(1)

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Balance Sheet

Current Assets:	
Cash	2,875,000
Acc. Receivable	939,776
Inventory	490,000
Other	893,000
Total	5,197,776
Fixed Assets:	
Land	1,575,000
Building & Equip	1,348,800
Total	2,923,800
Total Assets	8,121,576

Current Liabilities:	
Acc. Payable	298,484
Notes Payable	1,170,127
Total	1,468,611
Long-Term Liabilities	
Long-Term Debt	500,000
Accrued Exp.	203,000
Equity	
Common Stock	337,500
Add. Paid-In Capital	2,000,000
Preferred Stock	1,200,000
Retained Earnings	2,612,465
Treasury Stock	(200,000)
Total	5,949,965
Total Liabilities + Equity	8,121,576

Match ✓

Income Statement

Revenue	8,281,989
COGS	5,383,293
SG&A	1,323,368
Operating Income	1,575,328
Other Income	1,740,253
EBIT	3,315,581
Interest	50,000
Taxable Income	3,265,581
Taxes	653,116
Net Income	2,612,465

RE > EBIT, there must be other income sources! *

Tax rate not given, assume t = 0.2

← Assume b = 1?

② Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

$= \frac{5,177,776}{1,460,611}$

Current Ratio = 3.54

Equity Multiplier = $\frac{\text{Total Assets}}{\text{Total Equity}}$

$= \frac{8,121,576}{5,949,965}$

EM = 1.36

Du-Pont: ROE = PM × TAT × EM

$PM = \frac{NI}{Sales} = \frac{2,612,465}{8,281,989} = 0.315$

$TAT = \frac{Sales}{Total\ Assets} = \frac{8,281,989}{8,121,576} = 1.02$

EM = 1.36

ROE = 0.315 × 1.02 × 1.36 = 0.437

$ROE = \frac{NI}{Total\ Eq.} = \frac{2,612,465}{5,949,965} = 0.439$ ← rounding error ✓

① The Equity Multiplier fails to take into context any aspect of the current economic environment, therefore ignoring things such as recession, growth opportunities, etc.

② It also doesn't inherently give valuable information relative to the industry the company is in (EM of 1.2 could be good in one industry, but not another)

(4) $Q = 1000$ units

$VC = 5$

$FC = 10000$

$t = 0.2$

$r = 0.1$

$II = 20000$

↳ $Dep = 20000/5 = 4000$

$T = 5$

a) $$\frac{EAC + FC(1-t) - t(Dep)}{(P-VC)(1-t)} = Q$$

$$\frac{EAC + 10000(1-0.2) - 0.2(4000)}{(P-5)(1-0.2)} = 1000$$

$$EAC = \frac{II(r)}{1-(1+r)^{-T}}$$

$$EAC = \frac{20000(0.1)}{1-(1+0.1)^{-5}}$$

$$EAC = 5275.95$$

$$1800 = \frac{5275.95 + 8000 - 500}{P-5}$$

$$\boxed{P = \$20.59 \text{ /unit}}$$

5) The proxy for the annual financing cost is EAC, or effective annual cost, which represents the opportunity cost of the initial investment.

5.

P = $30
Q = 1000
T = 5 yrs
t = 0.2
r = 0.1
FC = 10000
II = 20000
VC = 5

Dep = 4000
MV = 3000

a) $OCF_1 = OCF_2 = \ldots = OCF_5 = OCF$

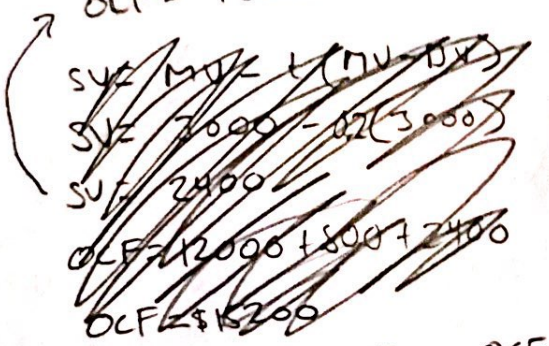
$OCF = (\text{Sales} - \text{Cash Costs})(1-t) + t(\text{Dep}) + SV$

$OCF = (P \times Q - VC \times Q - FC)(1-t) + (\text{Dep})(t) + SV$

$OCF = (30000 - 5000 - 10000)(0.8) + (4000)(0.2) + SV$

$OCF = 12000 + 800 + SV = 12{,}800$

$SV = MV - t(MV - BV)$
$SV = 3000 - 0.2(3000)$
$SV = 2400$



$$NPV = -20000 + \frac{OCF}{1.1} + \frac{OCF}{1.1^2} + \frac{OCF}{1.1^3} + \frac{OCF}{1.1^4} + \frac{OCF}{1.1^5} + \frac{SV}{1.1^5}$$

$$NPV = -20000 + \frac{OCF}{0.1}\left[1 - \frac{1}{1.1^5}\right] + \frac{2400}{1.1^5}$$

NPV = 30,012.28

b) You can tell NPV is positive because the price ($30) is greater than the price needed to financially break even, everything else kept constant.

