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Bachelor of Business Administration (BBA) | Semester 4 | UK4DSCMGT201

Financial Management

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Module 4: Financing Decision, Capital Structure and Cost of Capital

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1. Concept, Foundations, and Significance of Capital Structure

Capital structure refers to the permanent long-term financing mix of an enterprise, represented by the proportionate relationship between long-term debt, preferred equity, and ordinary shareholder equity on the corporate balance sheet. Deciding how much debt should be utilized to fund corporate expansion is one of the most critical responsibilities of executive management. Capital structure design seeks to achieve an **Optimal Capital Structure**—the unique debt-equity combination that minimizes the firm's Weighted Average Cost of Capital (WACC) while simultaneously maximizing the market value of the enterprise and shareholder wealth.

The strategic deployment of debt financing creates **Financial Leverage** (also referred to as "trading on equity"). Because interest paid on debt securities is a fixed, tax-deductible contractual commitment under the Indian Income Tax Act 1961, any growth in operating earnings (EBIT) produces a magnified percentage expansion in earnings per share (EPS) available to equity shareholders. However, if operating earnings decline, fixed interest burdens consume cash flows, exposing the company to financial distress, credit downgrades, and potential corporate insolvency.

2. Theories of Capital Structure

Financial economics provides four seminal theoretical paradigms explaining the relationship between capital structure, cost of capital, and overall firm valuation:

A. The Net Income (NI) Approach (David Durand)

The Net Income approach states that capital structure is decisively relevant to firm valuation. Durand argued that a corporation can increase its total market value and reduce its overall cost of capital simply by increasing the proportion of debt in its capital structure. The NI approach is predicated on two core assumptions: (1) The cost of debt (k_d) is strictly lower than the cost of equity (k_e) due to debt's senior contractual claim and tax shield; and (2) The perception of financial risk does not change among investors as debt increases; hence both k_d and k_e remain constant regardless of the leverage ratio.

Consequently, substituting expensive equity with cheap debt continuously lowers the overall cost of capital (k_o), reaching a maximum firm valuation at 100% debt financing.

B. The Net Operating Income (NOI) Approach (David Durand)

The Net Operating Income approach represents the exact antithesis of the NI approach. Durand argued that capital structure is entirely irrelevant to enterprise valuation. Total market value (V) is determined exclusively by capitalizing the firm's Net Operating Income (EBIT) at an overall

capitalization rate (k_o) dictated by the firm's business risk. As the corporation takes on additional debt, equity shareholders perceive heightened financial risk and demand higher returns, causing the cost of equity (k_e) to rise in exact mathematical proportion to offset the benefits of cheaper debt. Thus, the overall weighted average cost of capital remains constant at all debt-equity ratios.

C. The Traditional Approach

The Traditional approach represents a realistic compromise between the extremes of the NI and NOI models. It posits that a moderate infusion of debt lowers the overall cost of capital and enhances firm value because the advantages of lower-cost debt initially outweigh the mild increase in equity risk premium. However, beyond a certain optimum debt threshold, further borrowing causes both equity investors and debt providers to perceive severe insolvency risk. The cost of equity surges sharply, the cost of debt increases, and the overall cost of capital (WACC) begins to rise, forming a U-shaped cost curve. The minimum point of the U-shaped curve represents the **Optimal Capital Structure**.

D. The Modigliani-Miller (MM) Hypotheses

Franco Modigliani and Merton Miller revolutionized corporate finance in 1958 by establishing rigorous mathematical propositions on capital structure irrelevance and tax deductibility:

