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

Financial Management

Course Code: UK4DSCMGT201 • Module 2 Notes

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Module 2: Investment Decision and Capital Budgeting

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1. Nature, Significance, and Process of Capital Budgeting

Capital budgeting represents the long-term strategic investment decision-making process through which a commercial enterprise commits substantial financial capital into durable, productive assets whose economic benefits and cash inflows are anticipated to unfold over multi-year horizons. Unlike routine operational expenses (such as utility bills, warehouse rent, or administrative stationery) that are incurred to maintain existing operations within a single financial period, capital budgeting decisions permanently reshape the productive capability, risk profile, and future earning power of the firm.

The strategic significance of capital budgeting in corporate governance is underscored by four defining structural realities:

- **Long-Term Consequences:** A major capital expenditure—such as constructing a specialized chemical manufacturing plant or implementing enterprise-wide ERP software—commits the organization to an operational pathway for decades. If the original economic assumptions prove defective, the company must endure depressed returns and fixed depreciation burdens for years.
- **Substantial Capital Outlays:** Capital investments require massive monetary commitments, often exhausting years of accumulated retained earnings or necessitating substantial debt borrowings that alter the firm's capital structure and credit rating.
- **Irreversibility and Sunk Cost Exposure:** Most industrial fixed assets are customized to specific manufacturing processes. If market demand collapses, specialized machinery cannot be easily repurposed or liquidated on secondary markets without severe economic write-downs.
- **Direct Determination of Enterprise Valuation:** The fundamental value of a business is the present value of its future free cash flows. Superior capital budgeting execution generates positive Net Present Value (NPV), directly expanding shareholder wealth and equity market capitalization.

The Six-Stage Capital Budgeting Process Architecture

Sophisticated corporate organizations execute capital expenditure evaluations through a disciplined six-stage procedural workflow:

1. **Project Identification and Proposal Generation:** Ideas for capital investment originate across all levels of the organization, categorized into: replacement of worn-out equipment, operational cost-reduction modifications, capacity expansion of existing product lines, new product line introductions, or statutory regulatory mandates (such as pollution control effluent treatment plants).
2. **Cash Flow Estimation:** Projecting future incremental cash inflows and cash outflows across the full operational life of the proposed asset. Financial analysis strictly tracks cash flows after

corporate taxes, intentionally excluding non-cash accounting charges like depreciation while incorporating depreciation tax shields.

3. **Project Appraisal and Quantitative Evaluation:** Subjecting projected cash flows to formal quantitative screening models (Payback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return, and Profitability Index) to measure economic viability against corporate hurdle rates.
4. **Selection and Capital Allocation:** Prioritizing screened proposals in accordance with strategic corporate priorities, risk tolerance parameters, and financial capital availability (capital rationing constraints).
5. **Project Execution and Implementation:** Authorizing capital expenditures, executing engineering procurement and construction (EPC) contracts, and monitoring completion timelines to prevent cost and time overruns.
6. **Post-Audit and Post-Implementation Review:** Systematically comparing actual operational cash flows and operating costs against original projections. Post-audits uncover systematic forecasting biases, improve future capital budgeting estimates, and identify necessary corrective modifications.

2. Classification of Capital Budgeting Proposals

From an operational and portfolio decision standpoint, capital investment proposals are classified into three distinct categories based on their economic interdependency:

Project Typology	Operational Nature	Decision Acceptance Rule
Independent Projects	Projects whose cash flows are entirely unrelated to and unaffected by the acceptance or rejection of other proposals.	Accept all projects that satisfy the minimum financial hurdle rate (e.g., NPV > 0 or IRR > Cost of Capital), subject only to aggregate budget limits.
Mutually Exclusive Projects	Competing alternative proposals designed to accomplish the exact same operational objective; accepting one proposal automatically eliminates all alternatives.	Rank all viable alternatives quantitatively and select the single project delivering the highest positive Net Present Value (NPV).
Contingent / Dependent Projects	Projects whose operational viability and cash inflows are dependent upon the prior or simultaneous acceptance of another project.	Evaluate the dependent proposals as an integrated joint investment package; accept both or reject both based on combined NPV.

3. Principles of Incremental Cash Flow Estimation

The cardinal rule of capital budgeting appraisal states that evaluations must be conducted using **incremental, after-tax cash flows** rather than accrual accounting net income. Accounting net income includes non-cash accruals, revenue deferrals, and arbitrary overhead allocations that do not

reflect actual liquidity. Incremental cash flows represent the precise difference between the firm's total cash flows with the project versus total cash flows without the project.

