

Principles of Economics (Double Degree, Fall 2022)

Homework #6_Solutions

For Chapter 29

1. Textbook, Chapter 29, #3

3. When your uncle repays a \$100 loan from Tenth National Bank (TNB) by writing a check from his TNB checking account, the result is a change in the assets and liabilities of both your uncle and TNB, as shown in these T-accounts:

Your Uncle			
Assets		Liabilities	
Before:			
Checking Account	\$100	Loans	\$100
After:			
Checking Account	\$0	Loans	\$0

Tenth National Bank			
Assets		Liabilities	
Before:			
Loans	\$100	Deposits	\$100
After:			
Loans	\$0	Deposits	\$0

By paying off the loan, your uncle simply eliminated the outstanding loan using the assets in his checking account. Your uncle's wealth has not changed; he simply has fewer assets and fewer liabilities.

2. Textbook, Chapter 29, # 6

(提示：自学教材相应部分。)

6. a.

Happy Bank

Assets		Liabilities	
Reserves	\$100	Deposits	\$800
Loans	\$900	Bank Capital	\$200

b. The leverage ratio = $\$1,000/\$200 = 5$.

c.

Happy Bank			
Assets		Liabilities	
Reserves	\$100	Deposits	\$800
Loans	\$810	Bank Capital	\$110

d. Assets decline by 9%. The bank's capital declines by 45%. The reduction in bank capital is larger than the reduction in assets because all of the defaulted loans are covered by bank capital.

3. Textbook, Chapter 29, #7

7. With a required reserve ratio of 10%, the money multiplier could be as high as $1/0.10 = 10$, if banks hold no excess reserves and people do not keep some additional currency. So the maximum increase in the money supply from a \$10 million open-market purchase is \$100 million. The smallest possible increase is \$10 million if all of the money is held by banks as excess reserves.

4. The economy of Elmendyn contains 2,000 \$1 bills.

- If people hold all money as currency, what is the quantity of money as measured by M0, M1 and M2? (Hint: M0 includes only currency, while M1 includes M0 and demand deposits, and M2 includes M1 and time deposits.)
 $M0=M1=M2=2,000$.
- If people hold all money as demand deposits and banks maintain 100 percent reserves, what is the quantity of money as measured by M0, M1 and M2?
 $M0=0, M1=M2=2,000$.
- If people hold equal amounts of currency and demand deposits and banks maintain 100 percent reserves, what is the quantity of money as measured by M0, M1 and M2?
 $M0=1000, M1=M2=2000$.
- If people hold all money as demand deposits and banks maintain a reserve ratio of 10 percent, what is the quantity of money as measured by M0, M1 and M2?
 $M0=0, M1=2,000/0.1=20,000=M2$.
- If people hold equal amounts of currency and demand deposits and banks maintain a

reserve ratio of 10 percent, what is the quantity of money as measured by M0, M1 and M2? (2 point)

Suppose (in equilibrium) people hold \$ x of currency and \$x of demand deposits.
The bank's T-account is:

Assets	Liabilities
Reserves \$0.1x Loans \$0.9x	Demand Deposits \$x

The amount of reserves plus the amount of currencies equals to money issued by central bank, i.e.:

$$0.1x + x = 2,000, \text{ or } x = 2,000 / 1.1 = 1818.$$

$$\text{Then: } M0 = 1818, M1 = 3636 = M2.$$

- f. If people hold equal amounts of currency, demand deposits, and time deposits, and banks maintain a reserve ratio of 100 percent, what is the quantity of money as measured by M0, M1 and M2?

$$M0 = 2000 / 3 = 667, M1 = M0 + 2000 * 2 / 3 = 1333, M2 = 2,000.$$

- g. If people hold equal amounts of currency, demand deposits, and time deposits, and banks maintain a reserve ratio of 10 percent for all the deposits, what is the quantity of money as measured by M0, M1 and M2?

Suppose (in equilibrium) people hold \$x of currency, \$x of demand deposits and \$x of time deposits.

