

Monetary Policy

17

- EQUATION OF EXCHANGE
- QUANTITY THEORY OF MONEY
- MONETARISTS VS. KEYNESIANS
- FEDERAL FUNDS RATE

DEFINITION

Test your economic intuition by answering this question: If the economy is mired in a recession, should the money supply be increased or decreased? The correct answer is *increased*. Congratulate yourself for having good economic intuition if you answered correctly.

Here is a much more difficult, and less intuitive, question: Why does an increase in the money supply stimulate a sluggish economy? After a moment of thought, most people respond that an increase in the money supply would motivate spending. Not bad. But if households and corporations wanted to spend more, why don't they simply use the existing money supply more intensely? They could spend more without increasing the money supply if each dollar was turned over more often. If households and corporations don't want to increase spending, would an increase in the money supply force them to spend more?

You will be able to answer the more difficult questions posed above shortly. First, let's define monetary policy—changes in the money supply to fight recessions or inflations. The Board of Governors of the Fed designs and executes monetary policy in the United States. Suppose the Board of Governors decides to increase the money supply. In Chapter 18 we saw that this could be accomplished with a decrease in reserve requirements, a decrease in the discount rate, or an open market purchase of government securities.

The Federal Open Market Committee (FOMC) helps the Board of Governors decide which tool to use. If the open market purchases are selected, then the FOMC plots out exactly how many government securities will be purchased at what time. The FOMC is comprised of twelve members. All seven of the members of the Board of Governors sit on the FOMC, as well as five of the presidents of the twelve Fed regional banks.

CHANGES IN THE MONEY SUPPLY

Classical View

Classical economic analysis concludes that changes in the money supply have no effect on the equilibrium quantity of output; only prices and wages are affected. According to Classical theory, an increase in the money supply would increase aggregate demand, but the increase in aggregate demand would result in higher prices.

Workers would immediately realize that their wages could not buy as many goods and services at the higher prices and they would demand wage increases. When the dust settled, if

the money supply was raised 10 percent, prices and wages would rise 10 percent and nothing else would be changed.

If the economy was in a recession and the unemployment rate was high, an increase in the money supply would not help. After the money supply was increased, prices and wages would be higher, but the unemployment rate would be unchanged.

The Classical view on how an increase in the money supply affects the economy is reflected in the aggregate supply/aggregate demand (AS/AD) model in Figure 17.1. The increase in the money supply shifts the aggregate demand curve to the right. But suppliers respond to this increase in the demand for their products by raising prices from P_1 to P_2 , but not output. Remember, the Classical aggregate supply curve is vertical. So the increase in aggregate demand has no effect on the quantity of output. Since output is unaffected, so is unemployment.

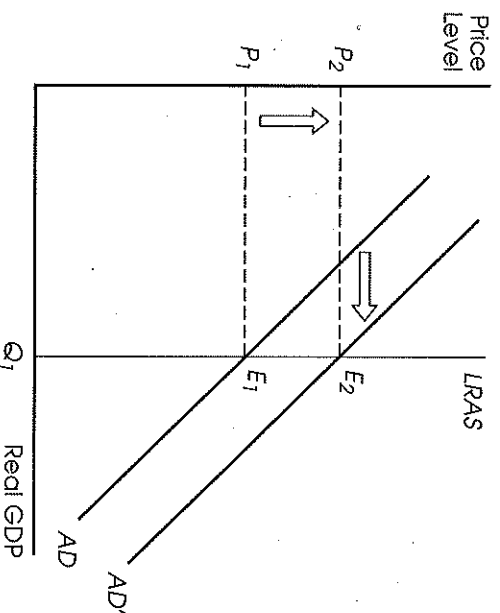


Fig. 17.1 An Increase in the Money Supply: Classical View

The Classical economists based their conclusions about how money affects the economy on the equation of exchange:

$$M \times V = P \times Q$$

Where M is the money supply

V is the velocity of money

P is the price level

Q is the quantity of output or real GDP

The money supply can be defined as M_1 or M_2 . The velocity of money is the number of times the typical dollar of M_1 or M_2 is used to make purchases during a year. The price level is the average price of a good or service in the economy, the same as the vertical axis in the AS/AD model. The quantity of output can be measured with real GDP and is the same as the horizontal axis in the AS/AD model.

The equation of exchange is a *tautology*, meaning it is true by definition. No economist, Classical or not, disputes the fact that $M \times V = P \times Q$. But the Classical economists take this a step further and assume that V and Q are constant. If this is true, then the arithmetic of the situation tells us that if M increases 10 percent, P must also increase 10 percent.

The Classical economists referred to this result as *monetary neutrality* or the *Quantity Theory of Money*. A change in the money supply would result in a proportional change in prices. The quantity of output, real GDP, the rate of unemployment, and other real variables are unaffected. This analysis is in line with the Classical notion that the only things that can affect the quantity of output are resource availability and technology.

Monetarist View

It is easy to shoot down the Classical theory of monetary neutrality. The theory is based on the assumption that V and Q are constant. In the United States, the velocity of M_1 was 3.6 in 1960 and 6.8 in 2013. Clearly, V is not constant. Similarly, Q , or real GDP, has increased 410 percent in the same time span. With a nonconstant V and Q , we can no longer conclude that a change in the money supply causes a proportional change in prices.

