

Homework II

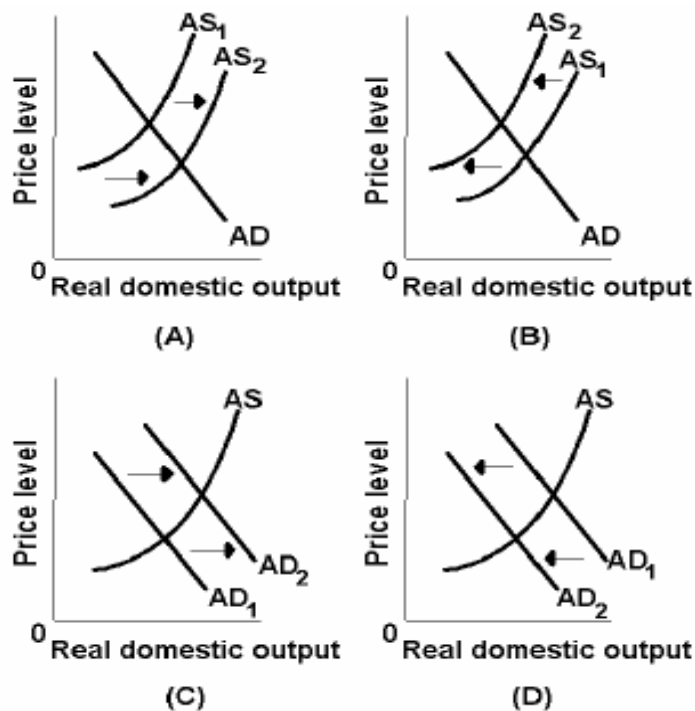
(Submission date: May 12 2025)

(Late submissions will not be evaluated)

What effect would each of the following have on aggregate demand or aggregate supply, other things equal? In each case, use a diagram to show the expected effects on equilibrium price level and the level of real output, assuming that the price level is flexible both upward and downward.

- a. A widespread fear of consumers of an impending economic depression.
- b. A new national tax on producer based on value added between the cost of inputs and the revenue received from their output.
- c. A reduction in interest rates at each price level.
- d. A major increase in spending for health care by the government.
- e. The general expectation of coming rapid inflation.
- f. The complete disintegration of OPEC, causing oil prices to fall by one-half.
- g. A 10 percent across the board reduction in personal income taxes.
- h. A sizeable increase in labor productivity (with no change in nominal wages).
- i. A 12 percent increase in nominal wages (with no changes in labor productivity).
- j. An increase in exports that exceeds an increase in imports.

Answer:



- a. Due to expected depression consumers may think that their income will fall in the future. Therefore, current consumption may be reduced and Aggregate Demand (AD) shifts to the left (Panel D).
- b. The new tax imposed will increase cost of production and will cause aggregate supply (AS) to decrease (Panel B).
- c. A decrease interest rate will increase investment and AD (Panel C).
- d. An increase in government spending for health expenses will increase AD (Panel C).
- e. An expected inflation will increase current consumption and therefore AD since people would like to buy good before rising prices (Panel C).
- f. Fall in oil prices will decrease cost of production therefore increase AS (Panel A).
- g. A decline in income taxes will increase disposable income consumption therefore AD (Panel C).
- h. AS will increase (Panel A).
- i. An increase in cost of production will decrease AS (Panel B).
- j. An increase in AD (Panel C).

1. Assume that in a hypothetical economy the marginal propensity to consume and the marginal propensity to spend are equal to 0.8. The economy is experiencing a severe recession. By how much would the government spending have to change to shift the aggregate demand curve rightward by \$25 billion? How large a tax change would be needed to achieve the same increase in aggregate demand? By how much would the government spending and taxes have to change to have the same change in aggregate demand without changing the balance of the budget?