Four rigorous principles govern professional cash flow modeling:

- **Sunk Costs are Strictly Excluded:** Sunk costs represent cash expenditures that have already occurred in the past and cannot be recovered regardless of whether the proposed project is accepted or rejected (such as past market research feasibility studies or historical engineering design fees). Because sunk costs are unalterable by future decisions, they are entirely irrelevant to project appraisal.
- **Opportunity Costs are Strictly Included:** An opportunity cost represents the cash flow forgone by deploying an existing organizational asset into the new project rather than putting it to its next-best alternative commercial use. For instance, if a company builds a new facility on vacant land it already owns that could otherwise be sold for Rs. 2 crores, that Rs. 2 crores forgone sales price (net of tax) must be treated as an upfront capital cash outflow.
- **Side Effects and Cannibalization are Factored:** A new project may exert positive or negative operational repercussions across other departments of the firm. If launching a new premium product cannibalizes sales of an existing product line, the lost gross contribution margin from the existing product must be deducted as an incremental cost.
- **Working Capital Commitments:** Most capital expansions require an initial investment in additional inventories and accounts receivable to support higher sales. This net working capital requirement represents an immediate cash outflow at Year 0, which is fully recovered as a cash inflow at the project's terminal termination date.

4. Traditional (Non-Discounted) Capital Budgeting Techniques

Traditional evaluation methods do not discount future cash flows. They are simple to compute and provide quick operational screening criteria, though they suffer from significant theoretical limitations.

A. The Payback Period (PBP) Method

The Payback Period represents the exact number of years required for an enterprise to recover its original capital cash investment from the operational net cash inflows generated by the project. For projects with uniform annual cash inflows, the formula is:

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Payback Period = Initial Capital Investment / Annual Cash Inflow
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Where: Initial Capital Investment is the net cash outlay at Year 0; Annual Cash Inflow is net operating profit after tax but before depreciation.

When cash inflows are unequal across operational years, the payback period is calculated by cumulating annual cash inflows until the cumulative total equals the initial capital expenditure.

Managerial Advantages of Payback Period:

- Exceptional computational simplicity, readily understood by operational managers and small business proprietors without financial engineering training.
- Favors projects that return capital rapidly, providing an effective liquidity screening filter for cash-constrained firms operating under working capital stress.
- Mitigates long-term political and technological obsolescence risk by prioritizing investments that break even within near-term forecastable horizons.

Critical Deficiencies of Payback Period:

- **Ignores the Time Value of Money:** Treats cash received in Year 5 as having identical purchasing power and value to cash received in Year 1.
- **Completely Disregards Cash Flows Beyond the Payback Cutoff:** A project requiring Rs. 10 lakhs that recovers Rs. 5 lakhs annually for 2 years (Payback = 2 years) and terminates would be chosen over a project that recovers Rs. 4 lakhs annually for 10 years (Payback = 2.5 years), despite the second project delivering massive long-term wealth.
- **Arbitrary Target Cutoff Standards:** The selection of the maximum acceptable payback threshold (e.g., 3 years vs 4 years) is subjective and lacks any linkage to market hurdle rates or shareholder wealth maximisation.

B. The Accounting Rate of Return (ARR) Method

The Accounting Rate of Return (also designated as the Return on Investment - ROI) measures project profitability using standard financial accounting figures rather than cash flows. It expresses the average annual post-tax accounting profit as a percentage of the capital investment:

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ARR = (Average Annual Net Profit After Tax / Average Investment) × 100
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Where: Average Investment = (Initial Capital Outlay + Salvage Value) / 2 + Additional Working Capital; Average Annual Net Profit After Tax = Sum of all years' PAT / Project Life in years.

Evaluation of ARR: While ARR incorporates the entire operating lifespan of the asset and utilizes easily accessible accounting data, it suffers from two major flaws: it relies on accrual accounting profits (which can be manipulated by choice of depreciation methods) rather than cash flows, and it completely ignores the time value of money by assigning equal weight to profits across all years.

5. Modern Discounted Cash Flow (DCF) Techniques

Discounted Cash Flow techniques overcome the flaws of traditional methods by explicitly discounting all future incremental cash inflows and outflows to their present values using the firm's cost of capital (hurdle rate). DCF methods align project selection with the wealth maximisation objective.

