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## *Contacts*

[andreybbrv@gmail.com](mailto:andreybbrv@gmail.com)

[andreybbrv@yandex.ru](mailto:andreybbrv@yandex.ru)

Skype: andreybbrv

# **Chapter 6**

## **FISCAL POLICY**

IN THIS CHAPTER:

- ✓ *Level of Output with Government Expenditures or Taxes*
- ✓ *Discretionary Fiscal Policy*
- ✓ *Built-In Stabilizers*
- ✓ *Government Deficit and Debt*
- ✓ *Implementing Fiscal Policy*
- ✓ *True or False Questions*
- ✓ *Solved Problems*

### **Level of Output with Government Expenditures or Taxes**

Taxes reduce personal disposable income and therefore consumption and aggregate spending, whereas government expenditures increase aggregate spending. The influence of government expenditures and of taxes upon aggregate spending is shown in Figure 6-1 in the shift of aggregate spending line ( $C + I + X_n + G$ ). An increase in net lump-sum tax revenues, *ceteris paribus*, shifts the aggregate spending line downward to  $(C + I + X_n + G)'$ , since higher taxes reduce consumer disposable income and therefore consumer spending at each level of output. An increase in gov-

ernment spending, *ceteris paribus*, shifts the aggregate spending line upward to  $(C + I + X_n + G)''$ . It therefore follows that the government can alter the economy's equilibrium level of output by changing its expenditures or net tax revenues. Such government actions are classified as discretionary fiscal policy.

## Discretionary Fiscal Policy

Discretionary fiscal policy involves intentional changes in government spending and/or net tax revenues in order to alter the level of aggregate spending. We have already found that an increase in government spending and/or a decrease in lump-sum taxes shifts the aggregate spending line upward and raises the equilibrium level of output, while a decrease in government spending and/or an increase in lump-sum taxes shifts the aggregate spending line downward and lowers the equilibrium level of output. The government can use discretionary fiscal actions (changing government spending and/or lump-sum taxes) to eliminate an inflationary or recessionary gap.

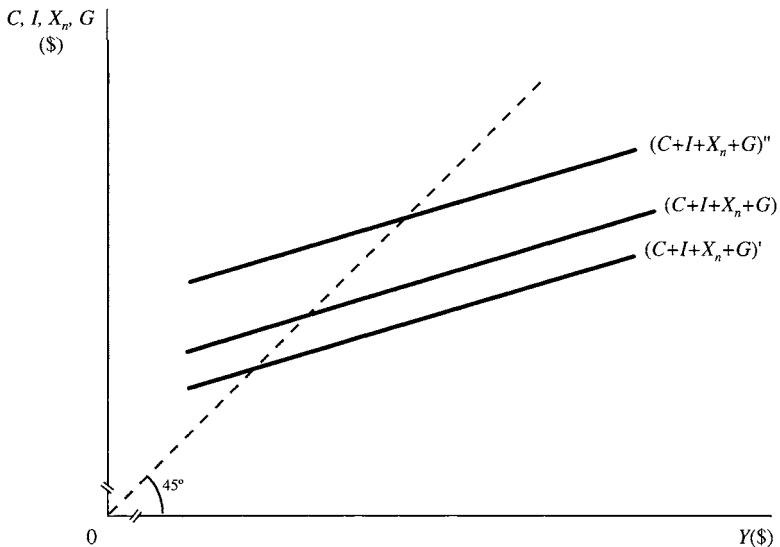


Figure 6-1

## Important Things to Remember ✓

In the real world, the government may change its spending and taxing policies for economic reasons or for purely political reasons.

A discretionary fiscal action has a multiplier effect upon the equilibrium level of output. The size of the multiplier depends upon whether there is a change in government spending, or in net lump-sum tax revenues, and there is an income tax. The value for the multiplier for the change in government spending is  $\Delta Y/\Delta G$ , while the value of the multiplier for the change in net lump-sum tax revenues is  $\Delta Y/\Delta T$ . When there is no income tax, a change in government spending has the same multiplier effect [ $k = 1/(1 - MPC)$ ] as does a similar change in investment spending or net exports. The multiplier is smaller for changes in net lump-sum tax revenues; the tax multiplier  $k_t = -MPC(k)$  or  $-MPC/(1 - MPC)$  is for an economy with no income tax.

An income tax reduces the value of both the expenditure and the lump-sum tax revenue multiplier since the amount of taxes paid to government is directly related to income earned. For example, when the income tax rate is 20 percent and personal income increases \$10, tax payments to the government rise \$2 and personal disposable income increases \$8 rather than \$10. Thus, an increase in personal income results in smaller increments in induced consumption, and therefore results in a smaller multiplied effect. When there is an income tax, the equation for the expenditure multiplier is  $k = 1/[1 - MPC + MPC(t)]$ , where  $t$  is the income tax rate. The equation for the lump-sum tax multiplier is  $k_t = -MPC(k)$  or  $-MPC/[1 - MPC + MPC(t)]$ .



