

**Practice Midterm Solutions**

Formulas:

<b>Performance Measures</b>	
Market value added (\$ millions)	market value of equity – book value of equity
Market-to-book ratio	market value of equity ÷ book value of equity
<b>Profitability Measures</b>	
Return on assets (ROA)	after-tax operating income/total assets
Return on capital (ROC)	after-tax operating income/(long-term debt + equity)
Return on equity (ROE)	net income/equity
EVA* (\$ millions)	after-tax operating income – cost of capital × capital
Operating profit margin	after-tax operating income/sales
<b>Efficiency Measures</b>	
Asset turnover	sales/total assets at start of year
Receivables turnover	sales/receivables at start of year
Average collection period (days)	receivables at start of year/daily sales
Inventory turnover	cost of goods sold/inventory at start of year
Days in inventory	inventories at start of year/daily cost of goods sold
<b>Leverage Measures</b>	
Long-term debt ratio	long-term debt/(long-term debt + equity)
Long-term debt-equity ratio	long-term debt/equity
Total debt ratio	total liabilities/total assets
Times interest earned	EBIT/interest payments
Cash coverage ratio	(EBIT + depreciation)/interest payments
<b>Liquidity Measures</b>	
Net working capital to assets	net working capital/total assets
Current ratio	current assets/current liabilities
Quick ratio	(cash + marketable securities + receivables)/current liabilities
Cash ratio	(cash + marketable securities)/current liabilities
<b>Growth Measure</b>	
Payout ratio	dividends/earnings

3 factor DuPont decomposition:

$$ROE = \frac{\text{Net income} + \text{after tax interest}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

ROE= Operating profit margin x Asset turnover x measure of leverage

- Present value of a cashflow:
- Present value of a perpetuity:
- Present value of a perpetuity received t years in the future:
- Present value of an annuity received for t years:

$$\sum_{t=1}^n \frac{C_t}{(1+r)^t}$$

$$\frac{C}{r}$$

$$\frac{C}{r(1+r)^t}$$

$$\frac{C}{r} - \frac{C}{r(1+r)^t}$$

### Part 1 - Short questions (5 points each)

1. What is the role of the financial manager?

**Management of uses (capital budgeting, investment) and sources (financing) of funds (money), with the goal of maximizing company value.**

2. What ratio would you use to measure:

a. Ability of a firm to pay it's short term liabilities

**Current, quick or cash ratios**

b. How efficient a firm is at managing inventories

**Inventory turnover**

c. How efficient a firm is at using its assets

**Asset turnover**

d. Ability of a firm to generate cash-flow in order to pay interest

**Cash-coverage ratio**

3. Calculate the discount rate equivalent to a 1 year discount factor of .96

**See Excel**

**4%**

4. Identify 2 reasons why IRR is not a good investment decision measure

**a. Greater IRR doesn't mean greater value creation**

**b. Projects NPV might be negatively correlated to discount rate**

**c. Multiple IRR when there are negative cash-flows in the future**

**Part 2 – Quantitative questions (20 points each)**

5. An analyst looks at the following common size summary of financial statement and says. Both firms seem equally profitable, they have the same Net Income + ATI / Sales ratio. Use a 3 factor DuPont decomposition to find additional insights regarding the source of profitability of each company. Comment your findings.

(all figures expressed as % of sales)

See Excel.

	<b>Block</b>	<b>Chain</b>
Sales	100	100
Net income + after tax interest	20	20
Assets	50	25
Debt	25	0
Equity	25	25

**See Excel for calculation. Should note: Return on equity is equal for both. Chain has greater asset turn-over but lower leverage.**

6. A local bank advertises the following deal: “Pay us \$100 a year for 10 years and then we will pay you (or your beneficiaries) \$100 a year forever.” .

- a. Explain and prove why this is not good deal if the interest rate available on other deposits is 10%?

**See Excel**

- b. What should be the future annual payment in order to make this a good deal?

**Solve for the present value of payments from the bank that equals the present value of payments to the bank.**

**See Excel**

**Part 3 – Long quantitative question (40 points)**

7. Using the following information and a discount rate of 10%, determine for each project:

<b>Project Bit</b>				
Year	0	1	2	3
After tax income		20	30	40
Depreciation		10	10	10
Capex	-50			2.8
Changes in NWC		0	0	0
FCF	-50	30	40	52.8

<b>Project Coin</b>				
Year	0	1	2	3
After tax income		4	5	40
Depreciation		10	10	10
Capex	-30			0.4
Changes in NWC		0	0	0
FCF	-30	14	15	50.4

- NPV : **See Excel**
- Profitability index: **See Excel**
- Payback period **See Excel**
- If you can only invest \$50, which project would you invest on? Why?  
**Project Bit, it has the highest NPV**