

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.
 - 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.

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. Mean of exchange - ppl accept it for their transaction of G&S.
2. Store of value - asset that retain yr wealth to next period ex) gold, house land.
3. unit of account. - unit that people use to compare the values of things.

Gold is consider as the store of value. Since it has price and can be bought / stored.

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?

$$\begin{aligned} \text{Money supply} &= \text{currency} + \text{demand deposits} + \text{savings} \\ &= 1000 + 1000 + 1000 \\ &= 3000 \$ \rightarrow \text{money supply in economy.} \end{aligned}$$

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

Fractional Reserve System (FRS) - when small part of deposits will be kept at the bank

Money can be created through this system because the goldsmiths and banks are lending some of the deposits to people and charge interest.

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? *some deposits will be kept*
- b) WITHOUT the fractional reserve system (FRS), how much is the money supply? *use money multiplier 4x*
- 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) reserve ratio of 20%. means the 1% of the total deposits that bank needs to keep reserves.

b) w/o FRS \rightarrow Money supply = currency + deposit
 $= 100 + 200$
 $= 300 \$ \#$

c) Money multiplier = $\frac{1}{RR}$
 $= \frac{1}{0.2}$
 $= 5 \# \rightarrow$ Initial deposit of 1 \$ can generate up to the total deposit of 5 \$

d) w/ FRS
total deposit = primary deposit \times money multiplier
 $= 200 \times \frac{1}{0.2}$
 $= 1000 \$ \#$

e) deposit create from FRS = total deposit - initial deposit
 $= 1000 - 200$
 $= 800 \$ \#$

f) w/ FRS
money supply = currency + deposit (w/ FRS)
 $= 100 + 1000$
 $= 1,100 \$ \#$

5. Explain three roles of central banks.

- 1) CB controls the money supply and interest rate, i.e. monetary policy.
- 2) CB becomes lender of last resort to troubled banks
- 3) CB manages exchange rates

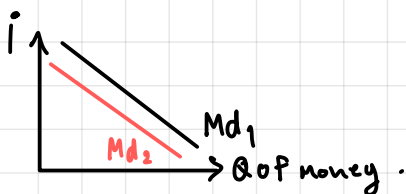
6. What is Liquidity? What is the most liquid asset? Explain the three reasons (according to Keynes) why people prefer to have liquidity. Which of these three reasons causes the money demand curve to be downward-sloping?

- Liquidity refers to how easily assets can be converted into ready cash [mean of exchange]
- Cash is the most liquid asset.
- reasons to have liquidity
 - Transaction Demand (daily use)
 - Precautionary Demand (emergency use)
 - Speculative Demand (future investment)
- Speculative Demand tend to cause the downward-sloping because the amount of cash people hold might depends on interest rate and price of stock.

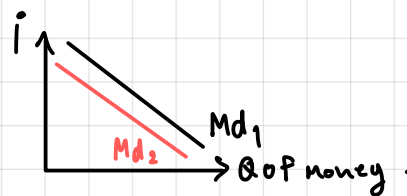
7. How does each of the followings affect the money demand curve? (That is, will it shift the curve, or is it movement along the curve?) Also, explain your reasoning.

- 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.

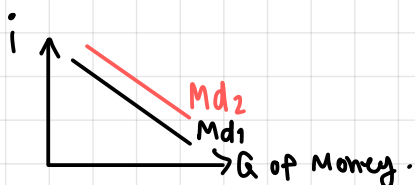
- a) People become poorer
 → affect the income
 → curve shifts to the left



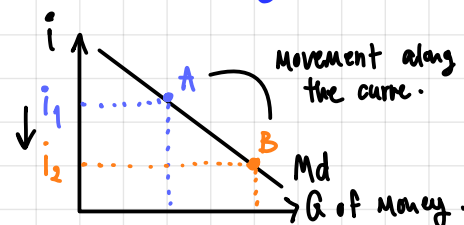
- c) Hold less cash due to debit / credit cards
 → curve shifts to the left



- b) Goods become more expensive
 → People need more money to consume
 → curve shifts to the right



- d) CB decrease i
 → People hold more cash since they get low return. ($Md \uparrow$)
 → movement along the curve

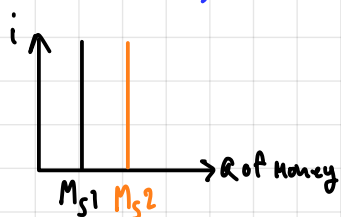


8. Why is the money supply curve a vertical line? How does each of the followings affect the money supply curve? Also, explain your reasoning.

