

1416124 Financial Modeling for Project Appraisal

Capital Budgeting helps in identifying and evaluating capital projects. used for long term investment decisions.

Capital budgeting techniques

- (1) Idea Generation
- (2) Project Evaluation
- (3) Project selection
- (4) Project implementation
- (5) Project Review.

Additional methods of Capital Budgeting

(1) Payback period (If even cashflow)

$$\text{Payback period} = \frac{\text{original investment or Initial Investment}}{\text{Annual cash inflows after tax}}$$

If cash inflow are uneven then,

$$\text{Payback period} = \text{full years under recovery} + \frac{\text{unrecovered cost at beginning of last year}}{\text{cash inflow during the year}}$$

Project with shorter payback period is accepted.

(2) Accounting Rate of Return / Average rate of return

$$\text{ARR} = \frac{\text{Average profit after tax}}{\text{Average Investment}} \times 100$$

where,

$$\text{Average profit after tax} = \frac{\text{Total profit for all years}}{\text{No. of years}}$$

$$\text{Average investment} = \frac{\text{cost} - \text{scrap} + \text{Additional working capital required} + \text{scrap}}{2}$$

Average investments if there is no increase in working capital

$$\text{Average Investment} = \frac{\text{cost} + \text{scrap}}{2}$$

Project with higher NRR is accepted

* Limitations

- (1) In PBP, cash flows after payback are totally ignored
- (2) NRR method on accounting profit. Accounting profit is after deducting cash and non-cash
- (3) Both methods ignore time value for money

Q1. Calculate payback period from following information

Years	Annual Profit before tax
1	40000
2	50000
3	50000
4	60000

Investment ₹ 100000

Depreciation as per straight line method

Tax @ 30%, Estimated life - 4 yrs.

Ans: Computation of cash flows after tax

Years	PBT	Tax @ 30%	PAT	Dep.	CAT	Cum. CAT
1	40000	12000	28000	25000	30000	30000
2	50000	15000	35000	25000	40000	70000
3	50000	15000	35000	25000	40000	110000
4	60000	18000	42000	25000	47000	157000

$$\text{Depreciation} = \frac{\text{Cost} - \text{Scrap}}{\text{Estimated life}} = \frac{100000 - 0}{4} = 25000$$

Payback period lies between 1st year & 2nd year

$$\text{Payback period} = \left(\frac{100000 - 30000}{60000} \right) \times 12 + 1 \text{ yr}$$

$$= \frac{47000 \times 12}{60000}$$

$$= 1 \text{ year } 9.4 \text{ months}$$

Q2. calculate payback period from following information

Years	Profit before Depreciation
1	40000
2	50000
3	50000
4	60000

Investment Rs 100k

Depreciation as per straight line method

Tax rate @ 30% , Estimated life - 4 yrs

Ans:- Computation of cash inflow

Years	PB Dep.	Dep	PBT	Tax @ 30%	PAT	Dep	CPAT	Cum CFA
1	40000	25000	15000	4500	10500	25000	35500	35500
2	50000	25000	25000	7500	17500	25000	42500	78000
3	50000	25000	25000	7500	17500	25000	42500	120500
4	60000	25000	35000	10500	24500	25000	49500	

Depreciation = 25000

PBP lies between 2nd & 3rd years

$$\text{Payback period} = 2 \text{ yrs} + \left(\frac{100000 - 78000}{42500} \right) \times 12$$

$$= 2 \text{ yrs} + \frac{22000 \times 12}{42500}$$

$$= 2 \text{ yrs} + 6 \text{ months}$$

Q3. Calculate payback period from the following info about profits before depreciation and tax and advise the company.

Years	Project A	Project B
1	30000	40000
2	40000	35000
3	45000	42000
4	50000	65000

Investment = Rs. 100k

Depreciation as straight line method

Tax rate @ 30%, Estimated life - 4 years

Ans: Computation of Cash Inflow: (Project A)

Years	PBD	Dep.	PBT	Tax @ 30%	PAT	Dep.	CFAT	Cum. ICFAT
1	30000	25000	5000	1500	3500	25000	28500	28500
2	40000	25000	15000	4500	10500	25000	35500	64000
3	45000	25000	20000	6000	14000	25000	39000	103000
4	50000	25000	25000	7500	17500	25000	42500	

Depreciation = 25000

PBP lies between 2nd & 3rd year.

$$\text{Payback period} = 2 \text{ yrs} + \left(\frac{100000 - 64000}{39000} \right) \times 12$$

$$= 2 \text{ yrs} + \frac{36000 \times 12}{39000}$$

$$= 2 \text{ yrs} + 11 \text{ months.}$$

Project B

Years	PBD	Dep.	PBT	Tax @ 30%	PAT	Dep.	CFAT	Cum. ICFAT
1	40000	25000	15000	4500	10500	25000	35500	35500
2	35000	25000	10000	3000	7000	25000	32000	67500
3	42000	25000	17000	5100	11900	25000	36900	104400
4	65000	25000	40000	12000	28000	25000	53000	

Depreciation = 25000

PBP lies in between 2nd & 3rd years

$$\text{Payback period} = 2 \text{ yrs} + \left(\frac{100000 - 67500}{36900} \right) \times 12$$

$$= 2 \text{ yrs} + \frac{32500 \times 12}{36900}$$

$$= 2 \text{ yrs} + 10 \text{ months}$$

Project A is 2 yrs 11 months

Project B is 2 yrs 10 months

The company should select Project B as it has a shorter payback period

Q4. Charlie company Ltd wishes to buy a machine costing Rs. 200000

The life of this machine is 10 yrs and scrap value would be Rs. 5000

Average Annual PBT Rs. 20000

Tax rate 35%

Dep charged on LM basis

Calculate PBP & ARR.

Ans: Annual PBT 20000

(-) Tax @ 35% (7000)

Annual PAT 13000

(+) Dep 19500

$$\left(\frac{200000 - 5000}{10} \right)$$

Annual CFAT 32500

$$\text{Payback period} = \frac{\text{Original Investment}}{\text{Annual CFAT}} = \frac{200000}{32500} = 6.15 \text{ yrs}$$

$$\text{ARR} = \frac{\text{Average PAT} \times 100}{\text{Average Inv}} = \frac{13000 \times 100}{102500} = 12.68\%$$

Average PAT = 13000

$$\text{Average Inv} = \frac{\text{Cost} + \text{Scrap}}{2} = \frac{205000}{2} = 102500$$