- **Proposition I (Without Taxes - 1958):** In perfect, frictionless capital markets without corporate taxes, transaction costs, or bankruptcy penalties, the market value of any firm is completely independent of its capital structure. A levered firm (V_L) and an unlevered firm (V_U) operating in the same risk class have identical market values ($V_L = V_U$). Modigliani and Miller proved this proposition via the **Arbitrage Mechanism**: if a levered firm traded at a higher value than an identical unlevered firm, rational investors would sell shares in the overvalued levered firm, borrow on personal account ("home-made leverage"), and purchase shares in the unlevered firm, rapidly restoring market equilibrium pricing.
- **Proposition II (With Corporate Taxes - 1963):** Recognizing the reality of corporate taxation, MM amended their theory. Because interest payments are tax-deductible expenses whereas equity dividends are paid from post-tax profits, debt financing creates an **Interest Tax Shield** equal to corporate tax rate (t) multiplied by debt amount (D). Therefore, the value of a levered firm exceeds the value of an unlevered firm by the present value of the interest tax shield:

$$V_L = V_U + (t \times D)$$

Where: V_L = Value of Levered Firm; V_U = Value of Unlevered Firm; t = Corporate income tax rate; D = Total face value of corporate debt.

3. Specific Cost of Capital Components

The Cost of Capital represents the minimum rate of financial return that an enterprise must earn on its productive asset investments to satisfy the return expectations of its various capital providers (debtholders, preference shareholders, and equity investors). It serves as the benchmark discount rate (hurdle rate) for all capital budgeting decisions.

A. Cost of Debt Capital (k_d)

Debt capital represents contractual borrowings. Because interest expense is tax-deductible, the effective post-tax cost of perpetual debt is calculated as:

$$k_{d(after\text{-}tax)} = [\ I\ /\ NP\ ] \times (1 - t)$$

Where: I = Annual contractual interest payment; NP = Net proceeds from debt issuance (Face value minus flotation costs / discounts, plus premium); t = Corporate tax rate.

For redeemable debt maturing after n years, the approximate post-tax cost of debt is:

$$k_d = [\ \{\ I + (RV - NP)\ /\ n\ \}\ /\ \{\ (RV + NP)\ /\ 2\ \}\ ] \times (1 - t)$$

Where: RV = Redemption value at maturity; NP = Net proceeds; n = Debt tenure in years.

B. Cost of Preference Share Capital (k_p)

Preference shareholders receive fixed dividend payouts. Unlike debt interest, preference dividends are paid out of post-tax profits and are not tax-deductible. The cost of irredeemable preference capital is:

$$k_p = D_p\ /\ NP$$

Where: D_p = Annual fixed preference dividend; NP = Net proceeds realized per preference share.

C. Cost of Equity Share Capital (k_e)

Equity shareholders are residual claimants bearing ultimate enterprise operational and financial risk. Unlike debt or preference capital, equity capital carries no contractual dividend commitments. Finance theory utilizes three major models to compute the cost of equity:

1. **Dividend Growth Model (Gordon's Model):** Assumes dividends expand at a constant annual compound growth rate (g):

   $$k_e = (D_1\ /\ P_0) + g$$

   Where: D_1 = Expected dividend per share at the end of Year 1; P_0 = Current market price per share; g = Constant annual dividend growth rate.

2. **Capital Asset Pricing Model (CAPM):** Formulated by William Sharpe, CAPM decomposes required equity return into the risk-free rate plus a risk premium proportional to systematic market risk (β):

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

   Where: R_f = Risk-free rate of return; β = Systematic equity beta coefficient; R_m = Expected return on the market portfolio; (R_m - R_f) = Market risk premium.

3. **Cost of Retained Earnings (k_r):** Retained earnings belong to equity shareholders. Their cost reflects the opportunity cost of forgone dividends, equal to k_e adjusted for personal income taxes and brokerage transaction costs. In basic corporate appraisal, $k_r = k_e$.

4. The Weighted Average Cost of Capital (WACC)

The Weighted Average Cost of Capital (k_o) is the composite, overall cost of capital for the enterprise, calculated as the weighted average of each specific capital component's cost, where weights represent the proportionate market or book value of each source in the capital structure:

$$\text{WACC } (k_o) = (w_d \times k_d) + (w_p \times k_p) + (w_e \times k_e) + (w_r \times k_r)$$

Where: w_d, w_p, w_e, w_r = Proportionate weights of debt, preference shares, equity shares, and retained earnings respectively (satisfying $\Sigma w = 1.0$); k_d, k_p, k_e, k_r = Specific component costs.