- a) People deposit more money.
- b) The central bank increases reserve ratio.
- c) The central bank decreases discount rate. → the interest rate that commercial banks pay to the CB to borrow reserves.
- d) The central bank decreases interest rate.

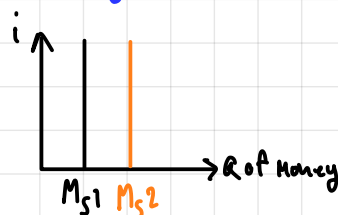
→ The M_s line is vertical b/c it doesn't depend on the interest rate

a) People deposit more money
→ M_s increase, shift to the right



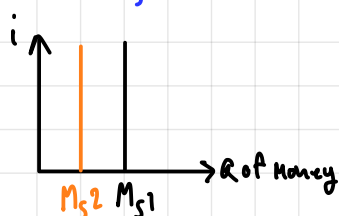
c) CB decreases discount rate.

→ Commercial banks borrow more reserves
→ $M_s \uparrow$



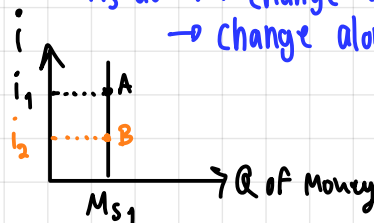
b) CB increases Reserve ratio (RR↑)

→ Commercial bank lends less money, keep more
→ $M_s \downarrow$, shift to the left



d) CB decreases i

→ M_s doesn't change b/c it doesn't depend on i
→ change along the curve.

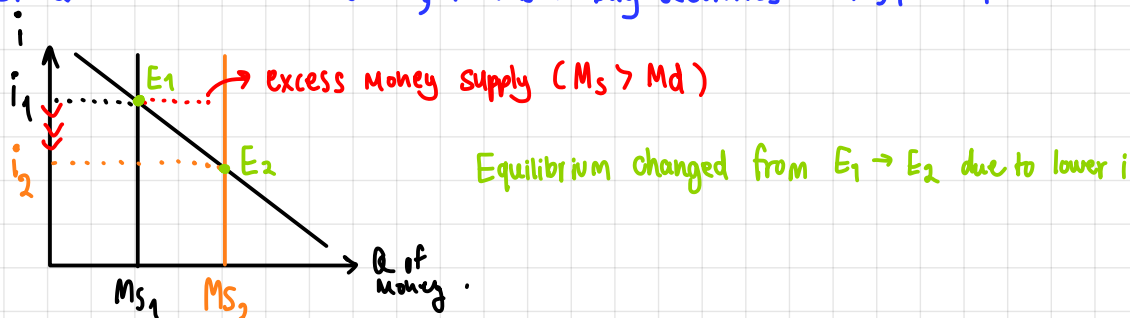


$i \downarrow$

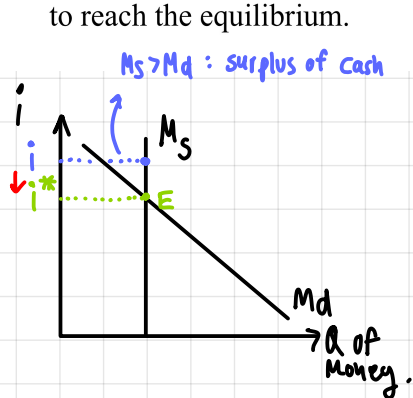
9. Suppose that the central bank wants to lower interest rate to boost the economy. Explain, together with the money market diagram, how the central bank can achieve this through an open market operation.

Open market operation: The purchase & sell by the CB of Gov securities in the open market
→ CB buys securities → CB pays money to public → $M_s \uparrow$
→ CB sells securities → CB takes money from public → $M_s \downarrow$

If CB wants to decrease i , it has to buy securities → $M_s \uparrow$ → $i \downarrow$



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.



People will convert their cash \rightarrow bond to get i
So the **Bond issuers will decrease i**

People will also deposit all to get i , CB can't pay that high i , So **CB will decrease i**

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

$$MV = PY$$

M = Money supply

V = velocity (how fast the money changes hand) \rightarrow constant

P = Price level

Y = real output \rightarrow at full employment level \rightarrow constant

* PY = nominal output *

So if $M \uparrow \rightarrow P \uparrow$ = 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) equilibrium interest rate (i^*)

$$\begin{aligned} M_d &= M_s \\ 200 - 1000i &= 100 \\ -1000i &= -100 \\ i &= 0.1 = 10\% \# \end{aligned}$$

b) $M_{d \text{ old}} = 200 - 1000(i)$

\downarrow

$M_{d \text{ new}} = 400 - 1000(i)$

\therefore 400 refers to transaction and precautionary demand.
(Increase for 200)