

Basic Principles of Capital budgeting

1. P.B.P

2. D.P.B.P

3. N.P.V

4. P.I

5. IRR

P.B.P

Initial Investment =

-10,00,000

| Year | CF | Cumulative CF |
|------|------------|---------------|
| 0 | -10,00,000 | -10,00,000 |
| 1 | 4,00,000 | -6,00,000 |
| 2 | 5,60,000 | -40,000 |
| 3 | 5,00,000 | 4,60,000 |
| 4 | | |

$$P.B.P = 2 + \frac{40,000}{5,00,000}$$

[- लिखा नाकामुल]

$$= 2 + (0.08 \times 12) \text{ month}$$

$$= 2 + (0.06 \times 30) \text{ day}$$

$$= 2 \text{ years } 28.8 \text{ days}$$

$$\approx 2 \text{ years } 29 \text{ days}$$

□ Payback period limitations.

□ D.P.B.P: Discounted Payback Period:

$n = \text{years}$
 $r = 10\%$

$$PV = \frac{CF}{(1+r)^n}$$

| years | CF | PV of CF |
|-------|------------|-------------------|
| 0 | -10,00,000 | -10,00,000 |
| 1 | 4,00,000 | 3,63,636.36 |
| 2 | 5,60,000 | 4,62,809.91 |
| 3 | 5,00,000 | 3,75,657.40 |
| 4 | 7,80,000 | 5,36,750.49 |
| 5 | 4,00,000 | 3,04,251.44 |
| | | <u>Cumulative</u> |

→ $\sum PV \text{ of CF}$
 $[+ \dots]$

NPV = CF

-10,00,000

-6,36,363.40

-1,73,553.73

2,00,103.67

$$D.P.B.P = 2y + \frac{1,73,553.73}{3,75,657.40}$$

month

day

NPV = Present value of cash flow

$$NPV = \sum_{i=1}^n PV \text{ of CF} - \text{Initial investment}$$

$$= 20,39,105.6 - 10,00,000$$

$$= 10,39,105.6$$

NPV > 0

P = Accept

NPV < 0

P = Reject

Or,

$$NPV = \left[\frac{400000}{(1.10)^1} + \frac{5,60,000}{(1.10)^2} + \frac{50,0000}{(1.10)^3} + \frac{780000}{(1.10)^4} + \frac{490,000}{(1.10)^5} \right] - 10,00,000$$

□ Profitability Index, $\sum_{i=1}^n$

$$PI = \frac{PV \text{ of cash flow}}{\text{Initial investment}}$$

$$= \frac{20,39,105.6}{10,00,000}$$

$$= 2.04$$

PI > 1 ; P = Accept

PI < 1 ; P = Reject ; PI = 0

IRR

Q) A project has the following cash flows

| y | C.F | PV of CF |
|---|-----|------------------------|
| 1 | 300 | $\frac{300}{(1.10)^1}$ |
| 2 | 400 | $\frac{400}{(1.10)^2}$ |
| 3 | 400 | $\frac{400}{(1.10)^3}$ |
| 4 | 500 | $\frac{500}{(1.10)^4}$ |

let,

$$r = 10\%$$

$$NPV = \left[\frac{300}{(1.10)^1} + \frac{400}{(1.10)^2} + \frac{400}{(1.10)^3} + \frac{500}{(1.10)^4} \right] - 1500$$

Again -

let,

$$r = 13\%$$

$$= \left[\frac{300}{(1.13)^1} + \frac{400}{(1.13)^2} + \frac{400}{(1.13)^3} + \frac{500}{(1.13)^4} \right] - 1500$$

$$NPV = -92.04$$

$$IRR = LR + \frac{LR NPV}{LR NPV - HR NPV} \times (HR - LR)$$

$$= 10 + \frac{18.5}{18.5 - (-92.04)} \times (13 - 10)$$

$$= 10 + 0.175$$

$$= 10.5175\%$$

Lower Rank,
LR = 10%

Higher Rank,
HR = 13%

LR NPV = 18.5

HR NPV = -92.04

IRR > cost of capital Rejected
(r)

Accepted if IRR < cost of capital
~~Accept~~

Q.

| <u>y</u> | <u>CF</u> |
|----------|-----------|
| 1 | 10,000 |
| 2 | 12,000 |
| 3 | 16,500 |
| 4 | 13,000 |

Initial investment 15,000
and cost of capital is 12%.

⇒ let, $r = 10\%$.

$$NPV = \left[\frac{10,000}{(1.10)^1} + \frac{12,000}{(1.10)^2} + \frac{10,500}{(1.10)^3} + \frac{13,000}{(1.10)^4} \right] - 15,000$$
$$= 12,594$$

if $r = 60\%$.

$$= 484.62$$

if $r = 70\%$.

$$= -1271.72$$

$$IRR = LR + \frac{LR \text{ NPV}}{LR \text{ NPV} - HR \text{ NPV}} \times (HR - LR)$$

$$= 60 + \frac{484.62}{484.62 + 1271.72} \times (70 - 60)$$

$$= 62.75\%$$

$IRR > (r)$ cost of capital
Accepted