5. Leverage Analysis: Operating, Financial, and Combined Leverages

Leverage refers to the employment of an asset or source of funds for which the enterprise pays a fixed cost or fixed return. Financial analysts measure leverage across three critical dimensions:

A. Operating Leverage (DOL)

Operating leverage arises from the presence of **fixed operating costs** (factory lease rentals, machine depreciation, administrative executive salaries) in the firm's production cost structure. Degree of Operating Leverage (DOL) measures the percentage responsiveness of operating profits (EBIT) to a given percentage change in sales revenue:

$$\text{Degree of Operating Leverage (DOL)} = \text{Contribution} / \text{EBIT} = (\text{Sales} - \text{Variable Costs}) / \text{EBIT}$$

High DOL indicates high operational fixed costs; small fluctuations in customer demand create massive swings in operating profitability.

B. Financial Leverage (DFL)

Financial leverage arises from the presence of **fixed financial charges** (interest on debt and debentures, preference dividends) in the firm's financing structure. Degree of Financial Leverage (DFL) measures the percentage responsiveness of Earnings Per Share (EPS) to a given percentage change in operating profit (EBIT):

$$\text{Degree of Financial Leverage (DFL)} = \text{EBIT} / \text{EBT} = \text{EBIT} / [\ \text{EBIT} - I - \{ D_p / (1 - t) \}\ ]$$

Where: EBIT = Earnings Before Interest and Taxes; I = Contractual interest payment; D_p = Preference dividends; t = Corporate tax rate; EBT = Earnings Before Taxes.

C. Combined (Total) Leverage (DCL)

Combined leverage captures the total integrated risk exposure of the enterprise by synthesizing operating and financial leverages. Degree of Combined Leverage (DCL) measures the percentage change in EPS resulting from a percentage change in sales revenue:

$$\text{Degree of Combined Leverage (DCL)} = \text{DOL} \times \text{DFL} = \text{Contribution} / \text{EBT}$$

Where: Contribution = Sales - Variable Costs; EBT = Earnings Before Taxes (net of interest).

6. Comprehensive Worked Numerical Problem: WACC and Leverage Computation

Managerial Case Problem: Malabar Technologies Ltd. presents the following capital structure and operational income data for FY 2025–26:

Capital Component	Book Value (Rs.)	Market Value (Rs.)	Specific Component Cost
10% Debentures (Face Value Rs. 100)	Rs. 20,00,000	Rs. 18,00,000	k_d (pre-tax) = 10%
12% Preference Shares	Rs. 10,00,000	Rs. 10,00,000	k_p = 12%
Equity Share Capital (Face Value Rs. 10)	Rs. 30,00,000	Rs. 60,00,000	k_e (CAPM-based) = 16%
Retained Earnings	Rs. 10,00,000	Rs. 12,00,000	k_r = 16%

Operational Income Data: Total Sales: Rs. 50,00,000; Variable Costs: 40% of sales; Fixed Operating Costs: Rs. 12,00,000; Corporate Tax Rate: 30%. Annual Interest on Debentures: Rs. 2,00,000; Annual Preference Dividend: Rs. 1,20,000.

Appraisal Requirement: (1) Calculate Post-tax Cost of Debt; (2) Calculate WACC using Market Value Weights; (3) Compute DOL, DFL, and DCL.

Solution and Step-by-Step Resolution:

Step 1: Post-Tax Cost of Debt

$$k_{d(\text{after-tax})} = 10\% \times (1 - 0.30) = 7.0\%$$

Step 2: Weighted Average Cost of Capital (WACC) using Market Value Weights

Total Market Value = 18L (Debt) + 10L (Pref) + 60L (Equity) + 12L (Retained) = **Rs. 1,00,00,000 (Rs. 1 Crore)**.