Answer:

Government expenditure multiplier = $1/(1-0.8) = 5$

Simple multiplier = $25/\Delta G$. $\Delta G = 5$ increase

Tax multiplier = $-0.8/(1-0.8) = -4$

Tax multiplier = $25/\Delta T$. $\Delta T = -6.25$ decrease

Balanced budget multiplier = Government expenditure multiplier + Tax multiplier

Balanced budget multiplier = $5 - 4 = 1$

Balanced budget multiplier = $25/\Delta T = \Delta G$. $\Delta T = \Delta G = 25$ increase

2. In the Republic of Survivorland the currency is Survivorland Lira (SL). During 2020, the Treasury of Survivorland sold bonds to finance the budget deficit. In all, the Treasury sold 50,000 10-year bonds with a face value of 100 SL. Further, assume that the Survivorland Central Bank reserve requirement was 20 percent, and that in the same year the bank bought 500,000 SL. worth of outstanding bonds on the open market. Finally assume that all of the Survivorland debt is either held by the private sector (the public) or the Central Bank.
 - a. What is the combined effect of the Treasury sale and Central Bank purchase on the total Survivorland's outstanding debt?
 - b. What is the effect of the Treasury sale on the money supply in Survivorland?
 - c. What is the effect of the Central Bank purchase of bonds on the money supply assuming no leakage of reserves out of the banking system?

Answer:

- a. The debt increases by 5 million SL in total; the privately held debt increases by only 4.5 million SL. because the Central Bank bought 500,000 SL. worth of debt.
 - b. The treasury sale has no effect on the money supply; the Treasury goes to the public to borrow money that it immediately spends.
 - c. When Central Bank buys in the open market it pays with new high-powered money that becomes a part of the banking system's reserves; it pays essentially with newly printed money. The money multiplier is $1/RR$ or $1/0.2$ or 5. Thus, the money supply expands by $5 \times 500,000$ or 2.5 million SL.
3. You are given the following T-account for a bank.

Assets		Liabilities	
Reserves	\$ 500	Deposits	\$ 3,500
Loans	\$ 3,000		

The required reserve ratio is 10 percent.

- a. How much is the bank required to hold as reserves, given its deposits of \$ 3,500?
- b. How much are its excess reserves?
- c. By how much can the bank increase its loans?
- d. Suppose a depositor comes to the bank and withdraws \$ 200 in cash. Show the new balance sheet of the bank, assuming the bank obtains the cash by drawing down its reserves. Does the bank now hold excess reserves? Is it meeting the required reserve ratio? If not, what can it do?

Answer:

- a. The bank is required to hold $\$3500 \times 0.1 = \350 in reserves.
- b. Excess reserves = $\$500 - \$350 = \$150$.
- c. Assuming that money lent out by the bank gets deposited in this same bank, the bank can lend out an additional $\$150 \times 10 = \1500

(d) New T-account:

Assets		Liabilities	
Reserves	\$300	Deposits	\$3,300
Loans	\$3,000		

Required reserves are now \$330. The bank has deficit reserves of \$30. The bank will need to reduce its loans and increase its reserve by at least \$30. This would result in reserves of \$300, loans of \$2,700, and deposits of \$3,000.

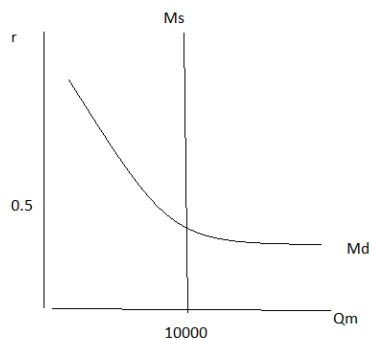
4. The demand for money in a country is given by

$M_d = 10,000 - 10,000r + Y$ where M_d is money demand in TL., r is the interest rate (a 10 percent interest rate means $r = 0.1$) and Y is national income.

Suppose the money supply (M_s) is set by the Central Bank at 10,000 TL.

- Find the equilibrium interest rate and graph the money market.
- Suppose national income rises to $Y = 7500$. What will happen in the money market and what is the new interest rate if the Central Bank does not change the money supply.
- The Central Bank wants to keep the equilibrium interest rate at the same value as in part (a). By how much should it change the money supply, given the new level of national income?
- Suppose the change occurred in part (b) and the money supply remains at 10,000 TL., but there is no observed change in the interest rate. What might have happened that could explain this?

