

Benefit Cost Analysis Exercise

Case 1. Integrated Steel Mill

In a middle-income developing country, a private consortium is considering investing in an integrated steel mill project and wishes to undertake a financial analysis of the project.

The project will last 25 years and produce 100,000 tons of steel products per year starting at the end of year 4. Each ton of output will sell for \$400 but the sales price is expected to rise with the general rate of inflation which is projected to be 6% per year over the life of the project. Total investment will be \$200 million spread evenly over the first 3 years of the project. There will be no inflation in construction costs. In the fourth year of the project, when production starts, annual operating costs are expected to be: (1) raw materials - \$ 8 million; (2) labor - \$ 4 million and (3) overheads - \$ 1 million. In each year following, raw materials are expected to rise by 6%, labor costs by 8 % and overhead by 5%.

Calculate net present value, benefit cost ratio and internal rate of return for this project. Assume that all benefits and costs are calculated at the end of each project year and the discount rate is 10%.

Organizational Steps:

1. Draw up a parameter table that summarizes information for the project.
2. Divide the cash flow into headings and estimate the net benefit cash flows of the proposed project.

Case 2. Air pollution control

A manufacturing plant in Ontario is required to install additional equipment to comply with air pollution standards specified by the provincial government. The plant engineer has summarized the estimates of the costs for four alternative pollution control systems in the table below, each having an estimated life of 10 years. Which one would you recommend given an annual discount rate of 8% and assuming the equipment is installed in Year 1 and annual costs are incurred in Years 1 to 10? Assume that all costs are calculated at the end of each project year, the salvage value occurs at the end of year 10 and the benefits from each system in terms of pollution reduction are the same.

Cost Estimates	System A	System B	System C	System D
Installation cost	12,000	15,000	18,000	20,000
Annual costs				
Power and water	2,560	2,560	2,000	1,900
Maintenance	3,600	3,400	2,920	2,600
Labor	800	740	520	480
Insurance	240	300	360	420
Salvage Value	0	0	1000	1500