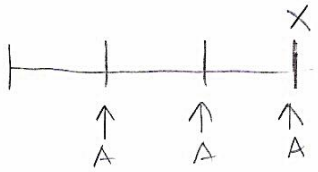
HI 2011/2012 fake pitalice

2



$r_1 = 6\,\%$
$r_2 = 3\,\%$
$A = 2000$

$$V(auto) = V_1(0) + V_2(0)$$

$$V_1(0) = 3000 \cdot 1.06^2 + 3000 \cdot 1.06 + 3000$$
$$= 9550.8$$

$$V_2(0) = \text{depozit} = \frac{A}{(1+r_2)^3} \cdot \frac{(1+r_2)^3 - 1}{r_2}$$

$$= 5657.2271$$

$$V(auto) = 9550.8 + 5657.2271 = 15208.027 //$$

3 NPV : unajmiti ili kupiti $[r = 5\,\%]$

NAJAM - 300 eura početkom svakog mjeseca

KUPNJA - 600 eura krajem svakog mjeseca
nakon 20 godina uložiti 10 000 eura
nakon 30 godina stan vrijedi 100 000

$$NPV_{NAJAM} = -300 + \frac{-300}{1 + 0.004166} + \dots + \frac{-300}{(1+0.004166)^{359}}$$

$$NPV_{KUPNJA} = \frac{-600}{1+0.004166} + \dots + \frac{-600}{1.004166^{359}} + \frac{-10000}{1.004166^{240}} + \frac{-600+100\,000}{1.004166^{360}}$$

Više se isplati kupnja.

4 $NPV = -N_0 + \frac{N_1}{1+r} + \frac{N_2}{(1+r)^2}$ 2

$N_0 = -100\,000$

$N_1 = 80\,000$

$N_2 = 30\,000$

---

a) ovisnost o r?

$$-100\,000 + \frac{80\,000}{1+r} + \frac{30000}{(1+r)^2} = 0$$

$x = 1 + r$

⋮

$x_1 = 1.07283 \rightarrow r = 0.0728$

$x_2 = -0.278 \rightarrow r = -1.278$ ×

r smije biti do 7.28 %

b) ako $r = 9\%$, $N_2 = ?$

$$-100\,000 + \frac{80000}{1.09} + \frac{N_2}{1.09^2} = 0$$

$N_2 = 31610$ //

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5.

5 BK : $C_{BK} = 95.12$, $N = 100$, $T = 1$ godina

K : $C_K = 104.95$, $N = 100$, $T = 2$ godine, $K = 10$

ARBITRAŽA = ?

- naći r

$B(0,1) = 95.12 = N \cdot e^{-rT} \rightarrow r = 0.05$

$r = 5\,\%$

$B(0,2) = 104.95 = 10e^{-r} + 110e^{-2r} \rightarrow r = 007$

$r = 7\,\%$

Različiti su, može arbitraža.

- $t = 0$ želim kupiti onu s većim r; $B(0,2)$

pa prodajem $\frac{B(0,2)}{B(0,1)} = 1.1033$ obveznica $B(0,1)$

$t = 1$ dobijem prvi kupon $= 10$

a moram isplatiti $1.1033 \cdot N = 110.33$

pa opet prodajem $\frac{110.33 - 10}{B(0,1)}$ obveznica $B(0,1)$

$t = 2$ dobijem drugi kupon $= 10$ i nominalu $= 100$

moram isplatiti $1.0548 \cdot N = 105.477$

$V(2) = 110 - 105.477 = 4.52$ //

6 Kamatna stopa poraste za +2 postotna poena

a) $\frac{\Delta C}{C} \cong -D \cdot \Delta y$

$\Delta C \cong 100 \cdot (-10 \cdot 0.02)$

$\cong -20$ (relativna promjena potrošnje)

Kad kamatna stopa raste, cijena pada.
Aktivna veća od procijenjene?

b) 2

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7 (imunizacija portfelja)

obveznice A : $C_A = 0.95$, $D_A = 1$ godina
obveznice B : $C_B = 1.15$, $D_B = 3$ godine
Ulažemo 25000 na godinu dana

a)
$t=0$

$$D_{A+B} = w_A \cdot D_A + w_B \cdot D_B$$
$$1 = w_A \cdot 1 + (1 - w_A) \cdot 3$$
$$\rightarrow w_A = 1, \quad w_B = 0$$ } sve uložiti u obveznicu A

$$\rightarrow \frac{25000}{C_A} = 26315.78$$ obveznica A kupiti

---

obveznice A : $C_A = 0.75$, $D_A = 0.61$
obveznice B : $C_B = 0.93$, $D_A = 2.5$
vrijednost portfelja u $t=0.5$ = $26315.78 \cdot 0.75$
$= 19736.835$

$$0.5 = w_A \cdot 0.61 + (1 - w_A) \cdot 2.5$$
$$\rightarrow w_A = 1.0582$$
$$w_B = -0.0582$$

$\rightarrow$ $19736.835 \cdot 1.0582 = 20\,885.518$ novaca u A
$19736.835 \cdot (-0.0582) = -1148.638$ novaca u B

$$\rightarrow \frac{20\,885.518}{C_A} = 27\,847.357$$
$$\frac{-1148.638}{C_B} = -1235.14$$

Prodati 1235.14 obveznica B, dodatno kupiti 1531.57 obv. A //

[6]

[8] $B(0,4) = 0.9320$

$B(0,2) = x > 0.9320$

$B(2,4) = a, \quad a > 0$

$\Big\}\ y(0,2) = y(0,4)$

$y(2,4)$

a) UVJET NEARBITRAŽE

$$B(0,T) = B(0,t) \cdot B(t,T)$$

$$B(0,4) = B(0,2) \cdot B(2,4)$$

$$0.9320 = x \cdot a, \quad a \in \langle 0,1 \rangle$$

b) MOGUĆNOST ARBITRAŽE, ?

ako $a > 1$