

## Sample Solutions of Quiz #2: 15.535 – Winter 2003

### QUESTION 1: Cost of Capital (30 pts)

*Krispy Kreme Donuts* is a fast growing donut store chain that is seeking to topple *Dunkin Donuts* as the top snackfood store in the U.S. The following questions relate to an analysis of the risk and cost of capital of this company.

(a) *Krispy Kreme's* stock closed yesterday at price of \$30.10 per share. Analysts predict earnings per share for *Krispy Kreme* to be \$0.87 next year. Analysts also predict that earnings will grow for the foreseeable future at a rate of 30% per year. Using a growing perpetuity model, calculate the implied cost of equity capital for *Krispy Kreme*. (You don't need beta here!)

**Growing Perpetuity Formula:  $E/(r-g)$  Therefore,  $r = E/P + g = 0.87/30.10 + 30\% = 32.89\%$**

**10 pts**

(b) Why might the “growing perpetuity model” used in part (a) overstate the cost of capital for *Krispy Kreme*? If you still used the implied cost of capital method, what changes to the model or different assumptions would you make to obtain a better estimate of *Krispy Kreme's* cost of capital?

**The lower bound of cost of capital is perpetual growth rate “g”. It appears that specified growth rate of 30% in perpetuity is too high. Therefore, estimated cost of capital is too high. Potential remedies:**

- (i) Use a lower perpetual growth rate based on economic arguments (ie return to GDP growth rate of 3 or 4%)
- (ii) Use more realistic two-stage or three-stage DCF model with high earnings growth rate in next 5 years (30%), then lower earnings growth in the middle (years 6-10), and then a low perpetual growth rate in years 11 and beyond.

**4 pts**

Yahoo! Finance reports that the current *Beta* for *Krispy Kreme* is 1.39. However, you re-estimate the CAPM *Beta* using monthly stock returns for the past 12 months and find that the *Beta* is 0.81 with a standard error of 0.55.

(c) Give three reasons why your estimated *Beta* “appears” to be different than the one reported by Yahoo! Finance.

- **Different estimation period (ie 60 months versus 12 months)**

\* **Yahoo may use more data (60 months) which provides a better beta estimate**

\* **Company risk has recently changed – your estimate is more up-to-date**

- **There is no statistical difference between betas of 1.39 and .81. For example, the value of 1.39 falls within the 95% confidence interval of your estimated beta 0. In other words, 1.39 is within 2 standard errors of 0.81 ( $0.55 \times 2$ ).**

- **Yahoo may use a different data to calculate its beta estimate (ie different risk-free rates or different market benchmark)**

**6 pts**

(d) The current yield on long-term government treasuries is 4.9%. What is the estimated cost of capital for *Krispy Kreme* using the CAPM using the estimated  $Beta=0.81$ ? How confident are you of your estimate (You should reply on statistical numbers to comment on this result).

**CAPM:  $R = R_f + Beta \times (R_m - R_f) = 4.9\% + 0.81 \times 7.95\% = 11.34\%$  (Use long-term historical risk premium from class notes)**

The 95% confidence interval for beta is  $0.81 \pm 2 \cdot 0.55 = [-0.29, 1.91]$ . This includes the value of zero which means that the firm may have no estimated market risk. Therefore, the estimated cost of capital ranges from [2.60%, 20.08%]. You are not very confident about the estimated very of 11.34%.

5 pts

(e) Using the 3-factor model, you estimate *Krispy Kreme's* "Size Beta" to be 0.66 and its "Distress Beta" to be -1.22. What do these coefficients mean? Do they imply a higher or lower cost of capital compared to the CAPM?

**The Size Beta of 0.66 means that the firm's risk attributes appear to be more like a small stock (ie positive factor loading). The Distress Beta of -1.22 means that the firm's risk attributes appear to be more like low B/M stock (ie negative factor loading means low distress).**

The long term average annual returns on the Size and Distress portfolios are 3.32% and 5.05%.

**Answer Option (A):** Assuming the market beta is the same under the CAPM and the 3-factor models, then the incremental return is  $0.66 \cdot 3.32\% - 1.22 \cdot 5.05\% = -3.97\% \rightarrow$  lower cost of capital estimated using 3-factor model.

**Answer Option (B):** Do not have enough information to determine difference in cost of capital because we do not know the market beta estimated using 3-factor model (can be different from CAPM beta because of correlation in factor returns).

5 pts

## **QUESTION 2: Accounting Trading Strategies (20 pts)**

(a) On March 1, 2003, ten companies in the retail sector announced their financial results for the latest fiscal year. The ROE (=EPS/Book Value per share) for the ten companies ranged from 3% to 21%. Explain how you would implement a trading strategy using the earnings announcement drift anomaly for these companies.