Answer:



- The equilibrium is at $r = .5$ or 50%, which is found as the intersection of the money demand and money supply curves. We can solve for r algebraically by setting $m_d = m_s$: $10,000 - 10,000r + 5,000 = 10,000 \rightarrow r = 5,000/10,000 = .5$.
- The intersection occurs at $r = .75$. algebraically, $10,000 - 10,000r + 7,500 = 10,000 \rightarrow r = 7,500/10,000 = .75$ or 75%.
- We need the money supply equal to what money demand would be when $r = .5$. money demand = $10,000 - 10,000(.5) + 7,500 = 12,500$. increase the money supply by \$2,500, to \$12,500.

d. One possibility is that the price level has fallen, shifting the money demand curve back to its original position.

6. Which function of money is in each of the following cases demonstrating?

- (1) You pay \$15 for a movie ticket.
- (2) A restaurant manager sets the prices of meals she serves in dollars.
- (3) A restaurant manager keeps \$5,000 worth of cash in a safety deposit box.
- (4) McDonald's announces that a Big-Mac now costs only \$3.00.
- (5) Bill Gates net worth is around \$90 billion.

Answer:

- (1) Medium of exchange.
- (2) Unit of account.
- (3) Store of value.
- (4) Unit of account.
- (5) Store of value.

7. Suppose the reserve ratio changes from 10% to 20%, with all else unchanged and banks fully loaned out. Does the money supply in the economy increase or decrease? Why? Use the simple money multiplier to illustrate your answer.

Answer:

If the reserve ratio changes from 10% to 20%, the quantity of money will fall. If, for example, reserves in the banking system are \$10,000, and the reserve ratio is 10%, the simple money multiplier is $1/0.1 = 10$ and the money supply is $10 \times \$10,000 = \$100,000$. If the reserve ratio changes to 20%, the simple money multiplier is $1/0.2 = 5$ and the money supply is $5 \times \$10,000 = \$50,000$.

8. Suppose the current money supply is \$10,000. For each of the following situations, determine the following: the monetary base, and what *open market operation* the Central Bank would have to take to achieve the stated desired change in the money supply. Assume that banks hold no excess reserves and individuals hold no currency.
- a. The reserve requirement is 0.1. The Central Bank wants to decrease the money supply by \$800.
 - b. The reserve requirement is 0.5. The Central Bank wants to increase the money supply by \$1,000.

Answer:

- a. Multiplier is 10. Monetary base is \$1,000. Sell \$80 in bonds.
 - b. Multiplier is 2. Monetary base is \$5,000. Buy \$500 in bonds.
9. Suppose the current money supply is \$8,000. For each of the following situations, determine the following: the money multiplier, the monetary base, and the change in the *discount rate* necessary to achieve the stated desired change in the money supply. Assume that for every 1 percentage-point decline in the discount rate, banks borrow an additional \$50. Assume that banks hold no excess reserves and individuals hold no currency.
- a. The reserve requirement is 0.1. The Central Bank wants to increase the money supply by \$600.
 - b. The reserve requirement is 0.5. The Central Bank wants to increase the money supply by \$400.

Answer:

- a. Multiplier is 10. Monetary base is \$800. Reduce the discount rate by 1.2 percentage points.
 - b. Multiplier is 2. Monetary base is \$4,000. Reduce the discount rate by 4 percentage points.
10. Assume the reserve requirement is 20%. Banks lend all excess reserves, people hold no cash, and banks meet their reserve requirements. Complete the first five rounds of the money creation process and show the totals when the money creation process is complete.

Round	Bank Gets	Bank Keeps	Bank Loans / Person Borrows
1	5,000	1,000	4,000
2	4,000	800	3,200
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
.			
.			
.			
Total	_____	_____	_____

Answer:

The completed table should look like the one below.

Round	Bank Gets	Bank Keeps	Bank Loans / Person Borrows
1	\$5000	\$1,000	\$4,000
2	\$4000	\$800	\$3,200
3	<u>\$3,200</u>	<u>\$640</u>	<u>\$2,560</u>
4	<u>\$2,560</u>	<u>\$512</u>	<u>\$2,048</u>
5	<u>\$2,048</u>	<u>\$409.60</u>	<u>\$1638.40</u>
Total	<u>\$25,000</u>	<u>\$5,000</u>	<u>\$20,000</u>