

CHAPTER 2: COST OF CAPITAL

Financial Management — Study Guide & Comprehensive Overview

1. INTRODUCTION

The basic task of a finance manager is the procurement of funds and their effective utilization in business. The ultimate objective of financial management is the maximization of shareholders' wealth (where $\text{Wealth} = \text{Performance} / \text{Expectations}$). Therefore, the finance manager must select a capital structure that minimizes investor expectations and maximizes shareholder wealth by accurately determining the cost of various sources of finance.

2. MEANING OF COST OF CAPITAL

Cost of capital is the return expected by the providers of capital (shareholders, lenders, and debenture holders) as compensation for contributing to the total capital. It represents the additional money paid for using capital, expressed as a percentage rate.

- **Discount Rate:** It is used to discount or compound cash flow streams.
- **Alternative Terms:** Also referred to as 'cut-off rate', 'hurdle rate', or 'minimum rate of return'.
- **Applications:** Critical benchmark for framing debt policies and taking capital budgeting decisions.

3. SIGNIFICANCE OF COST OF CAPITAL

Determining the correct cost of capital assists in key managerial decisions:

Strategic decision-making: For businesses, the cost of capital is pivotal in strategic decision-making. It influences capital budgeting, project investments, and capital structure choices. By determining these costs, companies can make informed decisions that optimize their financial structure, minimize costs, and maximize profitability.

Investment assessment: For investors, the cost of capital is a critical factor in assessing the attractiveness of an investment opportunity. Investors want to know whether the returns from an investment are expected to surpass the company's cost of capital. It helps them evaluate the risk and potential reward associated with an investment.

Capital structure optimization: Understanding the cost of capital allows businesses to balance debt and equity financing. This optimization can lead to lower capital costs, increased financial stability, and improved creditworthiness.

Performance evaluation: Cost of capital is also used to evaluate a company's financial performance. If a company consistently earns returns above its cost of capital, it indicates efficient capital utilization and value creation.

Market competitiveness: In a competitive market, companies with a lower cost of capital may have a competitive advantage. They can potentially offer lower prices or invest in growth opportunities more aggressively.

4. DETERMINATION OF COST OF CAPITAL

Cost is not merely what a company plans or actually pays; it reflects stakeholder expectations (investors, intermediaries, tax authorities). Cost calculations account for:

- Initial inflow received at issuance.
- Outflows from interest, dividends, and redemption amounts.
- Tax shields on interest or tax outflows on dividend payments.

Methods like Internal Rate of Return (IRR) or shortcut yield formulas are applied to equate present values of inflows and outflows.

Factors Influencing Cost of Capital

- **Supply and Demand:** Competition for funds during business expansion drives capital costs up.
- **Investor Preferences:** Savings rates and societal habits influence the overall capital pool.
- **Risk and Return:** Higher risk projects require higher potential returns to attract investors.
- **Inflation:** Expected returns must outpace inflation to preserve purchasing power.
- **Exchange Rates:** Currency fluctuations introduce additional risk for multinational entities.

5. COST OF LONG-TERM DEBT (Kd)

Debt funds do not confer ownership and enjoy a priority charge on profits before taxes. Debt instruments primarily include debentures, bonds, and long-term bank loans.

5.1 Features of Debentures or Bonds

- **Face Value:** Denominated principal value on which interest is computed.
- **Interest (Coupon) Rate:** Fixed annual or periodic percentage applied to face value.
- **Maturity Period:** Defined lifespan for redemption (infinite for irredeemable debt).
- **Redemption Value:** Agreed repayment amount upon maturity.
- **Tax Shield Benefit:** Interest payments are tax-deductible expenses, creating a tax shield that reduces effective debt cost: $\text{Effective Cost} = \text{Interest} \times (1 - \text{Tax Rate})$.

EXAMPLE 1: Tax Shield Illustration

X Ltd. (100% Equity) vs Y Ltd. (Uses Debt with 40 Lakh Interest):

- Both have EBIT of 100 Lakh.
- Y Ltd. pays 40 Lakh interest $\rightarrow$ PBT = 60 Lakh. At 35% Tax, Tax = 21 Lakh (vs 35 Lakh for X Ltd.).
- Tax Shield = $40 \text{ Lakh} \times 35\% = 14 \text{ Lakh}$ tax saved. Effective interest cost = 26 Lakh.

