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HANDOUT

FIN722

Corporate Finance

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FIN722

Corporate Finance

Financial Management Decisions — Study Handout

This handout covers FIN722 Corporate Finance: the three great decisions of the financial manager — investment (capital budgeting), financing (capital structure), and distribution (dividends) — plus valuation, risk-return, and working capital. Formulas are stated plainly with worked numbers; learn one worked example per formula and you can handle any numerical question.

Notation used throughout: CF = cash flow, r = discount rate / cost of capital, n = periods, NPV = net present value, IRR = internal rate of return, WACC = weighted average cost of capital.

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Unit 1: Introduction: Goals and Forms of Business

Lectures 1–4

Learning Objectives

- State the goal of financial management: shareholder wealth maximization
- Distinguish profit maximization from wealth maximization
- Compare sole proprietorship, partnership and corporation
- Explain the agency problem and its remedies

The Goal: Shareholder Wealth Maximization

The financial manager's goal is to **maximize the market value of the firm** (shareholder wealth), not accounting profit. Profit maximization is flawed: it ignores **timing** (Rs. 100 today vs Rs. 100 in five years), **risk** (a risky Rs. 120 vs a safe Rs. 100), and **quality** of earnings. Wealth maximization discounts future cash flows for time and risk — that is why the whole course is built on discounted cash flow.

Forms of Business Organization

Sole proprietorship — one owner; simple, but unlimited liability and limited capital.

Partnership — two or more owners; shared capital and skills; still unlimited liability (except limited partners).

Corporation — separate legal entity; limited liability; ownership via transferable shares; can raise large capital — but faces double taxation and the agency problem.

The Agency Problem

In corporations, **owners (principals)** delegate to **managers (agents)** whose interests may diverge — managers may prefer perks, empire-building or safety over shareholder value. Remedies: performance-based compensation (stock options), board oversight and independent directors, the threat of takeover, debt discipline (fixed obligations reduce free cash flow), and transparent reporting/audit.

Exam classic: 'A manager rejects a profitable but risky project to protect his job.' Identify: agency conflict (manager risk-aversion vs shareholder diversification). Remedy: tie pay to long-term share performance.

Unit Summary

- Goal = maximize firm value (discounted, risk-adjusted), not raw profit.
- Corporation: limited liability + easy capital, at the cost of agency problems and double tax.
- Agency problem: align managers with owners via incentives, boards, takeovers, debt, disclosure.

Exam Pointers

- ★ Give three reasons profit maximization is an inadequate goal.

- ★ Compare the three business forms on liability, capital raising and continuity.
- ★ Define the agency problem and name four remedies.

Unit 2: Time Value of Money

Lectures 5–8

Learning Objectives

- Compute future value and present value of single sums
- Value annuities and perpetuities
- Handle compounding frequencies and effective rates
- Solve for rate, time or payment in TVM problems

Core Formulas

Future value: $FV = PV \times (1 + r)^n$ —

Present value: $PV = FV / (1 + r)^n$ —

Ordinary annuity PV: $PVA = PMT \times [1 - (1+r)^{-n}] / r$ —

Annuity FV: $FVA = PMT \times [(1+r)^n - 1] / r$ —

Perpetuity: $PV = PMT / r$ (e.g., preference share with fixed dividend) —

Growing perpetuity: $PV = PMT / (r - g)$, valid only if $r > g$ —

- **Effective annual rate:** $EAR = (1 + r/m)^m - 1$, where m = compounding periods per year.
A 12% nominal rate compounded monthly gives $EAR = (1.01)^{12} - 1 = 12.68\%$.

Worked Examples

1) Rs. 100,000 invested at 10% for 5 years: $FV = 100,000 \times 1.6105 = \text{Rs. } 161,050$. 2) What single sum today grows to Rs. 200,000 in 4 years at 8%? $PV = 200,000 / 1.3605 = \text{Rs. } 147,006$. 3) A 3-year annuity of Rs. 50,000 at 10%: $PV = 50,000 \times 2.4869 = \text{Rs. } 124,345$. 4) Perpetual Rs. 10,000/year at 10% = Rs. 100,000.

