Shubham Laxman Hippargi
224cs3014
Assignment (CB Analysis)
SPPQM Assignment No-02

Q. Calculate net profit, payback period, return on investment net present value for following project
Discount rate = 12%.

Sol?

Year	Project A	Project B
0	-10000	-8000
1	2000	1000
2	2500	2000
3	6000	4000
4	2500	3000
5	2000	9000
6	2000	-6000

A. Net Profit (Project A) = Total Income - Total cost
= 17000 - 10000
= 7000

Net Profit (Project B) = 19000 - 14000
= 5000

B. Payback Period
for Project A = Payback period = end of 3rd Year
Project B = Payback period = end of 4th Year.

C. Return on Investment
Project A
Average Annual Profit = $\frac{7000}{6}$ = 1166.66

Return on Investment = $\frac{\text{Avg Annual Profit}}{\text{Total Investment}} \times 100$

= $\frac{1166.66}{10000} \times 100$

= 11.66%

Project B

Avg. Annual Profit = $\frac{5000}{6}$ = 833.33

Return on Investment = $\frac{833.33}{14000} \times 100$

= 5.95 %

D. Net Present Value

Year	Cashflow Project A	Discont factor	Discounted cashflow project A	Cashflow Project B	Discount factor	Discounted Cashflow Project B
0	-10000	1.000	-10000	-8000	1.000	-8000
1	2000	0.8929	1785.8	1000	0.8929	892.9
2	2500	0.7972	1993	2000	0.7972	1594.4
3	6000	0.7118	4270.8	4000	0.7118	2847.2
4	2500	0.6355	1588.75	3000	0.6355	1906.5
5	2000	0.5674	1134.8	9000	0.5674	5106.6
6	2000	0.5066	1013.2	-6000	0.5066	-3039.6

NPV Project A = 356.35 Rs

NPV Project B = 1308.6

Q2. Calculate Net Profit, Payback period, ROI, NPV for the following project. Discount Rate = 8 %.

Year	Project A	Project B	Project C
0	-8000	-8000	-10000
1	4000	1000	2000
2	4000	2000	2000
3	2000	4000	6000
4	1000	3000	2000
5	500	9000	2000
6	500	-6000	2000

Sol? Net Profit :-

Project A = Total Income - Total Cost
= 12000 - 8000
= 4000 Rs

Project B = 19000 - 14000
= 5000 Rs

Project C = 16000 - 10000
= 6000 Rs

B. Payback Period

Project A = At the end of 2nd Year
Project B = At the 2/3rd of 4th year
Project C = After completion of 3rd Year

C. Return on Investment

Project A

Avg. Annual Profit = $\frac{4000}{6}$ = 666.66 Rs

Return on Investment = $\frac{666.66 \times 100}{8000}$

= 8.33 %.

Project B

Avg. Annual Profit = $\frac{5000}{6}$ = 833.33

Return on Investment = $\frac{833.3}{14000} \times 100$

= 5.95 %.

Project C

Avg Annual Profit = ~~$\frac{6000}{10000} \times 100$~~ = ~~60~~ $\frac{6000}{6}$ = 1000

Return on Investment = $\frac{1000}{10000} \times 100$

= 10%.

D. Net Present Value.

Year	Cashflow Project A	Discount factor (8%)	Discounted Cashflow Project A	Cashflow Project B	Discount factor (8%)	Discounted Cashflow Project B
0	-8000	1.00	-8000	-8000	1.000	-8000
1	4000	0.9259	3703.6	1000	0.9259	925.9
2	4000	0.8573	3429.2	2000	0.8573	1714.6
3	2000	0.7938	1587.6	4000	0.7938	3175.2
4	1000	0.7350	735	3000	0.7350	2205
5	500	0.6806	340.3	9000	0.6806	6125.4
6	500	0.6302	315.1	-6000	0.6302	-3781.2

Year	Cashflow Project C	Discount factor 8%	Discounted Cashflow Project C
0	-10000	1.000	-10000
1	2000	0.9259	1851.8
2	2000	0.8573	1714.6
3	6000	0.7938	4762.8
4	2000	0.7350	1470
5	2000	0.6806	1361.2
6	2000	0.6302	1260.4

NPV for Project A = Rs 2111.3

NPV for Project B = Rs 2364.9

NPV for Project C = 2420.8 Rs.

Q3: Calculate Net Profit, Payback Period, ROI, NPV for the following projects. Discount factor = 10%.

