

Seminar 4

Return Concept, CAPM

1. A Canada-based investor buys shares of Toronto-Dominion Bank (Toronto: TD.TO) for C\$72.08 on 15 October 2007, with the intent of holding them for a year. The dividend rate is C\$2.11 per year. The investor actually sells the shares on 5 November 2007, for C\$69.52. The investor notes the following additional facts:
 - No dividends were paid between 15 October and 5 November.
 - The required return on TD.TO equity was 8.7 percent on an annual basis and 0.161 percent on a weekly basis.
 - A. State the lengths of the expected and actual holding periods.
 - B. Given that TD.TO was fairly priced, calculate the price appreciation return (capital gains yield) anticipated by the investor given his initial expectations and initial expected holding period.
 - C. Calculate the investor's realized return.
 - D. Calculate the realized alpha.
2. The estimated betas for AOL Time Warner (NYSE: AOL), J.P. Morgan Chase & Company (NYSE: JPM), and The Boeing Company (NYSE: BA) are 2.50, 1.50, and 0.80, respectively. The risk-free rate of return is 4.35 percent and the equity risk premium is 8.04 percent. Calculate the required rates of return for these three stocks using the CAPM.
3. The estimated factor sensitivities of TerraNova Energy to Fama-French factors and the risk premia associated with those factors are given in the following table:

	Factor Sensitivity	Risk Premium (%)
Market factor	1.20	4.5
Size factor	-0.50	2.7
Value factor	-0.15	4.3

- A. Based on the Fama-French model, calculate the required return for TerraNova Energy using these estimates. Assume that the Treasury bill rate is 4.7 percent.
 - B. Describe the expected style characteristics of TerraNova based on its factor sensitivities.
4. Newmont Mining (NYSE: NEM) has an estimated beta of -0.2 . The risk-free rate of return is 4.5 percent, and the equity risk premium is estimated to be 7.5 percent. Using the CAPM, calculate the required rate of return for investors in NEM.

Use the following text to answer A – F questions

Judy Chen is the primary portfolio manager of the global equities portfolio at Horizon Asset Management. Lars Johansson, a recently hired equity analyst, has been assigned to Chen to assist her with the portfolio.

Chen recently sold shares of Novo-Gemini, Inc. from the portfolio. Chen tasks Johansson with assessing the return performance of Novo-Gemini, with specific trade information provided in Exhibit 1.

EXHIBIT 1 Novo-Gemini, Inc. Trade Details

1. Novo-Gemini shares were purchased for \$20.75 per share.
 2. At the time of purchase, research by Chen suggested that Novo-Gemini shares were expected to sell for \$29.00 per share at the end of a 3-year holding period.
 3. At the time of purchase, the required return for Novo-Gemini based upon the capital asset pricing model (CAPM) was estimated to be 12.6% on an annual basis.
 4. Exactly 3 years after the purchase date, the shares were sold for \$30.05 per share.
 5. No dividends were paid by Novo-Gemini over the 3-year holding period.
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Chen explains to Johansson that, at the time of purchase, the CAPM used to estimate a required return for Novo-Gemini incorporated an unadjusted historical equity risk premium estimate for the US equity market. Chen notes that the US equities market has experienced a meaningful string of favorable inflation and productivity surprises in the past. She asks Johansson whether the historical equity risk premium should have been adjusted before estimating the required return for Novo-Gemini.

For another perspective on the reward to bearing risk, Chen asks Johansson to calculate a forward-looking equity risk premium for the US equity market using data on the S&P 500 index in Exhibit 2.

EXHIBIT 2 S&P 500 Index Data

Dividend yield, based on year-ahead aggregate forecasted dividends	1.2%
Consensus long-term earnings growth rate	4%
20-year US government bond yield	3%

Chen is now considering adding shares of Bezak, Inc. to the portfolio. Chen asks Johansson to calculate Bezak's weighted average cost of capital using the CAPM with the information provided in Exhibit 3.

EXHIBIT 3 Bezak, Inc.

Pretax cost of debt	4.9%
Long-term debt as a percent of total capital, at market value	25%
Marginal tax rate	30%
Bezak, Inc. beta	2.00
Estimated equity risk premium	5.5%
Risk-free rate	3.0%

Lastly, Chen asks Johansson to evaluate Twin Industries, a privately owned US company that may initiate a public stock offering. Johansson decides to adapt CAPM to estimate the required return on equity for Twin Industries. Using the MSCI / Standard & Poor's Global Industry Classification Standard (GICS), Johansson identifies a publicly traded peer company with an estimated beta of 1.09 that is much larger but otherwise similar to Twin Industries. Twin Industries is funded 49% by debt, while the publicly traded peer company is funded 60% by debt.

A.

Based upon Exhibit 1, the expected three-year holding period return for Novo-Gemini Inc. at the time of purchase was *closest* to:

- A. 39.76%.
- B. 42.76%.
- C. 44.82%.

B.

Based upon Exhibit 1, the realized three-year holding period return for Novo-Gemini Inc. was *closest* to:

- A. 39.76%.
- B. 42.76%.
- C. 44.82%.

C.

Based on Exhibit 2, the forward-looking estimate for the US equity risk premium is *closest* to:

- A. 2.2%.
- B. 5.8%.
- C. 8.2%.

D.

Based on Exhibit 3, and assuming interest on debt is tax-deductible, the weighted average cost of capital (WACC) for Bezak, Inc. is *closest* to:

- A. 10.87%.
- B. 11.36%.
- C. 13.61%.

E.

The estimate of beta for Twin Industries is *closest* to:

- A. 0.44.
- B. 0.85.
- C. 0.89.

F.

A potential weakness of Johansson's approach to estimating the required return on equity for Twin Industries is that the return estimate:

- A. does not include a size premium.
- B. may overstate potential returns over the long-term.
- C. does not consider systematic risk arising from the economics of the industry.

6. The following facts describe Larsen & Toubro Ltd.'s component costs of capital and capital structure:

Component Costs of Capital	
Cost of equity based on the CAPM	15.6%
Pretax cost of debt	8.28%
Tax rate	30%
Target weight in capital structure	equity 80%, debt 20%

Based on the information given, calculate Larsen & Toubro's WACC.

7.

An analyst wants to account for financial distress and market-capitalization as well as market risk in his cost of equity estimate for a particular traded company. Which of the following models is *most appropriate* for achieving that objective?

- A. The capital asset pricing model (CAPM).
- B. The Fama–French model.
- C. A macroeconomic factor model.

22. *CFA Examination Level II*

An analyst expects a risk-free return of 4.5 percent, a market return of 14.5 percent, and the returns for Stocks A and B that are shown in Table 15.

- a. Show on a graph
 - (1) where Stocks A and B would plot on the security market line (SML) if they were fairly valued using the capital asset pricing model (CAPM).
 - (2) where Stocks A and B actually plot on the same graph according to the returns estimated by the analyst
- b. State whether Stock A and Stock B are undervalued or overvalued if the analyst uses the SML for strategic investment decisions. [4 minutes]

TABLE 15

STOCK INFORMATION

Stock	Beta	Analyst's Estimated Return
A	1.2	16%
B	0.8	14%