The bank's T-account is:

Assets	Liabilities
Reserves \$0.1 * 2x = 0.2x Loans \$1.8x	Demand Deposits \$x Time Deposits \$x

The amount of reserves plus the amount of currencies equals to money issued by central bank, i.e.:

$$0.2x + x = 2,000, \text{ or } x = 2,000 / 1.2 = 1667.$$

$$\text{Then: } M0 = 1667, M1 = 2M0 = 3333, M2 = 3M0 = 5000.$$

- h. If people hold amounts of currency, demand deposits, and time deposits with a ratio of 1: 3: 6, and banks maintain a reserve ratio of 10 percent for demand deposits, and a reserve of 5 percent for time deposits, what is the quantity of money as measured by M0, M1 and M2?

Suppose (in equilibrium) people hold \$x of currency, \$3x of demand deposits and \$6x of time deposits.

The bank's T-account is:

Assets	Liabilities
Reserves \$0.1 * 3x + 0.05 * 6x = 0.6x Loans \$8.4x	Demand Deposits \$3x Time Deposits \$6x

The amount of reserves plus the amount of currencies equals to money issued by central bank, i.e.:

$$0.6x + x = 2,000, \text{ or } x = 2,000 / 1.6 = 1250.$$

$$\text{Then: } M_0 = 1250, M_1 = 4M_0 = 5000, M_2 = 10M_0 = 12500.$$

For Chapter 30

5. Textbook, Chapter 30, #1

1. In this problem, all amounts are shown in billions.
 - a. Nominal GDP = $P \times Y = \$10,000$ and $Y = \text{real GDP} = \$5,000$, so $P = (P \times Y) / Y = \$10,000 / \$5,000 = 2$.

Because $M \times V = P \times Y$, then $V = (P \times Y) / M = \$10,000 / \$500 = 20$.
 - b. If M and V are unchanged and Y rises by 5%, then because $M \times V = P \times Y$, P must fall by 5%. As a result, nominal GDP is unchanged.
 - c. To keep the price level stable, the Fed must increase the money supply by 5%, matching the increase in real GDP. Then, because velocity is unchanged, the price level will be stable.
 - d. If the Fed wants inflation to be 10%, it will need to increase the money supply 15%. Thus $M \times V$ will rise 15%, causing $P \times Y$ to rise 15%, with a 10% increase in prices and a 5% rise in real GDP.

6. Textbook, Chapter 30, #2

2.
 - a. If people need to hold less cash, the demand for money shifts to the left, because there will be less money demanded at any price level.
 - b. If the Fed does not respond to this event, the shift to the left of the demand for money combined with no change in the supply of money leads to a decline in the value of money ($1/P$), which means the price level rises, as shown in Figure 1.

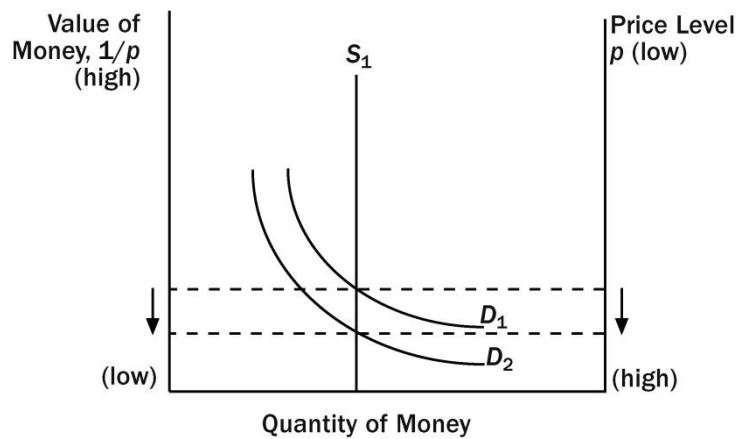


Figure 1

- c. If the Fed wants to keep the price level stable, it should reduce the money supply from S_1 to S_2 in Figure 2. This would cause the supply of money to shift to the left by the same amount that the demand for money shifted, resulting in no change in the value of money and the price level.