- **Annuity due:** payments at the beginning of each period — multiply the ordinary-annuity value by $(1 + r)$.

Unit Summary

- Money has time value: discount future cash flows at the opportunity cost of capital.
- Master the six formulas: FV, PV, PVA, FVA, perpetuity, growing perpetuity.
- Convert nominal rates to EAR before comparing investments with different compounding.

Exam Pointers

- ★ Compute PV of Rs. 500,000 due in 6 years at 9%.
- ★ A loan charges 1.5% per month. What is the EAR?
- ★ Value a growing perpetuity: dividend Rs. 5 next year, growth 4%, required return 12%.

Unit 3: Risk and Return

Lectures 9–12

Learning Objectives

- Compute expected return, variance and standard deviation
- Explain diversification and systematic vs unsystematic risk
- State and apply the CAPM
- Distinguish the SML from the CML

Measuring Return and Risk

Expected return: $E(R) = \sum p_i \times R_i$ (probability-weighted average). —

Variance: $\sigma^2 = \sum p_i \times (R_i - E(R))^2$; **standard deviation** $\sigma = \sqrt{\text{variance}}$ — the standard measure of total risk.

Coefficient of variation: $CV = \sigma / E(R)$ — compares risk per unit of return across investments.

Diversification

Total risk splits into **unsystematic (diversifiable)** risk — firm-specific events like a strike — and **systematic (market)** risk — recessions, interest-rate shifts that hit all firms. Diversification across 15–20 stocks eliminates most unsystematic risk; systematic risk cannot be diversified away and is the only risk the market rewards.

CAPM

CAPM: $E(R_i) = R_f + \beta_i \times (R_m - R_f)$. R_f = risk-free rate, β = sensitivity to market moves, $(R_m - R_f)$ = market risk premium. —

- $\beta = 1$: moves with the market. $\beta > 1$: aggressive (amplifies market). $\beta < 1$: defensive. $\beta = 0$: risk-free.
- The **Security Market Line (SML)** plots expected return against beta — every correctly priced asset lies on it. The **Capital Market Line (CML)** plots efficient portfolios of the market portfolio plus the risk-free asset against total risk σ .

Worked: $R_f = 8\%$, market return = 15%, stock $\beta = 1.4$. Required return = $8 + 1.4 \times (15 - 8) = 8 + 9.8 = 17.8\%$. If the stock's expected return is only 15%, it plots below the SML — overvalued, do not buy.

Unit Summary

- Risk = σ of returns; diversify away unsystematic risk; only systematic risk is priced.
- CAPM prices assets by beta: $E(R) = R_f + \beta(R_m - R_f)$.
- SML (beta, all assets) vs CML (total risk, efficient portfolios only).

Exam Pointers

- ★ Compute expected return and σ from a 3-state probability table.

- ★ A stock has $\beta = 0.7$, $R_f = 9\%$, $R_m = 16\%$. Find required return; is it attractive at 14% expected?
- ★ Explain why diversification cannot eliminate systematic risk.

Unit 4: Bond and Share Valuation

Lectures 13–16

Learning Objectives

- Value bonds: price, YTM, current yield
- Explain the price–yield inverse relationship
- Value shares: zero-growth, constant-growth and multistage models
- Compute dividend yield and capital gains yield

Bond Valuation

Bond price = PV of coupons (annuity) + PV of face value: $P = C \times [1 - (1+r)^{-n}] / r + F / (1+r)^n$. —

- **YTM** (yield to maturity): the discount rate equating price to promised cash flows — the bond's true return if held to maturity.
- **Price–yield rule:** when market rates rise, bond prices fall (and vice versa). Longer maturity and lower coupons = bigger price swings (interest-rate risk).
- Premium bond: coupon > YTM (price > face). Discount bond: coupon < YTM. Par: equal.