A. The Net Present Value (NPV) Method

Net Present Value is universally regarded by corporate finance academics and institutional analysts as the theoretically superior evaluation criterion. NPV is the difference between the present value of all

expected future cash inflows and the present value of the initial cash outlay required to fund the project:

$$NPV = \Sigma \left[CF_t / (1 + r)^t \right] - C_0$$

Where: CF_t = Incremental net cash inflow in year t (running from t = 1 to t = n); r = Project hurdle rate (Weighted Average Cost of Capital); C_0 = Initial capital cash outlay at Year 0.

NPV Decision Rule:

- If **NPV > 0**: Accept the project. The investment generates cash returns in excess of the cost of capital, directly expanding shareholder wealth.
- If **NPV < 0**: Reject the project. The investment earns less than the required hurdle rate and will destroy corporate value.
- If **NPV = 0**: Management is indifferent; the project recovers exactly its invested capital and required cost of capital without altering net equity value.
- For **Mutually Exclusive Proposals**: Select the single project generating the highest positive NPV.

B. The Internal Rate of Return (IRR) Method

The Internal Rate of Return is the exact discount rate that equates the present value of all expected future cash inflows to the project's initial capital outlay. In mathematical terms, IRR is the specific hurdle rate at which the Net Present Value of the project equals zero:

$$0 = \Sigma \left[CF_t / (1 + IRR)^t \right] - C_0$$

Where: IRR is the internal yield percentage solved iteratively by trial-and-error interpolation; CF_t = Cash inflow in period t; C_0 = Initial investment outlay.

IRR Decision Rule:

- If **IRR > Cost of Capital (k)**: Accept the project. The internal rate of economic yield exceeds the cost of procuring financing.
- If **IRR < Cost of Capital (k)**: Reject the project. Committing capital to the asset costs more than the asset's yield.
- If **IRR = Cost of Capital (k)**: The project breaks even in present value terms.

C. The Profitability Index (PI) / Benefit-Cost Ratio

The Profitability Index expresses the ratio of the present value of future operating cash inflows to the initial capital cash investment outlay. It provides a measure of relative capital efficiency per rupee of investment:

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Profitability Index (PI) = Present Value of Future Cash Inflows /
Initial Capital Outlay
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Where: PV of Future Inflows = $\Sigma [CF_t / (1 + r)^t]$; Initial Capital Outlay = C_O.

PI Decision Rule: Accept if **PI > 1.0** (corresponding directly to NPV > 0); Reject if **PI < 1.0**. The Profitability Index is particularly valuable in capital rationing environments, where capital budgets are constrained and projects must be ranked by return per rupee invested.

6. Comparative Analysis and Conflicts Between NPV and IRR

For independent investment proposals possessing conventional cash flow streams (an initial cash outflow followed entirely by positive cash inflows), NPV and IRR yield identical accept-or-reject conclusions. However, when evaluating **mutually exclusive projects**, NPV and IRR frequently produce conflicting project rankings due to structural differences:

1. **Disparity in Project Scale (Size Disparity):** A small project requiring Rs. 1,00,000 might yield an extraordinary IRR of 45% with an NPV of Rs. 35,000. A competing large project requiring Rs. 20,00,000 might yield an IRR of 22% with an NPV of Rs. 3,50,000. IRR ranks the small project first, whereas NPV correctly ranks the large project first because it adds ten times more absolute wealth to the enterprise.
2. **Disparity in Cash Flow Timing (Pattern Disparity):** When comparing a project that delivers large cash inflows in early years against an alternative that yields high cash inflows in distant future years, their NPV profiles intersect at a specific discount rate known as the **Fisher's Intersection Rate**. At discount rates below the Fisher rate, project rankings reverse.
3. **Underlying Reinvestment Rate Assumptions:** The fundamental theoretical reason for NPV-IRR conflict lies in their reinvestment rate assumptions. The **IRR method implicitly assumes that intermediate cash inflows are reinvested throughout the project life at the project's own internal rate of return** (which may be unrealistically high, such as 40%). Conversely, the **NPV method realistically assumes that intermediate cash inflows are reinvested at the firm's cost of capital (WACC)**. Because reinvestment at the corporate cost of capital is achievable in competitive capital markets, the NPV method is theoretically sound and must always take precedence over IRR during ranking conflicts.

