Financial Evaluation

Financial Evaluation:

- Once we have done financial analysis, we have to decide whether the project is acceptable or not.
- To decide acceptability of the project there are many methods developed over period of time.
- Methods are categorized in two main groups:
  - Non-discounting methods
  - Discounting methods.

Non-discounting Methods

- Non-discounting methods are simple and easy to use.
- But these do not consider the time value of money or inflation.
- There are two main non-discounting methods.
  - Payback Period and
  - Accounting Rate of Return

Payback Period Method:

- This is the simplest and one of the most widely used methods in India.
- It simply takes into account the time and cash flow.
- When the project cash flow will return the initial investment is the only criteria under this method.

Accounting Rate of Return Method

- Major drawback of PBP method is taken care of by this method.
- PBP method does not consider the cash flows beyond payback period, whereas this method takes into consideration projects total cash flow.
- In this method many rate of returns can be calculated for different type of analysis.

Accounting Rate of Return Method

1. Average income after tax/initial investment
2. Average income after tax/average investment
3. Average income after tax but before interest / initial investment
4. Average income after tax but before interest / average investment
5. Average income before interest and tax / Initial investment
6. Average income before interest and tax / average investment
7. Total income after tax + Depreciation – Initial Investment) / ½(Initial investment x years)

Discounting Methods :

- Major advantage of discounting techniques is that they take care of inflation and time value of money.
- There are many discounting techniques but most widely used are:
  - Net Present Value or NPV
  - Internal Rate of Return or IRR and
  - Profitability Index or PI methods.

Net Present Value Method

- Among the popular discounting methods NPV is the simplest.
- The net present value (NPV) of a project is the sum of cash flows that are expected to occur over the life of the project.
- It considers the project suitable for investment if project returns a positive net present value & reject the project if the NPV is negative.

Internal Rate of Return Method

- Among the discounting methods IRR is the most popular and widely used method.
- IRR of a project is the discount rate which makes its NPV equal to zero. So, it is the discount rate which equates the present value of future cash flows with the initial investment.
- It considers the project suitable for investment if project returns an IRR greater than cost of capital and reject the project if IRR is less than cost of capital.

Profitability Index (PI) or Benefit-Cost Ratio (BCR)

- It is ratio of the present value of benefits to the present value of investments.

$$BCR = \frac{\text{Present Value of Benefits (PVB)}}{\text{Initial Investment (I)}}$$

- It considers only those projects suitable for investment which return index value more than 1.

Investment Evaluation in Practice

Method	% of Companies considering Important
Internal Rate Of Return	85
Payback Period	67
Net Present Value	58
Profitability Index	35

Investment Evaluation:

ABC Ltd. Wants to install a new machine in the place of an existing old one which has become obsolete. The company made extensive research and have shortlisted two offers. The two models differ in cost, output and anticipated net revenue. The estimated life of both the machines is 5 years. There will be negligible salvage value at the end of 5th year. The details are as follows:

Machine	**Cost**	**Anticipated after tax cash-flow**				
		Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
A	25		5	20	14	6
B	40	10	14	16	17	8

Investment Evaluation:

The company's cost of capital is 16%. You are required to make an appraisal of the two offers and advise the firm by using the following: 1) Payback period, 2) Net Present Value,
3) Profitability Index, 4) Internal Rate of Return.

End of Year	16%	18%	20%
1	0.862	0.847	0.833
2	0.743	0.718	0.694
3	0.641	0.609	0.579
4	0.552	0.516	0.482
5	0.476	0.437	0.402

Payback Period:

Year	Machine A		Machine B	
	Cash Inflow	Cum. Cash Inflow	Cash Inflow	Cum. Cash Inflow
1	0	0	10	10
2	5	5	14	24
3	20	25	16	40
4	14	39	17	57
5	6	45	8	65

Net Present Value:

Year	DCF @ 16%	Machine A		Machine B	
		Cash Inflow	Present Value	Cash Inflow	Present Value
1	0.862	0	0	10	8.62
2	0.743	5	3.715	14	10.402
3	0.641	20	12.82	16	10.256
4	0.552	14	7.728	17	9.384
5	0.476	6	2.856	8	3.808
Total Present Value			27.119		42.47
Less: Initail Cost			25		40
NPV			2.119		2.47

Profitability Index:

Profitability Index = NPV/ Investment

Machine A = 27.119/25= 1.085

Machine B = 42.470/40= 1.062

Internal Rate of Return:

Machine A

Year	Cash Inflow	DCF @ 18%	PV	DCF @ 20%	PV
1	0	0.847	0	0.833	0
2	5	0.718	3.59	0.694	3.47
3	20	0.609	12.18	0.579	11.58
4	14	0.516	7.224	0.482	6.748
5	6	0.437	2.622	0.402	2.412
Total Present Value			25.616		24.21
Less: Initail Cost			25		25
NPV			0.616		-0.79

IRR= 18% + 0.616/0.616+0.790 x 2%= 18.88%

Internal Rate of Return:

Machine B

Year	Cash Inflow	DCF @ 18%	PV	DCF @ 20%	PV
1	10	0.847	8.47	0.833	8.33
2	14	0.718	10.052	0.694	9.716
3	16	0.609	9.744	0.579	9.264
4	17	0.516	8.772	0.482	8.194
5	8	0.437	3.496	0.402	3.216
Total Present Value			40.534		38.72
Less: Initail Cost			40		40
NPV			0.534		-1.28

IRR= 18% + 0.534/0.534+0.128 x 2%= 18.59%

Super electronics Ltd. An electronic goods manufacturing company, is producing a large range of electronics goods. It has under consideration two projects ‘X’ & ‘Y”, each costing Rs. 120 lakhs.