Soln

Year	Project A	Project B	Project C	Project D
0	−100000	−1000000	−100000	−120000
1	10000	200000	30000	30000
2	10000	200000	30000	30000
3	10000	200000	30000	30000
4	20000	200000	30000	30000
5	100000	300000	30000	75000

A. Net Profit = Total Income − Total Cost

Project A = 1500000 − 1000000

= Rs 50000

Project B = 1100000 − 1000000

= 100000

Project C = 150000 − 100000

= Rs 50000

Project D = 195000 − 120000

= Rs 75000

B. Payback period

Project A:- At the mid of year 5

Project B:- At the end of 5th Year

Project C:- At the 2/3rd time of 4th Year

Project D:- At the end of 4th Year.

C. Return on Investment

Avg. Annual Income = 10000

Project A

$$ROI = \frac{10000}{100000} \times 100 = 10\%$$

Project B

Avg. Annual Income = $\frac{100000}{5} = 20000$

ROI = $\frac{20000}{1000000} \times 100 = 2\%$

Project C

Avg. Annual Income = $\frac{50000}{5} = 10000$

ROI = $\frac{10000}{100000} \times 100 = 10\%$

Project D

Avg. Annual Income = $\frac{75000}{5} = 15000$

ROI = $\frac{15000}{120000} \times 100 = 12.5\%$

D. NPV :-

Year	Cashflow Project A	Discount factor 10%	Discounted Cashflow Project A	Cashflow Project B	Discount factor	Discounted factor Project B
0	-100000	1.0000	-100000	-1000000	+1.000	-1000000
1	10000	0.9091	9091	200000	0.9091	181820
2	10000	0.8264	8264	200000	0.8264	165280
3	10000	0.7513	7513	200000	0.7513	150260
4	20000	0.6830	13660	200000	0.6830	136600
5	100000	0.6209	62090	300000	0.6209	186270

NPV value for Project 'A' = Rs 618

NPV value for Project B = Rs -179770

Year	Cashflow Project C	Discount factor	Discounted factor Project C	cashflow Project D	Discout factor	Discounted factor Project D.
0	-100000	1.000	-100000	-120000	1.0000	-120000
1	30000	0.9091	27273	30000	0.9091	27273
2	30000	0.8264	24792	30000	0.8264	24792
3	30000	0.7513	22539	30000	0.7513	22539
4	30000	0.6830	20490	30000	0.6830	20490
5	30000	0.6209	18627	75000	0.6209	46567.5

NPV value for Project C = 13721 Rs
NPV value for Project D = 21661.5 Rs

Q4 How much money will you recieve if you invest Rs 18000 for 9 years at 15.2% compounded 4 times a year?

Soln Present value = Rs 18000
$r = 15.2\% \Rightarrow 0.152$
years = 9 but compounded 4 times a year
Hence $nt = 4 \times 9$.

formula => $\text{Present Value} = \frac{\text{Future Value}}{(1+r)^t}$

$\Rightarrow \text{Future Value} = P\left(1 + \frac{r}{n}\right)^{nt}$

$= 18000\left(1 + \frac{15.2}{100 \times 4}\right)^{9 \times 4}$

$= 18000\left(1 + \frac{0.152}{4}\right)^{36}$

$= 18000\left(1.038\right)^{36}$

$= 18000 \times 3.82917$
$= ₹ 68925.07$

Q6 If the interest rate is 5.06% compounded anually, what is the present value (Year 0) of the following set of cash flows.

A. Year 1 = 582

Present Value = $\frac{\text{Future Value}}{(1+r)^t}$

$\Rightarrow \frac{582}{(1+5.06\times10^{-2})^1} = \frac{582}{(1+0.0506)^1}$

$= \frac{582}{1.0506}$

$= \boxed{553.9691 \text{ Rs}}$

B. Year 4 = 254

Present Value = $\frac{\text{Future Value}}{(1+r)^t}$

$\Rightarrow \frac{254}{(1+0.0506)^4} = \frac{254}{(1.0506)^4}$

$\Rightarrow \frac{254}{1.2182} = \boxed{\text{Rs } 208.504}$

C. Year 5 = 1334

Present Value = $\frac{\text{Future Value}}{(1+r)^t}$

$= \frac{1334}{(1+0.0506)^5} = \frac{1334}{(1.0506)^5}$

$= \frac{1334}{1.2799} = \boxed{1042.26 \text{ Rs}}$

Q7 What is the present value of Rs 18000 recievable every year for ever if interest rate is 6.6% compounded annually?

Soln Present Value = $\frac{\text{Cashflow}}{r}$

$= \frac{18000}{0.066}$

$= \boxed{\text{Rs } 272727.27}$

Q8 What is the present value of Rs 72000 recievable at the end of 5 years at 7% compounded anually.

Soln Present Value = $\frac{\text{Future Value}}{(1+r)^t}$

$= \frac{72000}{(1+0.07)^5}$

$= \frac{72000}{(1.07)^5}$

$= \frac{72000}{1.402}$

$= \boxed{51,355.206 \text{ Rs.}}$