- Weight of Debt (w_d) = 18,00,000 / 1,00,00,000 = 0.18; Component Product = 0.18 × 7.0% = 1.26%
- Weight of Preference (w_p) = 10,00,000 / 1,00,00,000 = 0.10; Component Product = 0.10 × 12.0% = 1.20%
- Weight of Equity (w_e) = 60,00,000 / 1,00,00,000 = 0.60; Component Product = 0.60 × 16.0% = 9.60%
- Weight of Retained (w_r) = 12,00,000 / 1,00,00,000 = 0.12; Component Product = 0.12 × 16.0% = 1.92%

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WACC (Market Value Basis) = 1.26% + 1.20% + 9.60% + 1.92% = 13.98%
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Step 3: Operating, Financial, and Combined Leverage Computation

- Sales = Rs. 50,00,000
- Less Variable Costs (40%) = Rs. 20,00,000
- **Contribution = Rs. 30,00,000**
- Less Fixed Operating Costs = Rs. 12,00,000
- **EBIT (Operating Profit) = Rs. 18,00,000**
- Less Annual Interest = Rs. 2,00,000
- EBT = Rs. 16,00,000
- Adjusted EBT for Preference Dividend: EBT* = EBIT - Interest - [D_p / (1 - t)] = 18,00,000 - 2,00,000 - [1,20,000 / 0.70] = 16,00,000 - 1,71,429 = **Rs. 14,28,571**.

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DOL = Contribution / EBIT = 30,00,000 / 18,00,000 = 1.667
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DFL = EBIT / EBT* = 18,00,000 / 14,28,571 = 1.260
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DCL = DOL × DFL = 1.667 × 1.260 = 2.100 (or Contribution / EBT* =
30,00,000 / 14,28,571 = 2.100)
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Managerial Interpretation: The firm possesses a DOL of 1.67, indicating that a 10% increase in sales revenue will expand operating profit (EBIT) by 16.7%. The combined leverage of 2.10 indicates that a 10% increase in sales revenue will drive a 21.0% expansion in earnings per share, reflecting an optimized, sustainable financial structure.

7. EBIT-EPS Indifference Point Analysis

The **EBIT-EPS Indifference Point** represents the exact level of operating earnings (EBIT) at which two competing capital structure plans generate the identical Earnings Per Share (EPS) for ordinary equity shareholders. Below the indifference point, a conservative low-debt plan yields higher EPS

because fixed interest charges do not burden depressed earnings. Above the indifference point, an aggressive high-debt plan delivers superior EPS due to favorable financial leverage (trading on equity).

Mathematical Formulation of the Indifference Point

$$[(EBIT - I_1) \times (1 - t) - D_{p1}] / N_1 = [(EBIT - I_2) \times (1 - t) - D_{p2}] / N_2$$

Where: EBIT = Operating earnings at the indifference point; I_1, I_2 = Annual contractual interest under Alternative Plan 1 and Plan 2; t = Corporate tax rate; D_{p1}, D_{p2} = Preference dividends under Plan 1 and Plan 2; N_1, N_2 = Number of outstanding equity shares under Plan 1 and Plan 2.

Worked Numerical Problem: EBIT-EPS Indifference Point Resolution

Managerial Case Problem: Malabar Infotech Corporation requires Rs. 20,00,000 for cloud data center expansion. The company is evaluating two financing alternatives:

- **Plan Alpha (All-Equity):** Issue of 2,00,000 equity shares at face value of Rs. 10 each. Total debt = Rs. 0.
- **Plan Beta (Debt-Equity Mix):** Issue of 1,00,000 equity shares at Rs. 10 each (Rs. 10,00,000) and issue of 12% Debentures of Rs. 10,00,000 (Annual interest = Rs. 1,20,000).
- Corporate Tax Rate (t): 30%. No preference shares are issued.

Appraisal Requirement: Calculate the EBIT indifference point between Plan Alpha and Plan Beta, verify the resulting EPS, and state the managerial decision criteria.