Share Valuation

Zero growth: $P = D / r$ (like a perpetuity — preference shares).

Constant growth (Gordon model): $P = D / (r - g)$. —

Multistage: discount each high-growth dividend, then apply Gordon at the stable stage and discount back. —

- Total return = dividend yield (D/P) + capital gains yield (g in the Gordon model).

Worked: Bond — face Rs. 1,000, 10% annual coupon, 5 years, market rate 12%. Price = $100 \times 3.6048 + 1,000 \times 0.5674 = 360.48 + 567.43 = \text{Rs. } 927.91$ (discount bond, since 10% < 12%). Share — $D = \text{Rs. } 6$, $g = 5\%$, $r = 13\%$: $P = 6 / 0.08 = \text{Rs. } 75$.

Unit Summary

- Bond value = PV(coupons) + PV(face); YTM is the internal return; prices move inversely to rates.
- Shares: D/r (zero growth), $D/(r-g)$ (Gordon), staged discounting for multistage.
- Return always splits into income yield + capital gains.

Exam Pointers

- ★ Price a 5-year 10% Rs. 1,000 bond at 8% market rate. Premium or discount?
- ★ Value a share: $D = \text{Rs. } 4$, growth 6%, required return 14%.
- ★ Explain why long-term bonds are more sensitive to rate changes.

Unit 5: Capital Budgeting Techniques

Lectures 17–21

Learning Objectives

- Compute NPV, IRR, payback and discounted payback
- Compute profitability index and accounting rate of return
- Rank mutually exclusive vs independent projects
- Explain NPV vs IRR conflicts and reinvestment assumptions

The Techniques

NPV = PV of future cash flows – initial investment. Accept if $NPV > 0$. The theoretically correct rule. —

IRR = discount rate where $NPV = 0$. Accept if $IRR > \text{cost of capital}$. —

Payback = years to recover the initial outlay (ignores time value and post-payback flows). —

Discounted payback = payback using discounted cash flows (fixes time value, still ignores later flows). —

Profitability index $PI = \text{PV of inflows} / \text{initial investment}$. Accept if $PI > 1$ (useful under capital rationing). —

ARR = average accounting profit / average investment (uses profit, not cash — weakest method).

NPV vs IRR Conflicts

For **mutually exclusive** projects, NPV and IRR can disagree when projects differ in **scale** or **cash-flow timing**. NPV assumes reinvestment at the cost of capital; IRR assumes reinvestment at the IRR itself (often unrealistic). **Rule: for mutually exclusive projects, follow NPV** — it directly measures value added. Also watch for **multiple IRRs** with non-conventional cash flows (sign changes more than once).

Worked: Project costs Rs. 500,000; inflows Rs. 150,000/year for 5 years; cost of capital 10%. PV annuity factor (10%, 5) = 3.7908. PV inflows = 568,620. $NPV = \text{Rs. } 68,620 \rightarrow \text{accept}$. $IRR \approx 15.2\%$ (where $PV = 500,000$) $> 10\% \rightarrow \text{accept}$. Payback = $500,000/150,000 = 3.33$ years.

Unit Summary

- NPV (>0) is the primary rule; IRR ($> \text{cost of capital}$) usually agrees except for mutually exclusive projects.
- Payback and ARR are quick screens with known flaws — never the sole criterion.
- PI helps rank under capital rationing; beware multiple IRRs with unconventional flows.

Exam Pointers

- ★ Compute NPV, IRR (approx), payback and PI for given cash flows.
- ★ Two mutually exclusive projects: NPV says A, IRR says B. Which do you pick and why?

- ★ State the reinvestment-rate assumption behind NPV and IRR.

