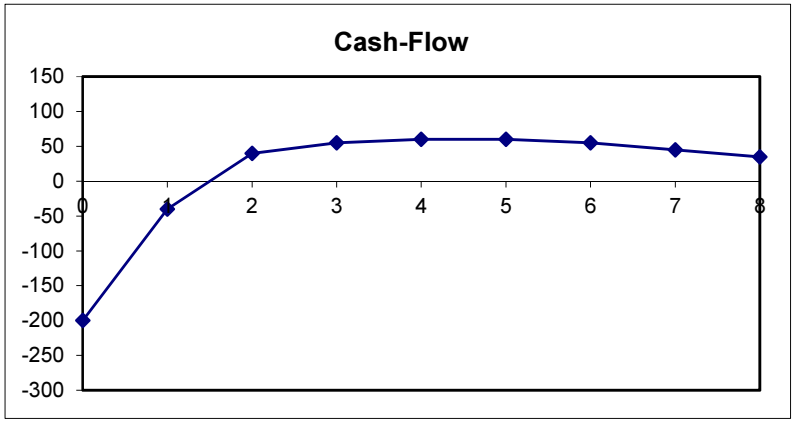
The Original Cash-Flow

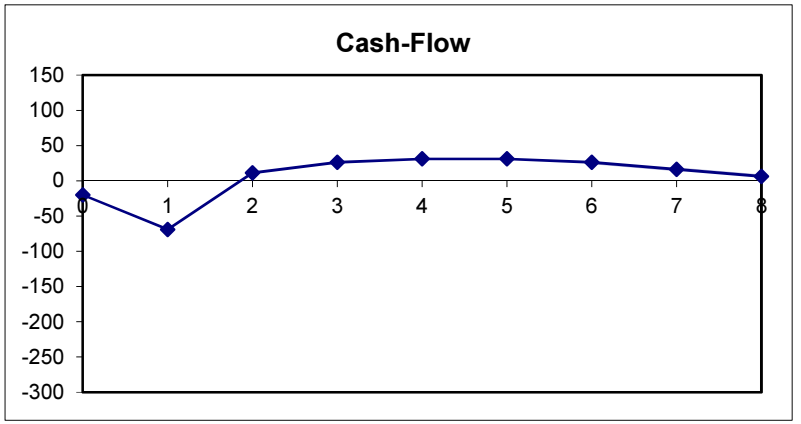
k	Q_k
0	-200
1	-40
2	40
3	55
4	60
5	60
6	55
7	45
8	35
Σ	110



P = 180 n = 8 i_e = 6,00%

$$R = P_* \frac{i_{e*}(1+ i)^n}{(1+ i_e)^n -1}$$ R = 28,99 (R = yearly cost of the Loan)

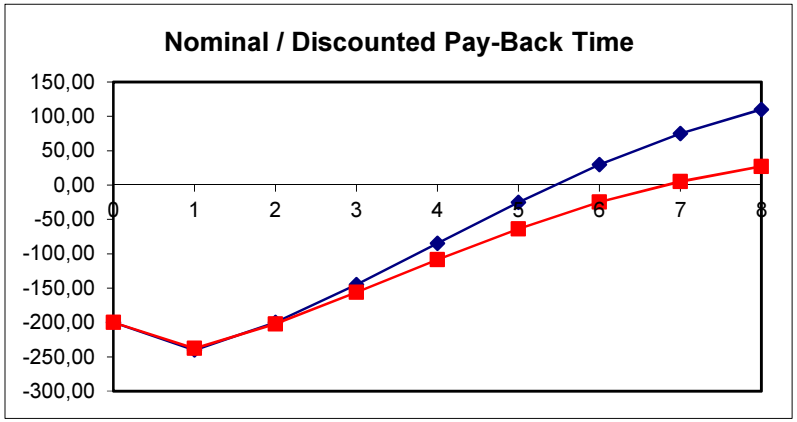
k	Q_k
0	-20
1	-68,99
2	11,01
3	26,01
4	31,01
5	31,01
6	26,01
7	16,01
8	6,01
Σ	58,11



The New Cash-Flow when drawing on a Loan Contract (of P,n,i_e,R)

Calculating Nominal and Discounted Pay-Back of the two Cash-Flows

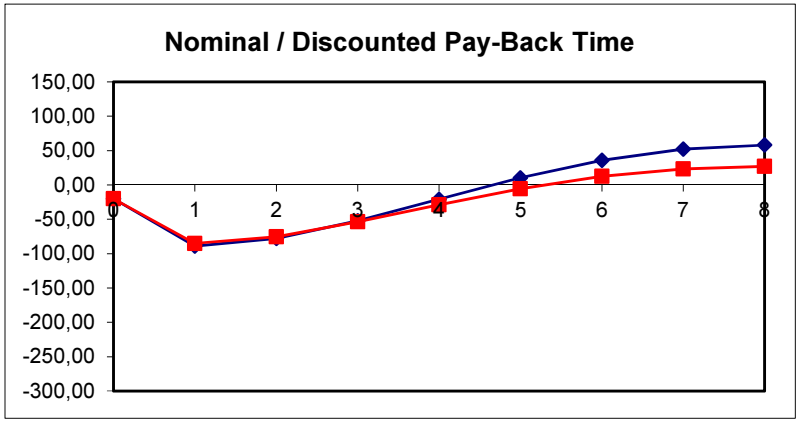
k	Q_k	i_e = 0%	i_e = 6,00%		
		$\Sigma_{L=0}^{k} Q_L$	$(1+i_e)^{-k}$	P_{Qk}	$\Sigma_{L=0}^{k} P_{QL}$
0	-200	-200,00	1,0000	-200,00	-200,00
1	-40	-240,00	0,9434	-37,74	-237,74
2	40	-200,00	0,8900	35,60	-202,14
3	55	-145,00	0,8396	46,18	-155,96
4	60	-85,00	0,7921	47,53	-108,43
5	60	-25,00	0,7473	44,84	-63,60
6	55	30,00	0,7050	38,77	-24,82
7	45	75,00	0,6651	29,93	5,10
8	35	110,00	0,6274	21,96	27,06
Σ	**110**	**NPBT**		**DPBT**	



