

Exercise 5

Money Market

1. What are the three functions of money? Evaluate whether “gold” can effectively serve these three functions.
2. Suppose that people hold 1000\$ as cash, 1000\$ as demand deposits, and 1000\$ as savings; calculate narrow money and broad money. How much is the “money supply” in the economy?
3. What is Fractional Reserve System (FRS)? Explain how money can be created through this system.
4. Suppose that the reserve ratio is 20% and that Mr.Bean has 100\$ CASH and 200\$ DEPOSIT. Assume that people deposits all their money, and that the banks lend all their deposits; answer the following questions.
 - a) What does the reserve ratio of 20% means?
 - b) WITHOUT the fractional reserve system (FRS), how much is the money supply?
 - c) Calculate the money multiplier.
 - d) WITH the FRS, how much is the TOTAL DEPOSIT within the economy?
 - e) How much deposit is created from the FRS?
 - f) WITH the FRS, how much is the money supply?
5. Explain three roles of central banks.
6. What is Liquidity? What is the most liquid asset? Explain the three reasons (according to Keynes) why people prefer to have liquidity. Which of these three reasons causes the money demand curve to be downward-sloping?

7. How does each of the followings affect the money demand curve? (That is, will it shift the curve, or is it movement along the curve?) Also, explain your reasoning.
- People become poorer.
 - Goods become more expensive.
 - People prefer to hold less cash due to debit/credit cards
 - The central bank decreases interest rate.
8. Why is the money supply curve a vertical line? How does each of the followings affect the money supply curve? Also, explain your reasoning.
- People deposit more money.
 - The central bank increases reserve ratio.
 - The central bank decreases discount rate.
 - The central bank decreases interest rate.
9. Suppose that the central bank wants to lower interest rate to boost the economy. Explain, together with the money market diagram, how the central bank can achieve this through an open market operation.
10. Suppose that the money market is NOT in equilibrium because the current interest rate is higher than the equilibrium rate, $i > i^*$. Explain how the money market adjusts to reach the equilibrium.
11. Write down the equation for the Quantity Theory of Money. Explain how this equation can be used to explain inflation.
12. Let the money demand function be $M_D = 200 - (1000)i$ and the money supply function be $M_S = 100$.
- Calculate the equilibrium interest rate, i^* . (Hint: set $M_D = M_S$ and solve for i^*)
 - Suppose that new money demand function becomes $M_D = 400 - (1000)i$. What can be inferred about the transaction and precautionary demand?

1. What are the three functions of money? Evaluate whether "gold" can effectively serve these three functions.

1. **Medium of exchange** - generally accepted in transactions of goods and services.
2. **Store of value** - An asset that can be used to transport purchasing power from one time period to another.
3. **Unit of account** - A standard unit that allows people to compare the values of things.

* Gold can serve these two functions but it is not medium of exchange.

2. Suppose that people hold 1000\$ as cash, 1000\$ as demand deposits, and 1000\$ as savings; calculate narrow money and broad money. How much is the "money supply" in the economy?

$$M_1 = 1000 + 1000 = 2000 \$ \text{ (narrow money)}$$

$$M_2 = M_1 + \text{savings} = 2000 + 1000 = 3000 \$ \text{ (broad money)}$$

$$M_1 = \text{money supply} = 2000 \$$$

3. What is Fractional Reserve System (FRS)? Explain how money can be created through this system.

FRS - The banking system used by banks. In this system, only a fraction of deposits are backed by actual cash on hand and are available for withdrawal.

Explanation.

- 1) People deposit money in banks for safety.
- 2) Banks issue "evidence or receipts" that can always be exchanged for money.
- 3) Banks now have a lot of deposits, so they lend these people and charged interest.
- 4) This expands the money supply in the economy.

4. Suppose that the reserve ratio is 20% and that Mr. Bean has 100\$ CASH and 200\$ DEPOSIT. Assume that people deposits all their money, and that the banks lend all their deposits; answer the following questions.

- What does the reserve ratio of 20% means?
- WITHOUT the fractional reserve system (FRS), how much is the money supply?
- Calculate the money multiplier.
- WITH the FRS, how much is the TOTAL DEPOSIT within the economy?
- How much deposit is created from the FRS?
- WITH the FRS, how much is the money supply?

a) 20% is the proportion of deposit that the bank need to keep at the central bank.

b.) $M_1 = 100 + 200 = 300 \$$

c) money multiplier = $\frac{1}{RR} = \frac{1}{0.2} = 5$
deposit

d) $200 \times 5 = 1000 \$$

e) $1000 - 200 = 800 \$$
↑ total dep. ↑ Real dep.

f) $1000 + 100 = 1100 \$$
↑ money deposit

5. Explain three roles of central banks.

- Control the money supply (monetary policy)
- Provide funds to trouble banks that cannot find any other sources of funds.
- Responsible for managing exchanges rates and the nation's foreign exchange reserves.

6. What is Liquidity? What is the most liquid asset? Explain the three reasons (according to Keynes) why people prefer to have liquidity. Which of these three reasons causes the money demand curve to be downward-sloping?

Liquidity refers to how easily assets can be converted into a means of exchange. Cash is the most liquid asset.