Unit 6: Cash Flow Estimation

Lectures 22–24

Learning Objectives

- Identify relevant vs irrelevant cash flows
- Treat sunk costs, opportunity costs and side effects correctly
- Compute operating cash flow with tax shields
- Handle inflation and equivalent annual cost

Relevant Cash Flows Only

- **Sunk costs** (already spent, e.g., Rs. 200,000 market research) — ignore; they cannot be recovered.
- **Opportunity costs** (using owned land that could be rented for Rs. 50,000/year) — include as a cost.
- **Side effects:** cannibalization (new product eats old sales — subtract) and synergies (add).
- **Allocated overheads** that exist regardless — exclude; only incremental overhead counts.
- Include: initial investment, working-capital changes, operating flows, salvage value (net of tax).

Operating Cash Flow and Tax Shields

OCF = (Revenue – Cash costs) × (1 – T) + Depreciation × T. The term **Depreciation × T** is the depreciation tax shield. —

- Depreciation itself is non-cash — it matters only through the tax shield.
- Working capital: an increase in inventory/receivables is a cash outflow at the start, recovered at the end.

Inflation and EAC

- Be consistent: nominal cash flows with nominal rates, real with real. $(1 + \text{nominal}) = (1 + \text{real})(1 + \text{inflation})$.
- **Equivalent Annual Cost (EAC):** converts machines with different lives into an annual cost for comparison: $\text{EAC} = \text{PV of costs} / \text{annuity factor}$.

Worked: Machine costs Rs. 1,000,000, 4-year life, straight-line depreciation, tax 30%, annual pre-tax savings Rs. 400,000, cost of capital 10%. Annual depreciation = 250,000; tax shield = 75,000. $\text{OCF} = 400,000 \times 0.7 + 75,000 = 355,000$. $\text{NPV} = 355,000 \times 3.1699 - 1,000,000 = 1,125,315 - 1,000,000 = \text{Rs. } 125,315 \rightarrow \text{accept}$.

Unit Summary

- Only incremental cash flows: include opportunity costs and side effects; exclude sunk costs and non-incremental overhead.
- $\text{OCF} = (\text{Rev} - \text{Costs})(1 - T) + \text{Dep} \times T$; depreciation counts only via its tax shield.

- Match nominal/real consistently; use EAC to compare unequal-lived assets.

Exam Pointers

- ★ Classify: sunk cost, opportunity cost, cannibalization — include or exclude?
- ★ Compute OCF and NPV from given data (like the worked example).
- ★ Two machines, lives 3 vs 5 years. Which comparison tool and why?

Unit 7: Cost of Capital

Lectures 25–27

Learning Objectives

- Compute cost of debt (after tax), preference and equity
- Estimate cost of equity via CAPM and dividend growth
- Compute WACC with market-value weights
- Explain marginal cost of capital and break points

Component Costs

Cost of debt: $r_d \times (1 - T)$ — interest is tax-deductible, so the after-tax cost is what matters.

Cost of preference: $r_p = D_p / P_{\text{net}}$ (dividend over net proceeds). —

Cost of equity — CAPM: $r_e = R_f + \beta(R_m - R_f)$. Dividend growth: $r_e = D/P + g$. Bond-yield-plus: $r_e = \text{bond yield} + \text{risk premium (3–5\%)}$.

WACC

WACC = $w_d \times r_d(1-T) + w_p \times r_p + w_e \times r_e$, with weights at MARKET values, not book. —

- WACC is the discount rate for average-risk projects and the hurdle for firm value creation: projects earning above WACC add value.
- Use divisional/project-specific rates when risk differs materially from the firm's average.

Marginal Cost of Capital

As a firm raises more capital, WACC eventually rises (debt capacity exhausted, new shares at a discount) — the **MCC schedule** steps up at **break points**: Break point = funds available at lower cost / weight. The firm should invest up to where the investment opportunity schedule (projects ranked by IRR) crosses the MCC.

