

Tutorial Question and case week Four session two Answer

The ratio of NPV at 10% to outlay in year 0 (the year of capital rationing) is as follows.

Project	Outlay in Year 0	PV	NPV	Ratio	Ranking
	\$	\$	\$		
A	50,000	55,700	5,700	1.114	3rd
B	28,000	31,290	3,290	1.118	2nd
C	30,000	34,380	4,380	1.146	1st

Working

Present value A

Year			Discount factor 10%	Present value
		\$		\$
1	Cash flow	(20,000)	0.909	(18,180)
2	Cash flow	20,000	0.826	16,520
3	Cash flow	40,000	0.751	30,040
4	Cash flow	40,000	0.683	27,320
				<u>55,700</u>

Present value B

Year			Discount factor 10%	Present value
		\$		\$
1	Cash flow	(50,000)	0.909	(45,450)
2	Cash flow	40,000	0.826	33,040
3	Cash flow	40,000	0.751	30,040
4	Cash flow	20,000	0.683	13,660
				<u>31,290</u>

Present value C

Year			Discount factor 10%	Present value
		\$		\$
1	Cash flow	(30,000)	0.909	(27,270)
2	Cash flow	30,000	0.826	24,780
3	Cash flow	40,000	0.751	30,040
4	Cash flow	10,000	0.683	6,830
				<u>34,380</u>

The optimal investment policy is as follows.

Ranking	Project	Year 0 outlay	NPV
		\$	\$
1st	C	30,000	4,380
2nd	B	28,000	3,290
3rd	A (balance)	2,000 (4% of 5,700)	228
		NPV from total investment = 7,898	

*4% = (2,000/50,000)

Then on board you 2nd ↓ in detail working

Project	Outlay in year 0	PV (\$)	NPV (\$)	Ratio	Ranking
A	50,000	55,700	5,700	1.114	3rd
B	28,000	31,290	3,290	1.118	2nd
C	30,000	34,380	4,380	1.146	1st

$PV \div \text{outlay} = \text{ratio}$

We have rational the projects within 60,000 investment and used those that have the highest return first i.e. project C and B have higher ratios than A

Start On board Calculation here 1st

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Present value A

Year	\$	Discount Factor 10%	Present value
1	(20,000)	0.909	(18,180)
2	20,000	0.826	16,520
3	40,000	0.751	30,040
4	40,000	0.683	27,320
			<u>55,700</u>

Present value B

Year	\$	Discount Factor 10%	Present value
1	(50,000)	0.909	(45,450)
2	40,000	0.826	33,040
3	40,000	0.751	30,040
4	20,000	0.683	13,660
			<u>31,290</u>

Present value C

Year	\$	Discount Factor 10%	Present value
1	(30,000)	0.909	(27,270)
2	30,000	0.826	24,780
3	40,000	0.751	30,040
4	10,000	0.683	6,830
			<u>34,380</u>

The on board calculation here 3rd

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The optimal investment policy - so we apply Capital rationing of 60,000 investment below. And work out the NPV of the investment made in each project based on above P.V.s worked out

Ranking	Project	Year 0 outlay	NPV \$
1st	C	30,000	4,380
2nd	B	28,000	3,290
3rd	A	2,000 (4% of 5,700)	228
		<u>NPV total investment</u>	<u>7,898</u>

* 4% = 2,000 / 50,000