

Problem set 3  
266: Fi. Markets and Institutions  
Spring 2015  
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**Directions.** You are to do this problem set alone.

**Due Date/time.** Your work is due by beginning of class (10:30am) April 28. You can hand the work in to me at the beginning of class. If you put the work under my office door or in my mailbox, it must be in before I leave for lecture at about 10:20 am.

**Questions.** If you have questions, email me or one of the TAs, raise them in class, or come to office hours.

**Grading.** All parts have equal value.

**Note:** Be sure to note the proper units (e.g., millions, billions, etc.) in the following answers.

1 Hedge funds, alpha, beta.

If the results of the capital asset pricing model (CAPM) were correct, the only way to earn an expected return greater than the risk free rate using publicly available information is by taking risk. Using our standard notation, the CAPM says that for any portfolio,  $A$ ,

$$i_{A,t}^e = i_t^{rf} + \beta(i_{M,t}^e - i_t^{rf})$$

or, rearranging,

$$i_{A,t}^e - i_t^{rf} = \beta(i_{M,t}^e - i_t^{rf}).$$

This second form of the equation says that the ‘excess return’ above the risk free rate on portfolio  $A$  must entirely be attributable to a nonzero  $\beta$ . Remember that  $\beta$  captures the key feature of risk: how the asset return varies with the overall market portfolio return.

Analysts often modify the CAPM equation with an ‘alpha’:

$$i_{A,t}^e - i_t^{rf} = \alpha + \beta(i_{M,t}^e - i_t^{rf}).$$

Now the excess expected return can be due to alpha or beta.

1.1 From a standpoint of portfolio theory, why is earning ‘alpha’ greater than the risk free rate so desirable?

1.2 You invest \$1 million in a hedge fund for 1 year. At the end of the year, the fund is worth \$1.15 million. What is the implied rate of return over the year on the assets of the fund. (Note: we will later consider fees. For this part, ignore the fees.)

- 1.3 Each year, the fund charges a management fee of 2 percent of asset values at the beginning of the year. It also charges an incentive fee of 20 percent of any increase in value between the beginning and end of the year.

Continuing from the previous part, what is the value of the investor's position at the end of the year, after all fees?

- 1.4 What rate of return (after fees) did the investor make on her \$1 million investment?

- 1.5 Continuing. Suppose that the hedge fund return is risky. Thus, with 70 percent probability the \$1 million invested will be worth \$1.643 million at the end of the year. With 30 percent probability the value falls to zero at the end of the year.

What is the expected value of hedge fund assets at the end of the year?

- 1.6 And what is the expected rate of return to the investor (after fees) in this case?

2 Etsy had an IPO on April 15. For this question, googling Etsy IPO should get you to the answers.

2.1 How many shares did Etsy sell? What was the IPO price?

2.2 And the price of Etsy shares at the close of the market April 15?

2.3 What was the closing price of Etsy shares on April 22, one week after the IPO.

2.4 What is a 'bookrunner' for an IPO?

2.5 What investment banks were bookrunners for the Etsy IPO?

3 Interest rates, negative.

3.1 Why would anyone lend money at a negative interest rate? For example, why would they buy a zero coupon bond for more than the face value?

- 3.2 Name a country that recently sold 10-year bonds with an implied negative nominal interest rate?
- 3.3 Continuing from previous part: If the expectations theory of the term structure held, what does a negative 10-year yield suggest about the expected path of short-term interest rates over the next 10 years?
- 3.4 Approximately what is the yield at present on German 10-year government bonds? And the yield on U.S. 10-year bonds?
- 3.5 According to the uncovered interest rate parity (UIP) theory, what do the values in the previous question suggest will happen to the value of the dollar versus the euro over the next 10 years?

3.6 Parts 3 and 5 of this problem derive implied expectations from financial market data using simple theories (the expectations theory of the term structure and UIP). What is missing from these theories that might mean that those derived expectations may not actually represent actual expectations of market participants?

#### 4 Unconventional monetary policy

4.1 Lower for longer. Under one standard view, a central bank facing a weak economy, undesirably low inflation, and whose policy rate is at its lower bound should promise to keep that policy rate at zero considerably longer than ‘normal times’ reasoning might dictate. A promise to deliver a policy rate that is ‘lower for longer’ is one form of forward guidance.

Explain the reasoning suggesting that this promise of rates that are lower for longer would stimulate the economy when announced.

4.2 Many central banks have engaged in large scale purchases of longer-term securities. A standard description of this policy is that the central banks are ‘flooding the economy with liquidity’ with the hope that this liquidity will stimulate the economy. Rightly or wrongly, the Fed has a very different account of why large scale asset purchases might stimulate the economy. Explain the Fed’s reasoning.

4.3 The large-scale asset purchases have led to an unprecedented level of reserves in the banking system of the U.S. What can banks collectively do to reduce the overall stock of reserves in the banking system?

4.4 And what can they do to reduce the overall stock of excess reserves?