ECO 301: Money and Banking
Week 7 Homework: Interest Rates and Rates of Return

Directions: Provide written answers for the following questions and prompts. **Show all of your work for present-value calculations.** You may print these sheets and put your answers in the space provided or you may use your own paper to write your answers.

1. Consider a coupon bond purchased on the secondary market with annual coupon payments, a face value of \$5,000, 8 years until maturity, a coupon rate of 4%. If the current interest rate is 3%, what is the present value of the bond?

2. Suppose you purchase a new car and finance it with a \$20,000 fixed payment loan with monthly payments at an interest rate of 6% compounded monthly. How much are your monthly payments?

3. Suppose you purchase a one-year federal government discount bond that pays \$1,000 in five years. If the current interest rate on five-year government bonds is 4.5%, what should be the price of the bond?

4. If the current interest rate is 5%, what is the present value of a coupon bond with annual coupon payments of \$115, a 10-year maturity, and a face value of \$2,500.

5. Suppose the coupon bond in the previous problem has a price of \$2200. Write down a formula that determines the yield to maturity (but don't actually compute it). Based on your formula, is the yield to maturity greater, less than, or equal to the current interest rate, 5%. How do you know?

6. Suppose you obtain a \$12,000 fixed payment loan today to pay for college. Suppose you have an arrangement with the bank so that you do not have to make your first payment until 2 years from now (gives you time to finish college and find a good-paying career). Suppose the maturity date is 10 years from your first payment and the interest on the loan is 6%, compounded monthly. What are your monthly payments?

7. Suppose a 30-year Treasury bond with face value \$1000 is sold for \$412.

   (a) What is the annualized yield to maturity?

   (b) In equilibrium, Treasury bonds are sold for a price such that the annualized yield to maturity is equal to the prevailing market interest rate for similar assets (similar risk, same present value cash flows, same maturity, etc). Suppose next year (29 years until maturity) interest rates are 2%. Is this an increase or decrease in interest rates? What will be the new price of the bond?

   (c) In part (b) above, suppose you sold the bond at the end of the first year. What was your capital gain / loss?

   (d) If you expect an increase in interest rates, are you more or less likely to hold long-term, fixed-interest rate, bonds? Explain.