Three motives

- Transaction Demand (for daily use)
- Precautionary Demand (for unexpected use)
- Speculative Demand (for future investment)

* The speculative demand causes the money demand curve to be downward-sloping (it has a negative relation with interest rate)

7. How does each of the followings affect the money demand curve? (That is, will it shift the curve, or is it movement along the curve?) Also, explain your reasoning.

- People become poorer.
- Goods become more expensive.
- People prefer to hold less cash due to debit/credit cards
- The central bank decreases interest rate.

a) The money demand curve shifts to the left due to a change in income.

b) Does not affect the money demand curve (change in money supply)

c) The money demand curve has a movement along the curve (change in speculative demand)

d) The money demand curve has a movement along the curve (change in interest rate)

8. Why is the money supply curve a vertical line? How does each of the followings affect the money supply curve? Also, explain your reasoning.

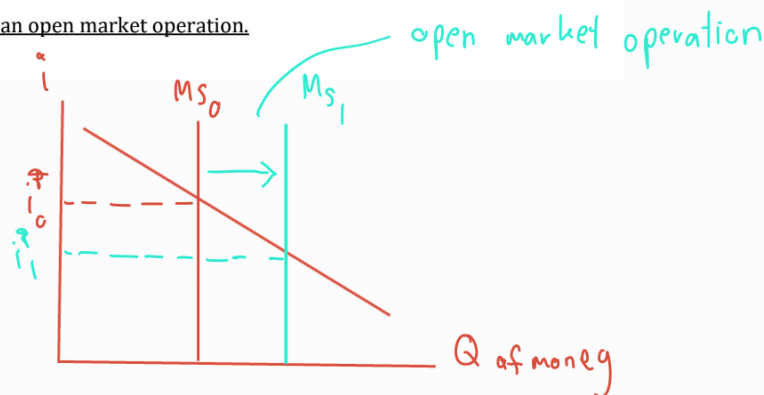
- a) People deposit more money.
- b) The central bank increases reserve ratio.
- c) The central bank decreases discount rate.
- d) The central bank decreases interest rate.

Money supply does not depend on interest rate
 $\therefore$ The money supply curve is a vertical line.

- a) The graph will shift to the right (M_s higher)
- b) The graph will shift to the left (M_s lower)
- c) The graph will shift to the right (M_s higher)
- d) not affect the money supply.

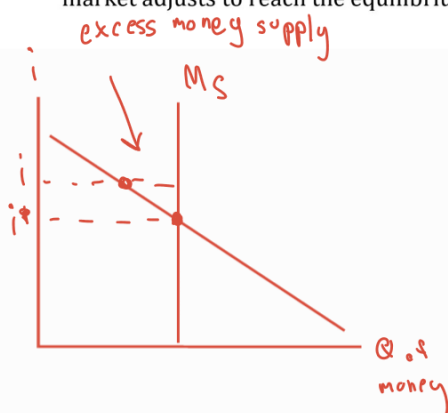
9. Suppose that the central bank wants to lower interest rate to boost the economy.

Explain, together with the money market diagram, how the central bank can achieve this through an open market operation.



central bank can use open market operation to lower the interest rate by buying security. central bank pays money to the public. This will increase $M_s \therefore M_s \uparrow \rightarrow i^* \downarrow$

10. Suppose that the money market is NOT in equilibrium because the current interest rate is higher than the equilibrium rate, $i > i^*$. Explain how the money market adjusts to reach the equilibrium.



In this situation, there is excess supply of money. People will convert cash into interest-bearing assets / buy bonds. There will be too much money offered to bond issuers, so they cannot give high interest rate to many savers. $\therefore$ Bond issuers need to reduce $i \rightarrow i$ falls to i^*

11. Write down the equation for the Quantity Theory of Money. Explain how this equation can be used to explain inflation.

$$M\bar{V} = P\bar{Y}$$

M = Money Supply, V = Velocity (how fast the money changes hand)

P = Price Level, Y = Real Output

• V is constant

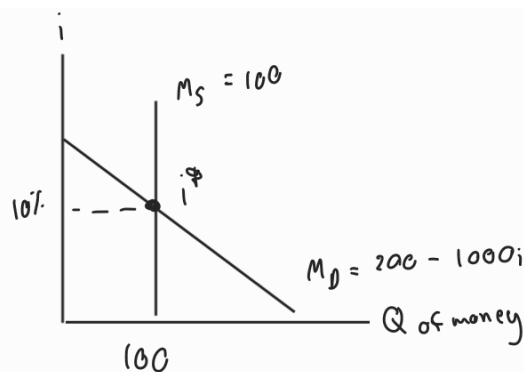
• Y is at the full-employment level and hence is constant.

∴ An increase in money supply leads to an increase in price level.

That is, printing money creates inflation.

12. Let the money demand function be $M_D = 200 - (1000)i$ and the money supply function be $M_S = 100$.

- a) Calculate the equilibrium interest rate, i^* . (Hint: set $M_D = M_S$ and solve for i^*)
b) Suppose that new money demand function becomes $M_D = 400 - (1000)i$. What can be inferred about the transaction and precautionary demand?



a) find i^*

$$100 = 200 - 1000i^*$$

$$i^* = \frac{100}{1000} = 0.1 = 10\%$$

b) M_d^T and M_d^P not concern about interest rate

$$M_d^T + M_d^P = 400 - 200 = 200$$

∴ There is an increase in M_d^T and M_d^P about 200.