3) $n = 3$ roky

$FV_3 = 1\,000\,000$

$i = 0{,}07$

$PV = ?$

$$PV = \frac{FV}{(1+i)^n}$$

$$PV = \frac{1\,000\,000}{(1+0{,}07)^3} = 816\,294{,}8 \text{ Kč}$$

---

4) $FV_2 = 5\,000\,000$; $n = 2$

$i = 0{,}05$

$PV = ?$

$$PV = \frac{FV}{(1+i)^n}$$

$$PV = \frac{5\,000\,000}{(1{,}05)^2} = 4\,535\,147{,}4$$

---

5) NÁKLAD = + 1 400 000

Ø ZISK = 300 000

Ø PB = ?

$$\text{Ø PB} = \frac{1\,400\,000}{300\,000}$$

Ø PB = 4,67 LET

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6) PROJEKT A:

NÁKLADY = 550 000

Ø ZISK = 200 000

PROJEKT B:

NÁKLADY = 400 000

Ø ZISK = 245 000

$$\text{Ø PB}_A = \frac{550\,000}{200\,000} = 2{,}75 \text{ let}$$

$$\text{Ø PB}_B = \frac{400\,000}{245\,000} = 2{,}54 \text{ let}$$

PRO PROJEKT B

---

7) NÁKLADY = 600 000

CF (180 000 ; 180 000 ; 180 000 ; 180 000 ; 180 000)

ROK 1 ROK 2 ROK 5

$i = 0{,}03$

$$ČSH = -I + \sum_{i=1}^{n} \frac{CF_i}{(1+i)^n} = -600\,000 + \frac{180\,000}{1{,}03} + \frac{180\,000}{1{,}03^2} + \ldots + \frac{180\,000}{1{,}03^5}$$

PŘÍK. 32. 5

$$ČSH = -600.000 + \boxed{a_1 \cdot \frac{q^n - 1}{q - 1}} = -600.000 + \frac{180.000}{1{,}03} \cdot \frac{\left(\frac{1}{1{,}03}\right)^5 - 1}{\left(\frac{1}{1{,}03}\right) - 1} =$$

$a_1 = \frac{180.000}{1{,}03}$

$q = \frac{1}{1{,}03}$

$n = 5$

DOSADIT → KONSTANTNÍ ANUITA

$$= -600.000 + 824.347{,}3$$

$$= 224.347{,}3$$

---

(6) $n = 8$ let

KUPON = 50

FV = 1.000

$i = 0{,}11$

$$MAX. CENA = \boxed{\frac{50}{1{,}11} + \frac{50}{(1{,}11)^2} + \dots \frac{50}{(1{,}11)^8}} + \frac{1.000}{(1{,}11)^8}$$

KONSTANTNÍ ANUITA

$$\boxed{a_1 \cdot \frac{q^n - 1}{q - 1}} \rightarrow \boxed{\begin{aligned} a_1 &= \frac{50}{1{,}11} \\ q &= \frac{1}{1{,}11} \\ n &= 8 \end{aligned}}$$

$$= MIN\ CENA = \frac{50}{1{,}11} \cdot \frac{\left(\frac{1}{1{,}11}\right)^8 - 1}{\frac{1}{1{,}11} - 1} + \frac{1.000}{(1{,}11)^8}$$

$$= 257{,}3 + 433{,}92 = 691{,}22$$

(7) $D = 50$

$i = 0{,}08$

MAX CENA $= \dfrac{50}{1{,}08} + \dfrac{50}{(1{,}08)^2} + \dfrac{50}{(1{,}08)^3} + \dots + \dfrac{50}{(1{,}08)^n}$

KONSTANTNÍ PERPETUITA

$a_1 \cdot \dfrac{1}{1-q}$ → $a_1 = \dfrac{50}{1{,}08}$, $q = \dfrac{1}{1{,}08}$ → NEBOLI → $\dfrac{C}{i} = \dfrac{D}{i}$

MAX CENA $= \dfrac{50}{1{,}08} \cdot \dfrac{1}{1 - \frac{1}{1{,}08}} = \underline{625}$, ALTERNATIVNĚ

MAX CENA $= \dfrac{D}{i} = \dfrac{50}{0{,}08} = \underline{625}$

(8) $P_3 = 1050$ PRODEJNÍ CENA ZA 3 ROKY

$D_0 = 30$ (POLOLETNÉ)

