

## Assignment 2: Behavior of interest rate

Due on Feb 20<sup>th</sup>, before 3 pm. Submit your work at the BE office.

Attempt all.

**Question 1:** Use the diagram of demand and supply for bonds to analyze the impacts of the following situations to interest rates in Thai bond market. Provide economics intuitions to support answer.

a) Investors expect a rise in oil price.

Inflation is expected to rise; this leads to an increase in nominal interest rate.

b) Prices in the bond market become more volatile.

Bond risk is higher; investors' demand for bond drop. Interest rate rises.

c) Financial regulation has allowed a new form of bond trading using a new internet platform.

d) A sudden rise in the volatility of gold price and stock prices

Risk on alternative assets increases; investors shift to a relatively safer asset, which is bond. Bond rate will fall and the price of bond will rise.

e) BOT is expected to rise its policy rate soon.

f) Thai baht is expected to appreciate.

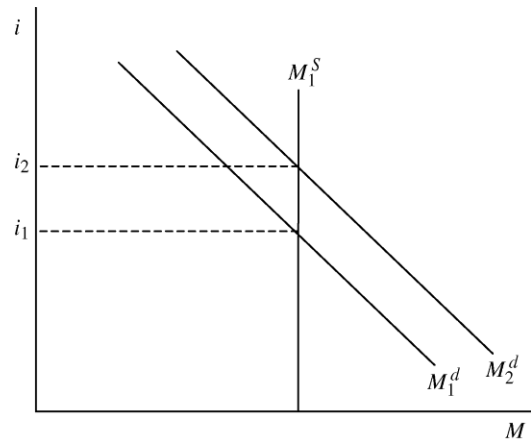
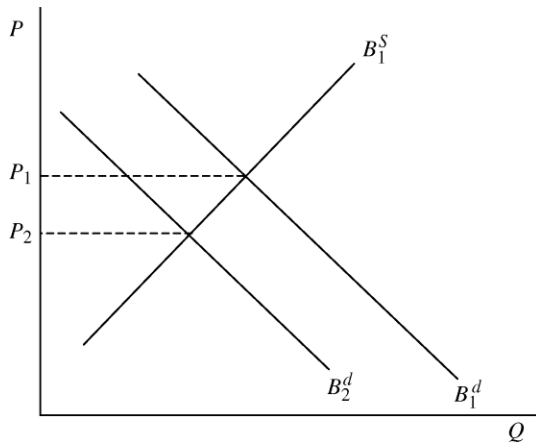
g) Chinese government has lifted off some capital control measures.

Investors find it more attractive to invest in China, rather than in Thailand. Demand for Thai bond will drop; bond rates are likely to increase for Thailand. The effect goes opposite direction for the Chinese bond; Chinese yield is likely to decrease.

## Question 2:

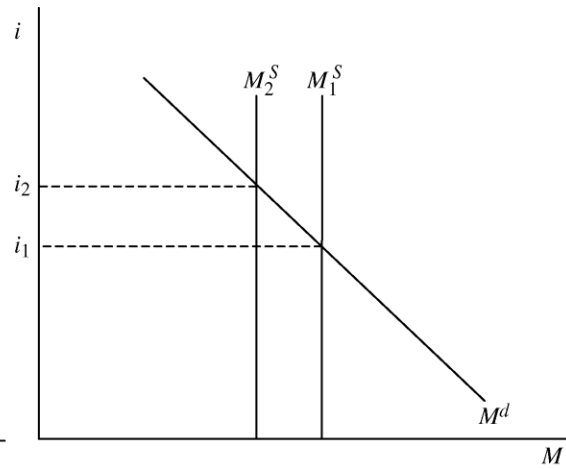
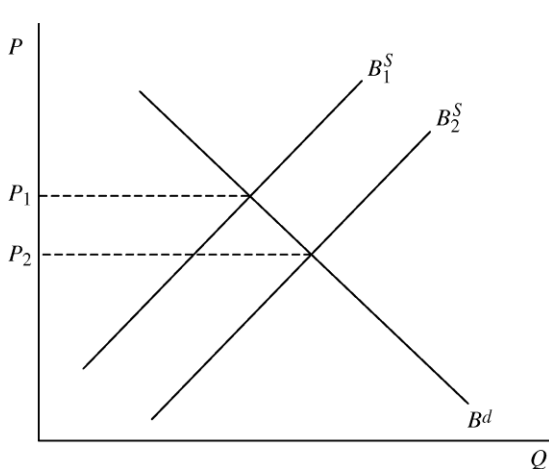
a) Using both the supply and demand for bonds and liquidity preference frameworks, show how interest rates are affected when the riskiness of bonds rises. Are the results the same in the two frameworks?

