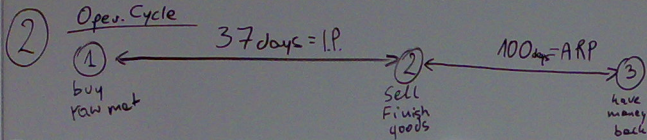


$$100,000 \times 2€ = 200,000$$

① $CR = 200,000$



③ ASSETS:

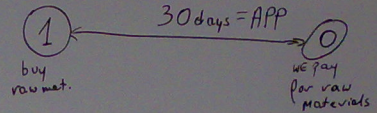
$$INV = \frac{CR}{360} \cdot IP = \frac{200,000}{360} \cdot 37 = 20,556$$

$$AR = \frac{CR}{360} \cdot ARP = \frac{200,000}{360} \cdot 100 = 55,556$$

$$CASH = (5) \cdot \frac{CR}{360} = 2,778$$

$$FA = 500,000$$

④ AP (our obligations to our suppliers)

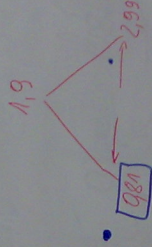
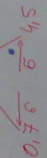


$$AP = \frac{200,000}{360} \cdot 30 = 16,667$$

ASSET	LIABILITIES
FA = 500,000	
INV = 20,560	
AR = 55,560	
CASH = 2,780	16,667 = AP
TA = 578,900	578,900 = TL

$$C.R_{AT10} = \frac{104 + 140 + 20}{80} = 3,3 \quad \left\{ \begin{array}{l} 2,6 \\ 67\% \end{array} \right.$$

$$C_u Ratio_S = \frac{60 + 60 + 4}{50} = \underline{\underline{2,88}}$$



$$QR_A = \frac{\overbrace{104 + 140 + 20}^{CA} - 104}{80} = 2$$

$$QR_B = \frac{80 + 60 + 4 - 80}{50} = 1,28$$



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$$FCF_0 = -984$$

$$FCF_{1-8} = 640$$

$$FCF_8 = 1600$$

$$\begin{aligned} NPV &= -984 + \frac{640}{0,1518\%} \cdot \left(1 - \frac{1}{1,1518^7}\right) + \frac{2240}{1,1518^8} \\ &= 2388 > 0 \quad \square \end{aligned}$$

- Capital Involvement
- FCF_0, FCF_{1-n}, FCF_n
- IRR
- Cost of Capital if D/
- NPV

What will change if IP

What will change if AR

What will change if AP

0% & $k_e = ?$ $k_{RF} = 7\%$, $k_m = 17\%$, $\beta_U = 0,9$

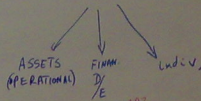
Longer?

Longer?

Longer?

$$CC = k_E^{13,5\%} \cdot \frac{E^{0,6}}{D+E} + k_D^{10\%} \cdot \frac{D^{0,4}}{D+E} \cdot (1-T) = 15,18\%$$

$$k_E = k_{RF}^{7\%} + \beta_L^* \cdot (k_m^{17\%} - k_{RF}^{7\%}) = 19,9\%$$



$$\beta_L^* = \beta_U \cdot \left(1 + \frac{D}{E} \cdot \frac{-0,07}{0,14}\right) = 1,39 \cdot 0,93 = 1,29$$

$$\beta_L = \beta_U \cdot \left(1 + (1-T) \cdot \frac{D}{E}\right) = 0,9 \cdot (1 + 0,14 \cdot 0,67)$$

$$\beta_L = 1,39$$

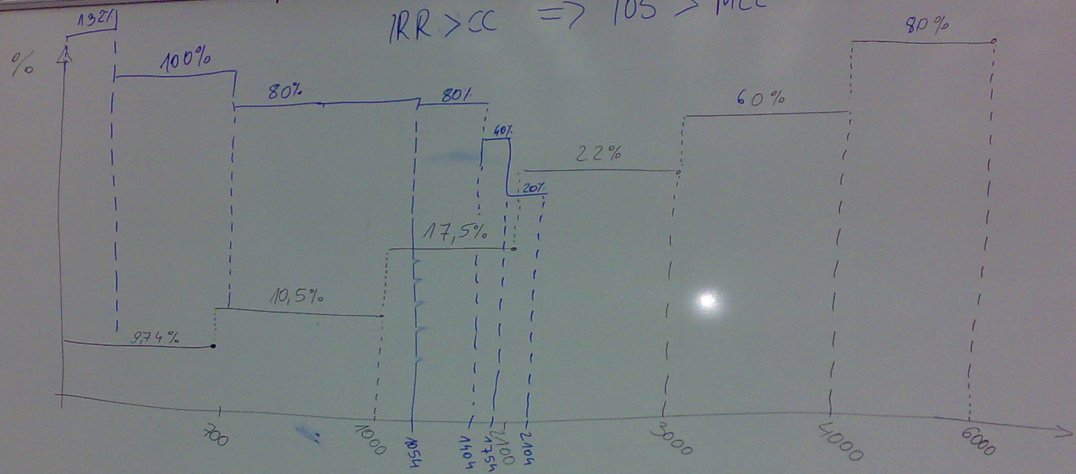
$$\frac{D}{D+E} = 40\%$$

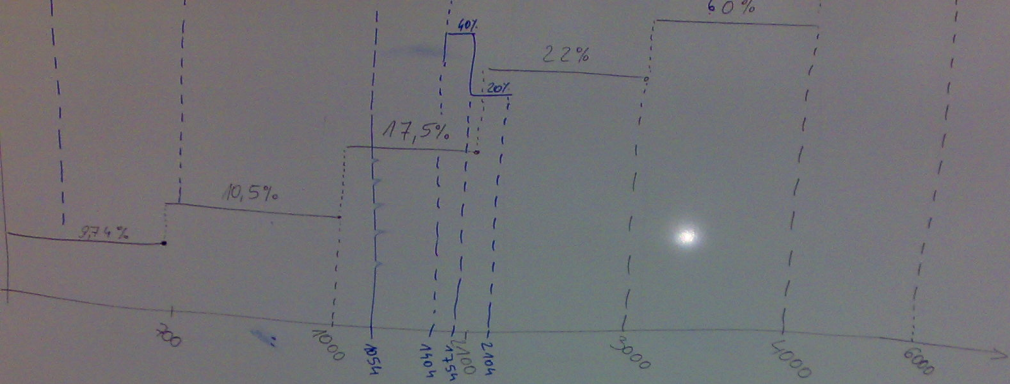
$$\frac{E}{D+E} = 60\%$$

$$\frac{D}{E} = 0,67$$

	DSL	GSL+OP	PN ⁷	LUB 6	POM 5	MAZOW 4	W-M 3	Matop 2	LUBEL 1
CR	720	720	720	720	720	720	720	720	720
OKZAP	40	41	43	45	46	48	55	60	80
OSN	21	23	23	25	28	29	38	40	50
FA	250	270	280	290	300	320	400	500	600
SP-cash	10	11	10	12	14	14	20	22	30
OOSZWD	14	14	14	14	14	14	14	14	14
FCF ₀	-354	-350*	-350*	-350*	-350*	-350*	-350*	-350*	-350*
FCF _{1.8a}	466								
FCF _{8a}	346								
IRR	132%	100%*	80%*	40%*	20%*	10%*	5%*	2%*	1%*

$IRR > CC \Rightarrow IOS > MCC$





OSN	2
FA	1
SP=cash	1
0052wd	1
FCIE ₀	-3
FCF _{1,8a}	4
FCF _{8a}	34
IRR	13

C/D Str 2007	D	E	D/E	D/(D+E)	k_e	WACC
0/	0	100000	0	0	0,2	0,2
30/	30000	70000	0,43	0,3	0,2347	0,189
50/	50000	50000	1	0,5	0,281	0,181
40/	40000	30000	2,333	0,7	0,389	0,1734

$$k_{e,0,3} = 0,2 + (0,2 - 0,1) \cdot 0,81 \cdot 0,43 = 0,2347$$

$$k_{e,0,5} = 0,2 + (0,2 - 0,1) \cdot 0,81 \cdot 1 = 0,2 + 0,081 = 0,281$$

$$k_{e,0,7} = 0,2 + (0,2 - 0,1) \cdot 0,81 \cdot 2,333 = 0,389$$

$$WACC_{0,3} = 0,2347 \cdot 0,7 + 0,1 \cdot 0,81 \cdot 0,3 = 0,189$$

$$WACC_{0,5} = 0,281 \cdot 0,5 + 0,1 \cdot 0,81 \cdot 0,5 = 0,181$$

$$WACC_{0,7} = 0,389 \cdot 0,3 + 0,1 \cdot 0,81 \cdot 0,7 = 0,1734$$

SP3.

a)

$$E = 100\ 000$$

$$D = 0$$

$$k_d = 0,1$$

$$r_A = 0,2$$

$$k_e = Z = r_A + (r_A - k_d)(1 - T_c) \frac{D}{E} = 0,2$$

$$k_e = 0,2 + (0,2 - 0,1)(1 - 0,19) \frac{0}{100\ 000} = 0,2$$

b)

$$E + D = 100\ 000$$

$$D = 0,2(E + D) \quad E = 80\ 000$$

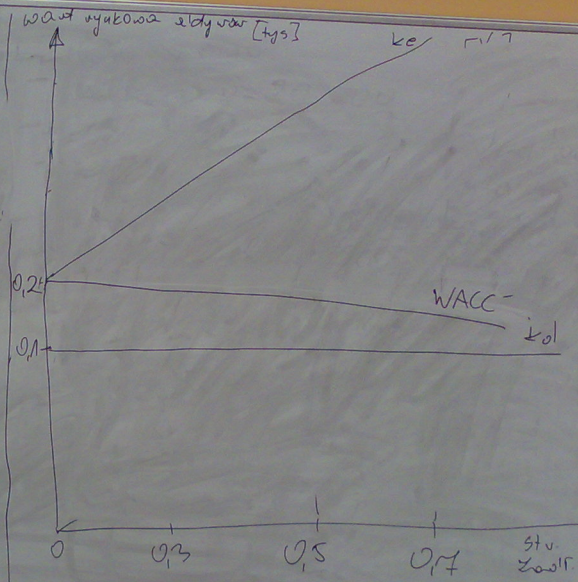
$$D = 20\ 000$$

$$k_d = 0,1$$

$$r_A = 0,2$$

$$k_e = 0,2 + (0,2 - 0,1)(1 - 0,19) \frac{20\ 000}{80\ 000}$$

$$k_e = 0,2 + 0,1 \cdot 0,81 \cdot \frac{2}{8} = 0,2202$$



C / W_d Str. zw. d.	D	E	D/E	D/(D+E)	k_e	WACC
0%	0	100000	0	0	0,2	0,2
30%	30000	70000	0,43	0,3	0,2347	0,189
50%	50000	50000	1	0,5	0,281	0,181
40%	40000	30000	2,333	0,7	0,389	0,1734

$$k_{e,0\%} = 0,2 + (0,2 - 0,1) \cdot 0,81 \cdot 0,43 = 0,2347$$

$$k_{e,3\%} = 0,2 + (0,2 - 0,1) \cdot 0,81 \cdot 1 = 0,2 + 0,081 = 0,281$$

$$k_{e,5\%} = 0,2 + (0,2 - 0,1) \cdot 0,81 \cdot 2,33 = 0,389$$

$$WACC_{0\%} = 0,2347 \cdot 0,7 + 0,1 \cdot 0,81 \cdot 0,3 = 0,189$$

$$WACC_{3\%} = 0,281 \cdot 0,5 + 0,1 \cdot 0,81 \cdot 0,5 = 0,181$$

$$WACC_{4\%} = 0,389 \cdot 0,3 + 0,1 \cdot 0,81 \cdot 0,7 = 0,1734$$

Stv.
Zahl



SP3.

