Exercise 5
Money Market

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

3 functions of money

1. Medium of exchange
what people generally accept in their transactions of goods and services.

2. A store of value: an asset that can be used to transport purchasing power from one time period to another.

3. A unit of account: the standard unit that allows people to compare the value of things

As commodity money, gold has been historically served its purpose as a medium of exchange, a store of value, and as a unit of account. However, at present, gold only serves as a store of value. But its not very good because not everyone will accept gold as a 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?

- Narrow money [M_1] is money that can be readily used for transactions.

M_1 = cash + demand deposit.

= 1000 + 1000 = 2000 $

Broad money [M_2] is the sum of M_1 and other monies that have to be converted before using them in transactions.

M_2 = M_1 + saving and time deposits.

= 2000 + 1000 = 3000 $

- When we want to measure the money supply, we will use M_1 to measure

Money supply = 2000 $

3. What is factional reserve system (FRS)? Explain how money can be created through this system.

- Fractional Reserve System [FRS] is the banking system used by goldsmiths and banks which small part of deposits will be kept in the central bank, and another part will be lend out.
- How money can be created
  - when people deposit money in banks, banks will lend these money out and charge interest to run a bank and it has some part that banks have to keep as a reserve at the central bank.

Bank A has 100 $ which is deposit of Mr. Z and it required reserve ratio is 10%.

loan money
TO Mr A = 90$

reseve
20$ at the
central bank

↓ Mr A buy goods&services from Mr.B

Mr.B recieves 90$
from Mr.A

↓ deposits at bank B
90$

Bank B = 90$

loan to
Mr. C = 90

cash reserve
at central
bank

- initial deposit = 100
- Total deposit = $100 \times \frac{1}{1-0.9}$
= 100×10
= 1000$

∴ 100$ deposits
create the
money supply
= 1000$

4.

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?

a) the banks need to keep 20% of their deposits as reserve at the central bank.

b) money supply = currency + demand deposits
= 100 + 200 + 300
= 600

c. the money multiplier = $\frac{1}{RR}$
= $\frac{1}{0.2}$ = 5

d. total deposit = initial money × money multiplier
= 300 × 5
= 1500

E.) deposit created from FRS = 240

F.) money supply = 100 + 200 + 240
= 540

5. Explain 3 roles of central banks

1. Open market operation refers to a central bank buying or selling government securities in the open market in order to influence the money supply.

2. The discount rate = the interest rate charged to commercial banks for loans they take from the central bank.

3. The reserve ratio = the portion of reservable liabilities that commercial banks must hold onto, rather than lend out or invest, this is a requirement determined by the central bank.

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 = the ease with which an asset, or securitys, can be converted into ready cash without affecting its market price.

The most liquid asset of all is cash itself.

• 3 reasons why people prefer to have liquidity

1. Transaction demand: people prefer to have liquidity to ensure that they can take part in necessary basic transactions because their income is not always available.

2. Precautionary demand: people prefer to have liquidity in order to meet social unexpected problems that need unusual costs.

3. Speculative demand: in order to speculate a fall in prices of bonds, people retain liquidity. A decrease in the interest rat results in an increase in the quantity of money demanded by people until interest rates rise.

Transaction demand and precautionary demand can cause the 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.

a) People become poorer.

b) Goods become more expensive.

c) People prefer to hold less cash due to debit/credit cards

d) The central bank decreases interest rate.

a) This will shift the curve because both transaction demand and precautionary demand depend on income. When people become poorer, they will consume fewer goods and services, and then people will need less cash.

b) this will shift the curve because when goods become more expensive, people will want to hold more cash for their transactions.

c) This will shifts the curve because people prefer to hold less cash that means money demand to hold cash is decreased, and money demand curve will shift to the left

a) this is movement along the curve because movement along the money demand is due to change in the interest rate. When the central bank decrease interest rate, people will need more cash. So that they are ready to invest when interest rate returns to rise again.

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.

The money supply curve is a vertical line because the money supply is controlled by the central bank and it does not depend on the interest rate.

a) Money supply curve shifts to the right depositing more money in a bank, a bank's total deposits increases. The bank will keep some of these deposits as required reserves, and it will loan out the excess reserves out. When that loan is made, it increases the money supply.

B) Money supply curve shifts to the left.

by the central bank increasing the reserve ratio, banks are able to loan less money, which will decrease the overall supply of money in the economy.

C) money supply curve shifts to the right.

- A decrease in the discount rate makes it cheaper for commercial banks to borrow money and thereby increases the money supply.

