IIT ROORKEE

NPTEL ONLINE CERTIFICATION COURSE

Project Management for Managers

Lec – 15

Financial Analysis

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Financial Analysis

Financial Feasibility : Ratio Analysis

Return on investment: This measures overall return on overall investments.
ROI = (EBIT – Tax) / (Investment)

EBIT= Earning before interest and taxes.

Return on equity: This measures return for shareholders.
ROE = (EAT - Preferential dividend) / (Equity)
EAT= Earning after tax

Operating profit margin: This measures the profitability in its gross terms.

OPM = EBIT/ Sales

Net profit margin: This measures profitability in its true terms.
NPM = EAT /Sales

Rs.1000 today or next month.

Ex: 1000 today or next month.

Ex: 1000 today or next month if "interest rate" = 20 %

Time value of money: Money available today is more than tomorrow.

Compound amount = Principal $(1+ r)^n$ or

Principal = Compound amount / $(1+ r)^n$ or

Present value of money = future value * present value factor

where PVF = $1/(1+ r)^n$

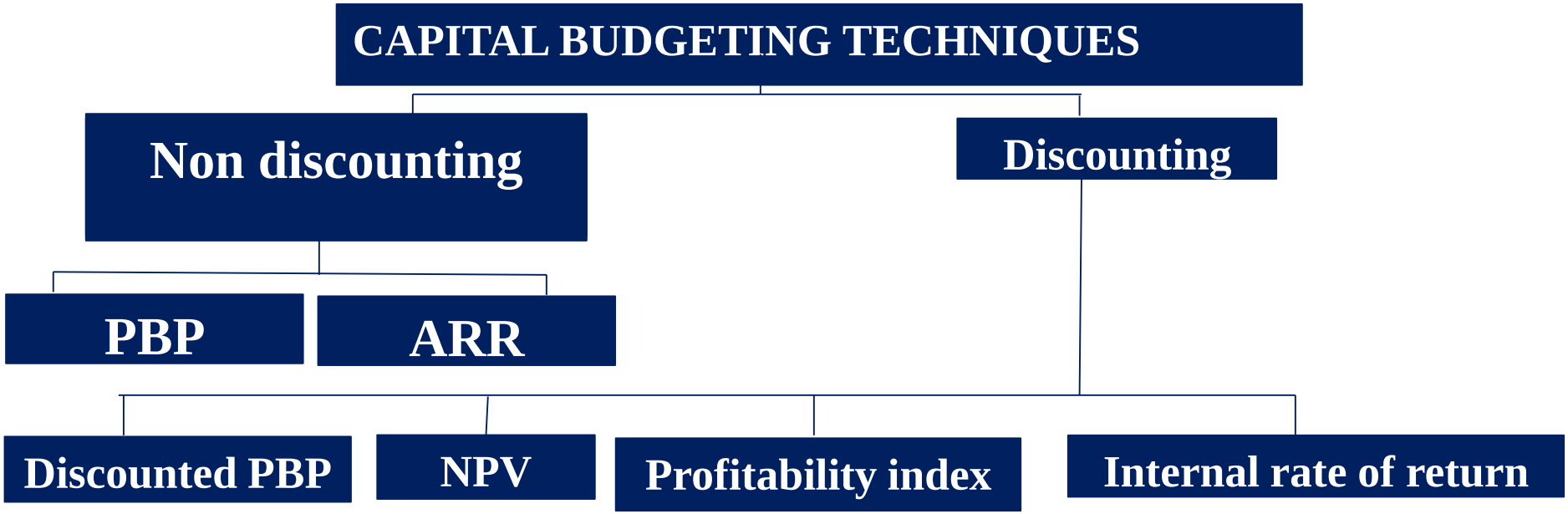
r = Discount factor,

n = No of periods

Capital budgeting, or **investment appraisal**, is the planning process used to determine whether an organization's **long term investments such** as

- new **machinery**,
- **replacement** machinery,
- new **plants**,
- new **products**, and
- research **development** projects

are worth the **funding of cash** through the firm's capitalization structure.



Discounting techniques **take time value of money** into account.
Non-discounting techniques are those techniques which do **not consider time value of money**.

PBP ????????

PBP = Time period in which investor gets back his invested money in fixed assets from the project

Example (PBP)	
Initial investment	300000
Annual cost of operation	20000
Expected annual revenues	
first two years	100000
next three years	200000
Planning horizone	5 yrs

Find : PBP ??