a)

$$E = 100\,000$$

$$D = 0$$

$$k_d = 0,1$$

$$r_A = 0,2$$

$$k_e = z = r_A + (r_A - k_d)(1 - T_c) \frac{D}{E} = 0,2$$

$$k_e = 0,2 + (0,2 - 0,1)(1 - 0,19) \frac{0}{100\,000} = 0,2$$

b)

$$E + D = 100\,000$$

$$D = 0,2(E + D) \Rightarrow E = 80\,000$$

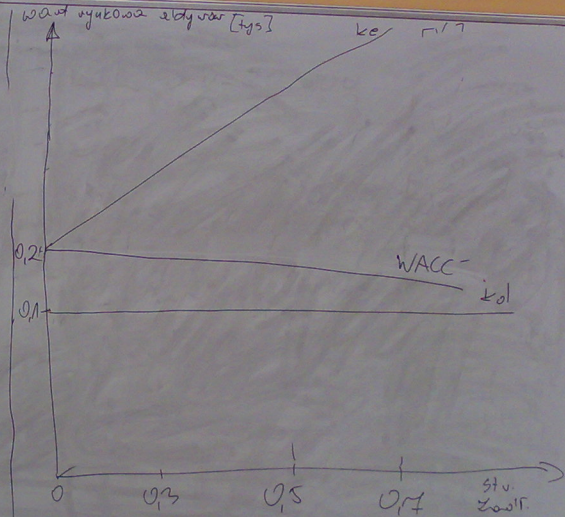
$$D = 20\,000$$

$$k_d = 0,1$$

$$r_A = 0,2$$

$$k_e = 0,2 + (0,2 - 0,1)(1 - 0,19) \frac{20\,000}{80\,000}$$

$$k_e = 0,2 + 0,1 \cdot 0,81 \cdot \frac{2}{8} = 0,2202$$



a) SP3.

$$E = 100\,000$$

$$D = 0$$

$$k_d = 0,1$$

$$r_A = 0,2$$

$$k_e = r_A + (r_A - k_d)(1 - T_c) \frac{D}{E}$$

$$k_e = 0,2 + (0,2 - 0,1)(1 - 0,19) \frac{0}{100\,000} = 0,2$$

b)

$$E + D = 100\,000$$

$$E = 80\,000$$

$$D = 20\,000$$

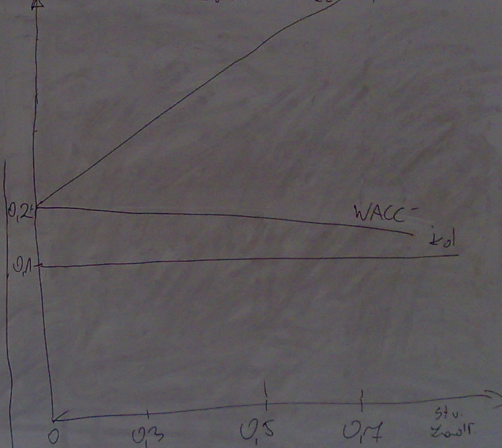
$$E = 60\,000$$

$$D = 40\,000$$

$$k_e = 0,2 + (0,2 - 0,1)(1 - 0,19) \frac{20\,000}{80\,000}$$

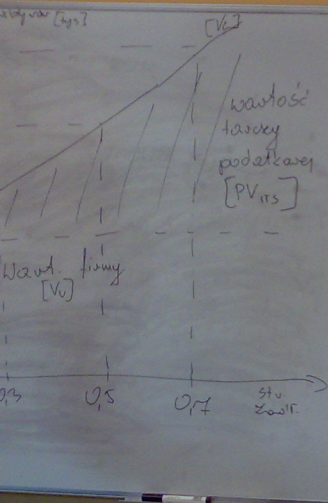
$$k_e = 0,2 + 0,1 \cdot 0,81 \cdot \frac{2}{8} = 0,2202$$

WACC-Strukturkoeffizient [1/100]



D/E	Strukturkoeffizient
0/1	0/
30/	30/
50/	50/
40/	40/

11



C/V_0 Stu. zad.	D.	L. udz	V_0	PV_{irs}	V_L	E	cen. udz
0%	0	100	100 000	0	100 000	100 000	1000
30%	30 000	70	100 000	5 400	105 400	145 400	1081,43
50%	50 000	50	100 000	9 500	109 500	159 500	1190
70%	70 000	30	100 000	13 300	113 300	173 300	1443,33

a) SP2

$T_c = 0,13$
 $\downarrow d = 0,1$
 $D = 50\ 000$

ROZNA
ODSETKOWA
TARIFA
RODATKOWA

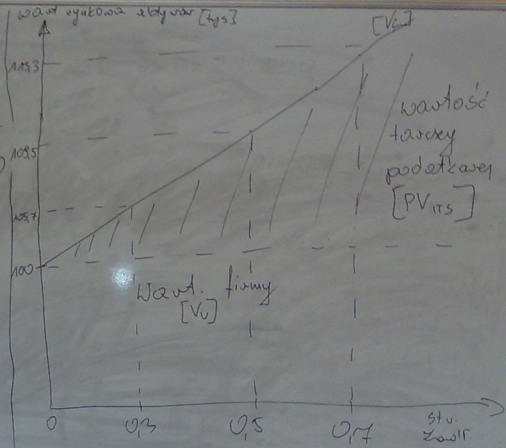
$= T_c \cdot d \cdot D = 950$

1. $V_L = V_V + PV_{ITS}$

$PV_{ITS} = T_c \cdot D = 9500$

$V_V = 100\ 000$

$V_L = 109\ 500$



t_c	Sto. podł.	D.
0%		0
30%		30000
50%		50000
40%		10000

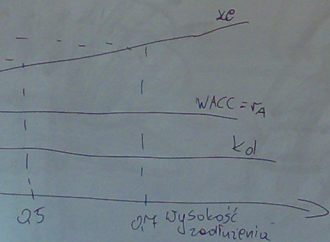
$$b) E + D = 100\ 000$$

$$D = 0,2E \Rightarrow D = 20\ 000$$

$$k_d = 0,1 \quad E = 80\ 000$$

$$k_A = 0,2$$

$$2) k_e = 0,2 + (0,2 - 0,1) \frac{20\ 000}{80\ 000} = 0,225$$



c)

Ws Str. zadł.	Ry. finans.	Wart zysk	Kap dług	Kap własny	Wzrost udzi	Cost udzi
0%	nie ma	100 000	0	100 000	100	1000
30%	niskie	100 000	30 000	70 000	70	1000
50%	przebieżane	100 000	50 000	50 000	50	1000
40%	wysokie	100 000	70 000	30 000	30	1000

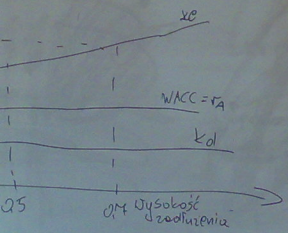
b) $E + D = 100\ 000$

$D = 0,2E \Rightarrow D = 20\ 000$

$E = 80\ 000$

$k_d = 0,1$

$k_e = 0,2 + (0,2 - 0,1) \frac{20000}{80000} = 0,225$



c)

k_d Str. zadł.	R_{ryz} finans	Wart zysk	kap dług	kap własny	liczba udzi	cenę udz
0%	nie ma	100 000	0	100 000	100	1000
30%	niskie	100 000	30 000	40 000	40	1000
50%	pośrednie	100 000	50 000	50 000	50	1000
40%	wysokie	100 000	40 000	30 000	30	1000

a) SP1
 $E = 100\ 000$
 $D = 0$
 $k_d = 0,1$
 $r_A = 0,2$

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

b) $E + D = 100\ 000$
 $D = 0,2 E \Rightarrow D = 20\ 000$
 $E = 80\ 000$
 $k_d = 0,1$
 $r_A = 0,2$

$$k_e = 0,2 + (0,2 - 0,1) \frac{20\ 000}{80\ 000} = 0,225$$

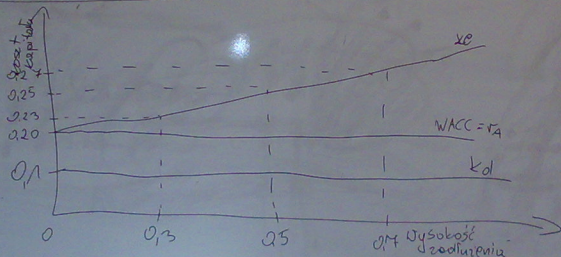
d) $r_A = 0,2$
 $k_d = 0,1$

$$k_{e1} = 0,2 + 0,1 \cdot 0 = 0,2$$

$$k_{e2} = 0,2 + 0,1 \cdot 0,3 = 0,23$$

$$k_{e3} = 0,2 + 0,1 \cdot 0,5 = 0,25$$

$$k_{e4} = 0,2 + 0,1 \cdot 0,7 = 0,27$$



c) Ws
 Str 200
 0/
 30/
 50/
 40/

a) SP1

$$E = 100\ 000$$

$$D = 0$$

$$k_d = 0,1$$

$$r_A = 0,2$$

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

b) $E + D = 100\ 000$

$$D = 0,2E \Rightarrow D = 20\ 000$$

$$k_d = 0,1 \quad E = 80\ 000$$

$$r_A = 0,2$$

$$k_e = 0,2 + (0,2 - 0,1) \frac{20\ 000}{80\ 000} = 0,225$$

d)

$$r_A = 0,2$$

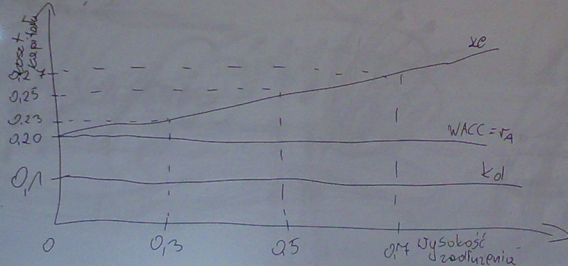
$$k_d = 0,1$$

$$k_{e1} = 0,2 + 0,1 \cdot 0 = 0,2$$

$$k_{e2} = 0,2 + 0,1 \cdot 0,3 = 0,23$$

$$k_{e3} = 0,2 + 0,1 \cdot 0,5 = 0,25$$

$$k_{e4} = 0,2 + 0,1 \cdot 0,7 = 0,27$$



7	1-22a	22b	
	CR	200000	450000
	-CE	132000	0
	-NCE	50000	500000
	= EBIT	18000	-50000
	= NOPAT = = EBIT · (1-T)	14580	-40500
+ NCE	50000	500000	
-ΔNWC	0	-62233	
-Capex	50000	0	
FCF _{1,22a}	14580	521733	