5.2 Cost of Irredeemable Debentures

Calculated using the standard formula:

FORMULA: Irredeemable Debt

$$K_d = [i / NP] \times (1 - t)$$

Where:

- i = Annual interest payment
- NP = Net proceeds (Issue price minus floatation costs) or Current Market Price
- t = Corporate tax rate

ILLUSTRATION 1

Sona Limited issued 12% irredeemable debentures 5 years ago at 103 (par 100). Current market price is 94, tax rate is 35%. Calculate current K_d .

SOLUTION 1

$$K_d = [12 / 94] \times (1 - 0.35) = 0.12766 \times 0.65 = 0.08297 \text{ or } 8.30\%$$

5.3 Cost of Redeemable Debentures (Approximation Method)

FORMULA: Redeemable Debt (Approximation)

$$K_d = [i(1 - t) + (RV - NP) / n] / [(RV + NP) / 2]$$

Where:

- i = Annual interest payment
- RV = Redemption value
- NP = Net proceeds or Current market price
- n = Remaining maturity period in years
- t = Corporate tax rate

ILLUSTRATIONS 2 & 3: Redeemable Debt Calculations

Illustration	Parameters	Formula Calculation	Result (Kd)
Illustration 2	10,000 NCDs @ 10%, Par 100, Issued @ 110 premium. Maturity 5 yrs. Tax 35%.	$[10(1-0.35) + (100-110)/5] / [(100+110)/2] = [6.5 - 2] / 105$	4.28%

Illustration 3	10,000 NCDs @ 10%, Par 100. Market Price = 80. Remaining life 5 yrs. Tax 35%.	$\frac{[10(1-0.35) + (100-80)/5]}{[(100+80)/2]} = \frac{[6.5 + 4]}{90}$	11.67%
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6. COST OF PREFERENCE SHARE CAPITAL (Kp)

Preference shareholders receive dividends at a fixed rate prior to equity holders. Preference dividends are paid out of post-tax profits and do not provide a corporate tax shield.

6.1 Cost of Irredeemable Preference Shares

FORMULA: Irredeemable Preference Shares

$$K_p = PD / P_0$$

Where PD = Annual Preference Dividend, P₀ = Net Proceeds or Market Price.

6.2 Cost of Redeemable Preference Shares

FORMULA: Redeemable Preference Shares

$$K_p = [PD + (RV - NP) / n] / [(RV + NP) / 2]$$

7. COST OF EQUITY SHARE CAPITAL (Ke)

Cost of equity reflects the expected rate of return demanded by equity shareholders. Five primary approaches are utilized based on available data:

7.1 Dividend Price Approach

Assumes dividends remain constant forever: $K_e = D / P_0$

7.2 Earnings Price Approach

Correlates earnings per share with market price: $K_e = EPS / P_0$

7.3 Growth Approach (Gordon's Model)

Assumes constant dividend growth rate (g):

FORMULA: Gordon's Growth Model

$$K_e = (D_1 / P_0) + g \quad \text{OR} \quad K_e = [D_1 / (P_0 - F)] + g$$

Where $D1 = D0(1 + g)$, and $g = b \times r$ (Retention rate $\times$ Return on Investment).

7.4 Capital Asset Pricing Model (CAPM)

Separates total risk into Unsystematic (diversifiable) and Systematic (market risk measured by Beta β):

FORMULA: CAPM Approach

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

Where R_f = Risk-free rate, β = Beta coefficient, R_m = Market return, $(R_m - R_f)$ = Market risk premium.

ILLUSTRATION 12

H Ltd.: Risk-free rate = 10%, Beta = 1.75, Market return = 15%. Calculate K_e .