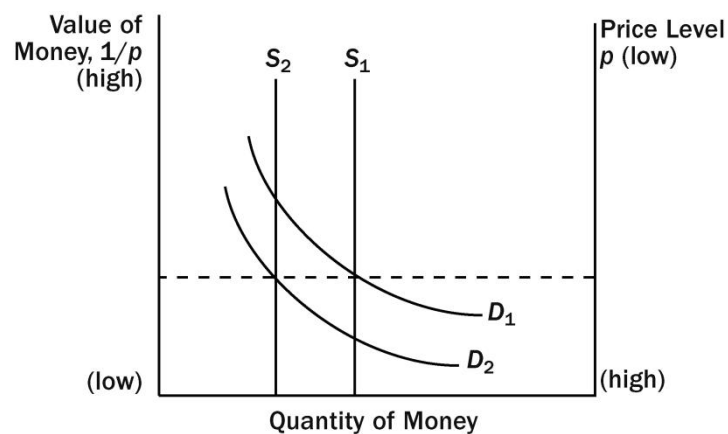


Figure 2

7. Textbook, Chapter 30, #5

5. a. When the price of both goods doubles in a year, inflation is 100%. Let's set the market basket equal to one unit of each good. The cost of the market basket is initially \$4 and becomes \$8 in the second year. Thus, the rate of inflation is $(\$8 - \$4)/\$4 \times 100 = 100\%$. Because the prices of all goods rise by 100%, the farmers get a 100% increase in their incomes to go along with the 100% increase in prices, so neither is affected by the change in prices.

- b. If the price of beans rises to \$2 and the price of rice rises to \$4, then the cost of the market basket in the second year is \$6. This means that the inflation rate is $(\$6 - \$4)/\$4 \times 100 = 50\%$. Bob is better off because his dollar revenues doubled (increased 100%) while inflation was only 50%. Rita is worse off because inflation was 50% percent, so the price of the good she buys rose faster than the price of the good (rice) she sells, which rose only 33%.
- c. If the price of beans rises to \$2 and the price of rice falls to \$1.50, then the cost of the market basket in the second year is \$3.50. This means that the inflation rate is $(\$3.5 - \$4)/\$4 \times 100 = -12.5\%$. Bob is better off because his dollar revenues doubled (increased 100%) while prices overall fell 12.5%. Rita is worse off because inflation was -12.5%, so the price of the good she buys didn't fall as fast as the price of the good (rice) she sells, which fell 50%.
- d. The relative price of rice and beans matters more to Bob and Rita than the overall inflation rate. If the price of the good that a person produces rises more than inflation, he will be better off. If the price of the good a person produces rises less than inflation, he will be worse off.

8. Textbook, Chapter 30, #6

6. The following table shows the relevant calculations:

	(a)	(b)	(c)
(1) Nominal interest rate	10.0	6.0	4.0
(2) Inflation rate	5.0	2.0	1.0
(3) Before-tax real interest rate	5.0	4.0	3.0
(4) Reduction in nominal interest rate due to 40% tax	4.0	2.4	1.6
(5) After-tax nominal interest rate	6.0	3.6	2.4
(6) After-tax real interest rate	1.0	1.6	1.4

Row (3) is row (1) minus row (2). Row (4) is $0.40 \times$ row (1). Row (5) is $(1 - .40) \times$ row (1), which equals row (1) minus row (4). Row (6) is row (5) minus row (2). Note that even though part (a) has the highest before-tax real interest rate, it has the lowest after-tax real interest rate. Note also that the after-tax real interest rate is much lower than the before-tax real interest rate.

