**Tutorial 4: Questions**

1. You own a $1,000-par zero-coupon bond that has 5 years of remaining maturity. You plan on selling the bond in one year and believe that the required yield next year will have the following probability distribution:

|  |  |
| --- | --- |
| **Probability** | **Required Yield** |
| 0.1 | 6.60% |
| 0.2 | 6.75% |
| 0.4 | 7.00% |
| 0.2 | 7.20% |
| 0.1 | 7.45% |

a. What is your expected price when you sell the bond?

b. What is the standard deviation?

2. Consider a $1,000-par junk bond paying a 12% annual coupon. The issuing company has 20% chance of defaulting this year; in which case, the bond would not pay anything. If the company survives the first year, paying the annual coupon payment, it then has a 25% chance of defaulting in the second year. If the company defaults in the second year, neither the final coupon payment nor par value of the bond will be paid. What price must investors pay for this bond to expect a 10% yield to maturity? At that price, what is the expected holding period return? Standard deviation of returns? Assume that periodic cash flows are reinvested at 10%.

3. Last month, corporations supplied $250 billion in bonds to investors at an average market rate of 11.8%. This month, an additional $25 billion in bonds became available, and market rates increased to 12.2%. Assuming a Loanable Funds Framework for interest rates, and that the demand curve remained constant, derive a linear equation for the demand for bonds, using prices instead of interest rates.

4. An economist has estimated that, near the point of equilibrium, the demand curve and supply curve for bonds can be estimated using the following equations:



a. What is the expected equilibrium price and quantity of bonds in this market?

b. Given your answer to part (a), which is the expected interest rate in this market?

5. As in Question 6, the demand curve and supply curve for bonds are estimated using the following equations:



Following a dramatic increase in the value of the stock market, many retirees started moving money out of the stock market and into bonds. This resulted in a parallel shift in the demand for bonds, such that the price of bonds at all quantities increased $50. Assuming no change in the supply equation for bonds, what is the new equilibrium price and quantity? What is the new market interest rate?

6. Following Question 5, the demand curve and supply curve for bonds are estimated using the following equations:

*Bd:* Price  

*Bs*: Price  Quantity  500

As the stock market continued to rise, the Federal Reserve felt the need to increase the interest rates. As a result, the new market interest rate increased to 19.65%, but the equilibrium quantity remained unchanged. What are the new demand and supply equations? Assume parallel shifts in the equations.