

Chapter 7 Case

Roger Malmquist, 2010-10-15

Making Investment Decisions with the Net Present Value Rule

Renovation of 127 bathrooms

I work as a city manager in Salem south of Stockholm. This is a real case on which I am going to explain and do a Net Present Value calculation.

In Salem we have 900 apartments with very low vacancy, just two at this moment. In our business plan for 2010 we decided to carry out the renovation of 127 bathrooms in this area.

There are 127 bathrooms.

We have negotiated a rent increase of 42.9 €/ month when the bathroom is finished.

Each bathroom costs 8,500 € to renovate.

Calculate with a return of 5% and an inflation rate of 2%

Calculate with a life expectancy of 30 yrs for these bathrooms.

Questions

1. What is the present value?
2. What is the Net Present Value?
3. What is the initial yield?
4. What is the internal rate of return?
5. Do you think it is a good investment?

Answers

First, it is best to make one excel to get a good overview, then you can easily change the numbers for example for inflation, rate of return... and quickly see what the result is.

	A	B	C	D	E	F	G
1							
2							
3	Bathrooms	127					
4	Renovate cost	-8 500					
5	Rent increase	42,9					
6	Inflation	2%					
7	Rate of return	5%					
8							
9							
10							
11	Ar	Cashflow		Present value	$PV = C / (1+r)$	Net Present Value	$NPV = PV - Investment$
12	0	-1079500		-1079500		-1079500	
13	1	65380	$=B5*12*B3$	62266	$=B13/(1+B57)^A13$	-1017234	$=SUMMA(D12:D13)$
14	2	66687	$=B13*(1+B56)$	60487	$=B14/(1+B57)^A14$	-956746	$=SUMMA(D12:D14)$
15	3	68021	$=B14*(1+B56)$	58759	$=B15/(1+B57)^A15$	-897987	$=SUMMA(D12:D15)$
16	4	69381	$=B15*(1+B56)$	57080	$=B16/(1+B57)^A16$	-840907	$=SUMMA(D12:D16)$
17	5	70769	$=B16*(1+B56)$	55449	$=B17/(1+B57)^A17$	-785458	$=SUMMA(D12:D17)$
18	6	72184	$=B17*(1+B56)$	53865	$=B18/(1+B57)^A18$	-731593	$=SUMMA(D12:D18)$
19	7	73628	$=B18*(1+B56)$	52326	$=B19/(1+B57)^A19$	-679267	$=SUMMA(D12:D19)$
20	8	75101	$=B19*(1+B56)$	50831	$=B20/(1+B57)^A20$	-628436	$=SUMMA(D12:D20)$
21	9	76603	$=B20*(1+B56)$	49379	$=B21/(1+B57)^A21$	-579057	$=SUMMA(D12:D21)$
22	10	78135	$=B21*(1+B56)$	47968	$=B22/(1+B57)^A22$	-531089	$=SUMMA(D12:D22)$
23	11	79697	$=B22*(1+B56)$	46597	$=B23/(1+B57)^A23$	-484492	$=SUMMA(D12:D23)$
24	12	81291	$=B23*(1+B56)$	45266	$=B24/(1+B57)^A24$	-439226	$=SUMMA(D12:D24)$
25	13	82917	$=B24*(1+B56)$	43973	$=B25/(1+B57)^A25$	-395253	$=SUMMA(D12:D25)$
26	14	84575	$=B25*(1+B56)$	42716	$=B26/(1+B57)^A26$	-352536	$=SUMMA(D12:D26)$
27	15	86267	$=B26*(1+B56)$	41496	$=B27/(1+B57)^A27$	-311041	$=SUMMA(D12:D27)$
28	16	87992	$=B27*(1+B56)$	40310	$=B28/(1+B57)^A28$	-270730	$=SUMMA(D12:D28)$
29	17	89752	$=B28*(1+B56)$	39159	$=B29/(1+B57)^A29$	-231572	$=SUMMA(D12:D29)$
30	18	91547	$=B29*(1+B56)$	38040	$=B30/(1+B57)^A30$	-193532	$=SUMMA(D12:D30)$
31	19	93378	$=B30*(1+B56)$	36953	$=B31/(1+B57)^A31$	-156579	$=SUMMA(D12:D31)$
32	20	95246	$=B31*(1+B56)$	35897	$=B32/(1+B57)^A32$	-120682	$=SUMMA(D12:D32)$
33	21	97151	$=B32*(1+B56)$	34871	$=B33/(1+B57)^A33$	-85810	$=SUMMA(D12:D33)$
34	22	99094	$=B33*(1+B56)$	33875	$=B34/(1+B57)^A34$	-51935	$=SUMMA(D12:D34)$
35	23	101076	$=B34*(1+B56)$	32907	$=B35/(1+B57)^A35$	-19028	$=SUMMA(D12:D35)$
36	24	103097	$=B35*(1+B56)$	31967	$=B36/(1+B57)^A36$	12939	$=SUMMA(D12:D36)$
37	25	105159	$=B36*(1+B56)$	31054	$=B37/(1+B57)^A37$	43993	$=SUMMA(D12:D37)$
38	26	107262	$=B37*(1+B56)$	30166	$=B38/(1+B57)^A38$	74159	$=SUMMA(D12:D38)$
39	27	109407	$=B38*(1+B56)$	29305	$=B39/(1+B57)^A39$	103464	$=SUMMA(D12:D39)$
40	28	111596	$=B39*(1+B56)$	28467	$=B40/(1+B57)^A40$	131931	$=SUMMA(D12:D40)$
41	29	113827	$=B40*(1+B56)$	27654	$=B41/(1+B57)^A41$	159585	$=SUMMA(D12:D41)$
42	30	116104	$=B41*(1+B56)$	26864	$=B42/(1+B57)^A42$	186449	$=SUMMA(D12:D42)$
43							
44	Net Present Value					186449	
45	Initial Yield				6,1%	0,061	$=B13/-B12$
46	Internal Rate of Return				6,3%	0,063	$=IR(B12:B42)$

