

Financial Valuation Techniques: NPV, IRR, and DCF Analysis

Welcome to Week 6. This presentation explores essential valuation methodologies used in financial analysis and investment decision-making. We'll examine how Net Present Value, Internal Rate of Return, and Discounted Cash Flow techniques help businesses evaluate investment opportunities and determine asset values.



Introduction to Valuation

Valuation is the process of determining the present value of an asset or investment opportunity based on its expected future cash flows. Proper valuation techniques help:

- Make informed investment decisions
- Allocate capital efficiently
- Compare different investment opportunities
- Determine fair market value for transactions



Net Present Value (NPV): Formula and Use

NPV Formula

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+r)^t}$$

Where: CF = Cash Flow, r = Discount Rate, t = Time Period

Decision Rule

- NPV > 0: Accept project
- NPV < 0: Reject project
- NPV = 0: Indifferent

Advantages

- Accounts for time value of money
- Considers all cash flows
- Directly measures value creation

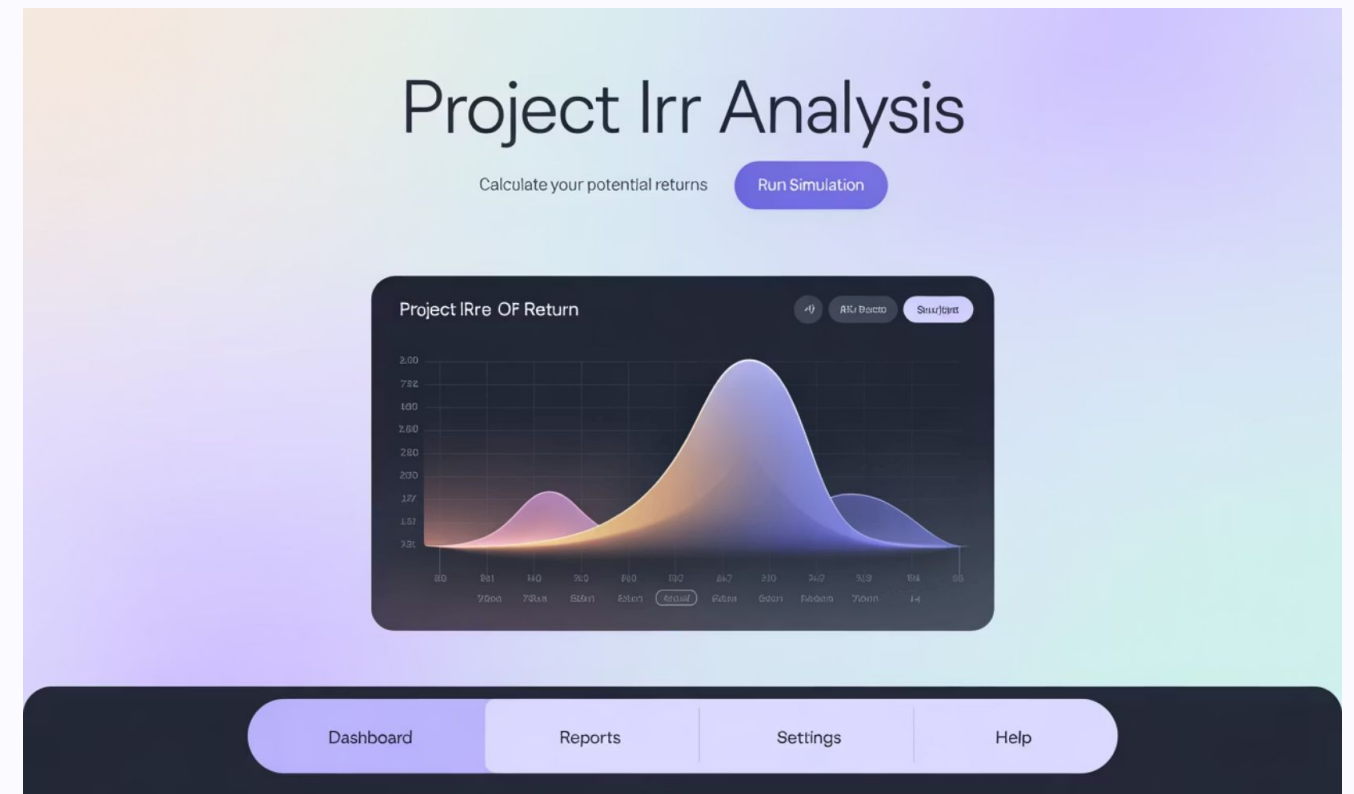


Internal Rate of Return (IRR): Concept and Interpretation

IRR is the discount rate at which the NPV of an investment equals zero. It represents the expected compound annual rate of return on an investment.

$$\sum_{t=0}^n \frac{CF_t}{(1 + IRR)^t} = 0$$

Decision rule: Accept projects where $IRR > \text{required rate of return}$.



Limitations: Multiple IRRs possible with non-conventional cash flows; may lead to incorrect rankings when comparing mutually exclusive projects of different sizes.

Discounted Cash Flow (DCF): Step-by-Step

Forecast Cash Flows

Project future free cash flows over the investment horizon (typically 5-10 years).

Determine Discount Rate

Calculate appropriate discount rate (WACC) reflecting risk and capital structure.