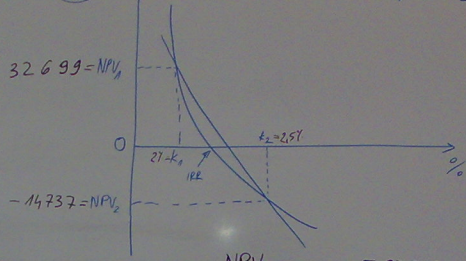
FCF = -562233

$NCE_{22b} = 500000 - 50000 \times 22 + 27 \cdot 50000 = 500000$

$\Delta NWC_{22b} = -(INV_1 + AR_0 + Capex - AR_0) - 22 \cdot \Delta NWC_{1,22a}$
 $= -20560 - 55560 - 2780 + 16667 - 22 \cdot 0 = -62233$

8 EA

$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$



$NPV_{(k=10\%)} = -562233 + \frac{14580}{0,1} \cdot \left(1 - \frac{1}{1,1^{22}}\right)$

$NPV_{(k=25\%)} = -562233 + \frac{14580}{0,025} \cdot \left(1 - \frac{1}{1,025^{22}}\right)$

$NPV_{(k=2\%)} = -562233 + \frac{14580}{0,02} \cdot \left(1 - \frac{1}{1,02^{22}}\right)$

9

$k_E =$

CC =
 $k_j = 6\%$
 $k_{RF} + \beta$
 ASSETS (OPERATIONS)
 FIN (DI)
 $\frac{1}{1,025^{22}} + \frac{FCF_{22} + F}{1,1^{22}} + \frac{5363}{1,1^{22}} + \frac{536}{1,02}$

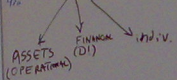
9

$$CC = k_D \cdot \frac{D}{D+E} \cdot (1-T) + k_E \cdot \frac{E}{D+E} = 11,85\% > IRR$$

$$k_D = 6\% \quad \frac{D}{D+E} = \frac{0,39}{0,81} \quad \frac{E}{D+E} = \frac{16,51}{0,61}$$

$k_E =$

$$k_{RF} + \beta_L \cdot (k_M - k_{RF}) = 16,32\%$$



$$\beta_L^* = \beta_L \cdot (1 + S_2) = 1,54$$

$$\beta_L = \beta_U \cdot (1 + (1-T) \cdot \frac{D}{E}) = 1,67 \quad (\beta_U = 1,1)$$

(HAMADA ROBERT) (DAMODARAN BETAS)

ii

IRR > CC ☺
IRR < CC ☹

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$$\frac{14580}{0,025} \cdot \left(1 - \frac{1}{1,1^{24}}\right)$$

$$- \frac{1}{1,1^{24}}$$

$$+ \frac{14580}{0,02} \cdot \left(1 - \frac{1}{1,02^{22}}\right)$$

$$\frac{1}{1,025^{24}} + \frac{536313}{1,025^{22}} = -14737$$

$$+ \frac{536313}{1,1^{22}} = -370251$$

$$+ \frac{536313}{1,02^{22}} = 32699$$

$$IRR^* = 2\% + \frac{32699 \cdot (0,5\%)}{32699 - (-14737)} = 2,34\%$$

> IRR

i^*

IRR > CC

IRR < CC

\bar{u}

\bar{n}

1,54

$\beta_0 = 1,1$
AN BETAS

$$+ \frac{32699 \cdot (0,5\%)}{32699 - (-14737)} = \underline{\underline{2,34\%}}$$

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9

$$k_E =$$

$$\frac{4580}{0,025} \cdot \left(1 - \frac{1}{1,125}\right) + \frac{14580}{0,02} \cdot \left(1 - \frac{1}{1,125}\right)$$

11

$$CC = k_D \cdot \frac{D}{D+E} \cdot (1-T) + k_E \cdot \frac{E+D}{D+E} = 11,85\% > IRR$$

$$k_D = 6\% \cdot 0,39 = 2,34\%$$

$$k_{RF} + \beta_L \cdot (k_M - k_{RF}) = 16,32\%$$

ASSETS (OPERATION)
FINANCIAL (BI)
DIV.

$$\beta_L^* = \beta_L \cdot (1 + S2) = 1,54$$

$$\beta_L = \beta_U \cdot \left(1 + (1-T) \cdot \frac{D}{E}\right) = 1,67$$

(HAWAPA ROBERT) (DAMUDARAN BETAS)

IRR > CC
IRR < CC

$$\frac{1}{1,025^{21}} + \frac{536313}{1,025^{22}} = -14737$$

$$\frac{FCF_{21} + FCF_{22}}{1,1^{22}} = -370251$$

$$\frac{536313}{1,02^{22}} = 32699$$

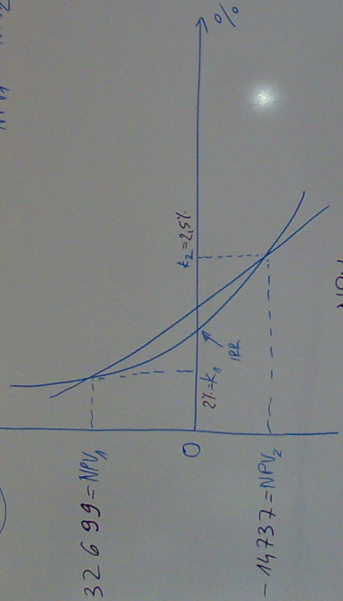
$$IRR^* = 2\% + \frac{32699 \cdot (0,5\%)}{32699 - (-14737)} = 2,1\%$$

8

$$IRR^* = k_n + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$$

9

$$k_E =$$



32699 = NPV₁

-14737 = NPV₂

$$NPV_{(k=25\%)} = -562233 + \frac{14580}{0,025} \cdot \left(1 - \frac{1}{1,1^{2n}}\right)$$

$$NPV_{(k=10\%)} = -562233 + \frac{14580}{0,1} \cdot \left(1 - \frac{1}{1,1^{2n}}\right)$$

$$NPV_{(k=2\%)} = -562233 + \frac{14580}{0,02} \cdot \left(1 - \frac{1}{1,02^{2n}}\right)$$

$$22 \cdot 22 \cdot 500000 = 500000$$

$$(k_0 - AP_0) - 22 \cdot \Delta NWC_{1,22,0} =$$

$$-2780 + 16667 - 22 \cdot 0 = -62233$$

7

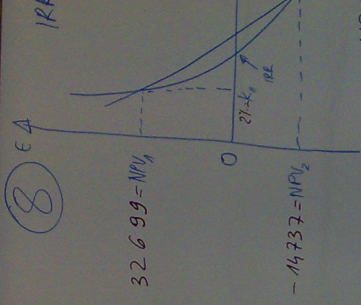
	1-22a	22b
CR	200000	450000
-CE	132000	0
-NCE	50000	500000
=EBIT	18000	-50000
=NOPAT = $\frac{EBIT \cdot (1-T)}{1}$	14580	-40500
+NCE	50000	50000
- Δ NWC	0	-62233
-Capex	50000	0
FCF _{1, 22c}	14580	521733

$NPV_0 = -562233$

$NCE_{22b} = 50000 - 50000 \cdot 22 + 22 \cdot 50000 = 500000$

$\Delta NWC_{22b} = -(NWC_1 + AR_0 + (Capex_1 - AP_0)) - 22 \cdot \Delta NWC_{1, 22a}$
 $= -20560 - 55560 - 2780 + 16667 - 22 \cdot 0 = -622233$

8



$NPV_{(k=10\%)} = -56$

NPV

$$\frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$$

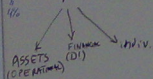
9

$$k_E =$$

$$CC = k_D \cdot \frac{D}{D+E} \cdot (1-T) + k_E \cdot \frac{E}{D+E} = 11,85\% > IRR \quad \text{!} \text{!}$$

$$k_D = 6\% \quad \frac{0,39}{0,81} + 16,21 \cdot \frac{0,61}{0,81}$$

$$k_{RF} + \beta_L \cdot (k_M - k_{RF}) = 16,32\%$$



$$\beta_L^* = \beta_L \cdot (1 + S_2) = 1,54$$

$$\beta_L = \beta_L^* \cdot (1 + (1-T) \cdot \frac{D}{E}) = 1,67 \quad \beta_0 = 1,1$$

(HAWAIIA ROBERT)

(JAMODARAN BETAS)

IRR > CC ☐
IRR < CC ○

<http://MICHAL.RIG.COM/>

THURSDAY 14th October
MICHALRIG@GMAIL.COM

$$= -562233 + \frac{14580}{0,025} \cdot \left(1 - \frac{1}{1,1^{21}}\right)$$

$$233 + \frac{14580}{0,11} \cdot \left(1 - \frac{1}{1,1^{21}}\right)$$

$$-2\% = -562233 + \frac{14580}{0,02} \cdot \left(1 - \frac{1}{1,02^0}\right)$$

$$\frac{1}{1,025^{21}} + \frac{536313}{1,025^{21}} = -14737$$

$$+ \frac{536313}{1,1^{22}} = -370251$$

$$+ \frac{536313}{1,02^{22}} = 32699$$

$$IRR^* = 2\% + \frac{32699 \cdot (0,5\%)}{32699 - (-14737)} = 2,34\%$$

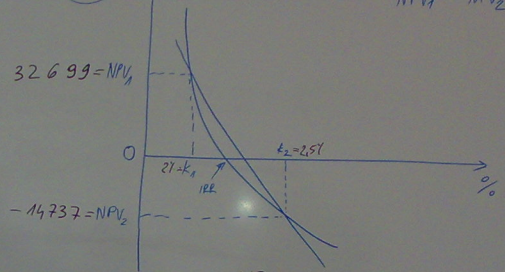
7	1-22a	22b
CR	200000	450000
-CE	132000	0
-NCE	50000	500000
= EBIT	18000	-50000
= NOPAT = $= EBIT \cdot (1-T)$	14580	-40500
+ NCE	50000	500000
- Δ NWC	0	-62233
- Capex	50000	0
FCF _{1-22a}	14580	521733

$CF_0 = -562233$

$NCE_{22b} = 500000 - 50000 \times 22 + 22 \cdot 50000 = 500000$

$\Delta NWC_{22b} = -(INV_0 + AR_0 + Cash_0 - AP_0) - 22 \cdot \Delta NWC_{1-22a}$
 $= -20560 - 55560 - 2780 + 16667 - 22 \cdot 0 = -62233$

8 €A



$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$

9

$k_E =$

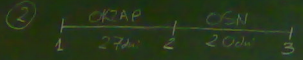
$NPV_{(k=25\%)} = -562233 + \frac{14580}{0,925} \cdot \left(1 - \frac{1}{1,1^{22}}\right)$
 $NPV_{(k=10\%)} = -562233 + \frac{14580}{0,1} \cdot \left(1 - \frac{1}{1,1^{22}}\right)$
 $NPV_{(k=2\%)} = -562233 + \frac{14580}{0,02} \cdot \left(1 - \frac{1}{1,02^{22}}\right)$

$k_{RF} = 4\%$
 ASSETS (OPERATING)
 $\frac{1}{1,025^{21}}$
 FCF
 $+ \frac{53}{1,1}$
 $+ \frac{5}{1,1}$

Jo 12 30

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① $CR = Q \cdot P = 720$



③

A	L
FA = 400	300 = E
$\frac{CRZAP}{300} = ZAP = 54$	172 = D
$\frac{CSN}{300} = NAL = 40$	28 = ZD
$3 \cdot \frac{CE}{300} = SP_0 = 6$	
Alt. 500	500