## Built-In Stabilizers

Personal income taxes and various government transfers automatically change the level of net tax revenues when the economy moves away (or

toward) the full-employment level of output. For example, government collects smaller revenues from income taxes when output decreases; lump-sum tax revenues also fall when output decreases because of increased government transfer payments to individuals in the form of unemployment insurance benefits, food stamps, and other government assistance programs. Because of such automatic changes in net tax revenues, consumer disposable income is not completely dependent on the level of output, consumer spending is more stable over the business cycle, and the amplitude of economic fluctuations is lessened.



### Note!

Built-in stabilizers only help to mitigate economic fluctuations, not to correct them.

## Government Deficit and Debt

A federal deficit exists when government outlays exceed revenues. The structural deficit is the deficit that exists when output is at its full-employment level; a cyclical deficit is the amount of the deficit that is attributable to output being below its full-employment level. In Figure 6-2,  $y_f$  represents full-employment output. Here the economy's structural deficit is \$200 (\$500 in government spending less \$300 in net tax receipts). Note that the deficit increases to \$300 when output declines to  $y_1$ , which is not surprising since there are smaller tax receipts and larger government transfers at output levels below  $y_f$ . Thus, at output  $y_1$ , the \$300 deficit consists of a \$200 structural deficit and a \$100 cyclical deficit.

The public debt is the amount of interest-bearing debt issued by the federal government at a given point in time and arises from previous yearly deficits. Some argue that a large public debt will result in default and federal bankruptcy. The federal government will not default, however, since it has the power to print money and the power to tax. The government can also repay a maturing debt obligation by issuing a new debt obligation. However, due to possible redistribution effects, there is concern about the large increases in the U.S. federal debt. A rapidly rising debt level necessitates larger interest payments. If the government increases

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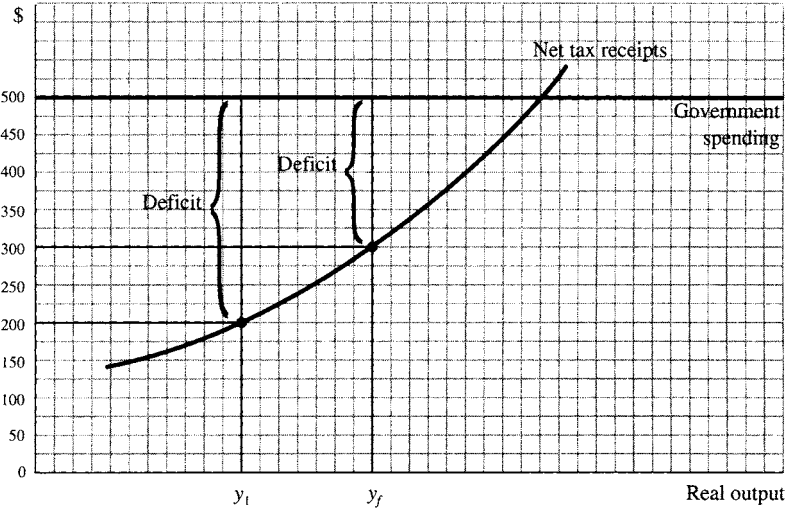


Figure 6-2

taxes to pay its higher interest expense, it could cause a redistribution of income from those who pay taxes to those who have substantial wealth.



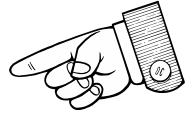
### Important!

There is a difference between the deficit and the debt. The former occurs yearly and the latter is an accumulation of the former deficits over time.

## Implementing Fiscal Policy

Since discretionary changes in tax revenues and government spending have a multiplier effect upon equilibrium output, it would appear that government has the ability to maintain full-employment output by manipulating its net tax revenues and/or spending. Fiscal policy, however, is not as easily implemented or as successful as first suggested. Suppose a recessionary gap exists. Will Congress and the administration agree on

an immediate course of action? In reality, an action lag is likely to occur because of conflicting priorities. For example, some individuals may advocate increased government expenditures on public goods, such as the rebuilding of roads, while others may prefer government expenditures on services such as public education. Another group may advocate expanded welfare services or reduced tax rates for middle-income workers. And once a fiscal plan of action is reached and implemented, will Congress and the administration be prepared to scale down or eliminate any of these measures should the fiscal stimulus eventually become excessive?



Besides political priorities, we must also recognize that economic activity exists in a dynamic, changing environment, where other variables may change. Thus, while a fiscal stimulus may close a recessionary gap and bring the economy to full employment, *ceteris paribus*, it is possible that investment and/or net export spending may increase after the fiscal stimulus is implemented, which would result in an inflationary gap. In addition, economists are uncertain about the output level at which full employment exists and have been unable to establish precise values for multipliers for the U.S. economy.

## True or False Questions

1. Fiscal policy refers to any change in government tax revenue and/or in government spending.
2. With no income tax and the MPC equal to 0.80, a \$10 increase in transfer payments shifts the aggregate spending line upward by \$8.
3. With no income tax and the MPC equal to 0.75, a \$10 decrease in net tax revenues results in a \$30 increase in the equilibrium level of output.
4. When the MPC is 0.75 and the income tax rate is 0.20, the lump-sum multiplier is  $-3$ .
5. The availability of food stamps is an example of discretionary fiscal policy.