SOLUTION 12

$$K_e = 10\% + 1.75 \times (15\% - 10\%) = 10\% + 8.75\% = 18.75\%$$

8. COST OF RETAINED EARNINGS (K_r)

Retained earnings reflect the opportunity cost of dividends foregone by equity shareholders. While similar to cost of equity, K_r is typically lower than K_e because retained earnings incur no floatation costs or underpricing discounts.

Formulas parallel K_e methods, substituting current market price P_0 directly without floatation expense adjustments.

9. WEIGHTED AVERAGE COST OF CAPITAL (WACC)

WACC (K_o) is the composite after-tax cost of capital across all long-term financing components (Debt, Preference, Equity, Retained Earnings) weighted by their proportion in the capital structure.

Book Value vs. Market Value Weights

- **Book Value (BV) Weights:** Historical accounting values; easy to extract but ignores inflation, growth, and current market conditions.
- **Market Value (MV) Weights:** Current market values; superior economic representation of modern capital structure. Market equity values reflect both paid-up equity and retained earnings (apportioned via BV ratios).

TEST YOUR KNOWLEDGE — PRACTICAL PROBLEMS & SOLUTIONS

Practical Problem 1: Pure Equity WACC

Gamma Ltd. has 5,00,000 shares @ 1.50 ex-div market price. Paid dividend 0.27 per share (constant). No debt.

SOLUTION 1

$K_e = D_1 / P_0 = 0.27 / 1.50 = 0.18$ (18%). Since there is no debt capital, $WACC = K_e = 18.00\%$.

Practical Problem 2: Multi-Component WACC

Source of Capital	Amount (₹)	Weight	Cost of Capital (After Tax)	WACC Component
Equity Share Capital	65,00,000	0.6190	16.30%	10.09%
12% Preference Share Capital	12,00,000	0.1143	12.00%	1.37%
15% Redeemable Debentures	20,00,000	0.1905	10.50% (15% × 0.7)	2.00%
10% Convertible Debentures	8,00,000	0.0762	7.00% (10% × 0.7)	0.53%
Total Capital	1,05,00,000	1.0000	-	13.99%

Practical Problem 3: Cost of Equity & YTM Debt Cost

(i) Cost of Equity: $K_e = [D_0(1+g) / P_0] + g = [2(1.06) / 25] + 0.06 = 8.48\% + 6\% = 14.48\%$

(ii) Cost of Debentures (YTM): 10% coupon, Par 100, Net Proceeds = 96, Maturity = 12 yrs, RV = 112, Tax = 50%. Annual post-tax interest = 5.

SOLUTION 3(ii)

- At 5% discount rate: $PV = 5(8.863) + 112(0.557) = 44.32 + 62.38 = 106.70$ (NPV = +10.70)
- At 10% discount rate: $PV = 5(6.814) + 112(0.319) = 34.07 + 35.73 = 69.80$ (NPV = -26.20)

$$IRR / K_d = 5\% + [10.70 / (10.70 - (-26.20))] \times 5\% = 5\% + (10.70 / 36.90) \times 5\% = 6.45\%$$

Practical Problem 4: Financing Pattern & Marginal WACC

Additional finance required: ₹10,00,000. Debt/Equity ratio = 3:7. Retained earnings available = ₹2,10,000. Tax = 50%.

- **Raising Pattern:** Equity = ₹7,00,000 (Retained Earnings ₹2,10,000 + New Equity ₹4,90,000). Debt = ₹3,00,000 (Up to ₹1,80,000 @ 10% + Balance ₹1,20,000 @ 16%).
- **Post-Tax Cost of Debt:**
$$\left[(1,80,000 \times 5\%) + (1,20,000 \times 8\%) \right] / 3,00,000 = [9,000 + 9,600] / 3,00,000 = 6.20\%$$
- **Cost of Equity / Retained Earnings:**
$$K_e = K_r = \left[\frac{D_0(1+g)}{P_0} \right] + g = \left[\frac{2(1.10)}{44} \right] + 0.10 = 5\% + 10\% = 15.00\%$$
- **Overall After-Tax WACC:**
$$\text{Overall WACC} = (0.70 \times 15\%) + (0.30 \times 6.20\%) = 10.50\% + 1.86\% = 12.36\%$$