Worked: Capital structure 40% debt, 10% preference, 50% equity (market values). $r_d = 12\%$, $T = 30\%$, $r_p = 14\%$, $r_e = 18\%$. $\text{WACC} = 0.4 \times 12\% \times 0.7 + 0.1 \times 14\% + 0.5 \times 18\% = 3.36\% + 1.4\% + 9\% = 13.76\%$.

Unit Summary

- After-tax debt, preference dividend yield, equity via CAPM or Gordon.
- WACC uses market-value weights; it's the hurdle rate for average-risk projects.
- MCC rises at break points; invest until project IRRs meet the MCC.

Exam Pointers

- ★ Compute WACC from given component costs and market weights.
- ★ Why market values, not book values, for WACC weights?
- ★ Find the break point: Rs. 4m retained earnings available, equity weight 50%.

Unit 8: Capital Structure Decisions

Lectures 28–31

Learning Objectives

- Explain MM propositions with and without taxes
- Apply the trade-off theory of leverage
- Describe the pecking order theory
- Evaluate financial leverage effects on EPS and risk

Modigliani–Miller

- **MM without taxes:** capital structure is irrelevant — firm value depends only on operating cash flows. Arbitrage (homemade leverage) enforces it.
- **MM with corporate taxes:** debt creates a tax shield, so firm value rises with leverage: $V_L = V_U + T \times D$. Taken literally, 100% debt would be optimal — which is absurd, so costs of debt must be added.

Trade-off Theory

Firms balance the **tax shield benefit of debt** against **financial distress and agency costs** (bankruptcy risk, lost customers, restrictive covenants, underinvestment). Optimal leverage is where marginal benefit = marginal cost. This predicts profitable, asset-heavy firms (collateral) carry more debt — matching observation.

Pecking Order Theory

Because of **asymmetric information**, firms prefer: 1) internal funds (retained earnings), 2) debt, 3) equity last. Issuing equity signals overvaluation (Myers–Majluf), so markets punish equity issues. Implication: no target ratio — leverage is the residue of financing needs.

- **Financial leverage effect:** debt magnifies EPS when ROA exceeds the interest rate, and magnifies losses when it doesn't — the classic leverage double-edge.

Worked: Firm EBIT Rs. 1,000,000, 100,000 shares, tax 30%. Unlevered EPS = 700,000/100,000 = Rs. 7. With Rs. 2,000,000 debt at 10%: interest 200,000; EAT = 560,000; shares fall to 80,000 (Rs. 2m equity retired at Rs. 100/share) → EPS = Rs. 7.00... compute: if shares bought at Rs. 50, retired 40,000 shares, remaining 60,000 → EPS = 560,000/60,000 = Rs. 9.33. Leverage raised EPS because ROA (10% pre-tax on assets) beat the after-tax debt cost — but risk rose too.

Unit Summary

- MM: irrelevant without taxes; tax shield favors debt with taxes ($V_L = V_U + T \cdot D$).
- Trade-off: tax shield vs distress/agency costs → an optimal range.
- Pecking order: retained earnings → debt → equity (information asymmetry).
- Leverage magnifies both EPS gains and risk.

Exam Pointers

- ★ State MM propositions I and II with and without taxes.

- ★ Explain the trade-off theory with a diagram description.
- ★ Why do markets react negatively to new equity issues? (pecking order)

Unit 9: Dividend Policy

Lectures 32–34

Learning Objectives

- Explain dividend irrelevance (MM) and its assumptions
- Describe bird-in-hand, tax preference and clientele effects
- Compare residual, stable and constant-payout policies
- Explain stock splits, buybacks and their signals

Dividend Irrelevance vs Relevance

- **MM irrelevance:** in perfect markets, dividend policy doesn't affect value — investors can create homemade dividends by selling shares.
- **Bird-in-hand:** investors prefer certain dividends now over uncertain capital gains (Gordon–Lintner) — dividends reduce uncertainty.
- **Tax preference:** where capital gains are taxed less than dividends, investors prefer retention.
- **Clientele effect:** firms attract investors who like their policy (retirees want dividends); changing policy loses the clientele.
- **Signaling:** dividend increases signal management's confidence in future earnings — markets react accordingly.

