BUS 220
Finansiering og investering
– høst 2024
Atle G. Guttormsen

Oppgavesett 0 - Fasit

Renteregning

Oppgave 1

$$15000 \cdot 1{,}05^{6} + 5000 \cdot 1{,}05^{5} = 26482{,}84$$

Oppgave 2

På konto etter 3 år: 100.000 * $1{,}055^{3}$ = kr 117.424,14

Opprinnelig sparekapital:	kr 100,000,00
Renter	kr 17,424,14

Oppgave 3

a)

4 %	År1	År2	År3	År4
30000	31200	32448	33745,92	35095,76

b)

		Rente	Rentes rente	Sluttbeløp	Andel
Opprinnelig beløp	30000				
Etter år 1	30000	1200	0	31200	
Etter år 2	30000	1200	48	32448	0,001479
Etter år 3	30000	1200	98	33746	0,004324
Etter år 4	30000	1200	150	35096	0,008427

c) 30 000 pluss rentene det siste året (1200) dvs. 31200
d) Se ovenfor

e)Sluttbeløp etter 20 år = 30 000*(1,04)^20=65 734
Herav enkel rente 1200*20=24000
Gir rentes rente 65734-30000-24000=11734
Andel =11734/65734=0,1785

Oppgave 4

$$92.000 \cdot 1{,}05^{x} = 150.000$$

$$1{,}05^{x} = 1{,}63043$$

$$X \approx 10 år$$

Oppgave 5

$$X \cdot 1{,}05^{6} = 200.000$$

X = 149.243

Kan sløse bort: 200.000 - 149.243 = 50.757

Oppgave 6

The decision involves comparing the present value, PV, of each option. Choose the option with the highest PV. Since the first cash flow occurs 0 years in the future, or today, it does not need to be adjusted.

PV(C_0) = **$1,000**

Since the second cash flow occurs 10 years in the future, it must be discounted back 10 years at eight percent.

PV(C_{10}) = C_{10} / $(1+r)^{10}$
= \$2,000 / $(1.08)^{10}$
= **$926.39**

Since the present value of the cash flow occurring today is higher than the present value of the cash flow occurring in year 10, you should take the $1,000 now.

Oppgave 7

The decision involves comparing the present value, PV, of each option. Choose the option with the highest PV.

a. At a discount rate of zero, the future value and present value of a cash flow are always the same. There is no need to discount the two choices to calculate the PV.

PV(Alternative 1) = **$10,000,000**

PV(Alternative 2) = **$20,000,000**

Choose Alternative 2 since its PV, $20,000,000, is greater than that of Alternative 1, $10,000,000.

b. Discount the cash flows at 10 percent. Discount Alternative 1 back one year and Alternative 2, five years.

PV(Alternative 1) = C / (1+r)
= \$10,000,000 / $(1.10)^{1}$
= **$9,090,909.10**

PV(Alternative 2) = \$20,000,000 / $(1.10)^{5}$
= **$12,418,426.46**

Choose Alternative 2 since its PV, $12,418,426.46, is greater than that of Alternative 1, $9,090,909.10.

c. Discount the cash flows at 20 percent. Discount Alternative 1 back one year and Alternative 2, five years.

PV(Alternative 1) = C / (1+r)
= \$10,000,000 / $(1.20)^1$
= **\$8,333,333.33**

PV(Alternative 2) = \$20,000,000 / $(1.20)^5$
= **\$8,037,551.44**

Choose Alternative 1 since its PV, \$8,333,333.33, is greater than that of Alternative 2, \$8,037,551.44.

d. You are indifferent when the PVs of the two alternatives are equal.

Alternative 1, discounted at *r*	= Alternative 2, discounted at *r*
\$10,000,000 / $(1+r)^1$	= \$20,000,000 / $(1+r)^5$

Solve for the discount rate, *r*, at which the two alternatives are equally attractive.

$[1 / (1+r)^1] (1+r)^5$	= \$20,000,000 / \$10,000,000
$(1+r)^4$	= 2
1+r	= 1.18921
r	= 0.18921 = **18.921%**

The two alternatives are equally attractive when discounted at 18.921 percent.

