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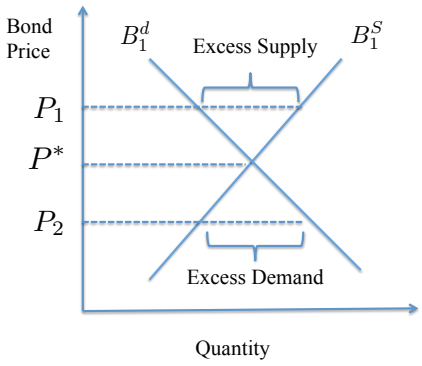
EE431 Economics of Financial Markets and Institutions
Guidance for Problem Set 3 (Semester 1/2013)
Debt Market and Structure of Interest Rate (2)

1. The excess return required on a risky asset over that earned on a risk-free asset is called risk premium

2. A Treasury bond due in one year has a yield of 6.2%; a Treasury bond due in 5 years has a yield of 6.7%. A bond issued by General Motors due in 5 years has a yield of 7.9%; a bond issued by Exxon due in one year has a yield of 7.2%. The default risk premiums on the bonds issued by Exxon and General Motors, respectively, are =7.2%-6.2%=1% and =7.9%-6.7%=1.2%.

3. When the price of a bond is above the equilibrium price, there is an excess ...supply of.. (demand for or supply of) bonds and price will ..decrease.. (increase or decrease)
When the interest rate on a bond is above the equilibrium interest rate, in the bond market there is excess ...demand for.. (demand for or supply of) bonds and the interest rate will ..decrease...(increase or decrease).
Graphically illustrate.

   Answer.

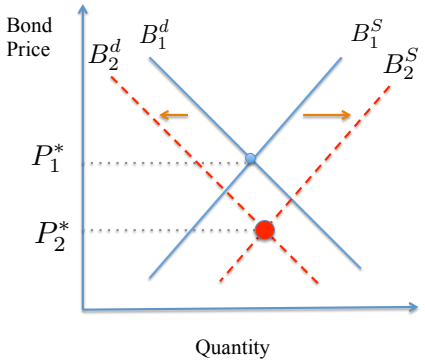


   When the bond price is equal to P^*, Bond Demand = Bond Supply and the bond market is in equilibrium.
   When the bond price is equal to P_1 , the bond price is higher than equilibrium price, Bond Supply > Bond Demand, there is an excess supply of bonds. Suppliers of the bond must lower thier bond prices to clear the excess supply. The price will be lower until it reaches equlibrium at $P = P^*$.
   When the bond price is equal to P_2 , the bond price is lower than equilibrium price, Bond Demand > Bond Supply, there is an excess demand for bonds. Bond buyers would have to pay a higher price to get the bonds they want. The price will be higher until it reaches equlibrium at $P = P^*$.

4. When a recession occurs, normally the demand for bonds ...decreases... and the supply of bonds ..decreases...

5. When the federal government's budget deficit increases, the ..supply.... curve for bonds shifts to the ..right... .

6. When the expected inflation rate increases, the demand for bonds ...decreases...., the supply of bonds ...increases..., and the interest rate ....rises... (rises or falls).
Graphically illustrate.
Answer.



From Fisher's equation, $r = i - \pi^e$ (or $(1 + r) = \frac{(1+i)}{(1+\pi^e)}$. As the expected inflation increases, real interest rate decreases for all levels of nominal interest rate.
For all levels of nominal interest rate, bond buyers get a lower real interest rate. Bond demand decreases for all levels of nominal interest rates (bond price levels). Bond demand shifts to the left from B_1^d to B_2^d.

For all levels of nominal interest rates, bond issuers pay a lower real interest rate. Cost of borrowing is lower. Bond supply increases for all levels of nominal interest rate (bond price levels). Bond supply shifts to the right from B_1^S to B_2^S.
As a result, the equilibrium bond price decreases from P_1^* to P_2^*. As equilibrium bond price decreases, the equilibrium interest rate increases. Note that equilibrium quantity is undetermined.

7. An economist has forecast that the term structure of interest rates will remain flat. According to the liquidity preference theory, the economist's forecast implies that future short-term interest rates will ..decrease... over time.

