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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?

Answers

① + Money serves as :

- a medium of exchange
- a store of value
- a unit of account.

+ Evaluate effectiveness of gold as money :

- cannot be a medium of exchange as businesses and people mostly do not accept gold
- gold can store value as it is intrinsically valuable
- gold cannot serve as a unit of account as most things are not valued in gold.

②. Calculate:

+ Narrow money: $M_1 =$ money in circulation
+ demand deposit

$$= 1,000 + 1,000$$

$$M_1 = \$2,000$$

+ Broad money: $M_2 = M_1 +$ savings $= 2,000 + 1,000$

$$M_2 = \$3,000$$

$$+ \text{ Money supply} = M_1 = \$2,000$$

③ + FRS is a system in which a fraction of deposit made in a bank is required to put in reserve while the rest can be used by the bank to do whatever (loan, etc).

+ Money is created through servicing the money not tied up in reserve. For instance, through loaning money, a chain of future deposits can occur through spending and earning the money loaned out.

④. a. 20% reserve ratio means that 20% of the deposited money must be put in reserve to serve as cash on hand.

b. Without FRS :

$$\text{Money Supply} = (\text{money in circulation}) + (\text{initial deposit} \times \frac{1}{RR})$$
$$= (\text{money in circulation}) + (\text{initial deposit} \times \frac{1}{0})$$

$\frac{1}{0}$ is undefined

Thus, money supply is undefined.

c. calculate the money multiplier:

$$mm = \frac{1}{RR} = \frac{1}{0.2} ; \text{ mm} = 5$$

d. Total deposit with FRS = initial deposit \times mm
 $= 200 \times 5$

$$\boxed{\text{Total} = \$1,000}$$

e. deposit made from FRS = $1,000 - 200$

$$\boxed{= \$800}$$

f. calculate money supply with FRS

$$\text{Money Supply} = \text{money in circulation} + \text{total deposit}$$

$$= 100 + 1,000$$

$$\boxed{\text{Money Supply} = \$1,100}$$

⑤. Three roles of Central Bank:

+ control money supply through monetary policy

+ lender of last resort: provide funds for troubled

bank who cannot find other sources of funds

+ manage exchange rates and the country's foreign exchange reserves.

⑥. + Liquidity refers to how easily assets can be converted to cash.

+ The most liquid asset is cash.

+ According to Keynes, people prefer liquidity because of:

- Transaction demand
- Precautionary demand
- Speculative demand.

+ Among the three reasons, speculative demand makes the money-demand curve downward-sloping.

⑦. a. People become poorer means people are getting less income \rightarrow shifts M_D to the left.

b. Goods become more expensive leads to lower transaction demand \rightarrow shifts M_D to the left.

c. People prefer to hold cash less means people have larger amount of cash on hand

\rightarrow shifts M_D to the right.

d. Central Bank lowers interest rate leads to higher money demand (movement along the line). M_D won't shift because there is no change in other factors aside interest rate.

⑧. + Money supply is a vertical line because it is controlled by the Central Bank through monetary policy.

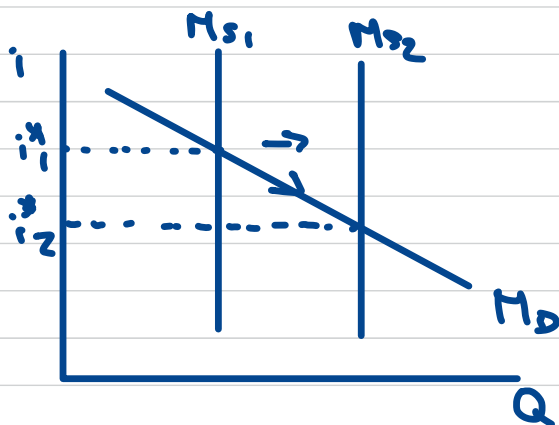
+ a. People deposit more money \rightarrow does not affect money supply unless the central bank decides to take action.

b. The central bank increases reserve ratio \rightarrow decrease in money supply as more money are tied to reserve.

c. The central bank decreases discount rate \rightarrow increase in money supply as banks can service out more money.

d. The central bank decreases interest rate means increase in money supply as bond issuers lower interest rate due to excess in money supply.

⑨. The central bank buys bonds to increase money supply in the market which leads to decrease in interest rate.



⑩. When $i > i^*$, it signals excess supply of money in the market, upon realizing this, bond issuers take advantage and lower interest rate to i^* .

⑪. QTM: $MV = PY$

With the assumption that Y is output at full employment and V is constant, intervention with money supply M would only positively change price level P .

Thus, if M increases, P also increases which is inflation.

⑫. a. Find i^*

$$M_D = 200 - 1000i ; M_S = 100$$

Equilibrium condition: $M_D = M_S$

$$200 - 1000i = 100$$

$$i = \frac{100 - 200}{-1000}$$

$$i^* = 0.1 = 10\%$$

b. $M_{D1} = 200 - 1000i ; M_{D2} = 400 - 1000i$

$M_{D2} - M_{D1} = 200$ thus, only positive change in interception \rightarrow an increase in M_D^T and for M_D^P .