P = 180 n = 8 i_e = 6,00%

$$R = P_* \frac{i_{e*}(1+i)^n}{(1+i_e)^n - 1} \qquad R = 28,99$$

k	Q_k	i_e = 0%	i_e = 6,00%		
		$\Sigma_{L=0}^{k} Q_L$	$(1+i_e)^{-k}$	P_{Qk}	$\Sigma_{L=0}^{k} P_{QL}$
0	-20	-20,00	1,0000	-20,00	-20,00
1	-68,99	-88,99	0,9434	-65,08	-85,08
2	11,01	-77,97	0,8900	9,80	-75,28
3	26,01	-51,96	0,8396	21,84	-53,44
4	31,01	-20,95	0,7921	24,57	-28,87
5	31,01	10,07	0,7473	23,18	-5,70
6	26,01	36,08	0,7050	18,34	12,64
7	16,01	52,09	0,6651	10,65	23,29
8	6,01	58,11	0,6274	3,77	27,06
Σ	**58,11**	**NPBT**		**DPBT**	



Calculating Internal Rate of Return of the two Cash-Flows

k	Q_k	i_1 = 8,00%		i_2 = 9,00%	
		$(1+i_1)^{-k}$	P_{Qk1}	$(1+i_2)^{-k}$	P_{Qk2}
0	-200	1,0000	-200,00	1,0000	-200,00
1	-40	0,9259	-37,04	0,9174	-36,70
2	40	0,8573	34,29	0,8417	33,67
3	55	0,7938	43,66	0,7722	42,47
4	60	0,7350	44,10	0,7084	42,51
5	60	0,6806	40,83	0,6499	39,00
6	55	0,6302	34,66	0,5963	32,79
7	45	0,5835	26,26	0,5470	24,62
8	35	0,5403	18,91	0,5019	17,57
Σ	**110**		**5,68**		**-4,08**

IRR ≅ 8,58%

P = 180 n = 8 i_e = 6,00%

$$R = P * \frac{i_e * (1+i)^n}{(1+i_e)^n - 1} \qquad R = 28{,}99$$

$$\mathbf{IRR \cong i_1 + (i_2 - i_1) * \frac{P_1}{(P_1 - P_2)}}$$

k	Q_k	i_1 = 14,00%		i_2 = 15,00%	
		$(1+i_1)^{-k}$	P_{Qk1}	$(1+i_2)^{-k}$	P_{Qk2}
0	-20	1,0000	-20,00	1,0000	-20,00
1	-68,99	0,8772	-60,51	0,8696	-59,99
2	11,01	0,7695	8,47	0,7561	8,33
3	26,01	0,6750	17,56	0,6575	17,10
4	31,01	0,5921	18,36	0,5718	17,73
5	31,01	0,5194	16,11	0,4972	15,42
6	26,01	0,4556	11,85	0,4323	11,25
7	16,01	0,3996	6,40	0,3759	6,02
8	6,01	0,3506	2,11	0,3269	1,97
Σ	**58,11**		**0,35**		**-2,17**

IRR ≅ 14,14%

Calculating Over-All Rate of Return of the two Cash-Flows

k	Q_k	P^-			S^+		
		Q_k^-	$(1+i_e)^{-k}$	P_{Qk}^-	Q_k^+	$(1+i_e)^{n-k}$	S_{Qk}^+
0	-200	200	1,0000	200,00	0	1,5938	0,00
1	-40	40	0,9434	37,74	0	1,5036	0,00
2	40	0	0,8900	0,00	40	1,4185	56,74
3	55	0	0,8396	0,00	55	1,3382	73,60
4	60	0	0,7921	0,00	60	1,2625	75,75
5	60	0	0,7473	0,00	60	1,1910	71,46
6	55	0	0,7050	0,00	55	1,1236	61,80
7	45	0	0,6651	0,00	45	1,0600	47,70
8	35	0	0,6274	0,00	35	1,0000	35,00
Σ	**110**	**240**		**238**	**350**		**422**

ORR = 7,44%

ΔP = 27,06

P = 180 n = 8 i_e = 6,00%

$$R = P_* \frac{i_{e*}(1+i)^n}{(1+i_e)^n - 1}$$ R = 28,99

$ORR = (S^+ / P^-)^{1/n} - 1$

k	Q_k	P^-			S^+		
		Q_k^-	$(1+i_e)^{-k}$	P_{Qk}^-	Q_k^+	$(1+i_e)^{n-k}$	S_{Qk}^+
0	-20	20,00	1,0000	20,00	0,00	1,5938	0,00
1	-68,99	68,99	0,9434	65,08	0,00	1,5036	0,00
2	11,01	0,00	0,8900	0,00	11,01	1,4185	15,62
3	26,01	0,00	0,8396	0,00	26,01	1,3382	34,81
4	31,01	0,00	0,7921	0,00	31,01	1,2625	39,15
5	31,01	0,00	0,7473	0,00	31,01	1,1910	36,94
6	26,01	0,00	0,7050	0,00	26,01	1,1236	29,23
7	16,01	0,00	0,6651	0,00	16,01	1,0600	16,97
8	6,01	0,00	0,6274	0,00	6,01	1,0000	6,01
Σ	**58,11**	**89**		**85**	**147**		**179**

ORR = 9,72%

ΔP = 27,06