In the bond supply and demand analysis, the increased riskiness of bonds lowers the demand for bonds. The demand curve  $B^d$  shifts to the left, and the equilibrium interest rate rises. The same answer is found in the liquidity preference framework. The increased riskiness of bonds relative to money increases the demand for money. The money demand curve  $M^d$  shifts to the right, and the equilibrium interest rate rises.



- b) An important way in which the central bank decreases the money supply is by selling bonds to the public. Using a supply and demand analysis for bonds, show what effect this action has on interest rates. Is your answer consistent with what you would expect to find with the liquidity preference framework?

When the Fed sells bonds to the public, it increases the supply of bonds, thus shifting the supply curve  $B^s$  to the right. The result is that the intersection of the supply and demand curves  $B^s$  and  $B^d$  occurs at a lower price and a higher equilibrium interest rate, and the interest rate rises. With the liquidity preference framework, the decrease in the money supply shifts the money supply curve  $M^s$  to the left, and the equilibrium interest rate rises. The answer from bond supply and demand analysis is consistent with the answer from the liquidity preference framework.



- c) If the next chair of the Federal Reserve Board (James Powell) has a reputation for advocating an even slower rate of money growth than the current chair, what will happen to interest rates?

Discuss the *possible* resulting situations.

*Slower rate of money growth will lead to a liquidity effect, which raises interest rates, while the lower price level, income, and inflation rates in the future will tend to lower interest rates. There are three possible scenarios for what will happen: (a) if the liquidity effect is larger than the other effects, then interest rates will rise; (b) if the liquidity effect is smaller than the other effects and expected inflation adjusts slowly, then interest rates will rise at first but will eventually fall below their initial level; and (c) if the liquidity effect is smaller than the expected inflation effect and there is rapid adjustment of expected inflation, then interest rates will immediately fall.*

### Question 3

Suppose you visit with a financial adviser, and you are considering investing some of your wealth in one of three investment portfolios: stocks, bonds, or commodities. Your financial adviser provides you with the following table, which gives the probabilities of possible returns from each investment:

Stocks		Bonds		Commodities	
Probability	Return	Probability	Return	Probability	Return
0.2	15%	0.4	15%	0.2	20%
0.3	8.3%	0.6	5%	0.25	12%
0.2	10%			0.25	6%
0.3	5%			0.2	5%
					0.10%

- Which investment should you choose to maximize your expected return: stocks, bonds, or commodities?
- If you are risk-averse and have to choose between the stock and the bond investments, which one should you choose? Why?

Stocks		Bonds		Commodities							
Prob	R	Prob	R	Prob	R						
0.2	15%	0.4	15%	0.2	20%	0.03	0.06	0.04	0.00072	0.00144	0.00221
0.3	8.30%	0.6	5%	0.25	12%	0.02	0.03	0.03	0.00001	0.00096	0.00016
0.2	10%			0.25	6%	0.02	-	0.02	0.00002	-	0.00031
0.3	5%			0.2	5%	0.02	-	0.01	0.00048	-	0.00041
						-	-	-	-	-	-

Mean	8.99%	9.00%	9.50%	0.00123	0.00240	0.00307
SD	3.51%	4.90%	5.54%			

- From the table, expected return on commodities is the highest one; return-maximizing investor should invest in commodities then.
- Both stocks and bonds offer investors nearly comparable expected rate of return. However, the standard deviation of bonds's return is much larger. Risk-averse investors are supposed to consider both risk and return trade-off. Given the marginal difference of the expected return, it is more likely that investors should choose stocks. (The conclusion is somehow counter-intuition. But this is an algebra question.)

**Question 4:** The demand curve and supply curve for one-year discount bonds with a face value of \$1,050 are represented by the following equations:

$$B^d: \text{Price} = -0.8 * \text{Quantity} + 1160$$

$$B^s: \text{Price} = \text{Quantity} + 720$$

Suppose that, as a result of monetary policy actions, the Federal Reserve sells 90 bonds that it holds. Assume that bond demand and money demand are held constant.

- How does the Federal Reserve policy affect the bond supply equation?

$$B^s: \text{Price} = \text{Quantity} + 720 \rightarrow \text{Quantity} = \text{Price} - 720$$

$$\text{New } B^s: \text{Old } B^s + 90$$

$$\text{New } B^s: \text{Price} - 720 + 90 = \text{Price} - 630$$

- Calculate the effect on the equilibrium interest rate in this market, as a result of the Federal Reserve action.

*If you solve for the new equilibrium, you will find that  $P = 924.44$*

*Given the face value of \$1050, the implied interest rate can be solved for; the rate will be 13.58%. The rate is supposed to be higher than before; sale OMO should cause a price depress in the bond market, and hence an increase in yield.*