

19BCE187 - UELMOOT-28-01-2022 1

Q.2 Probability of Occurrence Possible return

0.1	-10 %
0.2	5 %
0.4	20 %
0.2	35 %
0.1	50 %

$$\begin{aligned}
 \text{(a) Expected return} &= (0.1)(-10) + (0.2)(5) + (0.4)(20) + \\
 &\quad (0.2)(35) + (0.1)(50) \\
 &= -1 + 1 + 8 + 7 + 5 \\
 &= 20
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) Standard deviation of return} &= [0.1(-10-20)^2 + 0.2(5-20)^2 \\
 &\quad + 0.4(20-20)^2 + 0.2(35-20)^2 \\
 &\quad + 0.1(50-20)^2]^{\frac{1}{2}} \\
 &= [0.1(900) + 0.2(225) + \\
 &\quad 0.4(0) + 0.2(225) + 0.1(900)]^{\frac{1}{2}} \\
 &= [90 + 45 + 0 + 45 + 90]^{\frac{1}{2}} \\
 &= (270)^{\frac{1}{2}} \\
 &= \sqrt{270} \\
 &= 16.4316 \%
 \end{aligned}$$

- (c) Company PUT in is expected to earn same level of return with standard deviation of 20%.

Now, this ^{standard deviation} is greater than standard deviation of eye for an eye company i.e. 16.43% ($20 > 16.43\%$)

~~there~~ Hence it provides same return for larger risks (because standard deviation means greater risk)

Hence, the Share of eye for an eye company are better.

So the shares of eye for an eye company are better than PUT in.

Q.1 Zelensky Ltd has two proposals

Project A

Project B

Period	Cost	Profit after tax	Net	Cost	Profit after tax	Net cash flow
0	\$9000	-	-	\$12,000	-	-
1		\$1,000	\$5,000		\$1000	\$5000
2		1000	4000		1000	5000
3		1000	3000		4000	8000

① compute its payback period

for project A

CF received

After a period of 2 yrs total cash receive
 $5000 + 4000 = 9000$

Hence the payback period = 2 yrs

for project B

CF received by end of 2 yrs = 10000

CF remaining = 2000

CF received in third yr = 8000

Payback period = 2 yrs + $\frac{\text{CF remaining}}{\text{CF received in 3rd yr}}$

$$= 2 + \frac{2000}{8000}$$

$$= \underline{\underline{2.25 \text{ yrs}}}$$

⑥ Discounted payback period

Considered discount rate of 10 percent

Project A

Yrs	Net Cash Flow	P.V factor @ 10%	P.V of CF	Cumulative CF
0	9000	0.909	4545	
1	5000	0.909	3304	4545
2	4000	0.826	3304	7849
3	3000	0.751	2253	10102

CF received by end of 2 yrs = 7849

CF remaining = 1151

CF received in year 3 = 2253

Discounted payback period = $2 + \frac{1151}{2253}$

$$= 2 + \frac{1151}{2253}$$

$$= 2.51 \text{ yrs}$$

Project B

Yrs	Net CF	P.V factor @ 10%	P.V of CF	Cumulative CF
0	12000			
1	5000	0.909	4545	4545
2	5000	0.826	4130	8675
3	8000	0.751	6008	14683

CF received at by end of year 2 = 8675

$$CF \text{ remaining} = 3325 = (9000 - 8675)$$

CF received in year 3 = 6008

$$\begin{aligned} \text{Discounted payback period} &= 2 + \frac{3325}{6008} \\ &= \underline{\underline{2.5534}} \end{aligned}$$

(c) Profitability Index

for Project A :-

$$\begin{aligned} \text{Profitability Index (P.I.)} &= \frac{\text{P.V. of future CF}}{\text{Investment}} \\ &= \frac{10102}{9000} \\ &= \underline{\underline{1.1224}} \end{aligned}$$

for Project B :-

$$\begin{aligned} \text{P.I.} &= \frac{\text{P.V. of future CF}}{\text{Investment}} \\ &= \frac{14683}{12000} \\ &= \underline{\underline{1.2234}} \end{aligned}$$

⇒ Project with more profitability Index would be recommended first.

↳ here P.I. of project A is less than project B
So we give rank 1 to project B and
give rank 2 to project A.

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Q.3 Alternative : 1 :

Annual pension (Annuity), $A = ₹ 2,00,000$
for age 61 to 80, $n = 20$ years
Interest Rate, $r = 10\% = 0.2$

$$\therefore \text{Present value of Annuity} = A \left[\frac{1 - \frac{1}{(1+r)^n}}{r} \right]$$

$$= 2,00,000 \times \left[\frac{1 - \frac{1}{(1+0.2)^{20}}}{0.2} \right]$$

$$= 2,00,000 \times 8.5136$$

$$= ₹ 17,02,720$$

Rakesh needs to pay ₹ 20,00,000 today
to receive the above pension

$$\text{Total income today} = ₹ 17,02,720$$

$$- ₹ 20,00,000$$

$$= ₹ \underline{2,97,280}$$

He will lose ₹ 2,97,280 in present
value by choosing Alternative -1

Alternative - 2

Lumpsum Amount, F.V = ₹ 1,40,000
after 20 years $\therefore n = 20$ years

$$\therefore PV = \frac{F.V}{(1+r)^n} \quad (\because \text{Assuming annual compounding})$$

$$= \frac{1,40,00,000}{(1+0.1)^{20}}$$

$$= \frac{1,40,00,000}{(1.1)^{20}}$$

$$\therefore PV = ₹ 20,81,010.79$$

To choose Alternative 2 Rakesh needs to pay ₹ 20,00,000 today

$$\begin{aligned} \therefore \text{Today Total income today} &= ₹ 20,81,010.79 \\ &- ₹ 20,00,000 \\ &= ₹ 81,010.79 \end{aligned}$$

→ So, he will get ₹ 81,010.79 in present value by choosing alternative-2.

→ So, alternative-2 is more attractive for Rakesh for life expectancy of 20 years and 10% interest rate.

hence Alternative-2 is better than Alternative 1.