printing, postage, underwriting brokerage, and other costs of issuing securities.

Opportunity Cost of Capital is defined as "the incremental return on investment that a business foregoes when it elects to use funds for an internal project, rather than investing cash in a marketable security."

Intrinsic Value: The intrinsic value of an asset is the present value of the stream of benefits expected from it. It is also referred to as the fair value or reasonable value or investment value.

Marginal Cost of Capital: It means the cost of capital that represents the weighted cost of each additional rupee of financing from all sources, debt, preferred stock, and common stock.

Market Value Weights: It is the percentage of financing provided by different capital sources, measured by the current market prices of the firm's bonds and preferred and common stock.

10.9 ANSWER TO CHECK YOUR PROGRESS

Check Your Progress A

i). Cost of Debt:

$$k_d = \frac{\mathrm{I}(1-t) + \frac{F-P}{n}}{\frac{F+P}{2}}$$

I = Annual Interest to be paid = Rs.10
t = 0/45
F = Rs. 108, P = 90
n =12 years

$$k_p = \frac{10(1-0.45) + \frac{108-90}{12}}{\frac{108+90}{2}} = \frac{5.5+1.5}{99} = 0.0707\ (or) = \ 7.07\%$$

ii). The Cost of Preference Share (Face Value = Rs.100) may be found as follows

$$k_d = \frac{\mathrm{I}(1-t) + \frac{F-P}{n}}{\frac{F+P}{2}}$$

D = 12%
F = 100
P = 100-4 = Rs. 96

$$k_d = \frac{12 + \frac{100-96}{10}}{\frac{100+96}{2}} = \frac{12.4}{98} = \ 0.1265\ (or) = \ 12.65\%$$

Check Your Progress B

Weighted Average Cost of Capital

Source of capital	Amount	Specific Cost	Total Cost
Debt	64,000	5.2%	3,328
Equity	1,10,000	12.34%	2,2221.20
Reserves	18,000	12.34%	2,221.20
	1,92,000		19,123.20
$\mathrm{WACC} = \frac{19{,}123.20}{1{,}92{,}000} \times 100 = 9.96\%$			

10.10 TERMINAL QUESTION/ EXERCISES

1. What do you mean by term "Cost of capital"? Explain the different determining components of "Cost of capital"?
2. What is meant by "Cost of Retained Earnings and Cost of External Equity"? Explain with suitable example.
3. Explain your understanding on the relevance of Weighted Average Cost of Capital (WACC)? Cite example in support?
4. Discuss Weighted Marginal Cost of Capital (WMCC) Schedule?
   Explain its significance to the accounting professional?
5. Elaborate the term Cost of Capital with a relevant example?
6. Define and explain Opportunity Cost of Capital with suitable example.
7. Write short notes on the following:
   (i) Opportunity cost of capital
   (ii) Significance of cost of capital
   (iii) Explicit Cost
   (iv) Implicit cost

Exercises

1. A firm had 15 percent as its cost of capital in the F.Y 2015. The annual reports revealed that the said cost of capital had following components:
   a. Eight percent as 'riskless'.
   b. Three percent as 'business risk premium'
   c. Four percent as 'financial risk premium'.
   In FY 2016, the firm wishes for fresh capital by issuance of new equity shares.

   Please calculate the cost of equity capital in the below-mentioned circumstances:

   (a) FY 2016, the (a) riskless component increased by one percent. (b.) & (c.) remain as such.
   (b) (a.) riskless component up with 1% and (b.) component went up by 50% as the firm chose for plant expansion.
   (c) Nearest competitor declared a nine percent (a.) riskless component, three percent as (b.) component of business risk with only one percent towards the (c.) Financial risk component with having paid all their long-tenured dues in the FY 2015 itself.

   Ans: (a) 16 %, (b) 17.50%, (c) 13%

2. A firm BTM Ltd. issued 10% irredeemable preference shares with each share of INR 100/- each. Calculate the cost of preference share capital in each of the following cases:

(a) Issuance at a five percent reduction, (b) Issuance at a five percent premium

Ans: (a) 10.53%, (b) 9.10%

3. A company has having an ongoing market price of its shares valuing INR 95 each. It has just declared the below heads in its capital structure:

Equity (with expected dividend 12%)	Rs. 10, 00,000
10% Preference	Rs. 5, 00,000
8% Loan	Rs. 15, 00,000

Calculate the WACC, while supposing 50% as the tax rate, before as well as after the tax.

Ans: Before tax 9.66%, After tax 7.67%

4. Forever corporation carries a debt:equity in the ratio of 40:60. The company's expected returns (post taxes) on debt is four percent while on equity is ten percent. The corporation wishes to evaluate an investment opportunity worth INR 40,000. Please determine the intended opportunity's annual yield ensuring that the equity shares market value doesn't changes even after procuring addional debt.

Ans. 7.8%