Question 1

If you use excel, select all present values in column D and excel provides the answer for you.

Or use this formula.

$$PV = \frac{C1}{1+r} + \frac{C2}{(1+r)^2} \dots + \frac{C30}{(1+r)^{30}}$$

$$PV = \frac{65,380}{1,05} + \frac{66,687}{(1,05)^2} \dots + \frac{116,104}{(1,05)^{30}}$$

$$PV = 1,265,949$$

Question 2

Look at excel and fill in this simple formula

$$NPV = PV - \text{Investment}$$

$$NPV = 1,265,949 - 1,079,500$$

$$NPV = 186,449$$

Or use this formula on your calculator

$$NPV = -1,079,500 + \frac{65,380}{5\% - 2\%} - \frac{65,380}{5\% - 2\%} \times \frac{(1+2\%)^{30}}{(1+5\%)^{30}} = 186,457$$

Question 3

Here we take the first year's cash flow and divide it by the investment.

$$A \quad \text{Yield} = \frac{65,380}{1,079,500} = 0.0605 = 6.1\%$$

Question 4

$$A \quad \text{Internal rate of return} = 6.3\%$$

Question 5

Present Value 1,265,949 €
Net Present Value 186,449 €
Initial Yield 6.1%
Internal rate of return 6.3%

We have a positive net present value.

If my ambition was to own the property long term, I think this is a good investment.

Our tenants themselves pay for the renovation, which in Sweden would otherwise be an obligation on behalf of the property owners.

We will be saving money each year in our ongoing maintenance for moisture damage, which is an even higher cost when we need to carry out urgent repairs.

We get a higher income cash flow which will set the property in a higher value on the market.

Chapter 7 Group work

Roger Malmquist, 2010-10-15

Making Investment Decisions with the Net Present Value Rule

Renovation of a local

You work as asset manager in the South of Stockholm and you have just received a premises that has been cancelled at Nygatan 27 in Södertälje. The place is an old hair salon at 200 sqm.

Two people who have heard that the premises are vacant are calling you. They have slightly different requirements so you ask to get back to them when you have calculated their proposals.