④

$ZwD = 0052wD \cdot \frac{CF}{300} = 28$

⑤

$FCE = -472$

$K_{exp} Z_{exp} = L - ZwD = 472$

$= FA + NWC = 400 + 72$

$= FA + NAL + ZAP + SP - ZwD$

$400 + 40 + 54 + 6 - 28 = 472$

⑥

$\frac{D}{E} = 0,57$

$\frac{D}{D+E} = 44 = 0,36$

$w_D = \frac{E}{D+E} = 0,64$

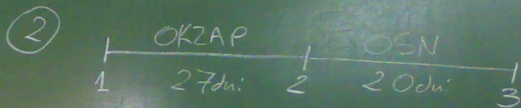
⑦ $FCE = -472$

	Alt. 1	Alt. 2
CR	2700	2700
-CE + FCW	-300	-300
-NCE _{exp}	-40	-40
= EBIT	2360	2360
-TAX _{exp}	-354	-354
= NOPAT	2006	2006
+ NCE _{exp}	40	40
-ΔNWC	0	-72
-CAPEX	40	0
FCE	373	448

do ŚRODY do 12³⁰

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① $CR = Q \cdot P = 720$



③

	A	L
	$FA_0 = 400$	$300 = E_0$
$OKZAP \cdot \frac{CR}{360} = ZAP_0 = 54$		$172 = D_0$
$OSN \cdot \frac{CR}{360} = NA_{L_0} = 40$		$28 = Z_w D_0$
$3 \cdot \frac{CR}{360} = SP_0 = 6$		
Alty...	560	500

} 472

④

⑤

⑥ $\frac{D}{E}$

$\frac{D}{D+E} = w$

$w_e = \frac{E}{D+E}$

do ŚRODY do 12³⁰

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① $CR = Q \cdot P = 720$

②

	OKZAP		OSN	
1	27dni	2	20dni	3

③

	A	L
	$FA_0 = 400$	$300 = E_0$
$OKZAP \cdot \frac{CR}{360} = ZAP_0 = 54$		$172 = D_0$
$OSN \cdot \frac{CR}{360} = NA_{L_0} = 40$		
$3 \cdot \frac{CR}{360} = SP_0 = 6$		$28 = Z_{L_0}$
	Algebra 500	500

} 172

⑦

$$FCF_0 = -472$$

CR

$$-CE = FC + VC$$

$$-NCE_{1..32a}$$

$$= EBIT$$

$$-TAX_{EBIT}$$

$$= NOPAT$$

$$+ NCE_{1..32a}$$

$$- \Delta NWC$$

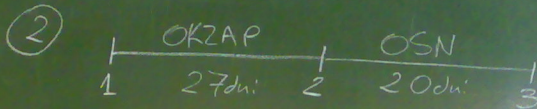
$$- CAPEX_{1..32a}$$

FCF

1...32a	32b
720	370
220	0
40	400
460	-30
87	-6
373	-24
40	400
0	-72
40	0
373	448

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① $CR = Q \cdot P = 720$

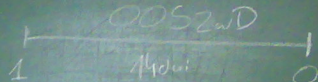


③

A	L
$FA_0 = 400$	$300 = E_0$
$OKZAP \cdot \frac{CR}{360} = ZAP_0 = 54$	$172 = D_0$
$OSN \cdot \frac{CR}{360} = NAL_0 = 40$	$28 = Z_w D_0$
$3 \cdot \frac{CR}{360} = SP_0 = 6$	
Актыва 500	500

} 472

④



$Z_w D = 0052wD \cdot \frac{CR}{360} = 28$

⑤

$FCF_0 = -472$
 $Kap. Zoon = L - Z_w D = 472$
 $= FA + NWC = 400 + 72$
 $= FA + NAL + ZAP + SP - Z_w D$
 $400 + 40 + 54 + 6 - 28 = 472$

⑥

$\frac{D}{E} = 0,57$
 $\frac{D}{D+E} = w_D = 0,36$
 $w_E = \frac{E}{D+E} = 0,54$

$$EBIT = 10462 + 1054 = 11516$$

$$NOPAT = 0.81 \cdot 11516 = 11316 = FCF_{1..∞}$$

$$\begin{array}{r} 47106 \\ - 7727 \\ - 5227 \\ \hline \end{array}$$

$$CI \quad \underline{34152}$$

$$FCF_0 = -34152$$

$$k_D = 4\%$$

$$k_M = 12\%$$

$$\beta_U = 0.67$$

$$\beta_E = 0.67 \left(1 + (1 - 0.19) \cdot \frac{34152 - 19198}{19198} \right) = 1.093$$

$$k_E = 4\% + 1.093 \cdot (12\% - 4\%) = 12.74\%$$

$$\begin{array}{l} 857 \\ / 14954 = k_D = 5.7\% \end{array}$$

$$D = 14954$$

1.000,

$$CC = 5.7\% \cdot \frac{14954}{34152} \cdot 0.81 + 12.74\% \cdot \frac{19198}{34152} = 9.18\%$$

$$\Delta V_t = -34152 + \frac{11316}{0.0918} = 89116 > 0 \quad \text{D}$$

$$EBIT = 10462 + 1054 = 11516$$

$$NOPAT = 0.81 \cdot 11516 = 11316 = FCF_{1-\infty}$$

$$\begin{array}{r} 47106 \\ - 7727 \\ - 5227 \\ \hline C1 \quad 34152 \end{array}$$

$$FCF_0 = -34152$$

$$W_A = 4\%$$

$$W_M = 12\%$$

$$\beta_U = 0.67$$

$$\beta_E = 0.67 \cdot (1 + (1 - 0.18)) \cdot \frac{34152 - 19198}{19198} = 1.093$$

$$k_E = 4\% + 1.093 \cdot (12\% - 4\%) = 12.74\%$$

$$D = 14954$$

$$\frac{857}{14954} = k_D = 5.7\%$$

1.000;

$$CC = 5.7\% \cdot \frac{14954}{34152} \cdot 0.81 + 12.74\% \cdot \frac{19198}{34152} = 9.18\%$$

$$\Delta V_E = -34152 + \frac{11316}{0.0918} = 89116 > 0 \quad \text{U}$$

$$EBIT = 79028 + 9402 = 88430$$

$$NOPAT = 88430 \cdot 0,81 = 71628 = FCF_{1 \dots \infty}$$

$$\begin{array}{r} 353358 \\ - 36827 \\ - 25548 \\ - 698 \\ \hline \end{array}$$

$$CI \quad 230286$$

$$FCF_0 = -290286$$

$$k_A = 4\%$$

$$k_M = 12\%$$

$$\beta_U = 1,09$$

$$\beta_L = 1,09 \cdot (1 + (1 - 0,19) \cdot \frac{290286 - 262382}{262382}) = 1,09$$

$$k_E = 4\% + 1,09 \cdot (12\% - 4\%) = 12,72\%$$

$$D = 27904$$

$$k_D = 4,5\%$$

$$CC = 4,5\% \cdot \frac{27904}{230286} \cdot 0,81 + 12,72\% \cdot \frac{262382}{230286} = 11,85\%$$

$$\Delta V_0 = -290286 + \frac{71628}{0,1185} = 314170 > 0 \quad \text{D}$$

$$EBIT = 79028 + 9402 = 88430$$

$$NOPAT = 88430 \cdot 0,81 = 71628 = FCF_{1..∞}$$

$$\begin{array}{r} 353358 \\ - 36827 \\ - 25548 \\ - 698 \\ \hline \end{array}$$

$$CI \quad 290286$$

$$FCF_0 = -290.286$$

$$k_p = 4\%$$

$$k_M = 12\%$$

$$\beta_U = 1,07$$

$$\beta_E = 1,07 \cdot (1 + (1 - 0,18) \cdot \frac{290286 - 262382}{262382}) = 1,09$$

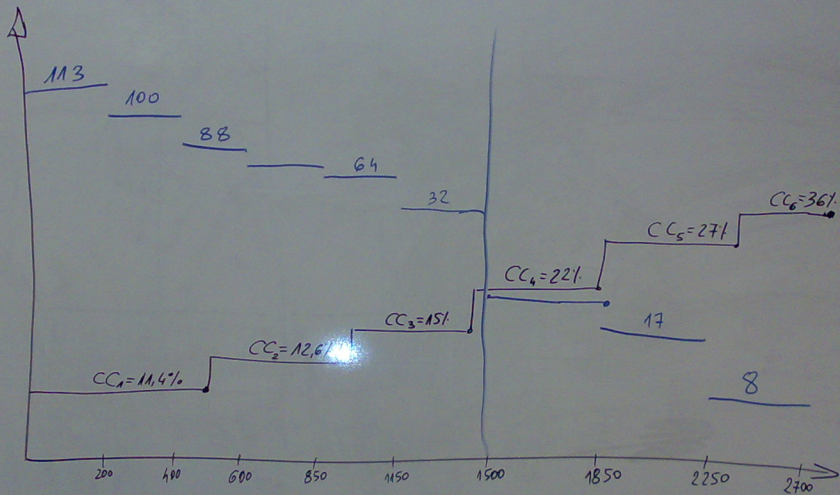
$$k_E = 4\% + 1,09 \cdot (12\% - 4\%) = 12,72\%$$

$$D = 27904$$

$$k_D = 4,5\%$$

$$CC = 4,5\% \cdot \frac{27904}{290286} \cdot 0,81 + 12,72\% \cdot \frac{262382}{290286} = 11,85\%$$

$$\Delta V_0 = -290286 + \frac{71628}{0,1185} = 314170 > 0 \quad \text{😊}$$



$$IIS > CC$$

↓
 Optym budżet
 inwest = 2 LUBUSKIEM

	WROCLAWIA <small>→ ANNA, OMA BIZOWY</small>	WY DSL	WLKP	ŁÓDŹ	GŁOGÓW	LUBUSKIE	
CR OKZAP OSNAL BVFOT @OSZWD	720 25	720 30	720				
FA Aktywa PZEM Kapitał Zaang							
FCF ₀ CE NCE FCF _{1...8} FCF _{8b}	-200	-200	-200	-250	-300	-350	-350
IRR	113%	100%	88%	70%	64%	32%	21%

	r	m	r_c	\downarrow
7%	7,01%	7,02%	6,99%	6,98%
200	220	240	180	160
300				
1,19				
1,13				
15,13%				
11,45%	11,53%	11,46%	11,41%	11,40%

6,97%	6,96%	6,95%	6,94%	6,93%	6,92%	6,91%	6,9%
140	120	100	80	60	40	20	0
11,39%	11,37%	11,36%	11,35%	11,34%	11,33%	11,32%	11,31%



$$k_d = 7\%$$

$$D = 200$$

$$E = 300$$

$$k_e = k_{RF} + \beta_L^* \cdot (k_M - k_{RF}) = 4\% + 1,13 \cdot 10\% = \underline{15,3\%}$$

Oper.

FINANS

INDYW.

$$\beta_L^* = \beta_L \cdot (1 + \overbrace{S_2}^{-0,05}) = 1,19 \cdot 0,95 = 1,13$$

Oper.

