

***ADVANCED CAPITAL
BUDGETING DECISIONS***

CLASS 11-HW-Q28

Topic Replacement Project

Question 28:

Lockwood Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at the same cost of ₹ 5 lakhs each. Salvage value of the old machine is ₹ 1 lakh. The utilities of the existing machine can be used if the company purchases model A. Additional cost of utilities to be purchased in this case will be ₹ 1 lakh. If the company purchases B, then all the existing utilities will have to be replaced with new utilities costing ₹ 2 lakhs. The salvage value of the old utilities will be ₹ 0.20 lakhs. The cash flows are expected to be:

Year	Cash inflows of A (₹)	Cash inflows of B (₹)	P.V. Factor @ 15%
1	1,00,000	2,00,000	0.870
2	1,50,000	2,10,000	0.756
3	1,80,000	1,80,000	0.658
4	2,00,000	1,70,000	0.572
5	1,70,000	40,000	0.497
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%. You are required to (i) COMPUTE, for the two machines separately, net present value, discounted payback period and desirability factor and (ii) STATE which of the machines is to be selected?

(Source: ICAI)

ANSWER:

Working:

Calculation of Cash -outflow at year zero

Particulars	A (₹)	B (₹)
Cost of Machine	5,00,000	5,00,000
Cost of Utilities	1,00,000	2,00,000
Salvage value of Old Machine	(1,00,000)	(1,00,000)
Salvage of value Old Utilities	—	(20,000)
Total Expenditure (Net)	5,00,000	5,80,000

i.

a. Calculation of NPV

Year	PV Factor @ 15%	Machine A		Machine B	
		Cash Inflows(₹)	Discounted value of inflows (₹)	Cash Inflows (₹)	Discounted value of inflows (₹)
0	1.000	(5,00,000)	(5,00,000)	(5,80,000)	(5,80,000)
1	0.870	1,00,000	87,000	2,00,000	1,74,000
2	0.756	1,50,000	1,13,400	2,10,000	1,58,760
3	0.658	1,80,000	1,18,440	1,80,000	1,18,440
4	0.572	2,00,000	1,14,400	1,70,000	97,240
5	0.497	1,70,000	84,490	40,000	19,880
Salvage	0.497	50,000	24,850	60,000	29,820
Net Present Value			42,580		18,140

Since the Net present Value of both the machines is positive both are acceptable.

b. Discounted Pay-back Period (Amount in ₹)

Year	Machine A		Machine B	
	Discounted cash inflows	Cumulative Discounted cash inflows	Discounted cash inflows	Cumulative Discounted cash inflows
1	87,000	87,000	1,74,000	1,74,000
2	1,13,400	2,00,400	1,58,760	3,32,760
3	1,18,440	3,18,840	1,18,440	4,51,200
4	1,14,400	4,33,240	97,240	5,48,440
5	1,09,340*	5,42,580	49,700*	5,98,140

* Includes salvage value.

Discounted Payback Period (For A and B):

$$\text{Machine A} = 4 \text{ years} + \left(\frac{5,00,000 - 4,33,240}{1,09,340} \right) = 4.61 \text{ years}$$

$$\text{Machine B} = 4 \text{ years} + \left(\frac{5,80,000 - 5,48,440}{49,700} \right) = 4.63 \text{ years}$$

c. Desirability Factor or Profitability Index:

$$\text{Profitability Index (PI)} = \frac{\text{Sum of present value of net cash inflow}}{\text{Initial cash outflow}}$$

$$\text{Machine A} = \frac{₹ 5,42,580}{₹ 5,00,000} = 1.08; \quad \text{Machine B} = \frac{₹ 5,98,140}{₹ 5,80,000} = 1.03$$

- ii. Since the absolute surplus in the case of A is more than B and also the desirability factor, it is better to choose A.

The discounted payback period in both the cases is almost same, also the net present value is positive in both the cases, but the desirability factor (profitability index) is higher in the case of Machine A, it is therefore better to choose Machine A.