**Post earnings announcement drift: Firms that announce highest (lowest) relative earnings tend to have higher (lower) stock returns over next year. Therefore, after the announcement of earnings on March 1, 2003, you could buy (go long) in the stocks with the highest earnings and sell (go short) in stocks with the lowest relative earnings.**

**Note that we use ROE to scale for firm size.**

10 pts

(b) You also ranked the ten retail companies based on their reported Accruals for the latest fiscal year. The ratio of Accruals-to-Total Assets was essentially the same for 8 companies. Of the two remaining companies, one company had very high accruals and the other company had very low accruals. What do you predict the stock returns will be for these two companies over the next 12 months?

**High accruals firm: expect low stock returns over the next 12 months**

**Low accruals firm: expect high stock returns over the next 12 months**

5 pts

(c) When do you expect the abnormal returns for these two companies to occur?

**The majority of the abnormal returns are expected to occur around the next 4 subsequent quarterly earnings announcements (when information about earnings/reversal of accruals is revealed)**

5 pts

**QUESTION 3: Contracting (20 pts)**

(a) Describe what is meant by performance pricing in debt contracts.

**The borrower's periodic interest payments are variable and change as a function of financial health/risk. The borrower's financial health/risk is measured using accounting ratios (i.e. Debt to EBITDA ratio). The interest rate is typically a base rate (ie LIBOR) plus a premium calculated based on the accounting ratio that is typically based on a pricing grid. Performance pricing allows (1) the borrower to typically receive a lower upfront interest rate, and (2) the lender to continually adjust the loan parameters to reflect repayment risk.**

10pts

*Rackham Corporation* raised \$23 million in early 2002 from private debt placement. In 2002, its debt-to-EBITDA ratio was 3.5. The debt contract stipulated that *Rackham* would have to pay an additional 30 basis points in quarterly interest payments for each additional 0.5 increase in its Debt-to-EBITDA ratio (For example, Debt-to-EBITDA greater than 4.0 would add 30 basis points, Debt-to-EBITDA greater than 4.5 would add 60 basis points, etc.). In early 2003, *Rackham* reported a Debt-to-EBITDA ratio of 3.99.

(b) Why might you be suspicious of potential accounting manipulation at *Rackham* in the current year?

***Rackham's* Debt-to-EBITDA ratio is "suspiciously" close to, but just below, the next performance-pricing increment. Given the incentives to pay a lower interest rate, we should check to see if *Rackham* manipulated (ie increased) its EBITDA. We could check its working capital accruals to see if they are out of line.**

5 pts

(c) What are the advantages of the **Z-score** over simple financial ratios (such as the current ratio) in predicting the financial health of a firm? Give at least two major advantages.

**(1) Individual ratios may not capture a firm's true financial health (ie low current ratio may mean poor liquidity (Bad) or good management of working capital (Good)).**

**(2) The Z-score includes stock market information which is a more timely measure of health compared to accounting numbers.**

**(3) It is easier for the firm to manipulate individual accounting numbers compared to a whole range of accounting numbers.**

5pts

**QUESTION 4: Option Accounting (10 pts)**

In his March 4, 2003 opinion editorial column in the Wall Street Journal, Mr T.J. Rodgers (President and CEO of Cypress Semiconductor) concludes that "*We need a pro forma accounting standards board, chartered to specify how to make clear, consistent corrections to*

*the GAAP statements to remove the phony assets from our balance sheets and the unwarranted charges to earnings from our income statements. Alternatively, if FASB would listen to its customers, GAAP could be restored to its pre-2001 level of usefulness, with pooling of interests accounting restored and option accounting left as is.”*

(a) As the CEO of a high technology company whose stock price has dropped by 50% over the past year, what are Mr Rodger’s motives to restore the old M&A accounting standards? (Hint: Consider the implications of SFAS 142 with regard to goodwill.)

**- May have overpaid for past acquisitions accounted for using the “Purchase Method. Under SFAS 142, firm will have to write down acquired goodwill if it is impaired. The impairment test is triggered because the firm’s stock price has dropped by a large amount. Firm will report a large loss which may adversely affect its stock price or it may violate certain debt contracts.**

**- Alternate answer: Under old pooling rules firm did not have to recognize amortization of goodwill nor did it have to recognize impairment (both reduce reported earnings).**

**5 pts**

(c) Explain why Cypress Semiconductor reported (related to options):

- (i) high GAAP profits in 1999 and 2000 and had effective federal tax rate of only 14%,
- (ii) lower GAAP profits in 2001 and 2002 yet its effective tax rate increased to 27%.

**(i) High profits in 1999-2000 led to stock price increase which ensured that employee stock options were in the money. Therefore, employees exercised their stock options which provided the company with IRS tax deductions (difference between stock price and exercise price of options). This lowered the effective tax rate for the firm.**

**(ii) Economy and stock market turned down in 2001-2002. This meant lower profits and a decrease in stock price. Fewer employee stock options were in-the-money and, therefore, fewer option exercises. This meant that firm had fewer tax deductions.**

**5 pts**