7. Comprehensive Worked Numerical Problem: Multi-Method Project Appraisal

Managerial Case Problem: Cochin Maritime Logistics Ltd. is evaluating a capital expenditure proposal to procure a high-efficiency container handling crane. The project parameters are detailed below:

- Initial Capital Outlay at Year 0: Rs. 10,00,000
- Economic Operational Life: 5 Years

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- Estimated Salvage Value at Year 5: Rs. 0
- Corporate Cost of Capital (Hurdle Rate): 10% per annum
- Expected Annual Net Cash Inflows (After Tax, Before Depreciation):

Operational Year	Annual Cash Inflow (Rs.)	Discount Factor at 10% (PVIF)	Discount Factor at 18% (PVIF)
Year 1	Rs. 3,50,000	0.9091	0.8475
Year 2	Rs. 3,20,000	0.8264	0.7182
Year 3	Rs. 2,80,000	0.7513	0.6086
Year 4	Rs. 2,40,000	0.6830	0.5158
Year 5	Rs. 2,10,000	0.6209	0.4371

Appraisal Requirement: Calculate (1) Payback Period; (2) Net Present Value (NPV) at 10%; (3) Profitability Index (PI) at 10%; and (4) Internal Rate of Return (IRR). State the managerial acceptance recommendation.

Solution and Step-by-Step Resolution:

Step 1: Payback Period Computation

Cumulating annual cash inflows:

- End of Year 1: Rs. 3,50,000
- End of Year 2: Rs. 3,50,000 + Rs. 3,20,000 = Rs. 6,70,000
- End of Year 3: Rs. 6,70,000 + Rs. 2,80,000 = Rs. 9,50,000 (Remaining recovery: Rs. 10,00,000 - Rs. 9,50,000 = Rs. 50,000)
- Year 4 Inflow: Rs. 2,40,000. Fraction of Year 4 needed: 50,000 / 2,40,000 = 0.208 years.

Payback Period = 3 + 0.21 = 3.21 Years (approximately 3 years and 2.5 months).

Step 2: Net Present Value (NPV) Computation at 10% Discount Rate

- Year 1: Rs. 3,50,000 × 0.9091 = Rs. 3,18,185
- Year 2: Rs. 3,20,000 × 0.8264 = Rs. 2,64,448
- Year 3: Rs. 2,80,000 × 0.7513 = Rs. 2,10,364
- Year 4: Rs. 2,40,000 × 0.6830 = Rs. 1,63,920
- Year 5: Rs. 2,10,000 × 0.6209 = Rs. 1,30,389

Total Present Value of Cash Inflows = Rs. 3,18,185 + Rs. 2,64,448 + Rs. 2,10,364 + Rs. 1,63,920 + Rs. 1,30,389 = **Rs. 10,87,306**.

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NPV = PV of Inflows - Initial Outlay = Rs. 10,87,306 - Rs. 10,00,000 = +Rs. 87,306
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Result: Positive NPV of Rs. 87,306. The project creates net corporate wealth.

Step 3: Profitability Index (PI) Computation

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PI = Present Value of Inflows / Initial Outlay = 10,87,306 / 10,00,000 = 1.087
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Result: PI of 1.087 > 1.0, confirming financial acceptability.

Step 4: Internal Rate of Return (IRR) Computation

At 10%, NPV is +Rs. 87,306. To find the rate where NPV = 0, we discount at a higher trial rate of 18%:

- Year 1: Rs. 3,50,000 × 0.8475 = Rs. 2,96,625
- Year 2: Rs. 3,20,000 × 0.7182 = Rs. 2,29,824
- Year 3: Rs. 2,80,000 × 0.6086 = Rs. 1,70,408
- Year 4: Rs. 2,40,000 × 0.5158 = Rs. 1,23,792
- Year 5: Rs. 2,10,000 × 0.4371 = Rs. 91,791

Total Present Value of Inflows at 18% = Rs. 9,12,440. NPV at 18% = Rs. 9,12,440 - Rs. 10,00,000 = **-Rs. 87,560**.

Applying standard linear interpolation formula:

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IRR = Lower Rate + [ NPV at Lower Rate / (NPV at Lower Rate - NPV at Higher Rate) ] × (Higher Rate - Lower Rate)
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IRR = 10% + [ 87,306 / (87,306 - (-87,560)) ] × (18% - 10%)
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IRR = 10% + [ 87,306 / 1,74,866 ] × 8% = 10% + (0.4993 × 8%) = 10% + 3.99% = 13.99%
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Result: IRR = 13.99% (approximately 14.0%).

