

Chapter 06: Section 4

Practice Question 182: Fisher's Effect

Mango Holdings is evaluating a capital expansion project with a risk profile that requires a real rate of return of 10%. The company's economists forecast an average annual inflation rate of 6% over the project's life. Calculate the nominal discount rate that should be used to evaluate the project's nominal cash flows.

Practice Question 183: (NPV)

BlueGem Textiles is considering an automated fabric finishing line project. The initial investment in machinery is Rs. 20,000,000. The project has a 4-year life. The machinery will be depreciated straight-line to zero over 4 years. At the end of 4 years, the machinery can be sold for Rs. 3,000,000. The project requires an investment in Net Working Capital equal to 15% of the *following year's* sales to support raw material inventory and trade receivables, which is fully recovered at the end of the project. The corporate tax rate is 30% and the nominal discount rate is 15%.

- Real Sales (in today's terms): Rs. 15,000,000 per year.
- Real Cash Operating Costs (in today's terms): Rs. 7,000,000 per year.
- General inflation is expected to be 5% per year.

Calculate the project's Net Present Value (NPV).

Practice Question 184: Profitability Index (PI)

You are the Capital Budgeting Analyst for Zenith Logistics Lanka Pvt Ltd, an integrated logistics provider focused on expansion and operational efficiency. Management has presented two mutually exclusive investment proposals for your evaluation.

Project A involves constructing a new automated warehouse in Kandy requiring an investment of Rs. 1 billion with a projected Net Present Value of Rs. 300 million.

Project B proposes upgrading the existing truck fleet with AI-driven route optimisation software at a cost of Rs. 400 million, generating an expected NPV of Rs. 150 million. The CEO strongly favours the warehouse project due to its higher absolute NPV of Rs. 300 million.

Should Zenith invest in a large, new automated warehouse with a high NPV or a smaller, less expensive fleet upgrade with a lower NPV but potentially higher relative return?

Your task is to analyse both proposals using appropriate capital budgeting techniques and provide a data-driven recommendation that considers the efficient allocation of the company's limited capital resources.

Practice Question 185: Profitability Index (PI)

BlueGem Textiles has a capital budget of Rs. 50 million for the upcoming financial year. The company is evaluating four independent modernisation projects across its manufacturing facilities. The financial details are as follows:

Project	Investment (Rs.)	NPV (Rs.)	PV of Inflows (Rs.)
A (Weaving Automation)	25,000,000	10,000,000	35,000,000
B (Dyeing Upgrade)	15,000,000	7,500,000	22,500,000
C (Finishing Line)	20,000,000	6,000,000	26,000,000
D (Quality Testing Lab)	10,000,000	5,500,000	15,500,000

Determine the optimal combination of projects that BlueGem Textiles should accept.

Practice Question 186: Equivalent Annual Annuity (EAA)

BlueGem Textiles must choose between two automated dyeing machines. Machine X has a 3-year life and an NPV of Rs. 4,500,000. Machine Y has a 5-year life and an NPV of Rs. 6,000,000. The company's discount rate is 10%. Which machine should be chosen?

Practice Question 187: Risk Adjusted Discount Rate (RADR)

Mango Holdings has a company-wide WACC of 12%. The conglomerate is considering a new venture in the high-growth technology sector through its investment arm, which is significantly riskier than its core cement and textile businesses. The current risk-free rate on government bonds is 7%. The expected market risk premium is 8%. Financial analysts have estimated that the project's beta is 1.5. The project requires an initial investment of Rs. 100 million and is expected to generate a single cash inflow of Rs. 140 million in three years.

Should Mango Holdings accept this project?

Practice Question 189: Comprehensive Comparability Framework

Zenith Logistics is evaluating two mutually exclusive distribution centre expansion projects, Project Phoenix and Project Griffin. The company's WACC is 11%, the risk-free rate is 6%, and the market risk premium is 8%.

Metric	Project Phoenix	Project Griffin
Initial Investment	Rs. 50,000,000	Rs. 30,000,000
Lifespan	4 years	6 years
Project Beta	1.25	0.75
Annual Cash Inflow	Rs. 25,000,000	Rs. 12,000,000

Project Phoenix involves a major automated warehouse facility in an emerging industrial zone (higher risk), while Project Griffin involves expanding an existing distribution hub with proven demand (lower risk).

Provide a comprehensive recommendation on which project Zenith Logistics should select.

Practice Question 190:

Zenith Logistics has a capital budget of Rs. 20 million for warehouse and fleet expansion and is considering four indivisible projects.

Project	Initial Investment (Rs. m)	NPV (Rs. m)
A (Regional Distribution Hub)	12	4.0
B (Fleet Modernisation)	8	3.0
C (Automated Sorting System)	7	2.8
D (Cold Chain Facility)	5	1.5

Determine the optimal portfolio of projects to accept.

Practice Question 191:

BlueGem Textiles has a capital budget of Rs. 100 million and 5,000 skilled engineering hours available for the year for its manufacturing modernisation programme. The company is considering two large, indivisible projects.

- **Project A (Automated Weaving Line):** Requires Rs. 70 million capital and 3,000 engineering hours for installation and commissioning. It has an NPV of Rs. 20 million.
- **Project B (Dyeing Plant Upgrade):** Requires Rs. 50 million capital and 2,500 engineering hours. It has an NPV of Rs. 18 million.

Formulate this resource allocation problem as a linear programming model.

Practice Question 192:

Zenith Logistics is purchasing a new automated sorting system for its main distribution centre for Rs. 6,000,000. The annual operating costs, which increase over time due to maintenance requirements, and the salvage value, which decreases, are projected as follows. The company's cost of capital is 10%. Determine the asset's economic life.

Year	Operating Cost (Rs.)	Salvage Value (Rs.)
1	500,000	4,500,000
2	700,000	3,500,000
3	1,000,000	2,500,000
4	1,500,000	1,000,000

Practice Question 193:

Trident Logic Ltd is evaluating two software platform development projects for its enterprise clients. The cost of capital is 10%.

- **Project A (Mobile Analytics Platform):** Requires an initial investment of Rs. 5,000,000 and generates cash inflows of Rs. 3,500,000 per year for 2 years.
- **Project B (Cloud Integration Suite):** Requires an initial investment of Rs. 7,000,000 and generates cash inflows of Rs. 4,000,000 per year for 3 years.

Which project should Trident Logic Ltd select, assuming the projects will be repeated to cover a common period?