**Tutorial 3: Questions**

1. Consider a bond with a 7% annual coupon and a face value of $1,000. Complete the following table:

|  |  |  |
| --- | --- | --- |
| **Years to Maturity** | **Discount Rate** | **Current Price** |
| 3 | 5 |  |
| 3 | 7 |  |
| 6 | 7 |  |
| 9 | 7 |  |
| 9 | 9 |  |

What relationship do you observe between yield to maturity and the current market value?

2. Consider a coupon bond that has a $1,000 par value and a coupon rate of 10%. The bond is currently selling for $1,150 and has 8 years to maturity. What is the bond’s yield to maturity?

3. Suppose that a commercial bank wants to buy Treasury Bills. These instruments pay $5,000 in one year and are currently selling for $5,012. What is the yield to maturity of these bonds? Is this a typical situation? Why?

4. What is the price of a perpetuity that has a coupon of $50 per year and a yield to maturity of 2.5%? If the yield to maturity doubles, what will happen to its price?

5. Property taxes in DeKalb County are roughly 2.66% of the purchase price every year. If you just bought a $100,000 home, what is the *PV* of *all* the future property tax payments? Assume that the house remains worth $100,000 forever, property tax rates never change, and that a 9% discount rate is used for discounting.

6. Suppose you want to take out a loan and that your local bank wants to charge you an annual real interest rate equal to 3%. Assuming that the annualized expected rate of inflation over the life of the loan is 1%, determine the nominal interest rate that the bank will charge you. What happens if, over the life of the loan, actual inflation is 0.5%?

7. You have paid $980.30 for an 8% coupon bond with a face value of $1,000 that mature in five years. You plan on holding the bond for one year. If you want to earn a 9% rate of return on this investment, what price must you sell the bond for? Is this realistic?

8. Calculate the duration of a $1,000 6% coupon bond with three years to maturity. Assume that all market interest rates are 7%.

9. Consider the bond in the previous question. Calculate the expected price change if interest rates   
drop to 6.75% using the duration approximation. Calculate the actual price change using discounted cash flow.