Answers: 1. True; 2. True; 3. True; 4. False; 5. False

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### Solved Problems

**Solved Problem 6.1** How do the following events affect an aggregate spending line?

- A \$15 increase in government spending.
- A \$10 decrease in investment spending.
- A \$15 decrease in net tax revenues when the MPC is 0.80.

**Solution:**

a. The aggregate spending line shifts upward by  $\Delta G$ , the amount of the change in government spending. In this case, there is a corresponding \$15 upward shift of the aggregate spending line.

b. Changes in investment shift the aggregate spending line by  $\Delta I$ . Here, there is a \$10 downward shift of the aggregate spending line.

c. Changes in lump-sum taxes shift the aggregate spending line by  $-\text{MPC}(\Delta T)$ . Since net tax revenues decrease \$15, there is a \$12 upward shift of the aggregate spending line [ $\$12 = -0.80(-\$15)$ ].

**Solved Problem 6.2** Suppose there is full employment at the \$600 level of output and the MPC is 0.80 in Figure 6-3.

a. Does the aggregate spending line ( $C + I + X_n + G$ ) depict the existence of an inflationary or recessionary gap?

b. What discretionary fiscal action can government implement to close this gap?

c. What discretionary fiscal action is needed when investment spending decreases \$5?

**Solution:**

a. There is a \$60 inflationary gap since the equilibrium level of output is \$660 and full-employment output is \$600.

b. Government spending should be decreased \$12 since the necessary decrease in aggregate spending is \$60 and the multiplier is 5 [ $\Delta Y = k(\Delta G)$ ;  $-\$60 = 5(\Delta G)$ ;  $\Delta G = -\$12$ ]. An alternative fiscal action is a \$15 increase in lump-sum taxes since the tax multiplier is  $-4$  [ $\Delta Y = k_t(\Delta T)$ ;  $-\$60 = -4(\Delta T)$ ;  $\Delta T = +\$15$ ].

c. The inflationary gap is \$35 rather than \$60 since the \$5 decrease in investment spending lowers aggregate spending \$25. To close the smaller inflationary gap, lump-sum taxes need to be increased \$8.75, or government expenditures need to be reduced \$7.



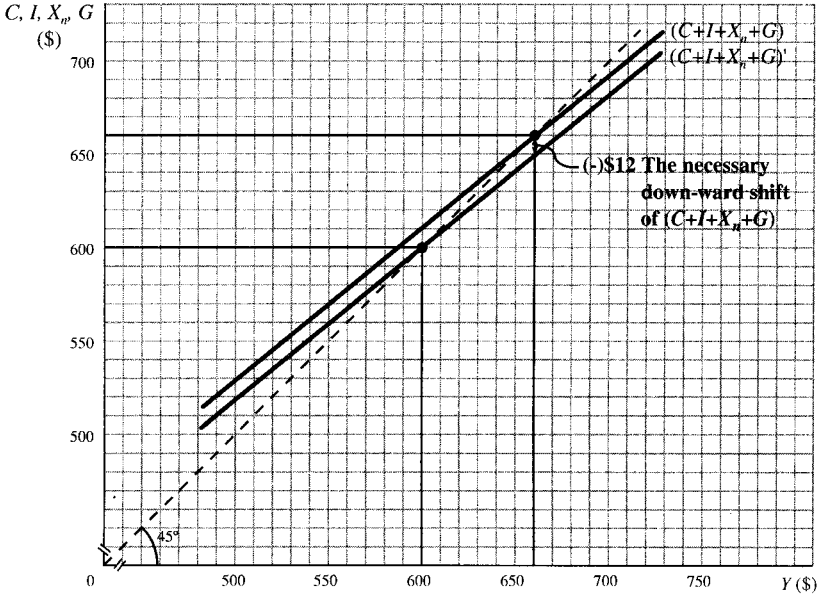


Figure 6-3

# **Chapter 7**

# THE FEDERAL RESERVE AND MONETARY POLICY

IN THIS CHAPTER:

- ✓ *Functions of Money*
- ✓ *Financial Instruments and Markets*
- ✓ *Creation of M1 Money Supply*
- ✓ *Federal Reserve System*
- ✓ *Monetary Tools*
- ✓ *Open-Market Operations*
- ✓ *True or False Questions*
- ✓ *Solved Problems*

## Functions of Money

Money serves as a medium of exchange, a measure of value, and a store of value. As a medium of exchange, money is the payment made to economic resources for their services, which the owners of these resources use to purchase goods and services. For example, labor is paid a money

wage; individuals use this money to purchase food and clothing. Paper currency and checking accounts comprise the medium of exchange in most countries. Money serves as a measure of value in that it is the common denominator for measuring prices and income. For example, a newspaper costs \$0.50 and workers may earn \$9.85 per hour. Money functions as a store of value in that the money received today can be saved and held for expenditures at some future date.



## Financial Instruments and Markets

Savings can be held in financial assets other than money. Since currency and checking accounts offer savers little or no interest, many savers are willing to transfer money balances they do not intend to spend for a period of time into a higher-yielding financial instrument. A credit or debt financial instrument is one which requires that a borrower make periodic interest payments and repay the amount loaned at the end of a contract period. An equity financial instrument gives the saver partial ownership of a firm and a share of its profits.

