IN-CLASS PRACTICE PROBLEMS FOR FIN 642

Professor Burch

These are not assigned HW problems, but rather are practice problems that are intended to be worked during class. Please bring them with you – we will work them as we progress through the course.

In-class practice problems for lecture 1

1. Consider the following exchange rates: $0.0091 = 1 Japanese yen; $0.82645 = 1 Euro. How many yen per dollar? How many yen per euro?

2. Gold sells for 330 euros per ounce in Brussels and 245 British pounds per ounce in London. Assume it is costless to transport gold between these two locations. What is the implied exchange rate in terms of pounds per euros? If the actual exchange rate is 0.80 pounds per euro, how could you profit? By how much would you profit?

3. Suppose your U.S.-based firm expects to be paid 300,000 British pounds in 6 months. You advise your firm to sell a 300,000 pound forward contract (maturing in 6 months) to hedge the exchange rate risk. Suppose the 6-month forward rate is £1 = $1.80. Show that if the future spot rate in six months (i.e., the prevailing spot exchange rate in 6 months) is £1 = $1.75, the net realized dollar value is $540,000. Show the same result occurs if the future spot rate is £1 = $1.90.

Practice problems for lecture 2

1. ABC stock has a current price of $40 and a monthly dividend yield of 0.2%. If the risk-free rate is 0.4% per month, what should the futures price be if the contract calls for delivery of 100 shares in one year? What if the contract calls for delivery in 6 months?

2. It is now March. The current annual risk-free rate is 3%. The current futures price for delivery of gold in 3 months is $350 and the current futures price for delivery of gold in one year is $355. Is there a mispricing?

3. Suppose there is a new futures contract on calling for delivery of 1000 shares of TIQ stock in one year. TIQ is currently paying no dividends and the T-bill rate is 5% per year. An investor takes a long position in the futures contract.
    a. If TIQ now sells for $60 per share, what should the futures price be?
    b. If TIQ stock increases by 3%, what will be the change in the futures price and the change in the investor's margin account (in dollars) if there is still one year until maturity?
    c. If the margin on the contract is $9000, what is the percentage return on the investor's position?

Practice problems for lecture 3

1. ABC stock, which pays no dividends, has a current stock price is $52 and the price of a 3-month put option with an exercise price of $52 has a current price of $3.10. The risk-free rate of interest is 6% per year. What should the price of a 3-month call option with an exercise price of $52 be?

2. You are given the following information.
   Price of put option on JUP with strike of $100 is $5.50.
   Price of call option on JUP with strike of $100 is $0.90.
   Both expire in 3 months and JUP stock is trading at $95.
   What should the price of a U.S. Treasury zero-coupon bond with a face value of $100 if it matures in 3 months? What is the implied risk-free rate over 3 months?

Practice problem for lecture 4

You open a margin account and put down $8000 to buy $12,000 worth of IBM, which is trading at $120 per share. The brokerage firm charges 9% per year on borrowed money and the maintenance margin is 35%.

a) If you close your account at the end of the year and IBM is at $110 per share, what is your rate of return?
b) How far could IBM fall at the end of the year before you would receive a margin call?

Practice problems for lecture 5

1. What is the YTM of a 5% bond maturing in 15 years if it sells for $902.00?

2. Today you own a 5% bond maturing in 20 years has a yield to maturity of 5%. Suppose you expect that in 6 months the bond will have a yield to maturity of 6%. What will be your rate of return on this bond over the 6 month period if your expectation is correct?

3. What is the coupon rate on a bond that matures in 10 years, has a yield to maturity of 8%, and is selling for $1050.00? What is the current yield?

Practice problems for Lecture 6

1. Given the following spot rates for zeros, what is the yield to maturity for an 8% coupon bond (with *annual coupons*) with two years until maturity?

maturity	yield to maturity
1 year	6.0%
2 years	7.0%

2. Consider the following term structure for zero-coupon bonds:

maturity (years)	yield to maturity
1	5.0%
2	5.5%
3	6.0%

Suppose bond A is a 1-year zero coupon bond, and bond B is a 3-year zero coupon bond.
A) If you expect the term structure next year to be the same as today's, which bond will provide a greater expected one-year rate of return?
B) What if you believe the pure expectation hypothesis holds?

3. Your firm owes 10 annual payments of $10,000 beginning in one year. If the yield on all bonds is 5%, what type of zero coupon bonds would be needed to fully fund and immunize the obligation? If the face value of each bond is $1000, how many of these bonds will your firm be purchasing?

   You'd have on your formula sheet that the duration of an annuity is

$$\frac{1+y}{y} - \frac{T}{(1+y)^T - 1}$$

Practice problems for lecture 7

1. RKS has 800,000 shares outstanding with a market value of $30 per share. They've announced a rights offering of 200,000 new shares with a subscription price of $25 each.
   a) What is the total market capitalization before and after the rights issue?
   b) What is the value of one right?
   c) What should be the ex-rights price of RKS stock?

[The formula you'd have on your formula sheet is $R = (P_R - S) / (N + 1)$]

2. Your firm needs to raise $5m and plans to do so with a seasoned equity offer. The firm's current stock price is $50 but when they announce the offer the stock price drops 4%. If the offer is priced at the new (post-announcement) stock price and underwriting expenses total 5% per share, how many shares must be sold?

Practice problems for Lecture 8

1. The firm's cash flows have a standard deviation of $80,000 per day, the interest rate is 7% per year (assume this is the nominal rate, compounded daily) and the cost of converting securities into cash or vice versa is $400 per transaction. The lower control limit is $50,000.
   A) Calculate the return point and upper control limit.
   B) When and in what amount should the firm buy and sell securities?
   C) What is the average cash balance?

   Here are the formulas you'd have on your formula sheet:
   $Z = (3b\sigma^2 / 4i)^{1/3}$, RP = LCL + Z, UCL = LCL + 3Z
   Avg cash bal = LCL + (4/3)Z

2. Trade credit terms are 2/10, net 30.
   What is the true interest cost of skipping the discount and paying on day 30? Calculate the APR and APY. Here are the formulas you'd have on your formula sheet:
   APR = [discount% / (100% - discount%)] x [365 / (total period - discount period)]
   APY = [1 + discount% / (100% - discount%)] $^{365 / (\text{total period - discount period})}$ - 1

3. Your firm is considering extending trade credit to a customer for buying one of your firm's widgets. You know or estimate the following:
   Sale price: $50,000
   Investment in sale: $35,000
   Collection period under the trade credit terms: 4 months
   Required return for your firm: 10%
   Customer's payment probability: 0.90
   Estimate the net present value of grating credit and advise your firm accordingly.

   The formula you would have on your formula sheet would be:
   $NPV = pR / (1 + r)^t - C$