Step 1: Setting up the Mathematical Equation

$$[(EBIT - 0) \times (1 - 0.30)] / 2,00,000 = [(EBIT - 1,20,000) \times (1 - 0.30)] / 1,00,000$$

Canceling (1 - 0.30) from both sides and simplifying the share ratio (2,00,000 / 1,00,000 = 2):

$$EBIT / 2 = (EBIT - 1,20,000) / 1$$

$$EBIT = 2 \times (EBIT - 1,20,000) = 2 \times EBIT - 2,40,000$$

$$2 \times EBIT - EBIT = Rs.\ 2,40,000 \Rightarrow EBIT = Rs.\ 2,40,000$$

Step 2: Verification of EPS at the Indifference Point (EBIT = Rs. 2,40,000)

- **Plan Alpha EPS:** EBIT = Rs. 2,40,000; Taxes at 30% = Rs. 72,000; PAT = Rs. 1,68,000. *EPS = 1,68,000 / 2,00,000 =* ***Rs. 0.84 per share***.
- **Plan Beta EPS:** EBIT = Rs. 2,40,000; Less Interest = Rs. 1,20,000; EBT = Rs. 1,20,000; Taxes at 30% = Rs. 36,000; PAT = Rs. 84,000. *EPS = 84,000 / 1,00,000 =* ***Rs. 0.84 per share***.

Both alternatives generate identical EPS of Rs. 0.84 at EBIT of Rs. 2,40,000.

Managerial Decision Rule:

- If expected operational EBIT is **greater than Rs. 2,40,000**: Select **Plan Beta (Debt-Equity Mix)**. Favorable financial leverage expands EPS above Plan Alpha.
- If expected operational EBIT is **less than Rs. 2,40,000**: Select **Plan Alpha (All-Equity)**. The absence of fixed interest charges shields shareholders from earnings collapse.

8. Modern Capital Structure Theories: Trade-Off and Pecking Order Frameworks

A. The Static Trade-Off Theory

The Trade-Off Theory posits that the optimal capital structure represents a deliberate trade-off between the **tax benefits of debt (the interest tax shield)** and the **deadweight costs of financial distress and bankruptcy**. As debt expands, the marginal present value of tax shields increases linearly, but the probability of financial distress surges exponentially. The optimal debt-equity ratio occurs at the precise point where the marginal tax benefit of an additional rupee of debt equals the marginal present value of financial distress costs.

B. The Pecking Order Theory (Stewart Myers and Nicolas Majluf)

Myers and Majluf (1984) rejected the concept of a static target optimal capital structure, arguing that corporate financing behavior is governed by **Information Asymmetry** between corporate insiders (executives) and external capital markets. Executives possess superior knowledge regarding the true intrinsic value of company assets and investment risks. Announcing a fresh equity issue signals to investors that management believes the stock is overvalued, triggering an immediate drop in share price.

To avoid underpricing dilution, enterprises finance investments according to a strict hierarchical "pecking order":

1. **Internal Financing First:** Relying exclusively on accumulated retained earnings and operational depreciation cash flows, which involve zero information asymmetry and zero flotation costs.
2. **Safe Debt Financing Second:** If internal funds are exhausted, issuing low-risk bank debt and secured debentures with minimal information sensitivity.
3. **Hybrid Securities Third:** Issuing convertible debentures and preferred equity if debt capacity nears institutional borrowing covenants.
4. **External Ordinary Equity as a Last Resort:** Issuing public equity shares only during severe financial distress when debt markets are completely closed.

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9. Practical Determinants of Corporate Capital Structure Design

While theoretical models provide mathematical rigor, corporate financial managers in practice must synthesize a comprehensive matrix of operational, institutional, and regulatory factors when establishing capital structure:

- **Financial Flexibility and Debt Service Coverage:** A corporation must never exhaust its total borrowing capacity during normal times. Retaining unused borrowing capacity ("reserve borrowing capacity") ensures that the enterprise can raise external funds during unexpected economic emergencies or sudden acquisition opportunities without issuing undervalued equity shares.
- **Interest Coverage Ratio (ICR) and DSCR:** Corporate lenders evaluate financial risk through coverage ratios:

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Interest Coverage Ratio (ICR) = EBIT / Annual Interest Expense
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Banks generally require an ICR of at least 2.5 to 3.0 times to ensure safe interest servicing.

For term loans, lenders calculate the **Debt Service Coverage Ratio (DSCR)**, incorporating principal repayment installments:

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DSCR = [ PAT + Depreciation + Interest ] / [ Interest + { Principal
                        Repayment / (1 - t) } ]
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A minimum DSCR of 1.5 to 2.0 is mandatory for infrastructure project financing under RBI prudential guidelines.