Many financial instruments are marketable and can be sold to another party in a secondary financial market. A financial instrument is liquid when the current owner can quickly convert it into a money balance with a minimal loss of nominal capital value. A saver therefore has a choice of holding a liquid financial instrument or money as a store of value. The portfolio decision of holding money, liquid financial instruments, or illiquid financial instruments depends upon the time horizon of the saver, the return on these alternative instruments, and the willingness of the saver to assume risk.

### You Need to Know ✓

Savers have a host of mediums in which to store extra money. We mention some major categories primarily for information purposes.

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Depository institutions (commercial banks, savings and loan associations, and credit unions) borrow savers' money balances and lend them to individuals, businesses, or government. By pooling the funds of many small savers and investing in a diversified portfolio of financial instruments, these institutions reduce the transaction costs and risks associated with lending to a borrower. In the U.S., the Federal Deposit Insurance Corporation (FDIC) insures the liabilities of deposit intermediaries. Savers therefore readily hold these liquid liabilities because they normally offer a higher interest return than money. Because the liabilities are liquid and therefore good stores of value, the Federal Reserve presents an M1, M2, and M3 definition of money. The M1 definition is a transaction definition and consists of currency and checking accounts, while M2 and M3 add other liquid financial instruments to the M1 definition.

Current measures of the money supply appear in Table 7.1. Small time deposits are certificates of deposit (CDs) issued by these same financial intermediaries in amounts less than \$100,000, and large time deposits exceed this dollar amount. CDs are classified as time deposits since the depositor agrees to keep these funds on deposit for a specified period of time or incur an interest penalty. Repurchase agreements (RPs) are large (at least \$1 million) overnight, collateralized loans.

**Table 7.1**

<i>M1</i>		1128.4
Currency outside banks	321.3	
Check-writing deposits	807.1	
<i>M2</i>		3564.5
<i>M1</i>	1128.4	
Savings deposits plus money-market deposit accounts	1215.5	
Small time deposits	784.7	
Overnight RPs and Eurodollars	86.0	
Noninstitution money-market mutual funds	349.9	
<i>M3</i>		4228.3
<i>M2</i>	3564.5	
Large time deposits	338.8	
Institution money-market mutual funds	197.0	
Term RPs and Eurodollars	128.0	

## Creation of M1 Money Supply

When a bank lends, it gives the borrower a check drawn upon itself. The Federal Reserve controls the banking system's ability to issue check-writing deposits by imposing a reserve requirement on checking deposits. U.S. bank reserves consist of currency held by banks and deposits that banks have at the Federal Reserve. The reserve requirement ( $r$ ) on check-writing deposits is currently 10 percent ( $r = 0.10$ ); it requires that a bank hold \$1 in reserves for each \$10 in checking account liability it has. Since U.S. banks are managed to maximize profits, they usually expand loans and issue check-writing deposits when they have more reserves than they are required to hold. Even when a bank has no excess reserves, it can lend and create new checking deposits if it can borrow the excess reserves of other banks.



With banks behaving in this manner, there is a tendency for the excess reserves of the banking system to approximate zero and for the combined sum of check-writing deposits to be a multiple of the amount of reserves held by all banks. When excess reserves for the combined banking system equal zero, the relationship of check-writing deposits ( $D$ ) and reserves ( $R$ ) can be presented as  $D_{\max} = dR$ , where  $d$ , the check-writing deposit multiplier, equals  $1/r$ . It therefore follows that the Federal Reserve can control the maximum amount of check-writing deposits by controlling the amount of reserves held by banks and by setting the reserve requirement on checking deposits.

### Example 7.1

Suppose the reserve requirement on check-writing deposits is 0.10 and reserves held by all banks total \$500,000. The maximum amount of check-writing deposits for the banking system is \$5,000,000.  $D_{\max} = dR$ ;  $d = 1/r$ ;  $d = 1/0.10 = 10$ ; since  $R = \$500,000$ ,  $D_{\max} = (10)\$500,000 = \$5,000,000$ .



Banks are essential to the U.S. monetary system as the Federal Reserve System can only work through these businesses.

## Federal Reserve System

The Federal Reserve System manages the U.S. money supply in order to minimize inflationary pressures and promote economic stability. The Federal Reserve System, frequently referred to as the Fed, consists of twelve Federal Reserve Banks, a Board of Governors, and a Federal Open Market Committee. The Federal Reserve System is considered independent in that its policy directives are not directly influenced by the congressional or executive branches of the federal government.

*Federal Reserve Banks.* Each of the twelve Federal Banks has its own president, services banks in a specific geographical area, and acts as a central bank for that region. A Federal Reserve Bank clears checks between banks, supervises and regulates banks in its region, performs bank examinations, provides currency to banks, and holds bank reserves. Private individuals and corporations do not deal directly with a Federal Reserve Bank.

*Board of Governors.* The seven-member Board of Governors is the policy-making body of the Fed. Each member of the Board is nominated by the President of the United States for a fourteen-year, nonrenewable term. Because appointments to the Board are terminal and last for many years, members of the Board of Governors are free of political considerations in the formulation of monetary policy.