8. An economist has forecast that the term structure of interest rates will remain flat. According to the pure expectations theory, the economist's forecast implies that future short-term interest rates will ...remain constant at the current short-term rate..over time.

9. Suppose the interest rate on a 1-year T-bond is 5.0% and that on a 2-year T-bill is 6.0%. Assuming the pure expectations theory is correct, what is the market's forecast for 1-year rates 1 year from now.

Answer.

According to pure expectation theory, $i_{n,t} = \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1.t+2} + ... + i^e_{t+n-1}}{n}$.

$$\begin{aligned} i_{2.t} &= \frac{i_{1,t} + i^e_{1,t+1}}{2}, \\ 6 &= \frac{5.0 + i^e_{1,t+1}}{2}, \\ i^e_{1,t+1} &= (6 \times 2) - 5.0 \\ &= 7. \end{aligned}$$

The market's forecast for 1-year rates 1 year from now is 7%.

10. One-year Treasury securities yield 5%, 2-year Treasury securities yield 5.5%, and 3-year Treasury securities yield 6%. Assume that the expectations theory holds. What does the market expect will be the yield on 1-year Treasury securities two years from now?

Answer. According to pure expectation theory, $i_{n,t} = \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1.t+2} + ... + i^e_{t+n-1}}{n}$.

$$\begin{aligned} i_{2.t} &= \frac{i_{1,t} + i^e_{1,t+1}}{2}, \\ 5.5 &= \frac{5 + i^e_{1,t+1}}{2}, \\ i^e_{1,t+1} &= (5.5 \times 2) - 5 \\ &= 6. \end{aligned}$$

$$\begin{aligned} i_{3.t} &= \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2}}{3}, \\ 6 &= \frac{5 + 6 + i^e_{1,t+2}}{3}, \\ i^e_{1,t+2} &= (6 \times 3) - 11 \\ &= 7. \end{aligned}$$

The market expects that the yield on 1-year Treasury securities will be 6% in the next year amd 7% in the next two years. This implies that the market expects interest rate to increase continuously.

11. Three-year Treasury securities currently yield 6%, while 4-year Treasury securities currently yield 6.5%. Assume that the expectations theory holds. What does the market believe the rate will be on 1-year Treasury securities three years from now?

Answer. According to pure expectation theory, $i_{n,t} = \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1.t+2} + ... + i^e_{t+n-1}}{n}$.

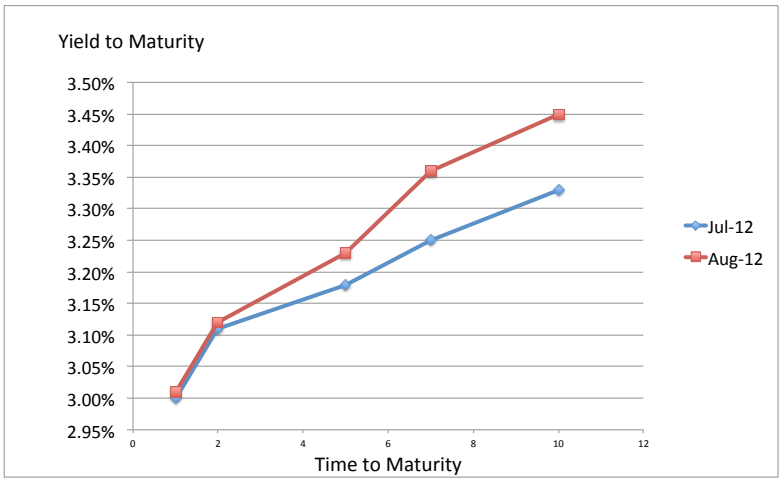
$$\begin{aligned} i_{3.t} &= \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2}}{3}, \\ &= 6\%, \\ i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2} &= 6 \times 3 = 18 \\ i_{4.t} &= \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2} + i^e_{1,t+3}}{4}, \\ &= \frac{\left(i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2}\right) + i^e_{1,t+3}}{4} \\ 6.5 &= \frac{18 + i^e_{1,t+3}}{4} \\ 6.5 \times 4 &= 18 + i^e_{1,t+3} \\ i^e_{1,t+3} &= (6.5 \times 4) - 18 \\ &= 26 - 18 \\ &= 8\% \end{aligned}$$

Therefore, the market believes that the rate on 1-year Treasury securities three years from now will be 8%.