9. 假定一个经济当中一些人把原本打算消费的、以现金形式取得的收入放在床垫下面，永不使用。则这会使得经济在长期中价格水平 ， 这些人 ， 其他人 。在更长的长期中，经济的产出 ， 这些人 ， 其他人 。

- A. 降低，变坏，变好。增加，变坏，变好
- B. 不变，不变，不变。不变，不变，不变
- C. 降低，变坏，变好。不变，不变，不变
- D. 降低，变坏，变好。增加，可能变好或变坏，变好

For Chapter 33

10. Textbook, Chapter 33, #3

3. a. The current state of the economy is shown in Figure 7. The aggregate-demand curve and short-run aggregate-supply curve intersect at the same point on the long-run aggregate-supply curve.

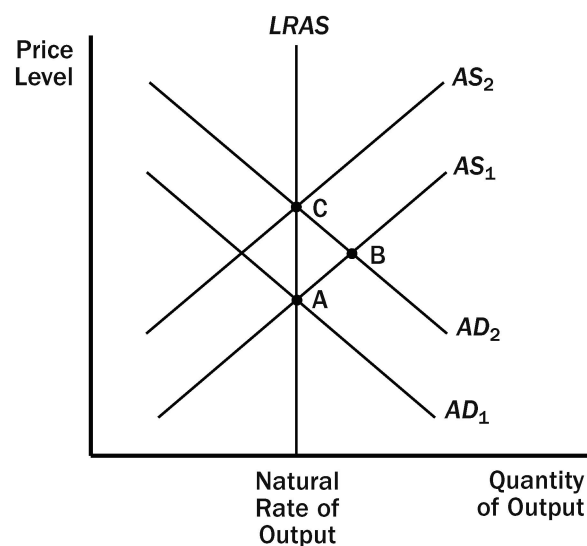


Figure 7

- b. If the central bank increases the money supply, aggregate demand shifts to the right (to point B). In the short run, there is an increase in output and the price level.

- c. Over time, nominal wages, prices, and perceptions will adjust to this new price level. As a result, the short-run aggregate-supply curve will shift to the left. The economy will return to its natural level of output (point C).
- d. According to the sticky-wage theory, nominal wages at points A and B are equal. However, nominal wages at point C are higher than at point A.
- e. According to the sticky-wage theory, real wages at point B are lower than real wages at point A. However, real wages at points A and C are equal.
- f. Yes, this analysis is consistent with long-run monetary neutrality. In the long run, an increase in the money supply causes an increase in the nominal wage, but leaves the real wage unchanged.

11. Textbook, Chapter 33, #7

- 7. a. People will likely expect that the new chair will not actively fight inflation so they will expect the price level to rise.
- b. If people believe that the price level will be higher over the next year, workers will want higher nominal wages.
- c. At any given price level, higher labor costs lead to reduced profitability.
- d. The short-run aggregate-supply curve will shift to the left as shown in Figure 9.

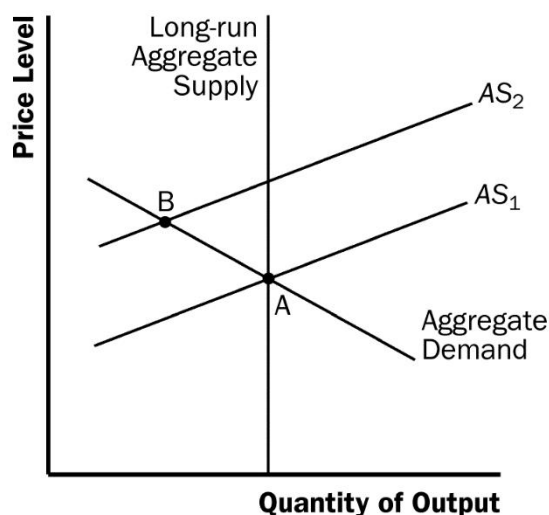


Figure 9

- e. A decline in short-run aggregate supply leads to reduced output and a

higher price level.

- f. No, this choice was probably not wise. The end result is stagflation, which provides limited choices in terms of policies to remedy the situation.