Fin

$$\beta_L = \beta_u \cdot \left(1 + (1-T) \cdot \left(\frac{D}{E} \right) \right) = 0,77 \cdot (1 + 0,81 \cdot 0,67) = \underline{1,19}$$

OPER.

$$\beta_u = 0,77$$

$$k_d \cdot \frac{D}{D+E} \cdot 0,81 + k_e \cdot \frac{E}{D+E}$$

$$CC = 7\% \cdot 0,4 \cdot 0,81 + 15,3\% \cdot 0,6 = 11,45\%$$

k_d

7%

D

200

E

300

β_L

1,19

β_L^*

1,13

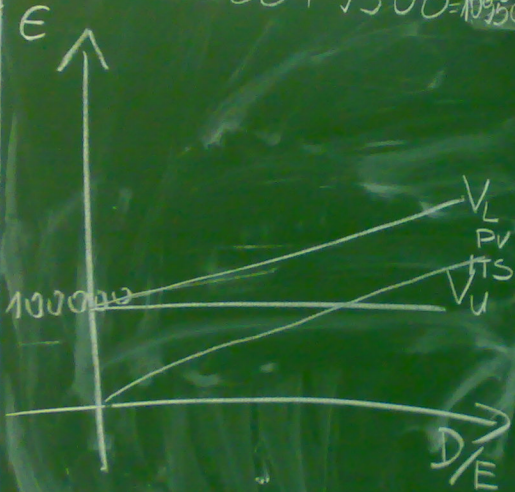
k_e

15,3%

CC

11,45%

$$V_L = 100000 + 9500 = 109500$$



c) STBUKURBA ZAPŁY 420000	DE URA (a)	LICZBA UDZIAŁÓW (b)	WART AKT NIEZADŁ (c)	PV ITS (d) = T * (a)	(c) + (d)
0%	0	100	100000	0	100000
30%	30000	70	100000	5700	105700
50%	50000	50	100000	9500	109500
70%	40000	30	100000	13300	113300

$0 = 109500$

• C) STRUKTURA ZADŁYZENIA	D/E UŁ (a)	LICZBA UDZIAŁÓW (b)	WARTOŚĆ WIEZADŁ (c)	PV (d) = T ⁰ (a)	V _L (c) + (d) * (e)	WARTOŚĆ E (f) = (a) * (f)	CENA UDZIAŁU (f) / (b)
0%	0	100	100000	0	100000	100000	1000
30%	30000	70	100000	5700	105700	45700	1081
50%	50000	50	100000	9500	109500	59500	1190
70%	40000	30	100000	13300	113300	43300	1443

V_L
 PV
 ITS
 V_U

D/E

$f(c)$
 $f(b)$
IT
ITS
ITS
V
V_L
PV

LEWA (a)	LICZBA UDZIAŁÓW (b)	WARTOŚĆ NIEZADŁ (c)	PV _{ITS} (d) = T · (a)	V _L (c) + (d) = (e)	WARTOŚĆ E (f) = (e) - (d)	CENA UDZIAŁU (f) / (b)
100	100	100000	0	100000	100000	1000
100	70	100000	5700	105700	45700	1081
100	50	100000	9500	109500	59500	1190
100	30	100000	13300	113300	43300	1443

$$\{T_c\} 19\% \quad D 50000$$

$$\{K_D\} 10\%$$

$$ITS = T_c \cdot K_D \cdot D$$

$$ITS = 19\% \cdot 10\% \cdot 50000$$

$$ITS = 950$$

$$b) V_u = 100000$$

$$V_L = V_u + PV_{ITS}$$

$$PV_{ITS} = \frac{ITS}{k_D} = \frac{950}{0.11} = 9500$$

Strukt. Zuteilung	Kapitalstruktur	Wartungs- / Reparaturkosten	Kapitalstruktur	Wartungs- / Reparaturkosten	Wartungs- / Reparaturkosten	Wartungs- / Reparaturkosten
0%	Myriase	100 000	0	100 000	100	1 000
30%	isachir	- -	30 000	70 000	70	- -
50%	duze	- -	50 000	50 000	50	- -
70%	b. duze	- -	70 000	30 000	30	- -

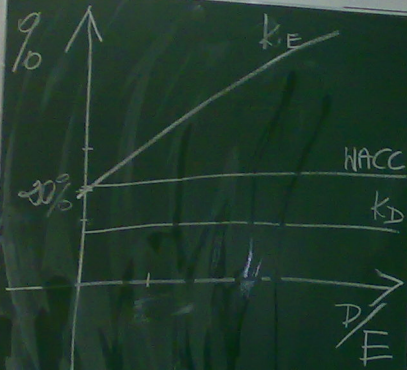
$$k_E = r_A + (r_A - k_D) \frac{D}{E}$$

$$k_E = 20\% + (20\% - 10\%) \frac{20 000}{20 000}$$

$$k_E = 22,5\% \quad (b)$$

$$k_E = 20\%$$

$$k_E =$$



Struktura zadłużenia	Typy finansowania	Wartość nominalna aktywów	Kapitał obcy	Wartość kap. włas.	Wzrost jednostek	Forma 1
0%	Wojniusz	100 000	0	100 000	100	1 000
30%	inżelnir	- -	30 000	70 000	70	- -
50%	dmie	- -	50 000	50 000	50	- -
70%	b. dmie	- -	70 000	30 000	30	- -

100 000

Kapitał obcy [D]

$$\{k_D\} = 10\%$$

$$\{ROA = r_A\} = 20\%$$

$$\{k_E\} = ?$$

Struktura zadłużenia	Procent zadłużenia	Wartość kapitału obcego	Kapitał obcy	Wartość kapitału własnego	Wzrost wskazujący	Wzrost wskazujący
0%	najmniejsza	100 000	0	100 000	100	1 000
30%	średnia	- -	30 000	70 000	70	- -
50%	duża	- -	50 000	50 000	50	- -
70%	b. duża	- -	70 000	30 000	30	- -

Stawka Zadłużenia	Reguła Habsburska	Wartość reprezentacji aktywna	Kapitał obcy	Wartość kap. własny	Wiek wzrostem	Średn. 1 wzrostem
0%	maximize	100 000	0	100 000	100	1 000
30%	incentiv	- -	30 000	70 000	70	- -
50%	dnie	- -	50 000	50 000	50	- -
40%	b. dnje	- -	70 000	30 000	30	- -

0% [D]

0%

$$9 \quad CC = k_d \cdot (1-T) \cdot \frac{D}{D+E} + k_e \cdot \frac{E}{E+D} \quad k_d = 7,5\%$$

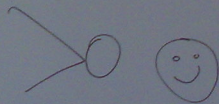
$$k_e = k_{RF} + \beta_L \cdot (k_M - k_{RF}) = 11,64\% \quad \beta_U = 0,7$$

$$\beta_L = \beta_U \cdot (1 + S^2) = 1,47 \cdot 1,032 = 1,52$$

$$\beta_L = \beta_U \cdot (1 + (1-T) \cdot \frac{D}{E}) = 0,7 \cdot (1 + 0,81 \cdot 1,35) = 1,47$$

$$CC = 7,5\% \cdot 0,81 \cdot 0,57 + 11,64\% \cdot 0,43 = 9,76\% < \begin{matrix} CC \\ < \\ IRR \end{matrix} \begin{matrix} < \\ < \\ 101,14\% \end{matrix} \quad \text{☺}$$

$$10 \quad NPV = -696 + \frac{697}{0,0976} \cdot \left(1 - \frac{1}{1,0976^{10}}\right) + \frac{1361}{1,0976^{10}} =$$



$$9 \quad CC = k_D \cdot (1-T) \cdot \frac{D}{D+E} + k_E \cdot \frac{E}{E+D} \quad k_D = 7,5\%$$

$$k_E = k_{RF} + \beta_L \cdot (k_M - k_{RF}) = 11,64\% \quad \beta_u = 0,7$$

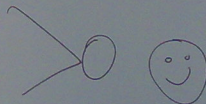
$$\beta_L^* = \beta_L \cdot (1 + \frac{D}{E}) = 1,47 \cdot 1,032 = 1,52$$

$$\beta_L = \beta_L \cdot (1 + (1-T) \cdot \frac{D}{E}) = 0,7 \cdot (1 + 0,81 \cdot 1,35) = 1,47$$

$$CC = 7,5\% \cdot 0,81 \cdot 0,57 + 11,64\% \cdot 0,43 = 9,76\% \quad \begin{matrix} CC \\ < \\ IRR \end{matrix} \quad \begin{matrix} < \\ < \\ 101,14\% \end{matrix} \quad \text{😊}$$

10

$$NPV = -696 + \frac{697}{0,0976} \cdot \left(1 - \frac{1}{1,0976^{98}}\right) + \frac{1361}{1,0976^{98}} =$$



B

$$NPV_{(k=10\%)} = -696 + \frac{697}{0,1} \cdot \left(1 - \frac{1}{1,1^{88}}\right) + \frac{1361}{1,1^{88}} = 6273$$

$$NPV_{(k=100\%)} = -696 + \frac{697}{1} \cdot \left(1 - \frac{1}{2^{88}}\right) + \frac{1361}{2^{88}} = 1$$

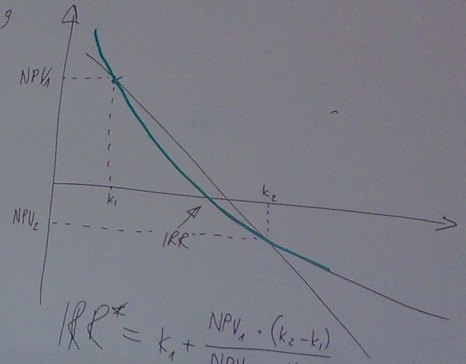
$$NPV_{(k=100,2\%)} = -696 + \frac{697}{1,002} \cdot \left(1 - \frac{1}{2,002^{88}}\right) + \frac{1361}{2,002^{88}} = -0,39$$

$$IRR^* = 100\% + \frac{1 \cdot 0,2\%}{1 - (-0,39)} = 101,14\%$$

$$FCF_0 = -696$$

$$FCF_{1,87} = 697$$

$$FCF_{88} = 1361$$



$$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$$

8

$$NPV_{(k=10\%)} = -696 + \frac{697}{0,1} \left(1 - \frac{1}{1,1^{85}}\right) + \frac{1361}{1,1^{85}} = 6273$$

$$NPV_{(k=100\%)} = -696 + \frac{697}{1} \cdot \left(1 - \frac{1}{2^{85}}\right) + \frac{1361}{2^{85}} = 1$$

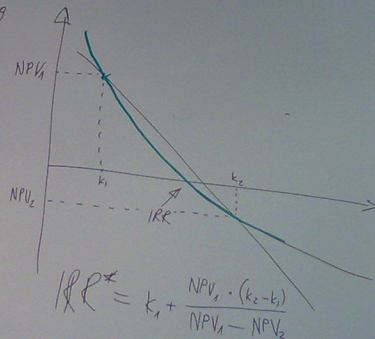
$$NPV_{(k=100,2\%)} = -696 + \frac{697}{1,002} \cdot \left(1 - \frac{1}{2,002^{85}}\right) + \frac{1361}{2,002^{85}} = -0,39$$

