

Problem Set #7**Due in hard copy at beginning of lecture on Monday, May 13, 2013****Important: Place all answers in the indicated spaces. Only your work and answers in the indicated spaces will be graded. All pages must be in order and stapled together.**

1. Answer briefly:
 - a. What three roles does money play in the economy?

1. **medium of exchange**
2. **unit of account**
3. **store of value**

- b. What is the difference between commodity money and fiat money?

Commodity money has value in non-monetary uses or in use as something other than money. Gold is the classic example of commodity money. Fiat money, on the other hand, has value as money only because it is decreed as money by the government. Fiat money retains its value only so long as people are willing to accept it, although the government ‘encourages’ wide spread acceptance both by declaring the fiat money as legal tender and by requiring that taxes be paid in the fiat money..

2. The first Tennessee Bank has \$1.5 million in total reserves and \$4 million in checking account balances. What is the bank’s reserve position if the required reserve ration (r_D) is 20%? (*i.e.*, What is the level of required reserves and the level of excess reserves?)

$$\text{Required Reserves} = \text{Deposits} \times r_D = \$4,000,000 \times 0.2 = \$800,000$$

$$\text{Total Reserves} - \text{Required Reserves} = \text{Excess Reserves}$$

$$\$1,500,000 - \$800,000 = \$700,000$$

$$\text{Required Reserves} = \$800,000 \text{ and Excess Reserves} = \$700,000$$

3. Suppose the commercial banking system in the U.S currently has \$300 billion in checking deposits and the required reserve ratio is 10%. Assume that there are no excess reserves.
 - a. Calculate the required reserves held by the commercial banking system and the amount of funds loaned to the public. (Hint: Think about the banking system’s balance sheet.)

$$\text{Required Reserves} = \$300 \text{ Billion} \times 0.10 = \$30 \text{ Billion}$$

Loans are equal to deposits less reserves (because the banks have loaned out all deposits not held as required reserves) or \$270 billion.

- b. If an additional \$50 billion is deposited into the commercial banking system, what will be the final level of checking deposits, the final level of required reserves and the final level of loans within the system continuing to assume that banks hold no excess reserves?

Deposits will increase by the change in reserves (the newly deposit \$50 billion) times the multiplier which with $r_D = 0.10$ is 10.

Hence, total deposits will be equal to \$300 billion plus \$50 billion x 10 or \$800 billion. Required reserves are now equal to \$800 billion x .1 or \$80 billion and loans are equal to \$720 billion.

4. Use t-accounts to illustrate what happens to commercial banks' balance sheets when each of the following transactions occurs. (Don't worry about the Fed's balance sheet for this question.)
- a. You withdraw \$500 from your checking account at the Sacramento Country bank to buy overpriced Sacramento Kings tickets.

Sacramento Country Bank			
Assets		Liabilities	
Reserves	-\$500	Deposits	-\$500

- b. Sam finds a \$100 bill on the sidewalk and deposits it into his checking account at the Sacramento Country Bank.

Sacramento Country Bank			
Assets		Liabilities	
Reserves	+\$100	Deposits	+\$100

- c. Mary Q. Contrary withdraws \$1,000 in cash from her checking account at the Sacramento Country Bank, carries it to San Francisco and deposits it into her account at the San Francisco City Bank.

Sacramento Country Bank			
Assets		Liabilities	
Reserves	-\$1,000	Deposits	-\$1,000

San Francisco City Bank			
Assets		Liabilities	
Reserves	+\$1,000	Deposits	+\$1,000

- d. Using the simplified money (or deposit) multiplier, what will be the effect of each of the above transactions on the money supply if the required reserve ratio is 12.5% and excess reserves are zero?
- Given zero excess reserves, the bank now has a reserve deficiency of \$437.50. (With the withdrawal of \$500, total reserves fell by \$500, but you no longer need the \$62.50 that was held against the original deposit, so the total deficiency is \$437.50.) The money supply must contract by the change in reserves (\$437.50) times the money multiplier ($1/0.125 = 8$) or \$3,500. Note here that while deposits will contract by \$4,000, the money supply only contracts by \$3,500. This is because the initial withdrawal, while it reduces deposits by \$500, does not change the money supply. It just replaces deposits with currency, both of which are part of M1. If on the other hand, the Fed had reduced reserves by \$500, the money supply would have been reduced by \$4,000.**
 - With the new deposit there now are excess reserves of $\$100 \times (1 - 0.125) = \87.5 . The money supply will expand by $\$87.5 \times 8 = \700 . The reasoning here is essentially the same as above. Remember that the initial deposit doesn't change the money supply. It is only the lending of the excess reserves that fuels new lending, deposit creation and growth of the money supply.**
 - There is no change in the money supply because neither deposits nor reserves in the banking system as a whole are changing. We're just moving deposits and reserves around in the banking system.**

e. Using the simplified money (or deposit) multiplier, what will be the effect of each of the above transactions on the money supply if the required reserve ratio is 15% and excess reserves are zero?

a. **Given zero excess reserves, the bank now has a reserve deficiency of \$425. (With the withdrawal of \$500, total reserves fell by \$500, but you no longer need the \$75 that was held against the original deposit, so the total deficiency is \$425.) The money supply must contract by the change in reserves (\$425) times the money multiplier ($1/0.15 = 6.667$) or \$2,833.33.**

b. **With the new deposit there now are excess reserves of $\$100 \times (1 - 0.15) = \85 . The money supply will expand by $\$85 \times 6.667 = \566.67 .**

c. **There is no change in the money supply because neither deposits nor reserves in the banking system as a whole are changing. We're just moving deposits and reserves around in the banking system.**

5. Suppose there is \$120 billion of cash, and that half of that is held in bank vaults as required reserves (that is, banks hold no excess reserves).

a. How large will the money supply be if the required reserve ratio is 10 percent?

