15.535 – Winter 2003
Sample Solutions
Quiz #1 – March 6,2003

QUESTION 1: Multiples Comparisons (20 pts)
Dell Computer trades at a M/B ratio of 13.86. The industry M/B ratio is 10.5.

(a) Provide 2 reasons why you might expect Dell to have lower stock returns than firms in its industry over the next 5 years (Hint: Market Efficiency compared to Market Inefficiency)

1} Inefficiency: Dell's stock price is too high relative to fundamental value (ie book value proxies for discounted future expected cash flows). As the market discovers this mispricing, Dell's stock price will drop (ie lower future stock returns).

2} Efficiency: Dell's net assets (and the cash flows generated by these net assets) may have lower systematic risk (ie lower discount rate) compared to other firms in the industry (one possible reason: lower leverage). Given that Dell's price is determined by the <u>discounted</u> present value of the CF's from its assets, then its current price should be higher compared to other firms (ie high M/B). However, its future expected returns (=discount rate) should be low BECAUSE it has low systematic risk.

10 pts

(b) Even though Dell's M/B ratio is high relative to its industry, this ratio may tell us nothing about whether Dell's stock is either under- or over-priced. Explain. (Hint: Accounting reasons).

Dell may have differences in the way it accounts for it assets and liabilities compared to other firms in its industry. For example, its book value of equity may be <u>relatively</u> too low (ie unrecognized intangible assets) or too high (ie impaired assets not written down).

10pts

QUESTION 2: Accounting Quality and Ratio Analysis (20 pts)
Q-Aqua Resources is water pipeline and distribution company. It claims that the water supply market is *"... most important and, potentially, the fastest growing global resource market over the next 50 years."*

The company reported losses (GAAP net income) for the past 3 years. Q-Aqua currently trades at $6.55 per share. In a recent press release, the company highlighted the fact that it had *"... positive operating income last year. In addition, sales have been growing at a rate of 25% per year for the past 2 years. Based on the fact the Q-Aqua trades at a <Price-to-Sales> ratio of only 2 and a <Price-to-Operating Income> ratio of only 7, the management believes that our company is currently undervalued."*

As part of your research, you examined Q-Aqua's most recent annual financial statement and focused on the supplemental footnotes to the income statement. In particular, the footnotes state that the company *"entered into 17 water supply swap transactions in 2001 and 38 water supply swap transactions in 2002. We are conservative in accounting for these swaps in that we fully book for all revenues and expenses related to these transactions each year."* Later in the same footnote, company management states that that *"We view the supply capacity received in these swap transactions as building of our overall capital abilities."*

Based on all of the above information, answer the following questions:
   a) Why might you question the validity of the company's reported operating income? Which component?

Operating income may only include revenues from swaps, but not the associated expenses. Therefore, operating income is overstated. Even if the swap expenses are not capitalized, they might be presented below operating income on the income statement.

10pts

   b) Why might you question the company's claim that *"we believe the company is currently undervalued."* (Focus on the <Price-to-Sales> ratio)

The <Price-to-Sales> ratio may use a sales number that includes questionable swap revenues that do not represent real economic value. For the <Price-to-Sales> ratio to be a meaningful valuation metric, the Sales number must be related to future expected free cash flows that the firm will generate from its operating business. This is questionable for these types of swaps.

10pts

QUESTION 3: Earnings-Based Valuation (20 pts)

Valanium Inc. is currently trading at a forward P/E ratio of 11. Analysts are projecting its earnings per share for the year ended December 2003 at $2.10.

(a) Using a perpetuity model, estimate of the equity cost of capital for *Valanium Inc.* (Show all calculations).