Managerial Summary Recommendation: Because the project generates a positive NPV of Rs. 87,306, a Profitability Index of 1.087 (> 1.0), an IRR of 13.99% exceeding the firm's 10% hurdle cost of capital, and achieves capital payback in 3.21 years, Cochin Maritime Logistics Ltd. should approve and implement the crane procurement project.

8. Capital Rationing: Optimal Project Selection under Budget Constraints

In classical capital budgeting theory under perfect capital markets, an enterprise should accept every independent investment proposal that generates a positive Net Present Value (NPV > 0). In corporate reality, however, enterprises invariably operate under **Capital Rationing**, a strategic operational state wherein the firm possesses more positive NPV investment opportunities than the financial capital available to fund them. Capital rationing is categorized into two distinct forms:

- **External (Hard) Capital Rationing:** Imposed by external capital market imperfections, institutional credit ceilings, or macroeconomic crises. External lenders and equity underwriters refuse to supply additional capital to the firm regardless of project profitability due to industry overexposure, excessive existing debt leverage, or market liquidity freezes.
- **Internal (Soft) Capital Rationing:** Self-imposed by corporate boards and senior management as a deliberate administrative policy. Corporate leadership restricts capital expenditure budgets to prevent uncontrolled expansion, preserve conservative balance sheet flexibility, avoid earnings dilution, or limit reliance on external debt financing.

Project Selection Mechanics under Capital Rationing

The mathematical approach to project selection depends fundamentally on whether investment proposals are divisible or indivisible:

A. Project Selection with Divisible Projects (The Profitability Index Ranking Method)

When projects are divisible—meaning management can accept fractional portions of a project with proportionate capital outlays and cash inflows—the optimal selection rule is to rank all available proposals in descending order of their **Profitability Index (PI)** and commit capital down the ranking until the total budget is exhausted.

B. Project Selection with Indivisible Projects (Integer Optimization Approach)

Most industrial capital investments (such as building a dedicated pharmaceutical plant or procuring a cargo vessel) are indivisible "all-or-nothing" proposals. In this scenario, simple PI ranking can result in suboptimal capital allocation because high-PI projects may leave unspent cash balances that cannot fund remaining proposals. Management must systematically evaluate all feasible project combinations that fit within the capital budget ceiling, selecting the specific combination that yields the **maximum aggregate Net Present Value (NPV)**.

Worked Numerical Problem: Indivisible Project Selection under Capital Rationing

Managerial Case Problem: Travancore Industrial Technologies Ltd. has a strictly enforced capital expenditure ceiling of Rs. 30,00,000 for the upcoming fiscal year. The corporate project appraisal committee has identified five mutually independent, indivisible capital proposals:

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Project Code	Required Capital Outlay (Rs.)	Present Value of Cash Inflows (Rs.)	Net Present Value (NPV) (Rs.)	Profitability Index (PI)
Project Alpha	Rs. 12,00,000	Rs. 15,60,000	Rs. 3,60,000	1.300
Project Beta	Rs. 10,00,000	Rs. 13,80,000	Rs. 3,80,000	1.380
Project Gamma	Rs. 8,00,000	Rs. 10,80,000	Rs. 2,80,000	1.350
Project Delta	Rs. 14,00,000	Rs. 18,20,000	Rs. 4,20,000	1.300
Project Epsilon	Rs. 6,00,000	Rs. 7,80,000	Rs. 1,80,000	1.300

Step 1: Formulation of Feasible Capital Budget Combinations

Management must test all combinations whose total initial outlay is less than or equal to Rs. 30,00,000:

