

Topic 5 exercise

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

- 1.) three functions of money →
- a medium of exchange (people generally accept it)
 - a store of value (transport purchasing power from one time period to another)
 - a unit of account (allows people to compare the value)

↓
"gold" can serve only 2 functions of money which are a store of value & a unit of account. But, it can't serve a medium of exchange function because only a few people accept gold as a means of payment.

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?

2.) first M_1 / transactions money / money supply

$\uparrow$ bank notes / coins $\uparrow$ easily withdraw money

$$= \text{currency in circulation} + \text{demand deposits}$$
$$= \text{cash} + \text{demand deposits} = 1000 + 1000$$
$$= 2,000 \$ \quad \#$$

then, broad money

$$= M_1 + \text{saving and time deposits}$$
$$= 2000 + \text{saving}$$
$$= 2000 + 1000 = 3,000 \$ \quad \#$$

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

↓
Fractional Reserve System (FRS) is the system which only a fraction of deposits are backed by actual cash on hand and are available for withdrawal. (Some fraction of money MUST BE KEPT in the bank !)

e.g. ↪ deposit : 100 at SCB

excess reserve

↳ proportion of deposit that SCB can do whatever it wants
e.g. lending

reserve

↳ proportion of deposit that SCB NEEDS TO KEEP at the central bank.

↳ how money can be created through this system? ↗

Deposit : 100 at Bank A
of Mr. A

RR = 20 % ↗

loan 80 to Mr B
20 reserve

deposit : 80 at Bank SCB
of Mr C

loan 64 to Mr D
16 reserve SCB

deposit of Mr. E → total money supply = 100 + 80 + 64 + ...

RR (required reserve ratio) : The percentage of its total deposits that a bank must keep as reserves at the Central Bank

$$\text{money multiplier} = \frac{1}{RR}$$

e.g. money multiplier = 5 means
initial deposit of 1 \$ can generate up to the
total deposit of 5 \$

the lower the RR, the higher the money multiplier
and the greater money supply created.

↳ How money can be created? ⇒ Bank can use some of deposit money to issue loans and then charged interest. Therefore, bank can get more money from interest and more people can receive money.

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?

↳ Mr. Bean has 100 \$ CASH and 200 \$ DEPOSIT

a) RR = 20% means Bank can use 80% of total deposit (= 160 \$) to do anything it wants such as issuing loans and Bank must keep 20% (= 40 \$) of deposit in the central bank.

b) WITHOUT FRS, how much is the money supply?
money supply : currency + demand deposit
= 100 + 200 = 300 \$

c) Calculate the money multiplier ⇒ money multiplier = $\frac{1}{RR} = \frac{1}{0.2} = 5$

d) WITH the FRS, TOTAL DEPOSIT within the economy ↗ =
200 × 5 = 1000 \$

e) deposit created from FRS = Total deposit - initial deposit
 $= 1000 - 200 = 800 \$$

f) WITH FRS, money supply = currency + demand deposit
 $= 100 + 160 = 260 \$$

5. Explain three roles of central banks.

- ↳ 5.) →
1. control money supply i.e. monetary policy (control interest rate)
 2. assist banks that are in difficult financial positions.
 3. manage exchange rates

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?

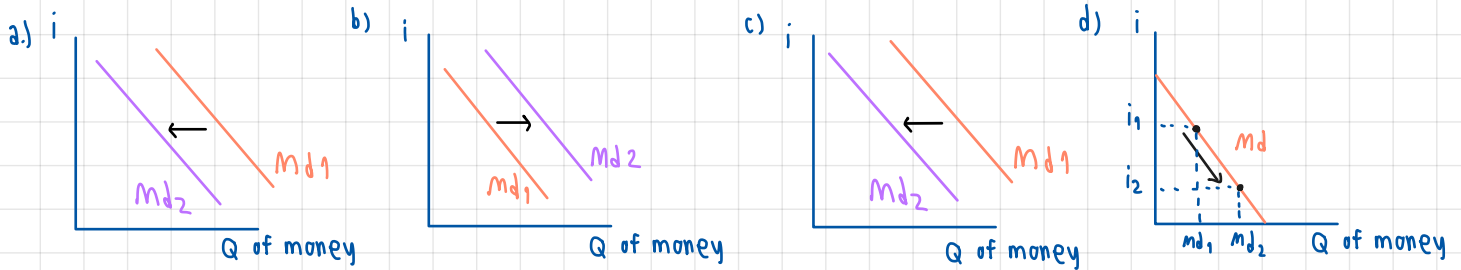
↓

- 6.) - What is Liquidity? ⇒ Liquidity is about how easily assets can be converted into a mean of exchange
- What is the most liquid asset? ⇒ cash
 - Why people prefer to have liquidity? ⇒ according to Keynes' ⇒ demand for liquidity is determined by
 - Transaction Demand (for daily use)
 - Precautionary Demand (for unexpected use)
 - Speculative Demand (for future investment) → ready to invest whenever the returns are high.
 - Which of these three reasons causes the money demand curve to be downward-sloping
 ⇒ Speculative Demand → when interest rates of bonds are low, people will demand more cash, so
 "a negative relationship" b/w. Money Demand & 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.

- 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) M_d^T will decrease and money demand curve will shift to the left because when people are poorer, they want to buy fewer G & S and thus need less money.
- b) M_d^T will increase and money demand curve will shift to the right because when goods become more expensive, people will need more money to buy G & S.
- c) M_d^P will decrease and money demand curve will shift to the left because when people use debit/credit cards instead of holding cash, the liquidity of money will become less, and people will demand less cash in order to use in emergency situations
- d) M_d^S will increase and movement along the curve is happens because when i are low, people want to have money in their hands in order to be ready to invest and get high returns.