Policies in Practice

Residual policy — pay dividends from leftover earnings after funding all positive-NPV projects (theoretically pure, volatile in practice).

Stable/predictable policy — steady or steadily growing dividend; most large firms choose this for the signaling value.

Constant payout ratio — fixed % of earnings; dividends swing with earnings.

Alternatives to Cash Dividends

- **Share repurchase:** buys back stock — tax-efficient return of cash, signals undervaluation, boosts EPS.
- **Stock split / stock dividend:** more shares, same value — cosmetic, but improves liquidity and signals confidence.

Case: A mature utility with few growth projects pays 80% of earnings as dividends; a young tech firm pays zero. Both are rational: the utility's clientele wants income and it has no positive-NPV projects to fund (residual logic), while the tech firm's investors prefer tax-advantaged growth and its projects beat the cost of capital.

Unit Summary

- MM: dividends irrelevant in perfect markets; real-world frictions (taxes, signaling, clienteles) make them matter.

- Policies: residual (theory), stable (practice), constant payout.
- Buybacks return cash tax-efficiently; splits are cosmetic but signal confidence.

Exam Pointers

- ★ State MM dividend irrelevance and its three key assumptions.
- ★ Contrast bird-in-hand and tax-preference theories.
- ★ A firm cuts its dividend unexpectedly. Analyze via signaling theory.

Unit 10: Working Capital Management

Lectures 35–38

Learning Objectives

- Define the cash conversion cycle and compute it
- Manage inventory with EOQ
- Evaluate credit policy and receivables
- Compare aggressive vs conservative working-capital policies

The Cash Conversion Cycle

CCC = Inventory days + Receivables days – Payables days. —

- Shorter CCC = cash freed faster = less financing needed. Levers: faster collection, leaner inventory, negotiated supplier terms (without damaging relationships).

Inventory: EOQ

EOQ = $\sqrt{(2 \times \text{Annual demand} \times \text{Order cost} / \text{Carrying cost per unit})}$. Balances ordering costs against holding costs. —

- Reorder point = daily usage $\times$ lead time (+ safety stock).

Receivables and Credit Policy

The **5 C's of credit**: Character, Capacity, Capital, Collateral, Conditions. Credit terms (e.g., 2/10 net 30) trade off higher sales against carrying cost and bad debts. **Aging schedules** monitor collection; factoring or credit insurance can offload risk.

- Cost of missing a discount: 2/10 net 30 $\rightarrow (2/98) \times (360/20) \approx 36.7\%$ annualized — almost always take the discount.

Financing Policy

- **Aggressive**: fund even permanent current assets with short-term debt — cheaper but risky (refinancing risk).
- **Conservative**: fund with long-term capital — safer, costlier.
- **Matching (hedging)**: match asset and liability maturities — the textbook middle path.

Worked: Inventory days 60, receivables days 45, payables days 30 $\rightarrow$ CCC = 75 days. EOQ: demand 10,000 units, order cost Rs. 500, carrying cost Rs. 20/unit $\rightarrow$ EOQ = $\sqrt{(2 \times 10,000 \times 500 / 20)} = \sqrt{500,000} \approx 707$ units per order.

Unit Summary

- CCC = inventory + receivables – payables days; shorten it to free cash.
- EOQ balances ordering vs carrying costs; reorder point triggers orders.
- Credit policy: 5 C's, terms trade-offs, aging control; skipping 2/10 net 30 costs ~37%.
- Financing: aggressive (cheap/risky) vs conservative (safe/costly) vs matching.

Exam Pointers

- ★ Compute CCC and EOQ from given data.
- ★ Should a firm skip 2/10 net 30? Compute the annualized cost.
- ★ Compare aggressive and conservative working-capital financing.

Key Terms Glossary

All key terms from this handout in one place — use for quick revision.

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