The projects are mutually exclusive and the company is considering the questions of selecting one of the two. Cash flows have been worked out for both the projects and the details are given below. ‘X’ has a life of 8 years and ‘Y’ has a life of 6 years. Both will have zero salvage value at the end of their operational lives. The company is already making profits and its tax rate is 50%. The cost of capital of the company is 15%.

Net Cash Inflow (Rs Lakhs)		
Year	**Project X**	**Project Y**
1	25	40
2	35	60
3	45	80
4	65	50
5	65	30
6	55	20
7	35	
8	15	

The Company follows straight line method of depreciating assets. Advise the company regarding the Selection of project based on Net Present Value.

Project X

End Of Year	Cash Flow	Depreciation	PBT	Tax	PAT	Net C.F. (PAT+Depr)	Discount factor at 15%	PV
1	25	15	10	5	5	20	0.87	17.4
2	35	15	20	10	10	25	0.756	18.9
3	45	15	30	15	15	30	0.658	19.74
4	65	15	50	25	25	40	0.572	22.88
5	65	15	50	25	25	40	0.497	19.88
6	55	15	40	20	20	35	0.432	15.12
7	35	15	20	10	10	25	0.376	9.4
8	15	15	0	0	0	15	0.327	4.905

PV of Cash Inflows	128.225
Less Initial Investments	120
Net Present Value	8.225

Project Y

End Of Year	Cash Flow	Depreciation	PBT	Tax	PAT	Net C.F. (PAT+ Depr)	Discount factor at 15%	PV
1	40	20	20	10	10	30	0.87	26.1
2	60	20	40	20	20	40	0.756	30.24
3	80	20	60	30	30	50	0.658	32.9
4	50	20	30	15	15	35	0.572	20.02
5	30	20	10	5	5	25	0.497	12.425
6	20	20	0	0	0	20	0.432	8.64

PV of Cash Inflows	130.325
Less Initial Investments	120
Net Present Value	10.325

ITC Ltd. Have decided to purchase a machine to Augment the company's installed capacity to meet the Growing demand for it's products. There are three Machines under consideration of the management. The relevant details including estimated yearly expenditure And sales are given. All sales are on cash.

Corporate income-tax is 40%.

Interest on capital may be assumed to be 10%

Particulars	Machine 1	Machine 2	Machine 3
Initial Investment required	300000	300000	300000
Estimated annual sales	500000	400000	450000
Cost of Production (estimated)			
Direct Material	40000	50000	48000
Deirect Labour	50000	30000	36000
Factory Overhead	60000	50000	58000
Administration Costs	20000	10000	150000
Selling and distribution Costs	10000	100000	10000

The economic life of machine 1 is 2 years, while it is 3 years for other two. The scrap values are 40000, 25000 and 30000 respectively. You are required to find out the most profitable investment based on Payback Period.

Particulars		Machine 1	Machine 2	Machine 3
Initial Investment required	1	300000	300000	300000
Sales	a	500000	400000	450000
Costs				
Direct Material		40000	50000	48000
Deirect Labour		50000	30000	36000
Factory Overhead		60000	50000	58000
Depriciation		130000	91667	90000
Administration Costs		20000	10000	15000
Selling and distribution Costs		10000	10000	10000
Interest On capital		30000	30000	30000
Total Cost	b	340000	271667	287000
Profit before Tax	a-b	160000	128333	163000
Less Tax at 40%		64000	51333.2	65200
Profit after Tax		96000	76999.8	97800
Add: Depriciation		130000	91667	90000
Net cash Flow	2	226000	168667	187800
Payback Period		**1.33**	**1.78**	**1.60**

Projects X & Y are analysed and have following parameters		
Particular	Project X	Project Y
Investment	7 cr	5cr
Project Life	8 years	10 years
Construction Period	3 years	3 years
Cost of Capital	15%	18%
NPV @ 12%	Rs. 3700	Rs. 4565
NPV @ 18%	Rs. 325	Rs. 525
IRR	45%	32%
Rate of Return	18%	25%
Payback	4 yr	6yr
BEP	45%	30%
Profitability Index	1.76	1.35

Relative Ranking of Projects X & Y		
Particular	Project X	Project Y
IRR	I	II
Rate of Return	II	I
Payback	I	II
Profitability Index	I	II
NPV @ 12%	II	I
NPV @ 18%	Equal	Equal
BEP	II	I
Cost of Capital	I	II