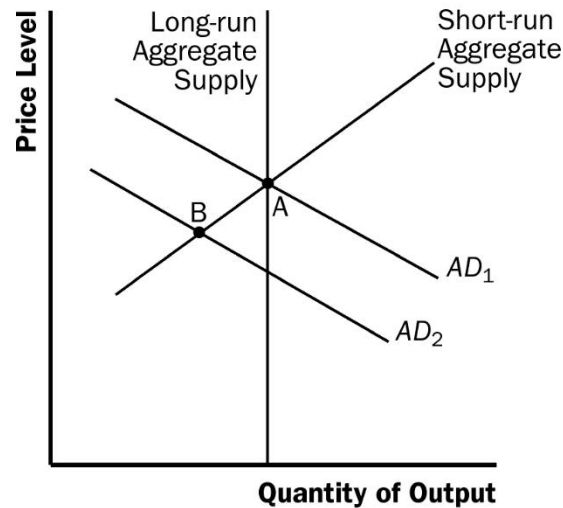


Figure 10

12. Textbook, Chapter 33, #10

10. a. If firms become optimistic about future business conditions and increase investment, the result is shown in Figure 17. The economy begins at point A with aggregate-demand curve AD_1 and short-run aggregate-supply curve AS_1 . The equilibrium has price level P_1 and output level Y_1 . Increased optimism leads to greater investment, so the aggregate-demand curve shifts to AD_2 . Now the economy is at point B, with price level P_2 and output level Y_2 . The aggregate quantity of output supplied rises because the price level has risen and people have misperceptions about the price level, wages are sticky, or prices are sticky, all of which cause output supplied to increase.

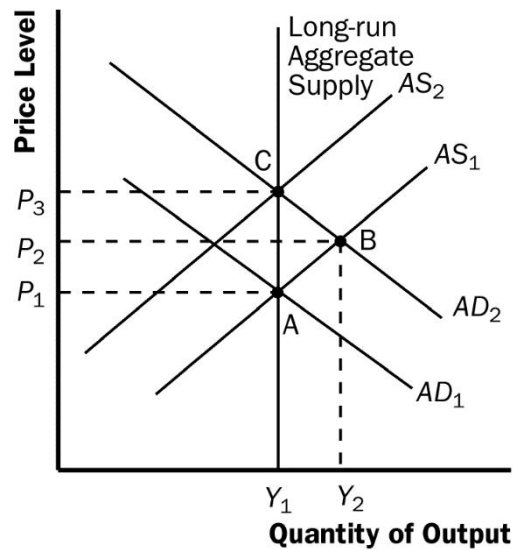


Figure 17

- b. Over time, as the misperceptions of the price level disappear, wages adjust, or prices adjust, the short-run aggregate-supply curve shifts to the left to AS_2 and the economy gets to equilibrium at point C, with price level P_3 and output level Y_1 . The quantity of output demanded declines as the price level rises.
- c. The investment boom might increase the long-run aggregate-supply curve because higher investment today means a larger capital stock in the future, thus higher productivity and output.

For Chapter 34

13. Textbook, Chapter 34, #1

1. a. When the Fed's bond traders buy bonds in open-market operations, the money-supply curve shifts to the right from MS_1 to MS_2 , as shown in Figure 1. The result is a decline in the interest rate.