*Federal Open Market Committee (FOMC).* The twelve-member FOMC is responsible for implementing U.S. monetary policy. It establishes directives for open-market operations which determine the M1 money supply. The seven-member Board of Governors and five Federal Reserve Bank presidents comprise the FOMC.

## Monetary Tools

The Fed supplies the private sector with whatever amount of currency it wants to hold—thus, the currency component of the M1 money supply is determined by the private sector. Monetary tools available to the Fed include changes in the reserve requirement, open-market operations that control the amount of reserves held by banks, and adjusting the discount rate, which may influence the amount of reserves banks borrow from Federal Reserve Banks.

*Reserve-Requirement Variation.* A decrease in the reserve require-

ment on check-writing deposits (monetary ease) creates excess reserves and increases the amount of check-writing deposits issued by banks. Similarly, an increase in the reserve requirement (monetary tightness) decreases the check-writing component of M1. While reserve-requirement variation is a powerful means of changing the M1 money supply, it is used infrequently. Monetary ease or tightness is usually done incrementally. Weekly or monthly changes in the reserve requirement are abrupt and would create management problems for the large number of banks that exist in the U.S.

*Open-Market Operations.* Open-market operations consist of the purchase and sale of government securities (debt obligations of the U.S. Treasury) by the Fed and are directed by the FOMC. When the Fed purchases government securities, it pays for these bonds by crediting the deposit account banks have at a Federal Reserve Bank. Since reserves include these deposits, such security purchases increase bank reserves and eventually the amount of check-writing deposits issued by banks. Federal Reserve sales of government bonds reduce bank reserves and check-writing deposits, and thereby the M1 money supply.

*Discount Rate.* A bank may borrow reserves (discount) from a Federal Reserve Bank when it has a reserve deficiency; the rate of interest it pays the Fed is the discount rate. Banks are encouraged to remedy a deficiency by borrowing the excess reserves of other banks in the Fed funds market rather than borrow at the Fed. So, the Fed frequently changes the discount rate after an increase or decrease in the Fed funds rate to encourage this practice. A discount rate change is newsworthy in that it confirms the direction of the movement in the Fed funds rate of interest and interest rates in general.

## Important!

Open-market operations are the primary tool of the Fed and are used practically daily to accomplish the Fed's goals.

## Open-Market Operations

A change in the M1 money supply affects the short-term rate of interest when there is no change in the private sector's demand for money. There

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are numerous reasons why the private sector holds money balances. These reasons can be categorized into types of demand, as follows: (1) a transaction demand, since money is needed to purchase goods and services, to pay employees, etc.; (2) a precautionary demand, since money may be held to meet emergency and unforeseen needs that may arise; (3) a portfolio (asset) demand, since some money balances are held in the expectation of opportunities in the financial markets. When there is a fixed demand for money, an increase in the M1 money supply lowers the short-term nominal rate of interest, *ceteris paribus*.

### Example 7.2

$L'$  in Figure 7-1 depicts the demand for money. The amount of money demanded is inversely related to the rate of interest since the holder of money forgoes a higher interest return from an alternative financial asset. When the Fed purchases government securities in the open market, bank reserves increase as does the M1 money supply. Thus, money supply curve  $S'$  in Figure 7-1 shifts rightward to  $S''$  as the M1 money supply increases and the short-term rate of interest falls from  $i_0$  to  $i_1$ .

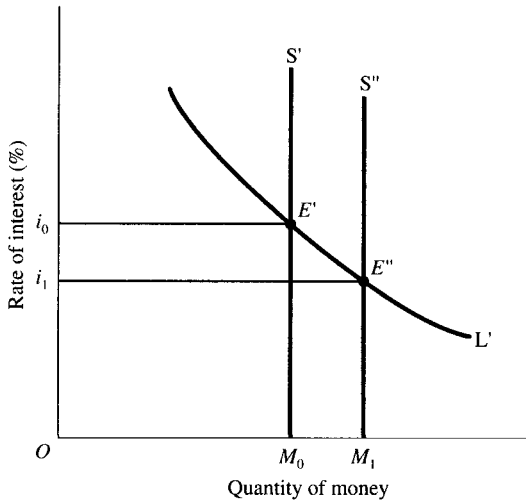


Figure 7-1



The downward pressure on short-term interest rates due to an increase in the money supply is also evident when we consider the effect that an increase in bank reserves has upon bank lending. In purchasing government securities and supplying more reserves to the banking system, the Fed increases the supply of excess reserves. Banks can encourage more borrowers to apply for bank loans by lowering their lending rates. Consumer spending on large-ticketed items such as houses and cars is interest-sensitive since individuals are likely to take out loans to pay for major purchases. Business investment—purchases of new buildings and equipment—is also interest sensitive. Thus, as depicted below, a Fed increase in the money supply should lower the rate of interest, increase interest-sensitive spending, and result in a higher level of spending and gross domestic output.

