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FINAL CA
MAY '19
REVISION NOTES
Strategic Financial Management

Capital Budgeting

CAPITAL BUDGETING

Q.1. A company is proposing to set-up a project worth ₹ 7.5 lacs. The following additional information is available :

(a) The project will result in production of product X as below :
   i) First year 10,000 units
   ii) Second year 20,000 units
   iii) Third year onwards till the end of eighth year 50,000 units annually.

(b) The company can market the entire production thinking of pricing it at ₹ 10.50 in the first year and ₹ 11 in subsequent years.

(c) The estimated relevant cost per unit is ₹ 8.50 in the first year and ₹ 8 from the second year onwards.

(d) Life of the machine is estimated to be eight years at the end of which the company expects to sell the equipment for ₹ 2.5 lacs.

(e) The depreciation is to be calculated as per Income Tax provision at 25%.

(f) This project will reduce the cost of certain existing operations at ₹ 5,000 per annum uniformly. Discounting rate is 10%. Is the investment worthwhile? Assume tax rate of 52.5%.

Q.2. A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product. At present, the waste is removed by a contractor for disposal on payment by the company of ₹ 50 lacs per annum for the next four years. The contract can be terminated upon installation of the aforesaid machine on payment of a compensation of ₹ 30 lacs before the processing operation starts. This compensation is not allowed as deduction for tax purposes.

The machine required for carrying out the processing will cost ₹ 200 lacs to be financed by a loan repayable in 4 equal installments commencing from the end of year 1. The interest rate is 16% per annum. At the end of the 4th year, the machine can be sold for ₹ 20 lacs and the cost of dismantling and removal will be ₹15 lacs.

Sales and direct costs of the product emerging from waste processing for 4 years are estimated as under :

Year	1	2	3	4
Sales	322	322	418	413
Material consumption	30	40	85	85
Wages	75	75	85	100
Other expenses	40	45	54	70
Factory overheads	55	60	110	145
Depreciation (as per income - tax rules)	50	38	28	21

Initial stock of materials required before commencement of the processing operations is ₹ 20 lacs at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be ₹ 55 lacs and the stocks at the end of year 4 will be nil. The storage of materials will utilise space which would otherwise have been rented out for ₹ 10 lacs per annum. Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of ₹ 15 lacs, in year 1 and ₹ 10 lacs in year 2 Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of ₹ 30 lacs per annum payable on this venture. The company's tax rate is 50%.

Present value factors for four years are as under :

Year	1	2	3	4
Present value factors	0.870	0.756	0.658	0.572

Advise the management on the desirability of installing the machine for processing the waste. All calculations should form part of the answer.

Q.3. An automobiles ancillary unit is proposing to set up a manufacturing establishment whose project cost is ₹ 320 lacs. The cost of land and buildings included in the project cost is ₹ 40 lacs, the breakup of which is as follows :

	(₹)
Land (4,400 sq. yards)	15 lacs
Building (area 25,000 sq. feet)	25 lacs

It is anticipated that in the first 4 years, the profitability will be low due to the time required for cultivating the market. To meet the situation, management is planning to hire factory premises of the same size at Re. 0.80 per square foot per month for the first four years, instead of own buildings. Repairs and maintenance, taxes, etc. will be borne by the landlord.

In the present project, the provision has been made for depreciation at 7% p.a. on original cost of buildings. Provision has also been made for repairs, maintenance, taxes etc., on buildings at ₹ 1,20,000 p.a.

The annual sales and profit figures as projected in the project report are as follows

(₹ in lacs)

Year	Sales	Net profit (NPADIT)	Capacity Utilization
I	200	(-5)	60%
II	275	5	75%
III	350	10	90%
IV	450	20	100%

After 4 years, the profit is expected to be steady at ₹ 40 lacs per annum. Institutional finance is available upto ₹ 200 lacs under both the alternatives.

(a) You are required to work out the average rate of return for the first four years on shareholders initial investment, under both the alternatives.

(b) If the lease is available for 4 years only, would you recommend leasing the premises, if it is anticipated that the cost of land will increase by 40% and the cost of construction by 20% at the end of the four year period? For this purpose, opportunity cost of finance may be taken at 10% p.a.

Q.4. Delhi Bridge Construction Company plans to build a bridge over a crossing. The construction work is expected to last 5 years and will be undertaken by a private sector firm to which ₹ 100 lacs will be payable at the end of year 1 and ₹ 50 lacs each at the end of next 4 years.