Person A: is interested in the premises and run it as hairdressing salon, but he would prefer us to freshen it up, the estimated cost of 20,000 € for a rent of 95 €/ sqm and contract duration of 3 years.

Person B: Wants to make room for and run a Thai Take Away, which requires a lot of rebuilding. Estimated cost of 60,000 € for a rent of 110 €/ sqm and contract duration of 5 years.

Calculate with a return of 6%

Calculate with an inflation of 2%

Questions

1. What is the present value of proposals A and B?
2. What is the Net Present Value of each alternative?
3. What is the initial yield of each alternative?
4. What is the internal rate of return of each alternative?
5. Which would you choose A or B, explain why?

Answers

	A	B	C	D	E	F
1						
2	Inflation	2%				
3	Discount rate	6%				
4				A		
5	Ar	Cashflow	PY	PY = C / (1+r)	NPV	NPV = PY - Investment
6	0	-20000	-20000		-20000	
7	1	19000	17925	=B7/(1+B\$3)^A7	-2075	=SUMMA(C6:C7)
8	2	19380	17248	=B8/(1+B\$3)^A8	15173	=SUMMA(C6:C8)
9	3	19768	16597	=B9/(1+B\$3)^A9	31770	=SUMMA(C6:C9)
10						
11	Net Present Value				36232	
12	Initial Yield			95,0%	0,950	=B7/B6
13	Internal Rate of Return			79,6%	0,796	=IR(B6:B9)
14						
15						
16						
17				B		
18	Ar	Cashflow	PY	PY = C / (1+r)	NPV	NPV = PY - Investment
19	0	-60000	-60000		-60000	
20	1	22000	20755	=B20/(1+B\$3)^A;	-39245	=SUMMA(C19:20)
21	2	22440	19972	=B21/(1+B\$3)^A2	-19274	=SUMMA(C19:C21)
22	3	22889	19218	=B22/(1+B\$3)^A;	-56	=SUMMA(C19:C22)
23	4	23347	18493	=B23/(1+B\$3)^A;	18437	=SUMMA(C19:C23)
24	5	23814	17795	=B24/(1+B\$3)^A;	36232	=SUMMA(C19:C24)
25						
26	Net Present Value				36232	
27	Initial Yield			36,7%	0,367	=B20/B19
28	Internal Rate of Return			25,8%	0,258	=IR(B19:B24)

Question 1a

$$PV = \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3}$$

$$PV = \frac{19,000}{1,06} + \frac{19,380}{(1,06)^2} + \frac{19,768}{(1,06)^3}$$

$$PV = 51,770$$

Question 1b

$$PV = \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \frac{C_4}{(1+r)^4} + \frac{C_5}{(1+r)^5}$$

$$PV = \frac{22,000}{1,06} + \frac{22,440}{(1,06)^2} + \frac{22,888}{(1,06)^3} + \frac{23,347}{(1,06)^4} + \frac{23,814}{(1,06)^5}$$

$$PV = 96,232$$

Question 2 a

$$NPV = PV - \text{Investment}$$

$$NPV = 51,770 - 20,000$$

$$NPV = 31,770$$

Or use this formula

$$NPV = -20,000 + \frac{19,000}{6\% - 2\%} - \frac{19,000}{6\% - 2\%} \times \frac{(1+2\%)^3}{(1+6\%)^3} = 31,770$$

Question 2 b

$$NPV = PV - \text{Investment}$$

$$NPV = 96,232 - 60,000$$

$$NPV = 36,232$$

Or use this formula

$$NPV = -60,000 + \frac{22,000}{6\% - 2\%} - \frac{22,000}{6\% - 2\%} \times \frac{(1+2\%)^5}{(1+6\%)^5} = 36,231$$

Question 3

A Internal rate of return = 79.6%

B Internal rate of return = 25.8%

Question 5

Present Value A = 51,770 €

Present Value B = 96,232 €

Net Present Value A = 31,770 €

Net Present Value B = 36,231 €

Yield A = 95%

Yield B = 37%

Internal rate of return A = 79.6%

Internal rate of return B = 25.8%

A or B?

Group discussions