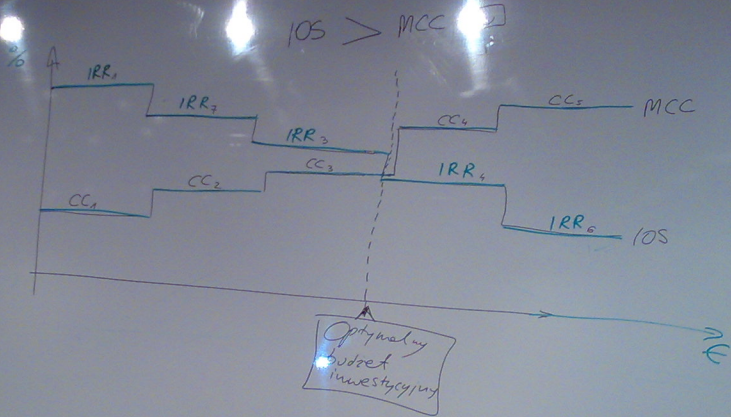
$$IRR^* = 100\% + \frac{1 \cdot 0,2\%}{1 - (-0,39)} = \underline{\underline{101,14\%}}$$

$$FCF_0 = -696$$

$$FCF_{1-87} = 697$$

$$FCF_{88} = 1361$$





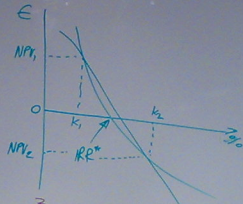
$$CC = 17\%$$

$$NPV = -2881 - \frac{45}{1,17} + \frac{2174}{1,17^2} + \frac{2470}{1,17^3} + \frac{2004}{1,17^4} + \frac{1709}{1,17^5} = 3161$$

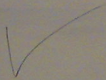
$$IRR^* = 38,96\%$$

$$NPV(k=38,9\%) = 0,02$$

$$NPV(k=39\%) = -0,04$$



	0	1	2	3	4	5
FCF	-2881	-45	2174	2470	2004	-23
						1732



	0	1	2	3	4	5 _n	5 _b
CR		3000	3300	2500	50	1000	1000
-CE	520	355	385	305	60	155	60
-NCE		276	276	276	276	276	925
EBIT	-520	2369	2639	1919	-286	569	15
NOPAT	-421	1919	2138	1554	-232	461	12
+NCE	276	276	276	276	276	276	925
-ΔNWC	160	2240	240	-640	-1960	760	-795
-CAPEX	2300	0	0	0	0	0	0
FCF	-2881	-45	2174	2470	2004	-23	1732

$$NWC = AB - PB = CA - CL = ZAP + NAL + IP - 2ND$$

	0	1	2	3	4	5 _a	5 _b
NWC	160	2400	2640	2000	40	800	5
ΔNWC		2240	240	-640	-1960	760	

	0	1	2	3	4	5 _a	5 _b
CR		3000	3300	2500	50	1000	1000
-CE	520	355	385	355	60	155	60
-NCE		276	276	276	276	276	925
EBIT	-520	2369	2639	1919	-286	569	15
NOPAT	-421	1919	2138	1554	-232	461	12
+NCE	276	276	276	276	276	276	925
-ΔNWC	160	2240	240	-640	-1960	760	925
-CAPEX	2300	0	0	0	0	0	-795
FCF	-2881	-45	2174	2470	2004	-23	1732

$$NWC = AB - PB = CA - CL = 2AP + NAL + SP - 2wD$$

	0	1	2	3	4	5 _a	5 _b
NWC	160	2400	2640	2000	40	900	5
ΔNWC		2240	240	-640	-1960	760	

$$\textcircled{1} CR = \sum Q_i \cdot P_i = 1440$$

$$\textcircled{2} CO = OKZAP + OSN$$

1	OKZAP	2	OSN	3
	25 dni		35 dni	

$$\textcircled{3} Aktywa = 752$$

$$\text{Aktywa Trwałe FA} = 500$$

$$\rightarrow \text{ZAPASY} = \frac{1440}{360} \cdot 25 = 100$$

$$\rightarrow \text{MAŁE ŻNOŚCI} = \frac{1440}{360} \cdot 35 = 140$$

$$\rightarrow \text{Str. pien.} = 3 \cdot \frac{1440}{360} = 12$$

$$P = 1440$$

+ OSN

OSN 1
35 dni 3

$$\textcircled{4} \quad \frac{14 \text{ dni}}{0052 \text{ wD}} \quad 1$$

$$Z_{wD} = 14 \cdot \frac{1440}{360} = 56$$

$$\textcircled{5} \quad \text{Kapitał Związy.} = \text{AKTYWA} - Z_{wD} \\ = 752 - 56 = \underline{696}$$

$$\textcircled{6} \quad \frac{D}{E} = \frac{400}{296} = 1,35$$

$$w_d = \frac{D}{D+E} = \frac{400}{696} = 0,57$$

$$w_e = \frac{E}{D+E} = \frac{296}{696} = 0,43$$

$FCF_0 = -696$ <small>1...88w</small>	28w 460
$CR = 1440$	0
$-CE = 540$	0
$-NCE = 40$	500
$EBIT = 860$	-40
$NOPAT = 697$	-32
$+NCE = 40$	500
$-Capex = 40$	0
$\Delta NWC = 0$	-196
$FCF = 697$ <small>1...88w</small>	664

$\textcircled{8}$ IRR

$$NPV_{(k=10\%)} = -696 + \frac{697}{0,1} \cdot \left(1 - \frac{1}{1,1^{88}}\right) + \frac{1361}{1,1^{88}}$$

$$\textcircled{4} \quad \begin{array}{c} 14 \text{ dni} \\ \hline 1 \quad \text{---} \quad 0 \\ \text{0052 wD} \end{array}$$

$$Z_{wD} = 14 \cdot \frac{1440}{360} = 56$$

$$\textcircled{5} \quad \text{Kapitał zaangaż.} = \text{AKTYWA} - Z_{wD} \\ = 752 - 56 = \underline{696}$$

$$\textcircled{6} \quad \frac{D}{E} = \frac{400}{296} = 1,35$$

$$\omega_D = \frac{D}{D+E} = \frac{400}{696} = 0,57$$

$$\omega_E = \frac{E}{D+E} = \frac{296}{696} = 0,43$$

$$\textcircled{7} \quad FCF_0 = -696$$

$$CR = 1440 \quad \begin{array}{l} 1 \dots 28a \\ 88b \\ 460 \end{array}$$

$$-CE = 540 \quad \begin{array}{l} 0 \\ 500 \end{array}$$

$$-NCE = 40 \quad \begin{array}{l} 500 \\ 460 \end{array}$$

$$EBIT = 860 \quad \begin{array}{l} -40 \\ 500 \end{array}$$

$$NOPAT = 697 \quad \begin{array}{l} -32 \\ 500 \end{array}$$

$$+NCE = 40 \quad \begin{array}{l} 500 \\ 460 \end{array}$$

$$- \text{Capex} = 40 \quad \begin{array}{l} 0 \\ 460 \end{array}$$

$$- \Delta NWC = 0 \quad \begin{array}{l} -196 \\ 460 \end{array}$$

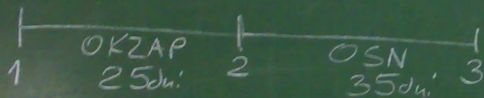
$$FCF = 697 \quad \begin{array}{l} 664 \\ 460 \end{array}$$

$\textcircled{8}$ IRR

$$NPV_{(k=10\%)} = -696 + \frac{697}{0,1} \cdot \left(1 - \frac{1}{1,1^{27}} \right) + \frac{1361}{1,1^{28}}$$

$$\textcircled{1} CR = \sum Q_i \cdot P_i = 1440$$

$$\textcircled{2} CO = OKZAP + OSN$$



$$\textcircled{3} Aktywa = 752$$

$$\text{Aktywne Transz. FA} = 500$$

$$\rightarrow ZAPASY = \frac{1440}{360} \cdot 25 = 100$$

$$\rightarrow \text{NALEŻNOŚCI} = \frac{1440}{360} \cdot 35 = 140$$

$$\rightarrow \text{Śr. pieł.} = 3 \cdot \frac{1440}{360} = 12$$

$$\textcircled{4} \begin{array}{c} 1440 \\ \text{---} \\ \text{00220D} \end{array} \begin{array}{c} 1 \\ 0 \end{array}$$

$$Z_{wD} = 14 \cdot \frac{1440}{360} = 56$$

$$\textcircled{5} \text{Kapitał Zaangaż.} = AKTYWA - Z_{wD} \\ = 752 - 56 = \underline{696}$$

$$\textcircled{6} \frac{D}{E} = \frac{400}{296} = 1,35$$

$$w_d = \frac{D}{D+E} = \frac{400}{696} = 0,57$$

$$w_e = \frac{E}{D+E} = \frac{296}{696} = 0,43$$

$$\textcircled{7} FCF_0 = -696$$

$$CR = 1440$$

$$-CE = 540$$

$$-NCE = 40$$

$$EBIT = 860$$

$$NOPAT = 697$$

$$+NCE = 40$$

$$-Capex = 40$$

$$-\Delta NWC = 0$$

$$FCF_{1-3} = 697$$

$\textcircled{8}$ IRR

$$NPV_{(10\%)} = -696 +$$

3

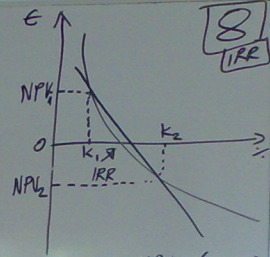
D	318	300	280	260
k_d	7%	6,95%	6,9%	6,88%
E	200	218	238	
β_L^*				
k_e	16,3%	15,3%	14,43	
CC	9,8%	9,7%	9,65	

(T)

$$\left[0,82 \cdot 0,93 \cdot \left(1 + 0,81 \cdot \frac{D}{518-D} \right) \right] \cdot 7\% + 4\% = k_e$$

$$CC = k_d \cdot \frac{D}{518} \cdot 0,81 + k_e \cdot \frac{518-D}{518}$$

8
IRR



$$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$$

$$= 55\% + \frac{182 \cdot 0,21}{182 + 1696} = 55,02\%$$

	1... 116a	1166
CR	720000	460000
-CE	318000	20000
-NCE	50000	500000
EBIT	352000	-60000
NOPAT	285000	-49000
+ NCE	50000	500000
-ΔNWC	0	-18000
-CAPEX	50000	0
FCF	285000	469000 = FCF _{116a}

$$NPV = -518 + \frac{285}{0,098} \cdot \left(1 - \frac{1}{1,098^{15}}\right) + \frac{496}{1,098^{15}} = 2390 > 0$$