$q = 0{,}06$ ROČNĚ $\Rightarrow 0{,}03$ POLOLETNĚ

$k = 0{,}08$ ROČNĚ $\Rightarrow 0{,}04$ POLOLETNĚ

$n = 3 \cdot 2 = 6$ (3 ROKY → 6 POLOLETÍ)

MAX CENA $= \dfrac{30 \cdot (1+0{,}03)}{(1+0{,}04)} + \dfrac{30 \cdot (1+0{,}03)}{(1+0{,}04)^2} + \dots + \dfrac{30 \cdot (1+1{,}03)^6}{(1+0{,}04)^6} + \dfrac{1.050}{(1+0{,}04)^6}$

$\dfrac{a_1 \cdot q^n - 1}{q - 1}$ → ANUITA S KONSTANTNÍM RŮSTEM → $a_1 = \dfrac{30 \cdot (1+0{,}03)}{1+0{,}04}$, $q = \dfrac{1+0{,}03}{1{,}04}$, $n = 6$

$$\text{MAX CENA} = \frac{30\cdot(1+0{,}03)}{(1+0{,}04)} \cdot \frac{\left(\frac{1+0{,}03}{1+0{,}04}\right)^6 - 1}{\left(\frac{1+0{,}03}{1+0{,}04}\right) - 1} + \frac{1.030}{(1+0{,}04)^6} =$$

$$= 1.440 + 329{,}8 = \underline{1.003{,}8}$$

---

(9) PERPETUITNÍ DLUHOPIS $C = 50$ × PERP. DLUH S KONS. R. $C = 30$, $g = 0{,}05$

$$\rightarrow PV_{\text{PERP. DLUH}} > PV_{\text{PERP. DLUH. S KONS. RŮSTEM}}$$

$$\boxed{\frac{C}{1+i} + \frac{C}{(1+i)^2} + \frac{C}{(1+i)^3} + \ldots + \frac{C}{(1+i)^n}} > \boxed{\frac{C\cdot(1+g)}{(1+i)} + \frac{C\cdot(1+g)^2}{(1+i)^2} + \ldots + \frac{C(1+g)^n}{(1+i)^n}}$$

KONSTANTNÍ PERPETUITA

$\Rightarrow \frac{C}{i}$

PERPETUITA S KONS. RŮSTEM

$\frac{C\cdot(1+g)}{1+i}$

$$\frac{C}{i} > \frac{C\cdot(1+g)}{1+i}$$

$$\frac{50}{i} > \frac{30\cdot(1+0{,}05)}{1+i}$$

$$50\cdot(1+i) > 30\cdot i\cdot(1+0{,}05)$$

$$50i - 2{,}5 > 31{,}5i$$

$$18{,}5i > 2{,}5$$

$$i > 0{,}1351 \rightarrow 13{,}51\ \%$$

10)

PROJEKT A

$V_0 = 550.000$

$n = 4, i = 11\%$

$CF(350.000^0; 250.000^1; 150.000^2, 50.000^3; 800.000^4)$

$$NSH_A = -550.000 + 350.000 + \frac{250.000}{1,11} + \frac{150.000}{1,11^2} + \frac{50.000}{1,11^3} + \frac{800.000}{1,11^4}$$

$$= -550.000 + 350.000 + 225.225,2 + 121.443,4 + 36.559,57 + 526.984,8 =$$

$$= -550.000 + 1.260.513 = \underline{+10.512,9}$$

PROJEKT B

$V_0 = 550.000$

$n = 4; i = 11\%$

$CF(50.000^0, 150.000^1, 250.000^2, 350.000^3, 800.000^4)$

$$NSH = -550.000 + 50.000 + \frac{150.000}{1,11} + \frac{250.000}{1,11^2} + \frac{350.000}{1,11^3} + \frac{800.000}{1,11^4} = -550.000 +$$

$$+ 50.000 + 135.135,2 + 202.905,6 + 255.917 + 526.984,8 = -550.000 +$$

$$+ 1.170.943 = \underline{+620.942,5}$$

PROJEKT „A"

---

11) INVESTICE = 4.500.000

CF = 5000.000

i = 0,07

$$NSH = -4500.000 + \frac{5.000.000}{1,07} = \underline{142.894,2}$$