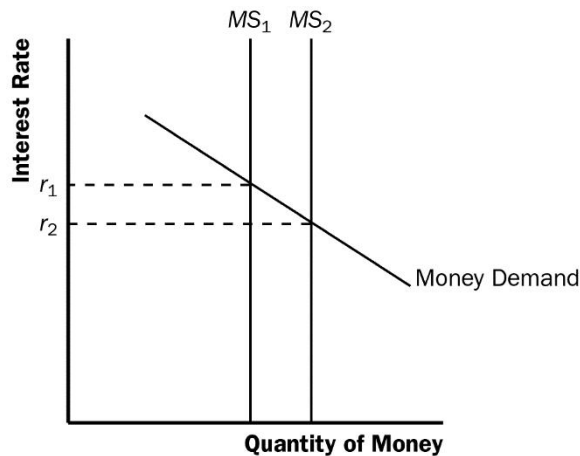


Figure 1

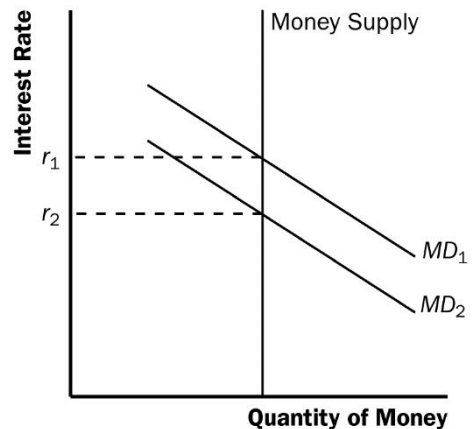


Figure 2

- b. When an increase in credit card availability reduces the cash people hold, the money-demand curve shifts to the left from MD_1 to MD_2 , as shown in Figure 2. The result is a decline in the interest rate.
- c. When the Federal Reserve reduces reserve requirements, the money supply increases, so the money-supply curve shifts to the right from MS_1 to MS_2 , as shown in Figure 1. The result is a decline in the interest rate.
- d. When households decide to hold more money to use for holiday shopping, the money-demand curve shifts to the right from MD_1 to MD_2 , as shown in Figure 3. The result is a rise in the interest rate.

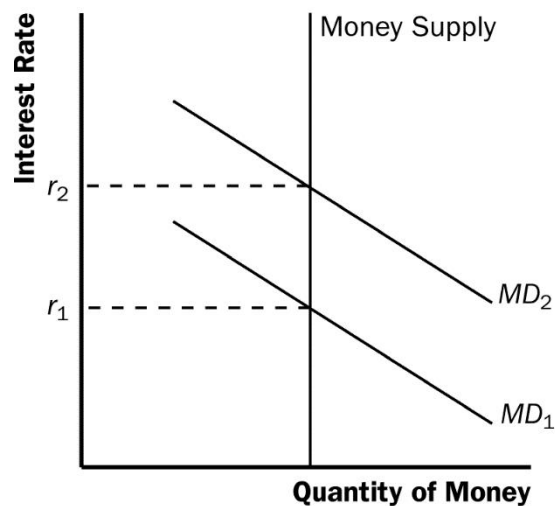


Figure 3

- e. When a wave of optimism boosts business investment and expands aggregate demand, money demand increases from MD_1 to MD_2 in Figure

3. The increase in money demand increases the interest rate.

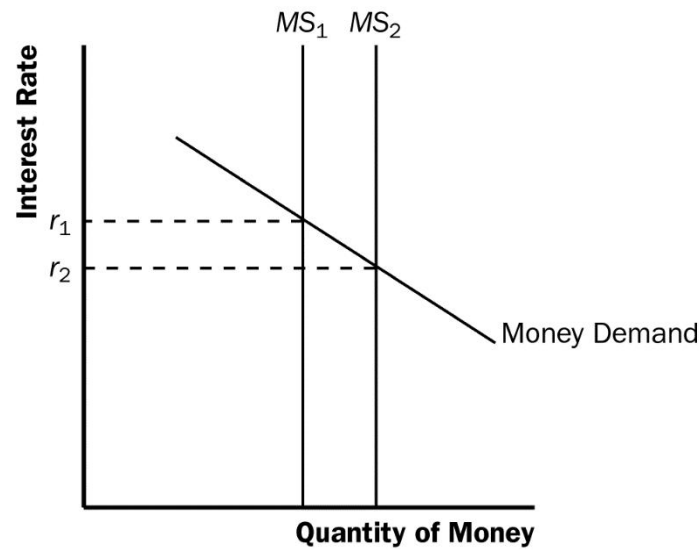


Figure 4

14. Textbook, Chapter 34, #3

3. a. When fewer ATMs are available, money demand is increased and the money-demand curve shifts to the right from MD_1 to MD_2 , as shown in Figure 6. If the Fed does not change the money supply, which is at MS_1 , the interest rate will rise from r_1 to r_2 . The increase in the interest rate shifts the aggregate-demand curve to the left, as consumption and investment fall.
- b. If the Fed wants to stabilize aggregate demand, it should increase the money supply to MS_2 , so the interest rate will remain at r_1 and aggregate demand will not change.
- c. To increase the money supply using open market operations, the Fed should buy government bonds.