In this case, since there is currency, $M^S = \text{Currency} + \text{Deposits} = \text{Currency} + \text{Reserves} \times (1/r_D)$.

$$M^S = \$60 \text{ billion} + \$60 \text{ billion} \times (1/0.10) = \$60 \text{ billion} + \$600 \text{ billion} = \text{\$660 billion}$$

Note that we have currency or cash here. Only half of the currency is held in bank vaults as reserves. As before, we multiply reserves by the money or deposit multiplier. We then add the cash held outside banks to the total deposits to get the total money supply.

b. How large will the money supply be if the required reserve ratio is 12.5 percent?

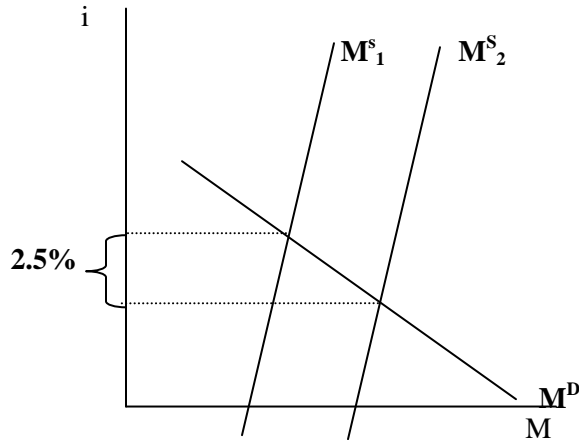
$$M^S = \$60 \text{ billion} + \$60 \text{ billion} \times (1/0.125) = \$60 \text{ billion} + \$480 \text{ billion} = \text{\$540 billion}$$

c. How large will the money supply be if the required reserve ratio is 16.67 percent?

$$M^S = \$60 \text{ billion} + \$60 \text{ billion} \times (1/0.1667) = \$60 \text{ billion} + \$359.93 \text{ billion} = \text{\$419.93 billion}$$

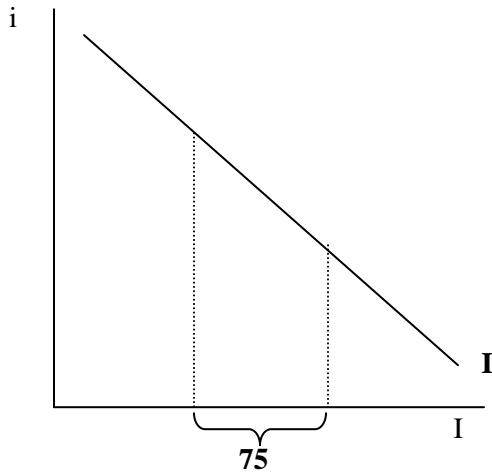
6. Explain and illustrate what a \$50 billion increase in the money supply will do to real GDP given the following assumptions. Show graphically what happens in the money market and goods market. Also, show what happens to aggregate demand.

- a. Each \$10 billion increase in the money supply reduces the interest rate by 0.5 percentage points (50 basis points). What happens to the interest rate?



The money supply increases by a total of \$50 billion, leading to a reduction in the interest rate of 2.5 percentage points or 250 basis points.

- b. Each 1 percentage point decline in the interest rates stimulates \$30 billion worth of new investment. What happens to total planned investment?

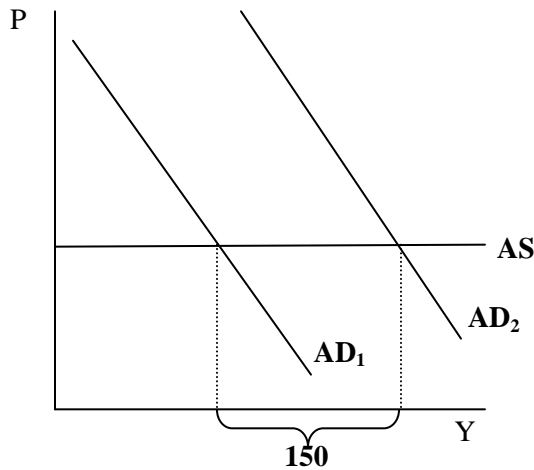


The cumulative 2.5 percentage point drop in interest rates causes investment to increase by 75 billion dollars. ($2.5 \times 30 = 75$)

- c. The expenditure multiplier for investment is 2. What happens to aggregate expenditure and output?

Given the model and notation we have used, this part of the question is really redundant. The increase in aggregate expenditure is 150 billion, the distance of the horizontal shift of the demand curve.

- d. The aggregate supply curve is flat (horizontal) indicating that prices don't increase when aggregate demand increases. What happens to output?



Since the price level doesn't change, there is no inflation and the multiplier remains 2. AD shifts to the right and output increases by 150.

7. .a. Why might investment not respond positively to low interest rates during a recession?

In a deep recession firms become very pessimistic. As a result, they see few profitable investment opportunities at any interest rate. In this circumstance, reducing interest rates is not effective in increasing aggregate demand.

- b. If investment fails to respond to low interest rates during a recession what, if any, other policy options are available?

Fiscal policy. The fiscal policy should focus on spending increases rather than tax cuts as a large portion of any tax cuts is likely to go toward saving or paying off debt rather than new spending given the level of pessimism.