Managerial Economics in a Global Economy, 5th Edition by Dominick Salvatore

Chapter 14

Long-Run Investment Decisions: Capital Budgeting

Capital Budgeting Defined

Process of planning expenditures that give rise to revenues or returns over a number of years

Categories of Investment

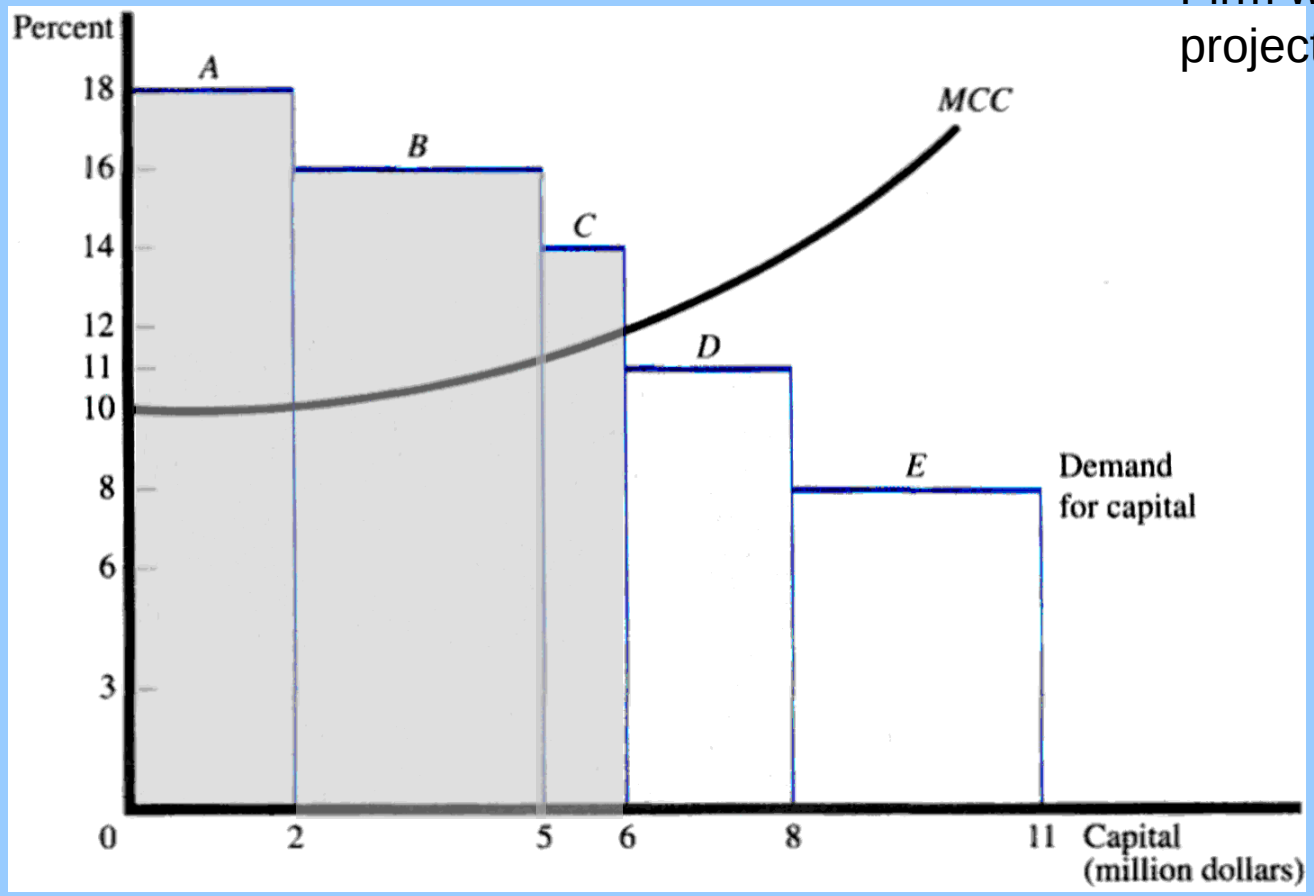
- Replacement
- Cost Reduction
- Output Expansion to Accommodate Demand Increases
- Output Expansion for New Products
- Government Regulation

Capital Budgeting Process

- Demand for Capital
  - Schedule of investment projects
  - Ordered from highest to lowest return
- Supply of Capital
  - Marginal cost of capital
  - Increasing marginal cost
- Optimal Capital Budget
  - Undertake all projects where return is greater than marginal cost

Capital Budgeting Process

Firm will undertake projects A, B, and C



Capital Budgeting Process

Projecting Net Cash Flows

- Incremental basis
- After-tax basis
- Depreciation is a non-cash expense that affects cash flows through its effect on taxes

Capital Budgeting Process

Example: Calculation of Net Cash Flow

Sales		$1,000,000
Less:	Variable costs	500,000
	Fixed costs	150,000
	Depreciation	200,000
Profit before taxes		$150,000
Less:	Income tax	60,000
Profit after taxes		$90,000
Plus:	Depreciation	200,000
Net cash flow		$290,000

Capital Budgeting Process

Net Present Value (NPV)

$$NPV = \sum_{t=1}^{n} \frac{R_t}{(1+k)^t} - C_0$$

R_t = Return (net cash flow)

k = Risk-adjusted discount rate

C_0 = Initial cost of project

Capital Budgeting Process

Internal Rate of Return (IRR)

$$\sum_{t=1}^{n} \frac{R_t}{(1+k^*)^t} = C_0$$

R_t = Return (net cash flow)

k^* = IRR

C_0 = Initial cost of project

Capital Rationing

Profitability Index (PI)

$$PI = \frac{\sum_{t=1}^{n} \frac{R_t}{(1+k)^t}}{C_0}$$

R_t = Return (net cash flow)

k = Risk-adjusted discount rate

C_0 = Initial cost of project

The Cost of Capital

Cost of Debt (k_d)

$$k_d = r(1-t)$$

r = Interest rate

t = Marginal tax rate

k_d = After-tax cost of debt

The Cost of Capital

Cost of Equity Capital (k_e):

Risk-Free Rate Plus Premium

$$k_e = r_f + r_p$$

$$ke = r_f + p_1 + p_2$$

r_f = Risk free rate of return

r_p = Risk premium

p_1 = Additional risk of firm's debt

p_2 = Additional risk of firm's equities

The Cost of Capital

Cost of Equity Capital (k_e): Dividend Valuation Model

$$P = \sum_{t=1}^{\infty} \frac{D}{(1+k_e)^t} = \frac{D}{k_e} \qquad k_e = \frac{D}{P}$$

P = Price of a share of stock

D = Constant dividend per share

k_e = Required rate of return

The Cost of Capital

Cost of Equity Capital (k_e): Dividend Valuation Model

$$P = \frac{D}{K_e - g} \qquad k_e = \frac{D}{P} + g$$

P = Price of a share of stock

D = Dividend per share

k_e = Required rate of return

g = Growth rate of dividends

The Cost of Capital

Cost of Equity Capital (k_e): Capital Asset Pricing Model (CAPM)

$$k_e = r_f + \beta(k_m - r_f)$$

r_f = Risk-free rate of return

β = Beta coefficient

k_m = Average rate of return on all shares of common stock

The Cost of Capital

Weighted Cost of Capital:

Composite Cost of Capital (k_c)

$$k_c = w_d k_d + w_e k_e$$

w_d = Proportion of debt

k_d = Cost of debt

w_e = Proportion of equity

k_e = Cost of equity