😊

9 $CC = k_d \cdot w_d \cdot (1-T) + k_e \cdot w_e =$

$k_d = 7\%$

$k_e = k_{RF} + \beta_L \cdot (k_M - k_{RF}) = 16,3\%$

$\beta_L^* = \beta_L \cdot (1 + u_f) = 1,75$

$\beta_L = \beta_U \cdot \left(1 + (1-T) \cdot \frac{D}{E}\right) = 1,88$

1,88

$CC = 7\% \cdot 0,61 \cdot 0,81 + 16,3\% \cdot 0,39 = 9,8\%$

$IRR > CC \quad 55,02\% > 9,8\%$

$w_e = \frac{E}{D+E} = 0,39$

6 $\frac{D}{E} = \frac{318000}{200000} = 1,59 \quad w_d = \frac{D}{D+E} = 0,61$

9 $CC = k_d \cdot w_d \cdot (1-T) + k_e \cdot w_e =$

$k_d = 7\%$

$k_e = k_{RF} + \beta_L \cdot (k_m - k_{RF}) = 16,3\%$

11% 4%

$\beta_L^* = \beta_L \cdot (1 + w_d) = 1,75$

1,88 -0,07

$\beta_L = \beta_U \cdot \left(1 + (1-T) \cdot \frac{D}{E}\right) = 1,88$

0,81 1,59



$CC = 7\% \cdot 0,61 \cdot 0,81 + 16,3\% \cdot 0,39 = 9,8\%$

$IRR > CC \quad \text{😊} \quad 55,02\% > 9,8\% \quad \text{😊}$

6 $\frac{D}{E} = \frac{318000}{200000} = 1,59 \quad w_d = \frac{D}{D+E} = 0,61$

7 $CR = 720000$
 $-CE = 318000$
 $-NCE = 50000$

$EBIT = 352000$
 $NOPAT = 285000$

$+NCE = 50000$
 $-ANWC = 0$
 $-CAPEX = 50000$

$FCF = 285000$

1166
 460000
 20000

500000

-60000

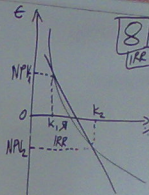
-49000

500000

-18000

0

469000 = FCF₁₁₆₆



$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$

$= 55\% + \frac{182 \cdot 0,21}{182 + 1636} = 55,02\%$

$NPV = -518 + \frac{285}{0,098} \cdot \left(1 - \frac{1}{1,098^{15}}\right) + \frac{496}{1,098^{15}} = 2390 > 0$

😊

$$① CR = Q \cdot P = 720000$$

$$② CO = OKZAP + OSN = 35 \text{ dni}$$

$$\begin{array}{c} \text{OKZAP} = 20 \text{ dni} \quad \text{OSN} = 15 \text{ dni} \\ \text{ZAP} = 20 \cdot \frac{720000}{360} \quad \text{NAL} = 15 \cdot 20000 \end{array}$$

$$③ \text{Aktywa} = FA + ZAP + NAL + SP \\ 500000 + 40000 + 30000 + 8000 = 578000$$

$$④ \begin{array}{c} 2052 \text{ dni} = 30 \text{ dni} \\ \text{Zu}D = 30 \cdot 2000 = 60000 \end{array}$$

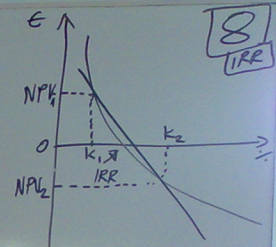
$$⑧ \text{IRR} \quad \begin{array}{l} NPV(k=10\%) = -518000 + \frac{285000}{0,1} \cdot \left(1 - \frac{1}{1,1^{115}}\right) + \frac{754000}{1,1^{116}} = 2332000 \\ NPV(k=55\%) = 182 \quad \parallel \quad NPV(k=55,2\%) = -1696 \end{array}$$

$$⑤ \text{KAPITZAANG} = \text{AKTYWA} - \text{Zu}D = FA + \text{NWC} \\ 518000 = 578000 - 60000 = 500000 + \text{ZAP} + \text{NAL} + \text{SP} - \text{Zu}D \\ 40000 + 30000 + 8000 - 60000$$

$$RF_0 = -518000$$

$$⑥ \quad \frac{D}{E} = \frac{318000}{200000} = 1,59 \quad \begin{array}{l} w_e = \frac{E}{D+E} = 0,39 \\ w_d = \frac{D}{D+E} = 0,61 \end{array}$$

1... 116a	116b
⑦ CR = 720000	460000
-CE = 318000	20000
-NCE = 50000	500000
EBIT = 352000	-60000
NOPAT = 285000	-49000
+ NCE = 50000	500000
-ΔNWC = 0	-18000
-CAPEX = 50000	0
FCF = 285000	469000 = FCF _{116b}



$$⑧ \text{IRR} \\ \text{IRR}^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2} \\ = 55\% + \frac{182 \cdot 0,2\%}{182 + 1696} = 55,02\%$$

$$① CR = Q \cdot P = 720000$$

$$② CO = OKZAP + OSN = 35 \text{ dni}$$

$$\begin{array}{c} \text{OKZAP} = 20 \text{ dni} \quad \text{OSN} = 15 \text{ dni} \\ \text{1} \quad \frac{2AP = 20 \cdot \frac{720000}{360}}{360} \quad \text{2} \quad \text{NAL} = 15 \cdot 2000 \quad \text{3} \end{array}$$

$$③ A_{ktywa} = FA + ZAP + NAL + SP$$

$$500000 + 40000 + 30000 + 8000 = 578000$$

$$④ \begin{array}{c} \text{okzad} = 30 \text{ dni} \\ \text{1} \quad \frac{Z_{wD} = 30 \cdot 2000}{= 60000} \quad \text{0} \end{array}$$

$$⑧ \text{ NPV}_{(k=10\%)} = -518000 + \frac{285000}{0,1} \cdot \left(1 - \frac{1}{1,1^{115}}\right) + \frac{754000}{1,1^{116}} = 2332000$$

$$\text{ NPV}_{(k=55\%)} = 182 \quad \parallel \quad \text{ NPV}_{(k=55,2\%)} = -1696$$

$$⑤ \text{ KAPITZAANG} = \text{AKTYWA} - Z_{wD} = FA + NWC$$

$$518000 = 578000 - 60000 = 500000 + ZAP + NAL + SP - Z_{wD}$$

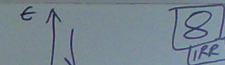
$$40000 + 30000 + 8000 - 60000$$

$$FCF_0 = -518000$$

$$w_e = \frac{E}{D+E} = 0,39$$

$$⑥ \frac{D}{E} = \frac{318000}{200000} = 1,59 \quad w_D = \frac{D}{D+E} = 0,61$$

⑦	1... 116a	116b
CR = 720000	460000	20000
-CE = 318000		
-NCE = 50000	500000	
EBIT = 352000	-60000	
NOPAT = 285000	-49000	
+ NCE = 50000	500000	
-ΔNWC = 0	-18000	
-CAPEX = 50000	0	
FCF = 285000	469000 = FCF _{116b}	
1... 116a		



$$⑧ \text{ IRR}$$

$$\text{IRR}^* = k_1 + \frac{\text{NPV}_1 \cdot (k_2 - k_1)}{\text{NPV}_1 - \text{NPV}_2}$$

$$= 55\% + \frac{182 \cdot 0,27}{182 - 1696} = 55,02\%$$

3	4a
0	50
0	25
5	15
5	10
10	8
5	15
0	-50
0	0
5	73

$$NCE_{\square} = 1100 - (15) \cdot 4 + 3$$

	0	1	2	3	4	4b
NWC	35	20	40	60	10	5
ΔNWC		-15	20	20	-50	-5

(C)

	4b
CR	2000
CE	25
NCE	1043
Σ BIT	932
NOPAT	755
NCE	1043
ΔNWC	-5
Capex	0
FCF	1048

	SPAT (A)
-	CR
-	CE
-	NCE
=	Σ BIT
=	NOPAT = Σ BIT
+	NCE
-	ΔNWC
-	CAPEX
=	FCF

(B)	1	2	3	4a
CR	100	200	300	50
-CE	30	40	50	25
-NCE	15	15	15	15
EBIT	55	145	235	10
NOPAT	45	118	190	8
+NCE	15	15	15	15
-ΔNWC	-15	20	20	-50
-Capex	0	0	0	0
FCF	75	113	185	73

$$NCE_{\square} = 1000 - (15) \cdot 4 + 3$$

	0	1	2	3	4	5
NWC	35	20	40	60	10	5
ΔNWC		-15	20	20	-50	-5

(C)	4
CR	20
CE	
NCE	10
EBIT	9
NOPAT	7.5
NCE	100
ΔNWC	
Capex	
FCF	1048

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$$CR = EQ \cdot P_i$$

$$CE = \frac{VC + FC}{1}$$

$$NWC = AB - PB$$

$$= ZAR + NAL + SP - Z_wD$$

SFOA

CR	0
CE	80
NCE	0
EBIT	-80
NOPAT = EBIT · (1-T)	-64,8
NCE	0
ΔNWC	35
CAPEX	1100
FCF	-1199,8

$n = 9$

	$1 \dots n_a$	n_b
CR	1440	770
$-CE = (FC + VC)$	400	0
$-NCE$	200	800
EBIT	840	-30
$NOPAT = EBIT \cdot (1-T) = 640$	640	-24
$+ NCE$	200	800
$-\Delta NWC$	0	-184
$-CAPEX$	200	0
FCF	640	960

$$FCF_0 = -984 \parallel FCF_{1..8} = 640 \parallel FCF_9 = 1600$$

$$NPV_{(k=10\%)} = -984 + \frac{640}{0,1} \cdot \left(1 - \frac{1}{1,1^8}\right) + \frac{1600}{1,1^9} = 3109$$

$$NPV_{(k_1=65\%)} = 0,34 \parallel NPV_{(k_2=65,5\%)} = -7$$

$n = 9$	$1 \dots n_a$	n_b
CR	1440	770
$-CE = (FC + VC)$	400	0
$-NCE$	200	800
<hr/>		
EBIT	840	-30
$NOPAT = EBIT \cdot (1-T) = 640$		-24
<hr/>		
+ NCE	200	800
$-\Delta NWC$	0	-184
$-CAPEX$	200	0
<hr/>		
FCF	640	960

$$FCF_0 = -984 \quad || \quad FCF_{1..8} = 640 \quad || \quad FCF_9 = 1600$$

$$NPV_{(k=10\%)} = -984 + \frac{640}{0,1} \cdot \left(1 - \frac{1}{1,1^8}\right) + \frac{1600}{1,1^9} = 3109$$

$$NPV_{1(k_1=65\%)} = 0,34 \quad || \quad NPV_{2(k_2=65,5\%)} = -7$$

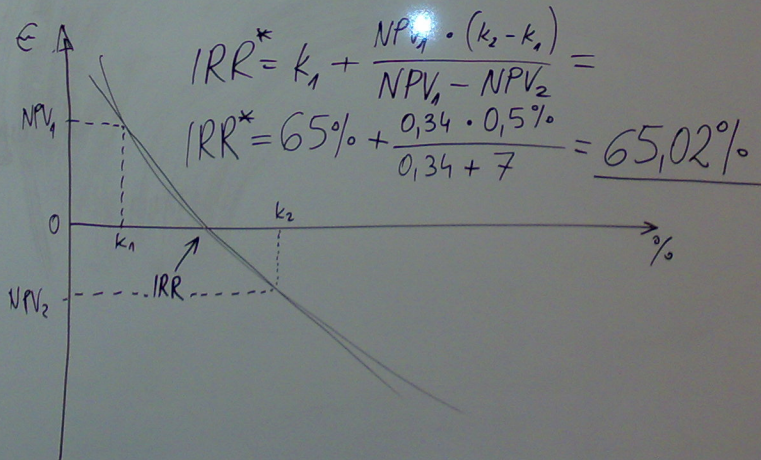
$$1064 = \text{ASSETS} = \text{FA} + \text{CA} = 800 + \underbrace{\frac{1440}{360} \cdot 0.5}_{\text{CASH}} + \underbrace{\frac{1440}{360} \cdot 0.26}_{\text{AR}} + \underbrace{\frac{1440}{360} \cdot 0.35}_{\text{INV}}$$

$\underbrace{800}_{\text{FA}=800} \quad \underbrace{184}_{\text{CA}=264}$

$$\text{CAPITAL I.} = \text{FA} + \text{NWC} = \text{FA} + \text{CA} - \text{CL} = \text{FA} + \text{CASH} + \text{AR} + \text{INV} - \text{AP}$$

$$\text{CAPITAL INVESTED} = 800 + 264 - \underbrace{20 \cdot \frac{1440}{360}}_{\substack{\text{CL}=80 \\ \text{AP}=80}} = 984$$

$$\text{FCF}_0 = -984$$

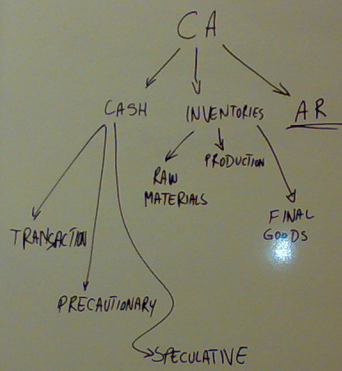


... 1-19%, calculate.

