

Introduction to Capital Budgeting

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Key concepts, steps, and tools for evaluating long-term investment projects.

1. What Is Capital Budgeting?

- **Definition:** The process by which a firm evaluates and selects major, long-term investments (e.g., new plants, equipment, product lines, or acquisitions).
 - **Goal:** Allocate scarce capital to projects that maximize shareholder value (i.e., generate returns above the firm's cost of capital).
 - **Time Horizon:** Typically 3–10+ years; cash flows extend far beyond the current accounting period.
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2. Why Capital Budgeting Matters

Reason	Explanation
Strategic Growth	Enables firms to pursue expansion, diversification, or technological upgrades.
Resource Allocation	Ensures limited financial resources are used where they create the most value.
Risk Management	Formal analysis highlights potential downside and uncertainty before committing funds.
Performance Measurement	Provides a benchmark for post-implementation review and accountability.

3. Core Concepts & Terminology

Term	Meaning
Cash Flow	Actual inflows and outflows of money (not accounting profits).
Initial Outlay	Up-front investment needed to start the project (purchase price, installation, working-capital changes).

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Term	Meaning
Incremental Cash Flow	Additional cash generated (or cost saved) because of the project, compared to the status quo.
Terminal Value	Cash flow expected at the end of the project's life, often including salvage value.
Discount Rate	Rate used to convert future cash flows to present value; typically the firm's weighted-average cost of capital (WACC) or a project-specific required return.
Hurdle Rate	Minimum acceptable rate of return; often equal to the discount rate.
Opportunity Cost	The benefit foregone by allocating capital to one project instead of the next best alternative.

4. Decision-Making Techniques

Technique	How It Works	When to Use
Net Present Value (NPV)	$NPV = \sum \frac{CF_t}{(1+r)^t} - \text{Initial Outlay}$. Positive NPV → accept.	Primary method; accounts for value creation and time value of money.
Internal Rate of Return (IRR)	Discount rate that makes NPV = 0. Compare IRR to hurdle rate.	Helpful for ranking projects; watch out for non-conventional cash flows or multiple IRRs.
Modified Internal Rate of Return (MIRR)	Uses finance rate for outflows and reinvestment rate for inflows; yields a single rate.	Preferred when cash-flow patterns are irregular.
Payback Period	Time needed for cumulative cash flows to recover the initial outlay.	Quick screening for liquidity risk; ignores time value and cash flows after payback.
Discounted Payback Period	Same as payback but discounts cash flows.	Adds time-value consideration to the simple payback.
Profitability Index (PI)	$PI = \frac{\text{Present value of future cash flows}}{\text{Initial outlay}}$.	Useful when capital is limited and projects must be ranked.

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5. The Capital Budgeting Process (Step-by-Step)

1. Identify Investment Opportunities

- Strategic planning, market research, technology scouting, regulatory changes.

2. Generate Preliminary Cash Flow Estimates

- Forecast revenues, operating costs, taxes,