- **Asset Tangibility and Nature of Corporate Assets:** Manufacturing and utility companies possessing large tangible fixed assets (commercial real estate, factories, logistics fleets) can issue secured long-term debentures because tangible assets serve as valuable collateral. Technology and service firms possessing intangible assets (patents, software algorithms, human capital) lack physical collateral and must rely predominantly on equity financing.
- **Cash Flow Predictability and Business Risk:** Firms operating in cyclical consumer durable industries (automobiles, construction equipment) face volatile revenue swings and must maintain conservative low-debt structures. Companies in non-cyclical essential goods (pharmaceuticals, utilities) generate stable revenues and can safely maintain high debt leverage.
- **Credit Rating Agency Benchmarks:** Publicly listed corporations strive to maintain investment-grade credit ratings (AAA, AA, A) from recognized rating agencies (CRISIL, ICRA, CARE). Lower credit ratings trigger sharp increases in borrowing coupon rates and restrict access to institutional pension funds.

10. Flotation Costs and Multi-Period Component Cost Adjustments

In real capital markets, raising external funds entails substantial flotation costs (underwriting commissions, brokerage fees, legal preparation, accounting audits, and mandatory newspaper

advertisement). Flotation costs reduce the net proceeds (NP) realized by the corporation below the nominal face value or issue price, directly elevating the effective cost of capital.

Adjusting Cost of Redeemable Debt for Flotation Expenses and Tax

When debentures are issued at a discount with flotation expenses and redeemed at a premium, the precise cost of debt formula incorporates both amortized issuance costs and terminal redemption premiums:

$$k_d = [\{ I \times (1 - t) + (RV - NP) / n \} / \{ (RV + NP) / 2 \}]$$

Where: I = Annual coupon interest; t = Corporate tax rate; RV = Redeemable value at maturity; NP = Net issue proceeds realized per debenture after subtracting underwriting discounts and issuance expenses; n = Maturity tenure in years.

11. Venture Capital, Private Equity, and Deal Structuring Mechanics

In addition to conventional public debt and equity markets, high-growth technology and entrepreneurial enterprises rely extensively on private risk capital to fund rapid expansion. The corporate finance framework categorizes private risk capital across distinct institutional stages:

- **Seed and Angel Funding:** High-risk capital injected by high-net-worth angel syndicates and early-stage accelerators to support initial concept validation, prototype engineering, and intellectual property patent filings.
- **Venture Capital (Series A, B, and C):** Institutional risk capital provided by specialized VC funds to finance commercial market expansion, customer acquisition, and operational scaling. Series A establishes product-market fit; Series B finances rapid scaling; and Series C supports cross-market acquisitions and preparations for public market listing.
- **Mezzanine Finance and Hybrid Debt:** Subordinated debt instruments embedding equity conversion options (warrants), bridging the gap between senior secured bank debt and pure common equity.

Key Contractual Clauses in Modern Investment Term Sheets

When negotiating equity investments with institutional private equity and venture capital funds, financial managers must evaluate protective contractual covenants that affect corporate control and valuation:

1. **Liquidation Preference:** Dictates the payout order upon a corporate liquidity event (acquisition or winding up). Standard 1x non-participating liquidation preference ensures the investor recovers their original invested capital before ordinary common shareholders receive residual proceeds.
2. **Anti-Dilution Protection:** Shields early investors from equity dilution in the event of a "down round" (subsequent capital raising at a lower valuation). Governed by *Broad-Based Weighted Average* or *Full Ratchet* formulas that adjust the conversion price of preferred shares.

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3. **Governance Rights:** Encompasses board observer seats, affirmative voting veto rights over material corporate actions (mergers, capital expenditures exceeding threshold limits, executive appointments), **Tag-Along Rights** (protecting minority investors by allowing them to sell shares on identical terms if promoters sell), and **Drag-Along Rights** (enabling majority investors to compel minority shareholders to approve a lucrative corporate acquisition).

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