15. Textbook, Chapter 34, #6

6. a. Legislation allowing banks to pay interest on checking deposits increases the return to money relative to other financial assets, thus increasing money demand.
- b. If the money supply remained constant (at MS_1), the increase in the demand for money would have raised the interest rate, as shown in

Figure 10. The rise in the interest rate would have reduced consumption and investment, thus reducing aggregate demand and output.

- c. To maintain a constant market interest rate, the Fed would need to increase the money supply from MS_1 to MS_2 . Then aggregate demand and output would be unaffected.

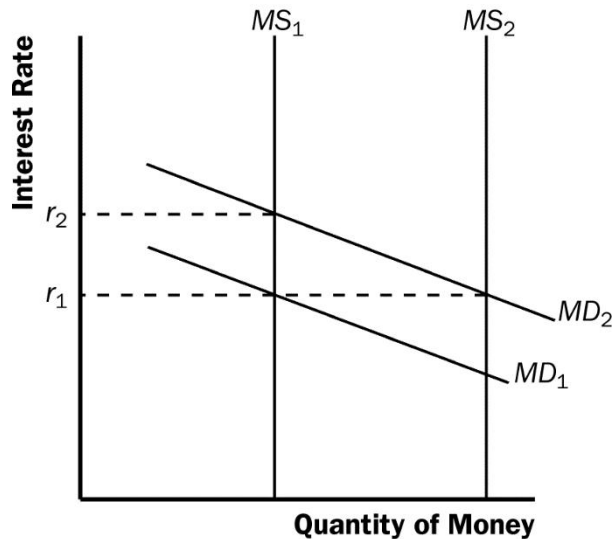


Figure 10

16. Textbook, Chapter 34, #8

8. If the marginal propensity to consume is $4/5$, the spending multiplier will be $1/(1 - 4/5) = 5$. Therefore, the government would have to increase spending by $\$400/5 = \80 billion to close the recessionary gap.

17. Textbook, Chapter 34, #11

11. a. $Y = C + I + G$ is the equilibrium condition for GDP in a closed economy (output equals the sum of consumption, investment, and government spending); $C = 100 + .75(Y - T)$ is the equation for consumption which depends on disposable income; $I = 500 - 50r$ is the equation for investment which depends on the interest rate; $G = 125$ means that government spending is fixed at 125; $T = 100$ means that taxes are fixed at 100.

- b. The marginal propensity to consume is 0.75.

- c. When the interest rate, r , is 4 percent,

$$Y = 100 + .75(Y - 100) + 500 - 50(4) + 125$$

$$Y = 100 + .75Y - 75 + 500 - 200 + 125$$

$$Y = 450 + .75Y$$

$$.25Y = 450$$

$Y = 1800$, which is less than the full employment level.

- d. Assuming no change in monetary policy, an increase in government purchases of 50 (to 175) would restore full employment. Because the marginal propensity to consume is .75, the multiplier is $1/(1-.75)$ or 4. To increase GDP from 1800 to 2000, or by 200, government spending would need to increase by $200/4 = 50$.

- e. Assuming no change in fiscal policy, a decrease of 1 percent (from 4 percent to 3 percent) in the interest rate would restore full employment.

$$2000 = 100 + .75(2000 - 100) + 500 - 50r + 125$$

$$2000 = 2150 - 50r$$

$$50r = 150$$

$$r = 3$$