(6) $r = 0.1$ I.I. $= 10000$

A

$II = 5000$

$PV = \frac{200}{1.1} + \frac{1200}{1.1^2} + \frac{1200}{1.1^3} + \frac{1400}{1.1^4} + \frac{2800}{1.1^5}$

$PV = 4769.93$

$PI = \frac{4769.93}{5000}$

$PI_A = 0.95$

B

$II = 5000$

$PV = \frac{2050}{1.1} + \frac{1100}{1.1^2} + \frac{1200}{1.1^3} + \frac{1200}{1.1^4} + \frac{1200}{1.1^5}$

$PV = 5239.03$

$PI_B = 1.05$

C

$II = 8000$

$PV = \frac{2300}{1.1} + \frac{2150}{1.1^2} + \frac{2150}{1.1^3} + \frac{2150}{1.1^4} + \frac{2150}{1.1^5}$

$PV = 8286.56$

$PI_C = 1.04$

A+B

$II = 10000$

$PV = \frac{2250}{1.1} + \frac{2300}{1.1^2} + \frac{2400}{1.1^3} + \frac{2400}{1.1^4} + \frac{4000}{1.1^5}$

$PV = 9872.35$

$PI_{AB} = 0.97$

C-B

$II = 5000$

$PV = \frac{256}{1.1} + \frac{1050}{1.1^2} + \frac{950}{1.1^3} + \frac{950}{1.1^4} + \frac{950}{1.1^5}$

$PI_{C-B} = 1.02$

Invest in Project C, it has an incremental PI over Project B of >1

(7) $PI = \frac{\text{PV of future cash flows}}{\text{Initial Investment}}$

if $PI > 1$, then PV of future cash flows is greater than the initial investment.

↳ Since $NPV = -\text{Initial Investment} + \text{PV of cash flows}$

↳ $PI > 1$ means $NPV > 0$

The company will break even from an accounting perspective

↳ By definition of the financial break-even point, the company must be covering all its financial costs | Yes

↳ This means that the NPV of the project must be ≥ 0

↳ By definition, the accounting break even point is less than the financial BEP since it ignores financing costs

↳ Since the NPV of this project is positive, we are financially breaking even

↳ If we are financially breaking even, we must be breaking even from an accounting perspective

The company will financially break even | Yes

↳ See above

The NPV is greater than zero | Yes

↳ See top

(9.) $\beta_T = 1.3$

$g = 0.10$

$Div_6 = 4$

$R_f = 0.03$

$R_m = 0.12$

$P_5 = \frac{Div_6}{R_T - g}$ ← price @ year 5

$P_5 = \frac{4}{R_T - 0.1}$

$R_T = R_f + \beta_T (R_m - R_f)$

$R_T = 0.03 + 1.3(0.12 - 0.03)$

$R_T = 0.147$

$P_5 = \frac{4}{0.147 - 0.1}$

$P_5 = \$85.11$

$P_0 = \frac{P_5}{(1+r)^5}$ ← bring back to current

$P_0 = \frac{\$85.11}{(1.12)^5}$

$\boxed{P_0 = \$48.29}$

10. P → f and X

$R_p = 0.075$ $R_x = 0.12$ $R_f = 0.03$ $R_m = 0.1086$ → find ρ_{xm}

$\sigma_p = 0.27$ $\sigma_x = ?$ $\sigma_f = 0$ $\sigma_m = 0.18$

$$\rho_{xm} = \frac{\sigma_{xm}}{\sigma_x \sigma_m}$$

$$\rho_{xm} = \frac{\sigma_{xm}}{\sigma_x (0.18)}$$

$$R_p = x_x R_x + x_f R_f$$

$$0.075 = x_x (0.12) + (1 - x_x)(0.03)$$

$$0.075 = 0.12 x_x + 0.03 - 0.03 x_x$$

$$x_x = 0.5, \quad x_f = 0.5$$

$$\sigma_p^2 = x_x^2 R_x^2 + \dots$$

$$\sigma_p = x_x \sigma_x$$

$$0.27 = 0.5(\sigma_x)$$

$$\sigma_x = 0.54$$

$$\rho_{xm} = \frac{\sigma_{xm}}{0.09772}$$

$$\sigma_{xm} = \beta_x \sigma_m^2$$

$$R_x = R_f + \beta_x (R_m - R_f)$$

$$0.12 = 0.03 + \beta_x (0.1086 - 0.03)$$

$$\beta_x = 1.145$$

$$\sigma_{xm} = 1.145 (0.18)^2$$

$$\sigma_{xm} = 0.037$$

$$\boxed{\rho_{xm} = 0.38}$$