**HOMEWORK 7**

*This homework is due on April 24th. It must be handwritten and handed in at the beginning of the lecture. No late homeworks will be accepted. Please show all your work to receive partial credit.*

1) a. You approach your broker to borrow money against securities held in your portfolio. Even though the loan will be secured by the securities in your portfolio, the broker’s rate for lending to customers is 6 percent. Assuming a risk-free rate of 4 percent and an expected market return of 12 percent with a standard deviation of 18 percent, draw the capital market line related to your investment opportunities.

b. Estimate your expected return and risk if he you invest 25 percent of your portfolio in the risk-free asset. What if you decides to borrow 25 percent of your initial wealth and invest the money in the market?

2) a. Assuming that the risk (standard deviation) of the market is 25 percent, calculate the beta for the following assets:

- A short-term U.S. Treasury bill

- Gold, which has a standard deviation equal to the standard deviation of the market but a zero correlation with the market

- A new emerging market that is not currently included in the definition of “market”—the emerging market’s standard deviation is 60 percent, and the correlation with the market is -0.1

- An initial public offering or new issue of stock with a standard deviation of 40 percent and a correlation with the market of 0.7 (IPOs are usually very risky but have a relatively low correlation with the market)

b. Suppose an investor allocates 20% of her wealth to T-bills, another 20% to gold, 25% to the emerging market and the rest to the initial public offering. If the expected market return is 12.5% and the risk-free rate is 3%, calculate the expected return of the investor's portfolio.

3) a. Describe the systematic and nonsystematic risk components of the following assets:

- A risk-free asset, such as a three-month Treasury bill

- The market portfolio, such as the S&P 500, with total risk of 20 percent

b. Consider two assets, A and B. Asset A has total risk of 30 percent, half of which is nonsystematic risk. Asset B has total risk of 17 percent, all of which is systematic risk. Which asset should have a higher expected rate of return?