$k_{RF}=7\%$, $k_m=17\%$, $\beta_U=0,9$

r?

based working capital decisions



$$\left. \begin{array}{l} +IP = 35 \text{ days} \\ +ARP = 45 \text{ days} \end{array} \right\} 80 \text{ days} = OC$$

$$-APP = 40 \text{ days}$$

$$CCC = 40 \text{ days}$$

$$INV = IP \cdot \frac{CR}{360} \Rightarrow IP = INV \cdot \frac{360}{CR} = 30 \text{ days}$$

$$DSO = ARP = AR \cdot \frac{360}{CR} = 40 \text{ days}$$

$$DOS_{WD} = APP = AP \cdot \frac{360}{CR} = 25 \text{ days}$$

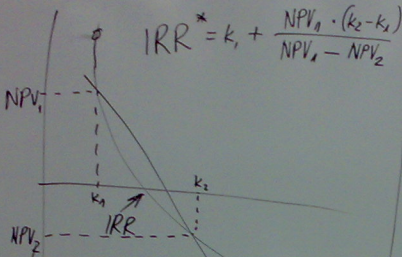
$$\text{Operating Cycle} = 30 + 40 = 70 \text{ days}$$

$$CKG = CCC = OC - APP = 70 - 25 = 45 \text{ days}$$

$$IT = \frac{720}{60} = 12x$$



⑧ $FCF_0 = -354$
 $FCF_{1...7} = 466$
 $FCF_8 = 812$



$$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$$

$$NPV_{(k=10\%)} = -354 + \frac{466}{0,1} \cdot \left(1 - \frac{1}{1,1^7}\right) + \frac{812}{1,1^8} = 2293$$

$$NPV_{(k=100\%)} = 112$$

$$IRR^* = 130\% + \frac{4,5 \cdot 5\%}{13,5} = 132\%$$

$$NPV_{(k=135\%)} = -9$$

$$NPV_{(k=130\%)} = 4,5$$

⑨ $k_d = 7\%$ ^{1,85} ¹²¹ ⁴⁷
 $k_e = k_{RF} + \beta_L^* \cdot (k_M - k_{RF}) = 18,8\%$

$$\beta_L^* = \beta_L \cdot (1 + uy) = 1,85$$

$$\beta_L = \beta_U \cdot \left(1 + (1-T) \cdot \frac{D}{E}\right) = 1,8$$

$$\beta_U = 0,7$$

$$CC = 7\% \cdot 0,81 \cdot 0,66 + 18,8\% \cdot 0,34 = 10,1\%$$

$$CC < IRR$$

$$10,1 < 132\% \quad \text{😊}$$

1 Q

2

3

FA =

ZAP = INV =

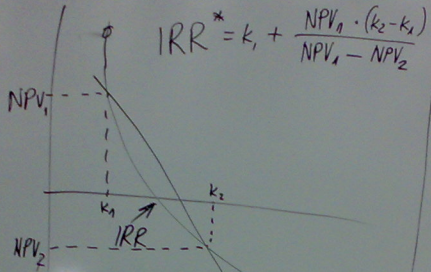
NAL = AR =

SP =

TA =

10 NPV =

⑧ $FCF_0 = -354$
 $FCF_{1-7} = 466$
 $FCF_8 = 812$



$$IRR^* = k_1 + \frac{NPV_1 \cdot (k_2 - k_1)}{NPV_1 - NPV_2}$$

⑨ $k_D = 7\%$ ^{1,85}
 $k_e = k_{RF} + \beta_L^* \cdot (k_M - k_{RF}) = 18,8\%$
 $\beta_L^* = \beta_L \cdot (1 + uy) = 1,85$
 $\beta_L = \beta_U \cdot (1 + (1-T) \cdot \frac{D}{E}) = 1,8$
 $\beta_U = 0,7$

$$NPV_{(k=10\%)} = -354 + \frac{466}{0,1} \cdot \left(1 - \frac{1}{1,1^7}\right) + \frac{812}{1,1^8} = 2293$$

$$NPV_{(k=100\%)} = 112 \quad \boxed{IRR^* = 130\% + \frac{4,5 \cdot 5\%}{13,5} = 132\%}$$

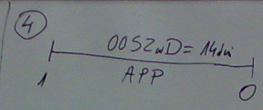
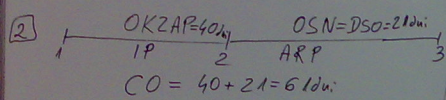
$$NPV_{(k=135\%)} = -9 \quad \parallel \quad NPV_{(k=130\%)} = 4,5$$

$$CC = 7\% \cdot 0,81 \cdot 0,66 + 18,8\% \cdot 0,34 = 10,1\%$$

$CC < IRR$
 $10,1 < 132\%$ 😊



1) $Q \cdot p = CR = 720 \dots$



5) $FA + NWC = TL - AP = 354$
 $= 250 + 80 + 42 + 10 - 28 = 382 - 28 = 354$

3)

A	L
FA = 250	E = 120
ZAP = INW = 80	D = 234 } 555
NAL = AR = 42	
SP = 10	28 = ZwD = AP
TA = 382	382 = TL

6) $\frac{D}{E} = \frac{234}{120} = 1,95$

$w_d = \frac{D}{D+E} = 0,66$

$w_e = 0,34$

7) $FCF_0 = -354$

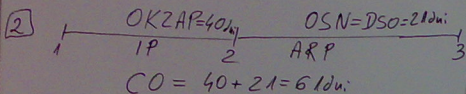
240	CR	720
0	-CE = VC + FC	120
250	-NCE	25
-10	EBIT	575
-8	NOPAT = EBIT · (1-T)	466
250	+NCE	25
-104	-ΔNWC	0
0	-CAPEX	25
$FCF_1 = 346$	FCF _{1,2,3}	466

10) $NPV = -354 + \frac{466}{1,101} \cdot \left(1 - \frac{1}{1,101^8}\right) + \frac{346}{1,101^8} \approx 2200 > 0$



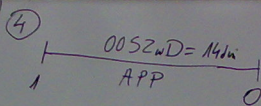


1 $Q \cdot p = CR = 720 \dots$



3

A	L
FA = 250	E = 120
ZAP = INV = 80	D = 234 } 354
NAL = AR = 42	
SP = 10	28 = 2wD = AP
TA = 382	382 = TL



5 $FA + NWC = TL - AP = 354$
 $= 250 + 80 + 42 + 10 - 28 = 382 - 28 = 354$

6 $\frac{D}{E} = \frac{234}{120} = 1,95$

$w_D = \frac{D}{D+E} = 0,66$

$w_E = 0,34$

7 $FCF_0 = -354$

240	CR	720
0	-CE = VC + FC	120
250	-NCE	25
-10	EBIT	575
-8	NOPAT = EBIT · (1-T)	466
250	+NCE	25
-104	-ΔNWC	0
0	-CAPEX	25
FCF ₀ = 346	FCF ₁₋₈	466

10 $NPV = -354 + \frac{466}{1,101} \cdot \left(1 - \frac{1}{1,101^8}\right) + \frac{346}{1,101^8} \approx 2200 > 0$



5 CAPITAL INVESTED

LIABILITIES

16667 = AP
578900 = TL

$$\left. \begin{array}{l} \text{CAPITAL} \\ \text{INVESTED} \end{array} \right\} = 578900 - 16667 = 562233$$

6 CAPITAL STRUCTURE ⇒ FINANCIAL RISK
STRUCTURE OF CAPITAL

$\frac{D}{E}$

$$\left. \begin{array}{l} D = 220000 \\ E = 342233 \end{array} \right\}$$

$$\frac{D}{E} = \frac{220000}{342233} = 0.64$$

$$w_e = \frac{342233}{562233} = 0.61$$

$$w_d = 0.39$$

7

Free CASH Flow FCF

$$CR = 200000$$

$$CE = FC + VC = 2000 \cdot 3.12 + 60000 = 132000$$

$$NCE = 50000$$

$$EBIT = 200000 - 132000 - 50000 = (+18000)$$

$$NOPAT = EBIT \cdot (1 - 0.19) = (+14580)$$

$$NCE = 50000$$

$$-\Delta NWC = 0$$

$$-CAPEX = 50000$$

$$FCF = 14580$$

1

2

Op
buy
row

3 ASSET

IN

AR

CAS

FA

5 CAPITAL INVESTED

LIABILITIES	
	CAPITAL INVESTED = $578900 - 16667 = 562233$
16667 = AP	
578900 = TL	

6 CAPITAL STRUCTURE ⇒ FINANCIAL RISK
STRUCTURE OF CAPITAL

$\frac{D}{E}$	$D = 220000$	$\frac{D}{E} = \frac{220000}{342233} = 0,64$
	$E = 342233$	$W_e = \frac{342233}{562233} = 0,61$

$W_d = 439$

7 Free CASH FLOW FCF

$CR = 200000$
 $CE = FC + VC = 2000 \cdot 3 \cdot 12 + 60000 = 132000$
 $NCE = 50000$

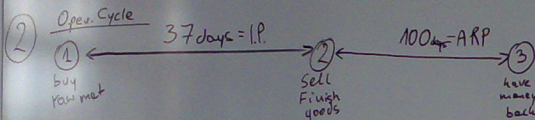
$EBIT = 200000 - 132000 - 50000 = (+18000)$
 $NOPAT = EBIT \times (1 - 0,19) = (+14580)$

$NCE = 50000$
 $-\Delta NWC = 0$
 $-CAPEX = 50000$

$FCF = 14580$

$$100,000 \times 2\text{€} = 200,000$$

① $CR = 200,000$



③ ASSETS:

$$INV = \frac{CR}{360} \cdot IP = \frac{200,000}{360} \cdot 37 = 20,556$$

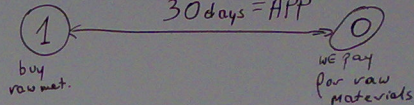
$$AR = \frac{CR}{360} \cdot ARP = \frac{200,000}{360} \cdot 100 = 55,556$$

$$CASH = (5) \cdot \frac{CR}{360} = 2,778$$

$$FA = 500,000$$

ASSET	LIABILITIES
FA = 500,000	
INV = 20,560	
AR = 55,560	
CASH = 2,780	16,667 = AP
TA = 578,900	578,900 = TL

④ AP (our obligations to our suppliers)



$$AP = \frac{200,000}{360} \cdot 30 = 16,667$$