The annual maintenance cost of the bridge is expected to be ₹ 10,00,000 at current prices. This cost is expected to increase at 7% p.a. At the end of 15 years after completion, the bridge will require a major repair work requiring materials of ₹100 lacs and expenses of ₹100 lacs, both in current prices. The prices of materials are expected to rise at the rate of general inflation for 16 years and constant thereafter but expense cost is expected to rise 6% over the general interest for the first three years and then will increase in line with general inflation rate.

The required rate of return may be taken as 17% p.a. and the life of the bridge may be taken as infinite. Numbers of vehicles using the bridge per day is 20,000 and the toll tax is expected to increase in line with general inflation. Find out the minimum toll tax chargeable per vehicle in the first year of operation so that the investment in bridge may breakeven over its life. (Assumption : All annual cash flows arise on the last day of the year).

Q.5. A and Co. is contemplating whether to replace an existing machine or to spend money on overhauling it. A and Co. currently pays no taxes. The replacement machine costs ₹ 90,000 now and requires maintenance of ₹ 10,000 at the end of each year for eight years. At the end of eight years, it would have a salvage value of ₹ 20,000 and would be sold. The existing machines require increasing amounts to maintenance each year and its salvage value falls each year as follows :

Year	Maintenance (₹)	Salvage (₹)
Present	0	40,000
1	10,000	25,000
2	20,000	15,000
3	30,000	10,000
4	40,000	0

COC is 15%. When should the machine be replaced? (Annuity for 8 years 4.4873 and at the end of the 8th year 0.3269).

Q.6. A delivery van must be replaced every four years and related cash flow are as under :

(Figures in ' ₹ 000)

	Age for Van in Years				
	Year 0	Year 1	Year 2	Year 3	Year 4
Cost of Van	1,500	----	----	----	----
Maintenance Cost	----	400	450	500	500
Repairs	----	----	100	200	400
Scrap Value	----	800	600	400	200

The firm is faced with the decision : Should the van be kept for four years and then scrapped away for ₹ 2,00,000? Or should it be replaced earlier?

Q.7. Catix Corporation is a divisionalised company and each division has the authority to make capital expenditure upto ₹ 2,00,000 without the approval of the corporate headquarters. The corporate controller has determined that the cost of capital for Catix Corporation is 12%. This rate does not include an allowance for inflation, which is expected to occur at an average rate of 8% over the next five years. Catix pays income tax at the rate of 40%. The Electronics Division of Catix is considering the purchase of an automated assembly machine. The divisional controller estimates that if the machine is purchased, two positions will be eliminated yielding a cost saving for wages and employees benefits. However, the machine would require additional supplies and more power would be required to operate the machine. The cost savings and additional cost in current 19x0 prices are as follows :

Wages and employee benefit of the two Positions eliminated (₹ 25,000 each)	₹	50,000
Cost of additional supplies	₹	3,000
Cost of additional power	₹	10,000

The new machine would be purchased and installed at the end of 19x0 at a net cost of ` 80,000. If purchased, the machine would be depreciated @ 25% as per Income Tax Laws. The machine will become technologically obsolete in four years and will have no scrap value at that time.

The Electronics Division compensates for inflation in capital expenditure analysis by adjusting the expected cash flows by an estimated price level index.

The adjusted after tax cash flows are then discounted using the appropriate discount rate.

The estimated year end index values for each of the next five years are presented below :

Year	Year – End Price Index
19x0	1.00
19x1	1.08
19x2	1.17
19x3	1.26
19x4	1.36
19x5	1.47

All operating revenues and expenses occur at the end of the year.

You are required to prepare an analysis of the automated assembly machine for the Electronics Division.

Q.8. XYZ Ltd. an infrastructure company is evaluating a proposal to build, operate and transfer a section of 35 kms. of road at a project cost of ₹ 200 crores to be financed as follows :

Equity Share Capital of ₹ 50 crores, loans at the rate of interest of 15% p.a. from financial institutions ₹ 150 crores. The Project after completion will be opened to traffic and a toll will be collected for a period of 15 years from the vehicles using the road the company is also required to maintain the road during the above 15 years and after the completion of that period, it will be handed over to the Highway authorities at zero value. It is estimated that the toll revenue will be ₹ 50 crores per annum and the annual toll collection expenses including maintenance of the roads will amount to 5% of the project cost. The company considers to write off the total cost of the project in 15 years on a straight line basis. For Corporate Income - tax purposes the company is allowed to take depreciation @ 10% on WDV basis. The financial institutions are agreeable for the repayment of the loan in 15 equal annual instalments - consisting of principal and interest.

Calculate Project IRR and Equity IRR. Ignore Corporate taxation.

Explain the difference in Project IRR and Equity IRR.