Oppgave 8

Har i banken etter 19 år:

$$X \cdot (1{,}043)^{19} = 150000$$

$$X = \frac{150000}{(1{,}043)^{19}} = 67405$$

Oppgave 9

$$10.000 \cdot \frac{(1+0{,}055)^{18}-1}{0{,}055} = 294.812$$

Oppgave 10

NV for 1. alternativ: $\frac{150.000}{1{,}04} + \frac{204.000}{1{,}04^4} = 318.610{,}82$

NV for 2. alternativ: $38.000 + \frac{38.000}{1{,}04} + \ldots + \frac{38.000}{1{,}04^9} = 320.542{,}62$

NV for 3. alternativ: 300.000

NV for 4. alternativ: $\frac{420000}{1{,}04^5} = 345.209{,}39$

4. alternativ er best

Oppgave 11

Du vinner en tv-konkurranse og kan velge mellom følgende premier

1) 120 000 som utbetales om ett år
2) 170 000 etter fem år og så ingen ting før etter femten da du får 20 000 til.
3) 10 300 hvert år til evig, utbetales første gang i dag.
4) 16 000 hvert år i ti år utbetales første gang om ett år.
5) 7 000 neste år som øker med 4% hvert år siden

a) Dersom kapitalkostnaden er 12 prosent, hvilken premie velger du?
b) Dersom kapitalkostnaden er 5 prosent, hvilken premie velger du

NB: Vis utregninger

Løsningsforslag:
Regner om alt til nåverdier:
a) 12 prosent
1) 120 000/(1+0,12)=107142
2) 170 000/(1+0,12)^5+20 000/(1+0,12)^15=100116
3) (10 300/0,12)+10300=96133
4) 16 000 * A (A=annuitetsfaktoren for rente 12% og 10 år) = 90 403
5) 7000/(0,12-0,04)=87500

Du velger alternativ 1

b) 5 prosent
1) 120 000/(1+0,05)=114285
2) 170 000/(1+0,05)^5+20 000/(1+0,05)^15=142819
3) 10 300/0,05=216300
4) 16 000 * A (A=annuitetsfaktoren for rente 12% og 10 år) = 123 547
5) 7000/(0,12-0,04)=700 000

Du velger alternativ 5

Oppgave 12

The deposit at the end of the first year will earn interest for six years, from the end of year 1 to the end of year 7.

$$FV = \$1{,}000\ (1.12)^6$$
$$= \$1{,}973.82$$

The deposit at the end of the second year will earn interest for five years.

$$FV = \$1{,}000\ (1.12)^5$$
$$= \$1{,}762.34$$

The deposit at the end of the third year will earn interest for four years.

FV = $1,000 (1.12)^4
= $1,573.52

The deposit at the end of the fourth year will earn interest for three years.

FV = $1,000 (1.12)^3
= $1,404.93

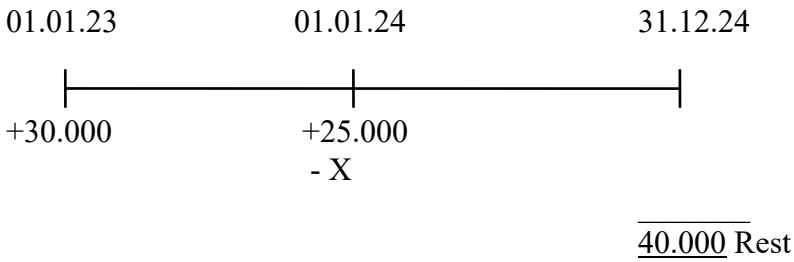
Combine the values found above to calculate the total value of the account at the end of the seventh year:

FV = $1,973.82 + $1,762.34 + $1,573.52 + $1,404.93
= **$6,714.61**

The value of the account at the end of seven years will be $6,714.61.

Oppgave 13

Kan maksimalt ta ut kr X



30000 • 1,05 = 31.500

(31.500 + 25.000 - X) • 1,05 = 40.000
59.325 - 1,05X = 40.000
1,05X = 19.325
X = 18.404

Han kan altså ta ut 18404 kroner 01.01.24.