$\uparrow M \rightarrow \downarrow i \rightarrow \uparrow \text{total spending} \rightarrow \uparrow \text{gross domestic product}$

## True or False Questions

1. A savings deposit is a medium of exchange.
2. A marketable financial instrument can be traded on a secondary market.
3. The banking system's ability to issue check-writing deposits is limited by the reserve requirement on checking deposits and the amount of reserves held by the bank.
4. The maximum increase in check-writing deposits is \$100,000, *ceteris paribus*, when the Fed purchases government securities valued at \$10,000 and the reserve requirement is 10 percent.
5. When there is a stable demand-for-money curve, a decrease in the M1 money supply lowers the short-term nominal rate of interest.
6. Bank reserves increase and the fed funds rate decreases when the Fed purchases government securities, *ceteris paribus*.

Answers: 1. False; 2. True; 3. True; 4. True; 5. False; 6. True

## Solved Problems

### Solved Problem 7.1.

- a. Why are check-writing deposits included in the definition of money?

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b. Is there backing for coins, paper currency, and check-writing deposits?

c. How can money have value without commodity backing?

### **Solution:**

a. In most cases, one can pay for the purchase of a good or service with cash or by writing a check. Since checks are accepted as payment, they are classified as money along with coins and paper currency.

b. In the U.S., coins, paper currency, and checking accounts have no intrinsic value. While coins have a metallic content, the market value of the coined material is considerably less than the face (monetary) value of the coin. Paper currency is issued by the Fed and has no commodity backing, while check-writing deposits are noncollateralized liabilities of deposit institutions.

c. Anything has value when its supply is limited and demand is virtually unlimited. The basis for value for an inconvertible paper standard (coins, paper currency, and checking accounts) is that government can and is willing to limit its supply, economic units are willing to receive it in payment for services, and spending units can use it to obtain goods and services.

**Solved Problem 7.2** Why are financial intermediaries essential to the efficient operation of the economy?

**Solution:** An economic system is judged efficient when it achieves maximum use of economic resources and maximum satisfaction of consumer wants. Financial instruments and institutions generate efficiency in the following ways:

a. The financial system increases consumer satisfaction by facilitating the allocation of spending over time. It allows some units to spend more than their current income (dissave) and allows other spending units to increase their future spending level by earning interest on the money they have saved.

b. The creation of safe and liquid financial claims by financial intermediaries reduces the likelihood that some savers will hold money balances idle. By rechanneling savings into the circular flow, spending flows are stabilized. This in turn stabilizes employment and economic activity.

c. Financial instruments encourage savers to lend their savings to those who want to spend more than their current money inflow. A large

portion of the funds borrowed from savers is used by business firms to add to the economy's capital stock. This increases productive capacity.

d. Since the profit motive guides the operation of financial institutions, money saving is distributed to those capital uses that have the greatest productivity.

**Solved Problem 7.3** Suppose the banking system holds no excess reserves.

a. What is the maximum amount of check-writing deposits issued by the banking system when reserves total \$1,000 and the reserve requirement is (1) 0.20, (2) 0.16, and (3) 0.10?

b. Find the maximum amount of check-writing deposits when the reserve requirement is 0.20 and reserves total (1) \$1,000, (2) \$1,250, and (3) \$2,000.

c. Compare the quantity of check-writing deposits when reserves are held constant and the reserve requirement is lowered in (a) with the quantity of deposits when the amount of reserves held by banks is increased and the reserve requirement remains constant in b.

**Solution:**

a. The maximum amount of check-writing deposits is found by solving  $D_{\max} = R/r$ . (1)  $D_{\max}$  is \$5,000 ( $D_{\max} = \$1,000/0.20$ ); (2) \$6,250; and (3) \$10,000.

b. When the reserve requirement remains at 0.20 and bank reserves increase from \$1,000 to \$1,250 to \$2,000, check-writing deposits increase from (1) \$5,000 to (2) \$6,250 to (3) \$10,000.

c. The situations in a. and b. show that the Fed has two alternative ways of bringing about similar increases in the amount of check-writing deposits; by lowering the reserve requirement or by increasing the amount of reserves held by the banking system.

# **Chapter 8**

# MONETARY AND FISCAL POLICY

IN THIS CHAPTER:

- ✓ *Using Monetary and Fiscal Policy*
- ✓ *Problems with Fiscal and Monetary Policy*
- ✓ *Price Level Changes*
- ✓ *Choosing Fiscal or Monetary Policy*
- ✓ *True or False Questions*
- ✓ *Solved Problems*

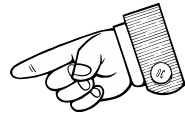
## Using Monetary and Fiscal Policy

Previous chapters have shown that monetary and fiscal policies are alternative ways of changing aggregate spending to close GDP gaps. For example, if output is below its full-employment level, an increase in the money supply, an increase in government spending, or a decrease in taxes raises aggregate spending and increases equilibrium output.

### **Example 8.1**

Suppose the expenditure multiplier  $k_e$  is 5, the tax multiplier  $k_t$  is  $-4$ , and full-employment output exists at \$900. If equilibrium output is \$800, shifting the aggregate spending line upward can close the \$100 recession-

ary gap and bring the economy to full-employment output. This could be accomplished by a \$20 increase in government spending [ $\Delta Y = k_e \Delta G$ ;  $\$100 = 5(\$20)$ ], a \$25 decrease in lump-sum taxes, or an increase in the money supply which lowers interest rates and increases investment spending \$20.