Calculate Terminal Value

Estimate value beyond forecast period using perpetuity growth or exit multiple.

Discount All Values

Apply discount rate to all projected cash flows and terminal value.

Sum Components

Add all discounted values to determine the present value of the investment.

Choosing a Discount Rate

1 Weighted Average Cost of Capital (WACC)

$$WACC = (E/V) \times R_e + (D/V) \times R_d \times (1 - T_c)$$

Where: E = Equity value, D = Debt value, V = Total value, R_e = Cost of equity,
 R_d = Cost of debt, T_c = Corporate tax rate

2 Capital Asset Pricing Model (CAPM)

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

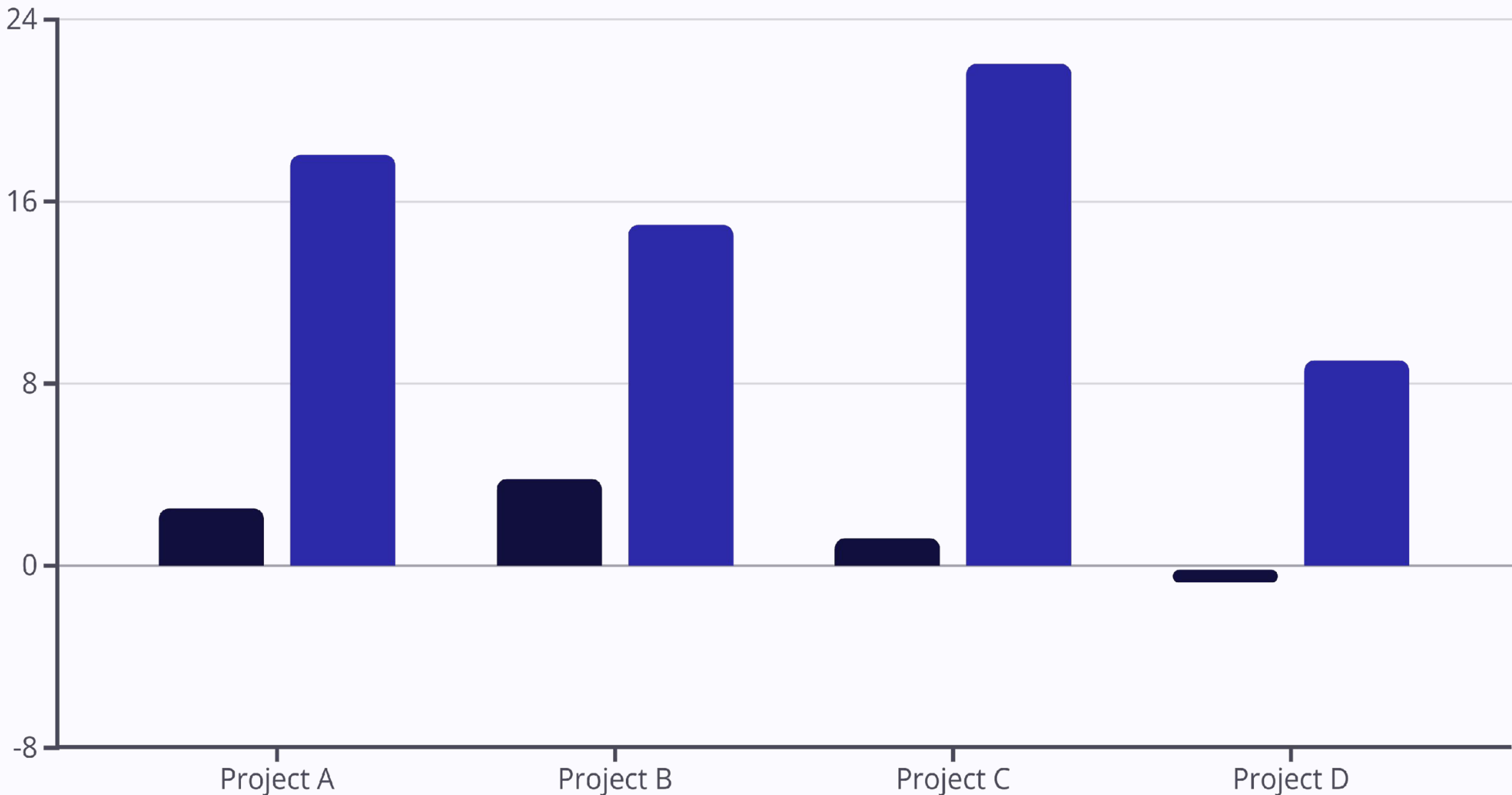
Where: R_f = Risk-free rate, β = Beta (systematic risk), R_m = Market return

3 Risk Adjustments

Higher discount rates for riskier projects; consider country risk premiums, size premiums, and specific risk factors



Comparing Valuation Outcomes





Valuation in Practice: Common Pitfalls



Overly Optimistic Forecasts

Beware of unrealistic growth assumptions and failure to account for competitive pressures that erode margins over time.



Discount Rate Errors

Using inappropriate discount rates that don't reflect the true risk of the investment or inconsistent application across projects.



Terminal Value Sensitivity

Terminal value often represents 60-80% of total value. Small changes in assumptions can dramatically impact valuation outcomes.



Ignoring Qualitative Factors

Focusing solely on quantitative metrics while overlooking strategic considerations, management quality, and market positioning.