Problem Set 1

Foundations of Financial Markets
Summer 2007, Section 1
Due date: End of class, May 22

1. You are among the OTC marketmakers in the stock of BioEngineering, Inc. and quote a bid of 102 1/4 and an ask of 102 1/2. Suppose that you have zero inventory.

   (a) On Day 1 you receive market buy orders for 10,000 shares and market sell orders for 4,000 shares. How much do you earn on the 4,000 shares that you bought and sold? What is the value of your inventory at the end of the day? (Hints: It is possible to have negative inventory. Further, there is more than one correct way to value an inventory, but please state what assumption your valuation is based on.)

   (b) Before trading begins on Day 2 the company announces trial testing of a cure for acne in mice. The quoted bid and ask jump to 110 1/4 - 110 1/2. During Day 2 you receive market sell orders for 8,000 shares and buy orders for 2,000 shares. What is your total profit or loss over the two-day period? What is the value of your inventory at the end of Day 2?

   (c) Where did your profit or loss come from? What is a market maker's objective, that is, how does a market maker seek to make money? Is there anything you could have done during Day 1, consistent with a market maker's objective, that would have improved your performance over the two-day period?

2. Which of the following investments do you prefer?

   (a) Purchase a zero-coupon bond, which pays \$1000 in ten years, for a price of \$550.

   (b) Invest \$550 for ten years in Chase at a guaranteed annual interest rate of 4.5%.

3. Suppose you get for free one of following two securities: (a) an annuity that pays \$10,000 at the end of each of the next 6 years; or (b) a perpetuity that pays \$10,000 forever, but payments do not begin until 10 years from now (the first cash payment from this security is 11 years from today). Which security would you choose if the annual interest rate is 5%? Does your answer change if the interest rate is 10%? Explain why or why not.

4. You are considering the following one-year investments: (i) Bank A promises to pay 8% on you deposit compounded annually. (ii) Bank B promises to pay 8% on you deposit compounded daily. (iii) Bank C promises to pay 8% on you deposit compounded continuously. Compare the effective annual rate (EAR) on these investments.

5. When a company, say IBM, sells shares in the primary market, it receives money directly, and therefore it has reason to care deeply about the price it receives. In contrast, when a share of IBM is sold by one investor to another in the secondary market, IBM itself is not directly involved. Why does, or should, IBM care about the price of its shares in the secondary market?