PROBLEM SET #1
ECON 308, MONEY AND BANKING

PROF. ALEXANDER MONGE N.
Department of Economics
Northwestern University

T.A. Adeline Delavande

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Exercise 1

Assume that the annual interest rate is 4.5%. Your portfolio is composed of the following securities:

1. A balance of $4000 in your checking account.
2. A coupon bond that pays 500 at the end of each year. The maturity of the bond is 10 years and has a face value of 10000.
3. T-bills maturing at the end of this first period with face value of 1500.
4. A coupon bond to a company. With this bond, you receive a coupon payment of 100 each period. It has a face value of 2,000 with a maturity of 2 periods. This bond has a provision that gives you the option to recall it for 1,900 at the end of the first period. (Hint: In what follows you should consider whether or not to exercise the option.)
5. Your only debt is with your parents. You owe them 5,000 due in two years. Specifically, you are supposed to pay them 2,000 in one year and 3,000 at the end of the second year.

1. With this information:
   (a) What is the present value of your portfolio?
   (b) What is the rate of return of your portfolio in each period?

2. Now, assume that the interest rate rises to 7%.
   (a) What is the answer to all the previous questions?
   (b) How good is the approximation formula using the duration of the portfolio?

Exercise 2

Assume that you own a little firm here in Evanston. The problem is that you need to leave the town in exactly one year, so you need to have sold by then. You have received two offers. In the first one you have to sell right now. The offer is for $500,000. The second offer is for the next year, i.e. you keep your firm for the current year and receive the payment at the end. For that you receive also $500,000.

The problem here is that you have to decide right now.
The monthly interest rate is 1%. Imagine that you know the profits that the firm will generate for each of next twelve months: In the first month, the firm actually generates loses for 10,000. In the second month, the firm breaks even (zero profits). In each of the subsequent five months profits are 20,000. In the final five months, the firm generates profits of only 5,000 per month.

Which offer should you accept?

Exercise 3

Assume that a coupon bond that matures in three periods is currently traded at a value $P_0 = 96$. The bond has three coupons, maturing in one, two and three years from now. Each coupon is for $C = 10$. The face value of the bond is $F = 100$.

(a) For the first period, What is the current yield?
(b) For the first period, what is the rate of return of holding the bond if its price at the end of the first period is $P_1 = 97$. How does the return compare with the current yield?
(c) What is the rate of return of holding the bond second period if the price is $P_2 = 97$?
(d) What is the yield to maturity of the bond in each period? (Hint: you can use a financial calculator for this)