D) the money supply curve does not change

the money supply is a fixed amount that does not change just because interest rates have changed

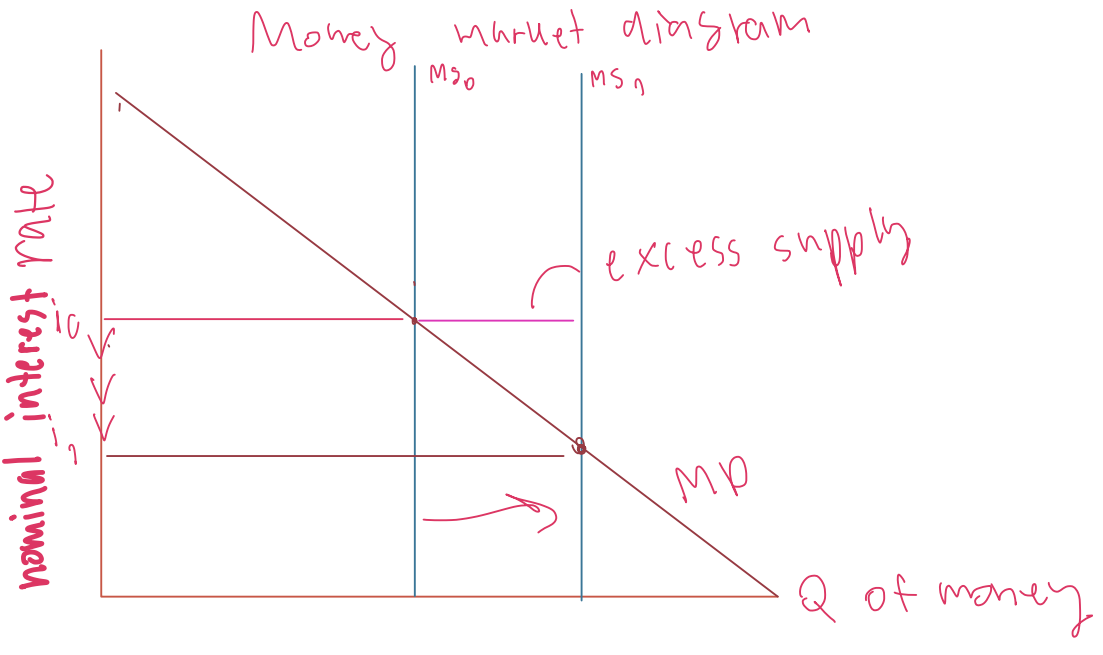
9. Suppose that the central bank wants to lower interest rate to boost the economy. Explain, together with the money market diagram, how the central bank can achieve this through an open market operation.

The central bank affects the quantity of money in circulation by buying or selling government securities through an open market operation.

- If the central bank wants to reduce interest rate to boost, the central bank will buy government securities in the open market. It will increase the money supply in the economy by swapping out securities in exchange for cash to the general public. Then the money supply will increase, and interest rates will decrease.

Therefore, open market operation has a direct effect on money supply and also affects interest rates because if the central bank buys government securities, prices are pushed higher and interest rate decreases.

· In the money market, the central bank can use expansionary monetary policy to increase the money supply and reduce interest rate; $MS \uparrow, i \downarrow$



If the central bank increases the money supply from MS_0 to MS_1, interest rate falls from i_0 to i_1.

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.

• if $i > i^*$, there is excess money supply.

When the interest rate is high, money demand to hold cash of people will decrease because they want to convert their cash into interest-bearing assets. When people convert cash into interest-bearing assets too much, bond issuers can not give high interest rate to many savers then bond issuers will respond by decreasing the interest rate. i falls to i^*. Now, the money market returns to the equilibrium.

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

Equation for TQM: $MV = PY$

M = money supply

V = velocity

P = price level

Y = real output

[PY = nominal output]

According to the quantity theory of money, if the amount of money in the economy doubles, all else equal, price levels will also double.

This means the consumer will pay twice as much for the same amount of goods and services. This increase in price levels will eventually result in a rising inflation level; inflation is a measure

of the rate of rising prices of goods and services in an economy.

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) The equilibrium interest rate, i^*; $M_D = M_S$

$200 - (1000)i = 100$

$200 - 1000i = 100$

$100 = 1000i$

$0.1 = i^*$

b) The new money demand to hold cash is more than the old one because people have more income or greater preference to hold cash to use for daily transactions or ~~for~~ unexpected use, so M_d^t and M_d^r will increase and the curve will shift to the right.