1. **Combination 1 (Beta + Gamma + Alpha):** Outlay = 10L + 8L + 12L = Rs. 30,00,000. Total NPV = 3.8L + 2.8L + 3.6L = **Rs. 10,20,000**. Unspent Budget = Rs. 0.
2. **Combination 2 (Delta + Beta + Epsilon):** Outlay = 14L + 10L + 6L = Rs. 30,00,000. Total NPV = 4.2L + 3.8L + 1.8L = **Rs. 9,80,000**. Unspent Budget = Rs. 0.
3. **Combination 3 (Delta + Alpha):** Outlay = 14L + 12L = Rs. 26,00,000. Total NPV = 4.2L + 3.6L = **Rs. 7,80,000**. Unspent Budget = Rs. 4,00,000.
4. **Combination 4 (Beta + Gamma + Delta):** Outlay = 10L + 8L + 14L = Rs. 32,00,000 (Exceeds Budget, Infeasible).
5. **Combination 5 (Alpha + Gamma + Epsilon):** Outlay = 12L + 8L + 6L = Rs. 26,00,000. Total NPV = 3.6L + 2.8L + 1.8L = **Rs. 8,20,000**. Unspent Budget = Rs. 4,00,000.

Managerial Decision: Combination 1 (Projects Alpha, Beta, and Gamma) completely utilizes the Rs. 30,00,000 capital budget and generates the maximum aggregate Net Present Value of Rs. 10,20,000, creating superior shareholder wealth compared to all other combinations.

9. Risk and Uncertainty Analysis in Capital Budgeting

Standard discounted cash flow modeling assumes that future cash flows and economic conditions are known with deterministic precision. In corporate operational reality, however, capital investments are exposed to technological obsolescence, demand shifts, cost overruns, and economic recessions. Corporate finance utilizes four major analytical techniques to incorporate risk into project evaluation:

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A. Risk-Adjusted Discount Rate (RADR) Method

The RADR method adjusts the discount rate applied to expected future cash flows upward to compensate for project-specific risk. Total project hurdle rate (k) is decomposed into the risk-free rate of return (R_f) plus an explicit project risk premium (b):

$$RADR = R_f + Risk\ Premium$$

Where: R_f = Yield on sovereign government securities (risk-free rate); Risk Premium = Additional return demanded based on operational and market volatility.

Safe replacement projects are evaluated at lower hurdle rates (e.g., 9%), while speculative new venture expansions are evaluated at higher hurdle rates (e.g., 16%). Cash flows from riskier projects must overcome higher hurdle barriers to achieve positive NPV.

B. Certainty Equivalent (CE) Approach

Rather than adjusting the discount rate, the Certainty Equivalent approach adjusts uncertain future cash flows downward to convert them into guaranteed, riskless equivalents using certainty equivalent coefficients (α_t ranging between 0 and 1). These risk-adjusted cash flows are then discounted at the risk-free rate (R_f):

$$NPV = \Sigma \left[\frac{(\alpha_t \times CF_t)}{(1 + R_f)^t} \right] - C_0$$

Where: α_t = Certainty equivalent coefficient for year t; CF_t = Expected risky cash inflow; R_f = Risk-free rate of return; C_0 = Initial capital outlay.

C. Sensitivity Analysis and Scenario Modeling

- **Sensitivity Analysis ("What-If" Analysis):** Measures how sensitive project NPV is to changes in a single underlying operational variable (such as sales volume, selling price per unit, raw material cost, or initial capital expenditure) while holding all other variables constant. It identifies the critical variables that demand strict operational monitoring.
- **Scenario Analysis:** Acknowledges that variables move simultaneously in economic cycles. Management models three comprehensive operational scenarios: *Pessimistic Scenario* (high inflation, low market demand, increased raw material costs), *Expected / Base Case Scenario* (normal market growth), and *Optimistic Scenario* (robust consumer demand, favorable pricing power), calculating weighted expected NPV across all three states.

10. Capital Budgeting Under Inflationary Conditions

Macroeconomic inflation alters the purchasing power of money over time and distorts capital budgeting evaluations if not treated with mathematical consistency. The fundamental rule of inflationary capital budgeting states that **cash flows and discount rates must be measured on identical bases**:

Nominal Cash Flows must be discounted using a Nominal Discount Rate.

Real Cash Flows must be discounted using a Real Discount Rate.

The relationship between the nominal discount rate (k_{nom}), the real discount rate (k_{real}), and the expected inflation rate (i) is governed by the **Fisher Effect**:

$$(1 + k_{nom}) = (1 + k_{real}) \times (1 + i)$$

Where: k_{nom} = Nominal market interest rate; k_{real} = Real inflation-adjusted hurdle rate; i = Expected annual rate of macroeconomic inflation.

Failing to account for inflation systematically underestimates project attractiveness if nominal cash inflows are discounted using real rates, or destroys value if real cash inflows are discounted using inflated nominal rates.

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