## Problems with Fiscal and Monetary Policy

An expansionary fiscal policy might not result in an increase in output exactly equal to  $k_e \Delta G$  because of the crowding-out effect. Government spending increases, which raise the level of output, will usually push the rate of interest higher. Private-sector interest-sensitive spending will thereby fall and be crowded out by the fiscal action. Thus, the net increase in equilibrium output due to increased government spending is usually less than  $k_e \Delta G$ . How much less depends upon the interest sensitivity of the demand for money and the interest sensitivity of investment spending.

### Example 8.2

Suppose  $k_e$  is 5, full-employment output exists when output is \$900, and equilibrium output is initially \$800. A \$20 increase in government spending, *ceteris paribus*, should increase spending \$100 and bring output to its full-employment level. But suppose the rate of interest increases as a result of the \$20 increase in government spending and investment spending declines \$5. The net effect of the government's fiscal action is then \$75 rather than \$100, and full-employment output is not reached. The net effect equals  $\Delta G(k_e) + \Delta I(k_e) = \$20(5) - \$5(5) = \$75$ . Since policymakers do not know in advance the extent to which there will be crowding out, the effect of a stimulative fiscal policy upon output is uncertain.

### You Need to Know ✓

Crowding out may partially negate fiscal policies and so must be considered carefully when implementing any action.

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Normally, the rate of interest falls and interest-sensitive spending and equilibrium output increase when the Fed increases the money supply. While most economists agree that changes in the money supply impact interest-sensitive spending, there is substantial disagreement about the predictability of the effect. Keynesians have traditionally argued that there is considerable uncertainty about the effect a money supply change has upon the rate of interest and the level of investment. Monetarists contend that a change in the money supply has a highly predictable effect upon nominal GDP. The disagreement about the predictability of a money supply change has centered around the velocity of money (average circulation of a unit of money in the economy) and its variability. When the demand for money and/or the investment demand are subject to unpredictable shifts, the effect of a money supply change upon equilibrium output is uncertain.

### Price Level Changes

In an aggregate demand and aggregate supply framework, an economic stimulus is constrained by a possible increase in the price level. (Note: previous chapters assumed there would be no increase in the price level until the economy reached its full-employment level of output. Such a scenario is unlikely to exist in the real world.) It therefore follows that the effect on output of a monetary or fiscal stimulus depends upon the slope of the aggregate supply curve.

A steeply sloped aggregate supply curve has a smaller effect upon output than a relatively flat one. While the actual steepness of the aggregate supply curve is unknown, it is generally believed that aggregate supply is more steeply sloped the closer output is to its full-employment level.

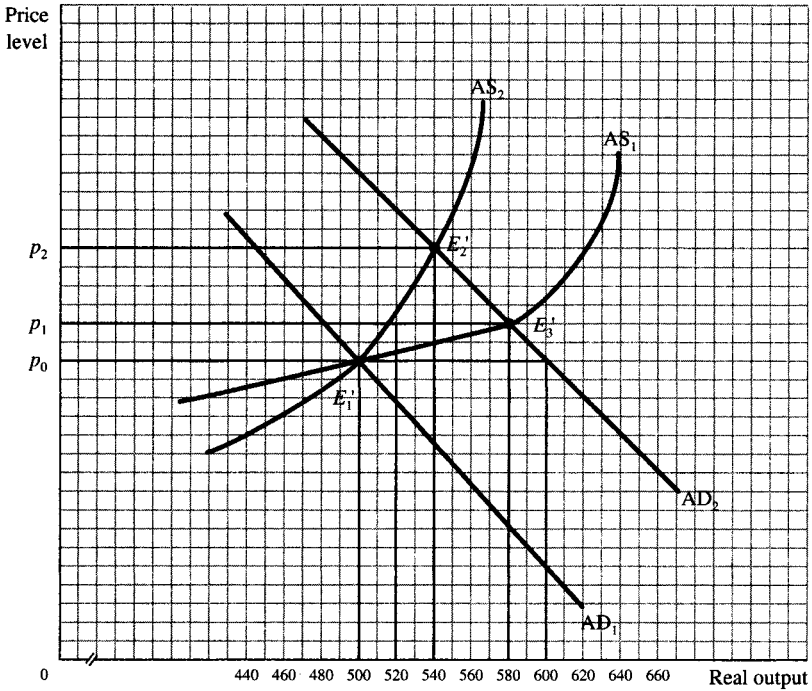


### **Important!**

Price level changes constrain any monetary or fiscal policy, but are difficult to counteract because the slopes of the aggregate demand and aggregate supply curves can only be estimated.

**Example 8.3**

Suppose  $k_e$  is 5, there is no crowding out, and full-employment output is \$600. Equilibrium output is initially \$500 in Figure 8-1 for aggregate demand and aggregate supply curves  $AD_1$  and  $AS_1$ . The recessionary gap is \$100 since full-employment output is \$600; the price level is initially  $p_0$ . Since the expenditure multiplier is 5, a \$20 increase in government spending should increase output \$100 and bring output to its full-employment level when the price level remains at  $p_0$ . This \$100 increase in spending is presented in Figure 8-1 by the shift of aggregate demand from  $AD_1$  to  $AD_2$ . Since aggregate supply  $AS_1$  is positively sloped, the price level rises from  $p_0$  to  $p_1$ . This increase in the price level decreases private-sector spending; equilibrium output thus increases to \$580 rather than to \$600. Suppose the aggregate supply curve is  $AS_2$  rather than  $AS_1$ . Figure 8-1 shows that the increase in aggregate demand from  $AD_1$  to  $AD_2$  raises the price level to  $p_2$  rather than  $p_1$ , and equilibrium output is \$540.