PBP= Y0 - (CuCF0)/(CF1)

Y0 = is the year just before the pay back period is attained

CuCF0= cumulative cash flow of Y0

CF1= cash flow of pay back year

Initial investment		300000
Annual cost of operation		20000
Expected annual revenues		
	first two years	100000
	next three years	200000
Planning horizon		5 yrs

Year	Cash flow	CuCF0
0	-300	-300
1	80	-220
2	80	-140
3	180	40
4	180	220
5	180	400

PBP= (interpolated as the year when CCF becomes zero) = 2- (-140/180)=2.78 yrs

Payback Period

Payback period is the length of time required to recover the initial outlay on the project

XYZ Enterprise's Capital Project

Year	Cash flow	Cumulative cash flow
0	-100	-100
1	34	- 66
2	32.5	-33.5
3	31.37	- 2.13
4	30.53	28.40

Find PBP

PBP = 3- (-2.13/30.53) = 3.06yrs

Example: Projected cash flow 30 lac in first year, CF is going to increase by 10 lac for next 3 years, and then decreases by 15 lac and closes in 5th year. Initial investment 140 lac, working capital requirement is 20 lac. The company foresees to fetch a net salvage value of 35 lac after 5 years. **Find PBP??**

Example: Projected cash flow 30 lac in first year, CF is going to increase by 10 lac for next 3 years, and then decreases by 15 lac and closes in 5 year. Initial investment 140 lac, working capital requirement is 20 lac. The company foresees to fetch a net salvage value of 35 lac after 5 years. **Find PBP??**

Year	Cash flow	CuCF0
0	-140	-140
1	30	-110
2	40	-70
3	50	-20
4	60	40
5	45	85

BPB= 3 – (-20/60)=3.33 yrs or 3 yrs 4months

Example: Compare following projects using PBP

Year	Project A (CuCF0)	Project B (CuCF0)	Project C (CuCF0)
0	-110	-110	-110
1	20	20	0
2	30	30	0
3	40	40	90
4	30	30	30
5	20	20	20
6	20	10	20

Which project is best and why???

Project A			Project B			Project C		
Year	Cash flow	(CuCF0)	Year	Cash flow	(CuCF0)	Year	Cash flow	(CuCF0)
0	-110	-110	0	-110	-110	0	-110	-110
1	20	-90	1	20	-90	1	0	-110
2	30	-60	2	30	-60	2	0	-110
3	40	-20	3	40	-20	3	90	-20
4	30	10	4	30	10	4	30	10
5	20	30	5	20	30	5	20	30
6	20	50	6	10	40	6	20	50

PBP = 3- (-20/30) = 3.33yrs

Project A			Project B			Project C		
Year	Cash flow	Cum CF	Year	Cash flow	Cum CF	Year	Cash flow	Cum CF
0	-110	-110	0	-110	-110	0	-110	-110
1	20	-90	1	20	-90	1	0	-110
2	30	-60	2	30	-60	2	0	-110
3	40	-20	3	40	-20	3	90	-20
4	30	10	4	30	10	4	30	10
5	20	30	5	20	30	5	20	30
6	20	50	6	10	40	6	20	50

A better than B, additional 10 lac, PBP is same for all three projects 3yrs and 8 months

A better than C, **early recovery**. 20lac in first year will fetch interest for 2 years and 30 lac (second year) will fetch interest for 1 year. An example depicts drawback of PBP

Pros

- Simple
- Rough and ready method for dealing with risk
- Emphasizes earlier cash inflows

Drawbacks of PBP

1. Does not consider WC and salvage value
2. Does not consider cash flows after the PBP
3. Does not consider time value of money
4. No consideration for risk
5. Ignores cost of capital
6. It measures project's capital recovery, not profitability

Average rate of return (ARR):Considers cash flows after PBP, working capital and salvage value

ARR = average return / average investment

Average return = Sum of all CFs/n,

Average investment

=1/2 (initial investment + terminal cash flow)

=1/2 {(fixed investment +WC) + (WC+SV)}

= WC + ½ (FI+SV)

FI= fixed investment, WC =working capital, SV =salvage value

Ex. Projected cash flow 30 lac in first year, CF is going to increase by 10 lac for next 3 years, and then decreases by 15 lac and closes in 5 year. Initial investment 140 lac, working capital requirement is 20 lac. The company foresees to fetch a net salvage value of 35 lac after 5 years.

Find :ARR

Example:- Let us determine the ARR for the following 2 alternative investments:

		Machine A:	Machine B:
Cost		56,125	58,125
Annual estimated income after depreciation & tax			
	Year 1	3,375	11,375
	Year 2	5,375	9,375
	Year 3	7,375	7,375
	Year 4	9,375	5,375
	Year 5	11,375	3,375
Total earnings		36,875	36,875
Estimated life		5 years	5 years
Estimated salvage value		3,000	3,000

Which investment is better????

ARR = Annual average net earnings after taxes X 100
Average investment over the life of the project

Average earnings = Total earnings / Estimated life in years

For machines A:- 36,875 / 5 = 7,375
For machines B:- 36,875 / 5 = 7,375

Average investment = (Initial investment - Salvage Value) / 2 + Working capital + Salvage value.

For Machine A: (56,125 - 3000) / 2 + 0 + 3000 = 29,562.50
For Machine B: (58,125 - 3000) / 2 + 0 + 3000 = 30,562.50

ARR for Machine A : 7375/29562.50 * 100 = 24.95% or 25%
ARR for Machine B : 7375/30,562.50 * 100 = 24.13% or 24%.

Machine A would be preferred as ARR is higher. However, if we use previous method , then machine B is better.