12. Consider the following information. Plot the yield curves in August 2012 and July 2012 in one graph.

TTM (Time To Maturity)	July 2012	August 2012
1	3.00%	3.01%
2	3.11%	3.12%
5	3.18%	3.23%
7	3.25%	3.36%
10	3.33%	3.45%

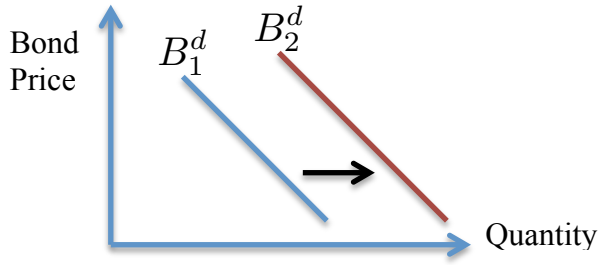
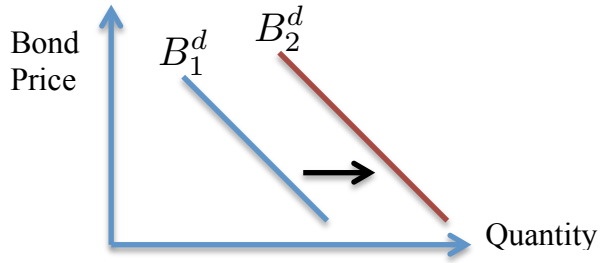
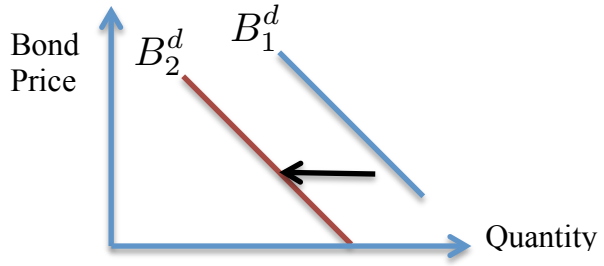
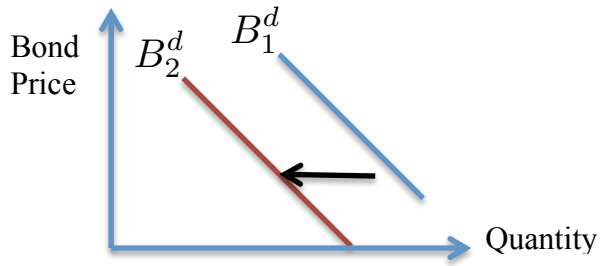
Answer.

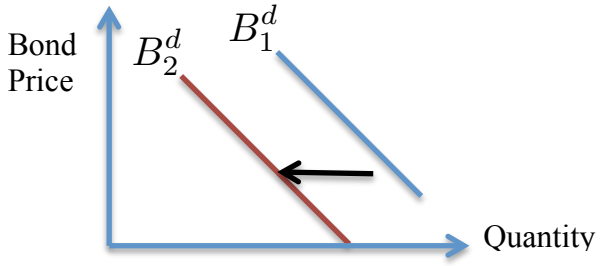
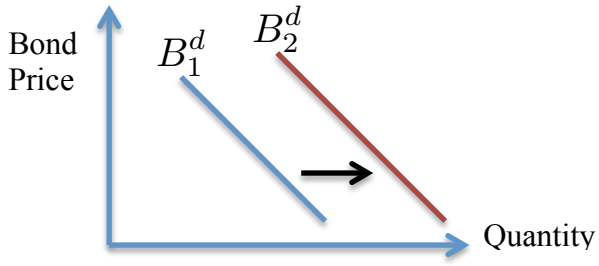


* Note: I do appologize if there is any mistake. Please kindly inform me if you find any.