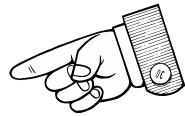
**Figure 8-1**

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Note that there is a smaller increase in equilibrium output but a larger increase in the price level because aggregate supply curve  $AS_2$  is more steeply sloped than  $AS_1$ .

### Choosing Fiscal or Monetary Policy

Other factors also influence the choice of a monetary or fiscal stimulus: how quickly the economic stimulus impacts economic activity and how the economic stimulus affects the economy's structure of output. A change in government spending normally has the most immediate impact on economic activity since a change immediately affects spending levels. The response to money supply changes is more likely to lag. While money supply changes immediately impact the rate of interest, the response of interest-sensitive spending to an interest rate change may not be as immediate since many investment projects are not ready to be started when funding costs decrease. A money supply change, however, has a short action lag since the Fed, unlike Congress, can respond quickly to changing economic conditions. Thus, in spite of its longer impact lag, monetary policy is the principal economic stabilization measure used in the US because of its short action lag.



Those who advocate minimal interference with the market prefer monetary policy to fiscal policy. Monetary policy, through its interest rate effect, works through the financial markets and impacts private-sector spending; a fiscal action may redistribute income within the private sector or expand public rather than private-sector goods and services. For example, a change in the personal income tax rate does not equally impact each income class.



#### **Note!**

Monetary policy is the primary type of policy used to affect the U.S. economy.

### True or False Questions

1. An increase in government spending always crowds out an equal amount of private-sector interest-sensitive spending.



2. The net increase in equilibrium output is \$10 when  $k_e$  is 5, government spending increases \$10, and higher interest rates crowd out \$8 of investment spending.

3. An increase in aggregate demand has no effect upon real output when aggregate supply is vertical.

4. A \$10 increase in the money supply increases equilibrium output \$50 when  $k_e$  is 5, there is no crowding out, and aggregate supply is positively sloped.

5. Monetary policy is more frequently used than fiscal policy since it more quickly impacts aggregate spending.

Answers: 1. False; 2. True; 3. True; 4. False; 5. False

## Solved Problems

**Solved Problem 8.1** What happens to equilibrium output and the price level in Figure 8-2 when an increase in the money supply shifts aggregate demand from  $AD_1$  to  $AD_2$ ?

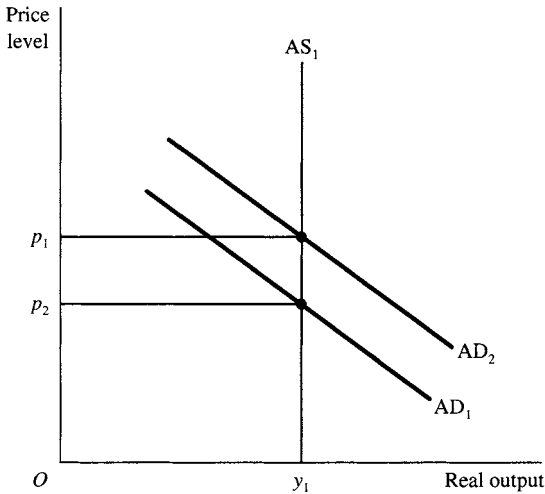


Figure 8-2

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**Solution:** The rightward shift of aggregate demand, caused by an increase in the money supply, has no effect upon equilibrium output but increases the price level from  $p_2$  to  $p_1$ . Aggregate demand shifts have no effect upon output whenever the aggregate supply curve is vertical; demand shifts in such an economic situation only affect the price level.

### **Solved Problem 8.2**

- a. A stimulative monetary or fiscal action should increase aggregate demand. What factors may limit the actual increase in aggregate demand?
- b. An increase in aggregate demand should raise equilibrium output. What is responsible for the size of the increase in equilibrium output?

### **Solution:**

a. Factors that constrain the aggregate demand shift when there is a fiscal or monetary stimulus are crowding out and the interest sensitivity of the demand for money and investment spending. An increase in government spending and/or a decrease in taxes raises output, usually resulting in an increase in the rate of interest. Higher interest rates can crowd out private-sector interest-sensitive investment spending. So, the actual increase in aggregate demand due to a fiscal stimulus depends upon the magnitude of the crowding-out effect. An increase in money supply raises private-sector spending by lowering the rate of interest. The actual decrease in the interest rate depends upon the interest sensitivity of the demand for money. The effect that a decrease in the interest rate has upon spending in turn depends upon the interest sensitivity of investment spending. Thus, a money supply increase can cause a large or small shift of the aggregate demand.

b. An increase in aggregate demand should raise equilibrium output; the actual increase in output depends upon the slope of the aggregate supply curve. When aggregate supply is steeply sloped, demand increases have a smaller effect upon output than when aggregate supply is less steeply sloped.