

ECO 301: Money and Banking
Instructor: Dr. James Murray
Homework: Measuring Interest Rates
Due: Monday, February 13, 2012

Learning Objective: LO3: Predict changes in interest rates using fundamental economic theories including present value calculations, behavior towards risk, and supply and demand models of money and bond markets.

1. (10 points) If the current interest rate is 5%, what is the present value of a coupon bond with annual coupon payments of \$100, a 10 year maturity, and a face value of \$2,500.
2. (10 points) Suppose the coupon bond in the previous problem has a price of \$2000. Write down a formula that determines the yield to maturity. Is the yield to maturity greater, less than, or equal to the current interest rate, 5%.
3. (10 points) Suppose you obtain a \$100,000 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 3 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 5%, compounded monthly. What are your monthly payments?
4. Suppose a 30 year Treasury bond with face value \$1000 is sold for \$412.
 - (a) (10 points) What is the yield to maturity? What is the *annualized* yield to maturity?
 - (b) (10 points) 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) (10 points) In part (b) above, suppose you sold the bond at the end of the first year. What was your capital gain / loss?
 - (d) (10 points) If you expect an increase in interest rates, are you more or less likely to hold long-term bonds? Explain.