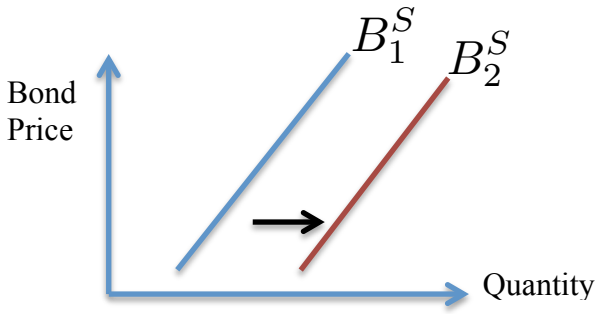
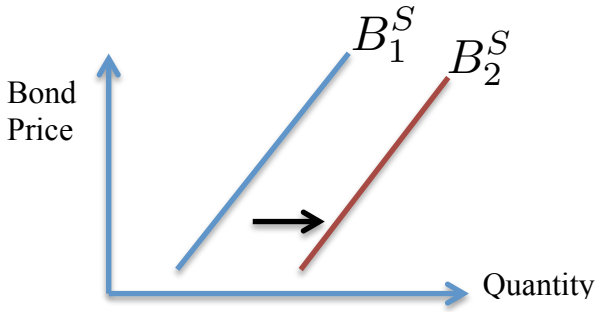
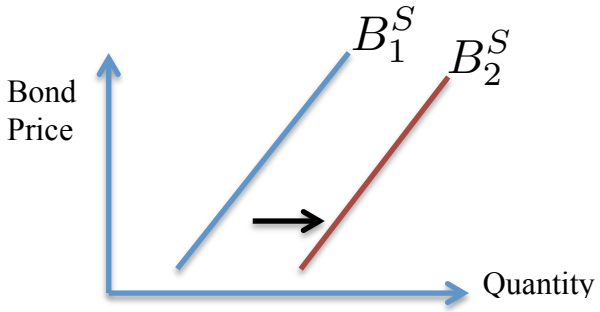
13. Fill in the tables

Factors that shift the demand for bonds (B^d)

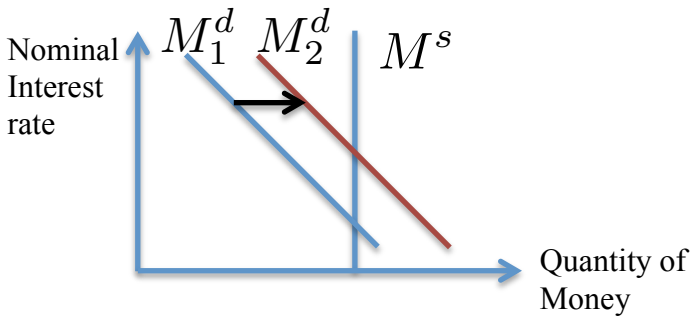
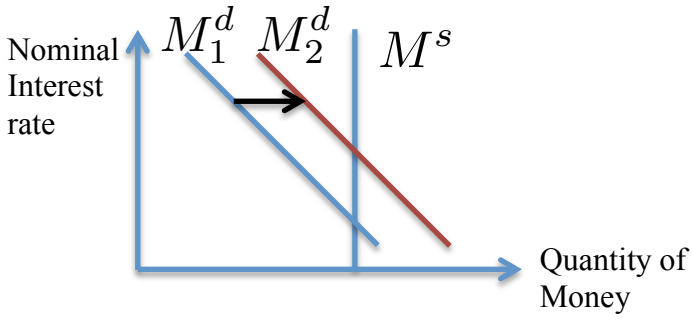
All else being equal An increase in	**Cause**	**Graph the effect on the bond Market**
Wealth (example)	B^d ↑	
Expected Return on Bonds	B^d .... ↑	
Expected Inflation	B^d ..... ↓	
Expected Return on other assets	B^d ..... ↓	

All else being equal **An <u>increase</u> in**	**Cause**	**Graph the effect on the bond Market**
Riskiness of Bonds relative to other assets	B^d ..... ↓	
Liquidity of Bonds relative to other assets	B^d ..... ↕	

Factors that shift the supply of bonds (B^S)

All else being equal An increase in	Cause	Graph the effect on the bond Market
Expected Profitability	B^S.... ↑	
Expected Inflation	B^S..... ↑.....	
Government Borrowing	B^S..... ↑.....	

Factors that shift the Demand and Supply of Money

All else being equal An increase in	Cause/ Money Demand or Money Supply/ Increase or decrease	Graph the effect on the money market
Income (example)	Money Demand ↑	
Price Level	Money Demand ↑	
Money Supply	Money Supply ↑