If one assumes a perpetuity model where next year's earnings are related to a perpetuity of future free cash flows, then P/E=1/r. Therefore, r=9.1%

5pts

(b) The book value of equity of *Valanium* at the end of fiscal 2002 was $15.00 per share. Calculate abnormal earnings for the fiscal year ended 2003. (Show your calculations)

$$AE_{2003} = E_{2003} - r*BV_{2002} = 2.10 - (0.091*15.00) = \$0.74 \text{ per share}$$

5pts

(c) Assuming a perpetuity in abnormal earnings, calculate the predicted stock price of *Valanium Inc.* using the residual income (EBO) valuation model.

$$P = BV_0 + AE_1/(1+r) + AE_2/(1+r)^2 + ...$$
If perpetuity in AE, then $P = BV_0 + AE_1/r = 15 + 0.74/0.091 = \$23.09$

5pts

(d) What factors would allow you to justify a perpetuity in abnormal earnings?
- **Accounting Factors: Current BV is understated which means that <u>calculated</u> abnormal can persist because of a persistently understated book value.**
- **Economic Factors: Firm can somehow prevent competitors from entering the market who might otherwise drive abnormal earnings (rents) to zero (i.e. a monopoly)**

5pts

QUESTION 4: Cash Flow Analysis (20 pts)

Listed below is the summary balance sheet for FGST Corp for fiscal years ended 2001 and 2002 (all numbers in millions of dollars). The company reported net income in 2002 of $1,400 million. FGST had no capital expenditures or asset sales in 2001 and 2002. Shares outstanding remained constant over the 2 years. The company's long-term debt matures in the year 2010.

Summary Balance Sheet **FGST Corp (all amounts in $MM)**	Year ended **2002**	Year ended **2001**
Cash	2,600	1,500
Accounts Receivable (net)	4,900	3,200
Inventory	5,500	4,100
<u>Property Plant & Equipment (Net of Deprec)</u>	<u>29,500</u>	<u>32,500</u>
Total Assets	$42,500	$41,300
Accounts Payable	3,300	2,800
Accrued Liabilities	1,500	2,200
<u>Long Term Debt</u>	<u>25,400</u>	<u>25,400</u>
Total Liabilities	30,200	30,400
<u>Shareholders Equity</u>	<u>12,300</u>	<u>10,900</u>
Total Liabilities & Shareholders Equity	$42,500	$41,300

(a) Calculate CFO (cash flow from operations) for the fiscal year 2002. Please show all your work. State any assumptions you may make in deriving your calculations.

<u>Quickie Method</u>: Given no financing or investment changes in cash, then CFO equals change in cash: $CFO_{2002} = \Delta Cash_{2002} = Cash_{2002} - Cash_{2001} = 2{,}600\text{-}1{,}500 = \underline{\$1{,}100M}$

<u>Indirect Method (Standard Method)</u>:

No Capex, Assets Sales. Therefore, Deprec = Change in PPE = (32500-29500) = 3000
CFO = NI – WC Accruals + Depreciation = NI –(ΔNon-Cash WC) + Depreciation
**   = NI – [ΔAR + ΔInventory - ΔAP - ΔAccLiab] + Depreciation**
**   = 1,400 – [(4900-3200) + (5500-4100) – (3300-2800) – (1500-2200)] + 3000**
**   = $\underline{\$1{,}100M}$**

                                                                                          10 pts

The company is expected to have relatively stable sales for the next 3 years (2003-2006).
(b) Do you expect the working capital accruals in 2003 to be higher, lower, or the same as working capital accruals reported in 2002? Provide reasons to support your answer.
WC Accruals in 2002 are positive and equal to $3,300M (see part (a)). Given that firm will have no sales growth and that WC accruals tend to revert to zero over time when there is no growth, then one should expect WC accruals to be <u>lower</u> over the next 3 years.

                                                                                           5 pts

(c) What do you expect free cash flow to equity (FCFE) to be in 2006? Please state any assumptions you make and provide reasons for your answer.
Given no sales growth, then one should expect flat NI for the net several years. It we assume that over the long run average (i) depreciation=Capex, (ii) WC accruals will smooth to zero, and the firm has no debt repayment or issuances until 20010, then it would reasonable to assume that predicted $FCFE_{2006} = NI_{2006} = NI_{2002} = \underline{\$1{,}400M}$

                                                                                           5 pts