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.

8.) money supply curve is vertical because money supply is determined by the Central Bank, and it doesn't depend on interest rate.

a) money supply will $\uparrow$ because when people deposit more money, the money multiplier happens and money in the system increases.

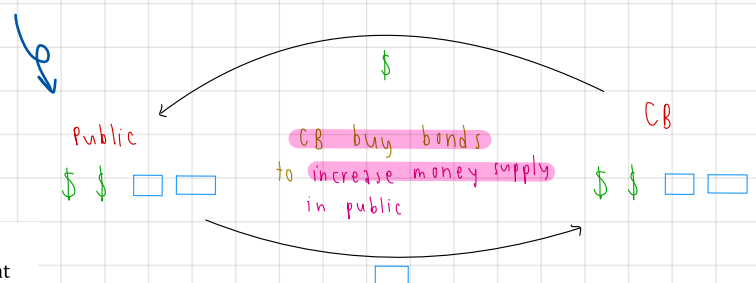
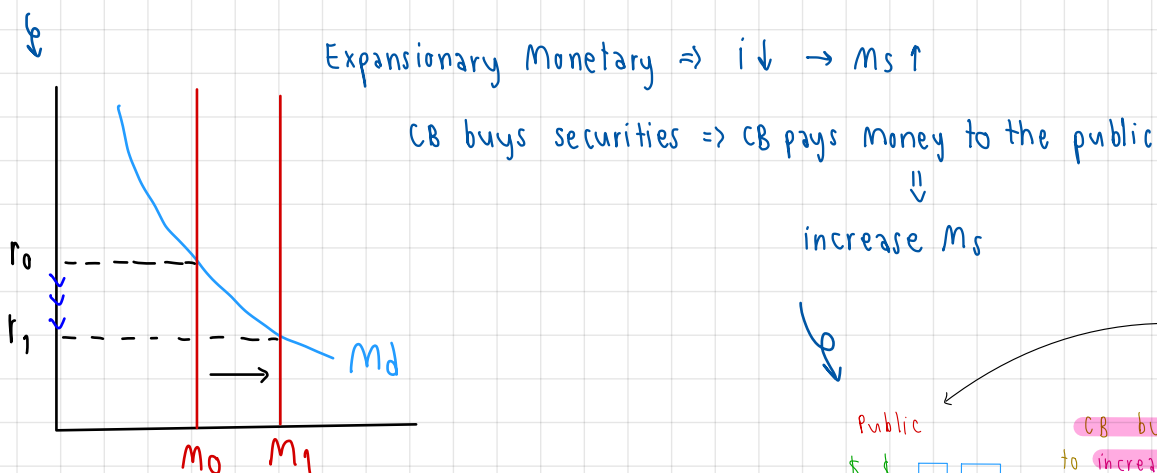
b) money supply will $\downarrow$ because it makes "excess reserve" money become fewer which means fewer proportion of money that bank can use to do anything such as issuing loans.

c) discount rate is an interest that commercial banks need to pay to the Central Bank when they borrow money from the central bank, so in this situation, money supply will $\uparrow$ because the commercial bank will have more money to issue loans.

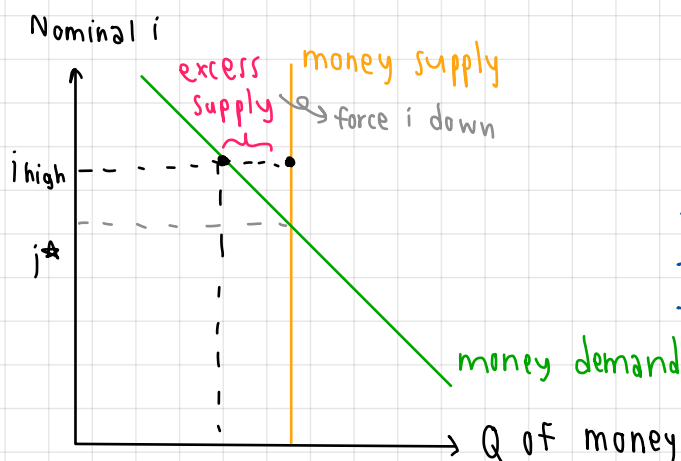
d) money supply will have no change because money supply does not depend on interest rate

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.



when $i > i^*$

- excess supply of money (too much cash on hand)
- ppl convert cash into interest-bearing assets / buy bonds
- too much money offered to bond issuers & they can't give high i to many people
 - bond issuers need to reduce i
 - i falls to i^* (adjustment)

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

QTM equation $\Rightarrow \overline{MV} = \overline{PY}$ (M = money supply
 V = Velocity (how fast the money changes hand)
 P = Price level
 Y = Real Output
 PY = Nominal Output (nominal GDP))

V and Y are constant, so when $M \uparrow$, P will $\uparrow$ too
 $\therefore$ 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 $M_S = 100$.

- 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?

$M_D = 200 - (1000)i$
 $M_S = 100$

a) Find equilibrium interest rate from $M_D = M_S$

$$\begin{aligned} 200 - (1000)i &= 100 \\ 200 - 1000i &= 100 \\ 100 &= 1000i \\ \frac{100}{1000} &= i \\ i^* &= 0.1 \end{aligned}$$

b) new money demand function $M_D = 400 - (1000)i$ (400-200)

transaction and precautionary demand increase by 200 because they don't depend on interest rate.