The Monetarist view on how a change in the money supply affects the economy is more realistic. The Monetarist view starts with the assumption that V and Q are stable, but not constant, in the short run. Now if the money supply is increased 10 percent, it is by no means definite that P will increase by 10 percent. Monetarists claim that both P and Q will increase and not necessarily by 10 percent.

According to the Monetarist view, as in Figure 17.2, a change in the money supply affects the economy in many ways. For one, interest rates will be affected and this will affect spending levels and, therefore, aggregate demand. For another, more money directly translates into more spending as households and firms try to spend and invest the increment in the money supply. And there are other channels through which a change in the money supply will affect the economy. They are “too numerous to enumerate,” according to Milton Friedman, a Nobel Prize-winning economist who is often called the father of monetarism.

TIP

The Fed can affect interest rates in the economy by raising or lowering the money supply. Raising the money supply lowers interest rates.

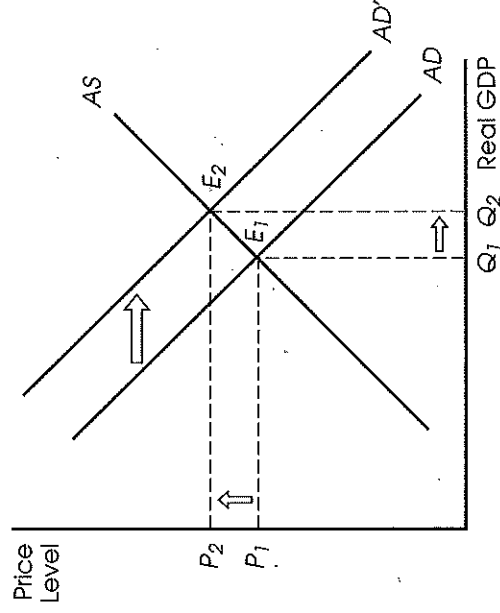


Fig. 17.2. An Increase in the Money Supply: Monetarist View

On the AS/AD model, an increase in the money supply results in an increase in aggregate demand. This translates into an increase in the price level and the quantity of output. We get a different result than the Classical analysis because the aggregate supply curve is drawn upward sloping from left to right instead of vertical.

The Monetarist view on how a change in the money supply affects the economy, like the Classical view, is based on the equation of exchange. However, the Monetarist view is not as rigid. The Classical view maintains that V and Q are constant, so that an increase in M will have a proportional effect on P . Q is not affected. The Monetarist view is that V and Q are stable in the short run, but not constant. This means that both P and Q will be affected when M is increased. Indeed, the Monetarists assert that most of the fluctuations in Q over the years are the result of the Fed changing M .

The Monetarists are highly critical of the Fed. If changes in output are caused primarily by changes in the money supply, then all the Fed need do is allow the money supply to increase at a reasonable constant rate, say three percent a year. When the Fed undertakes monetary policies that reverse the direction of money growth, this results in the recessions and inflations we observe in the economy.

Keynesian View

A third perspective on how a change in the money supply affects the economy is that of the Keynesians. See Figure 17.3. This view, like the monetarist view, is concerned with short-run effects and uses an upward sloping aggregate supply curve. The difference is that the Keynesians believe that a change in the money supply affects the economy through one channel, not many—and that channel is the interest rate.

An increase in the money supply would lower interest rates, since more money is available to be borrowed. Lower interest rates encourage households and firms to take out loans in order to increase spending and investment in plant and equipment. This means more aggregate demand.

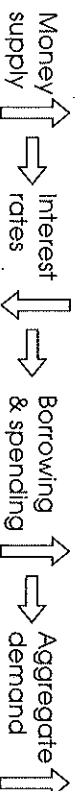


Fig. 17.3 How an Increase in the Money Supply Affects the Economy: Keynesian View

However, Keynesians argue that the increase in aggregate demand will be small. The increase in the money supply will only lower interest rates a bit according to Keynesian analysis. To see this consider Table 17.1, which shows the supply and demand for money.

The supply of money is vertical because it is not related to the nominal rate of interest. The Federal Reserve determines the money supply. The demand for money is downward sloping to reflect the fact that it is negatively related to interest rates. When interest rates rise, households and firms decrease their money holdings. They would rather put their money where it can earn the higher rates of interest, usually in bonds.

The demand for money is also affected by prices and income. If either of these increase, the demand for money will shift to the right. If prices increase, then households and firms will need more money to pay for the things they buy. If income increases, then households will want to buy more things and this means larger money holdings in their wallets or in their checking accounts.

Table.17.1 The Supply and Demand for Money

The Supply of Money	
Why is it vertical?	The amount of money supplied to the economy is determined by the Fed and is not affected by a change in the nominal interest rate.
What can shift it?	A change in the amount of money in the economy
The Demand for Money	
Why is it downward sloping?	A rise in the nominal interest rate induces people and firms to place their funds where they can earn the higher return. This means they have less on hand.
What can shift it?	<ul style="list-style-type: none"> ■ A change in income ■ A change in the price level

Keynesians believe that the money demand curve is rather flat. That way, if the money supply is increased as in Figure 17.4, then interest rates do not fall very much. Moreover, Keynesians claim that even if the interest rate did fall appreciably, borrowing and spending would not increase all that much.

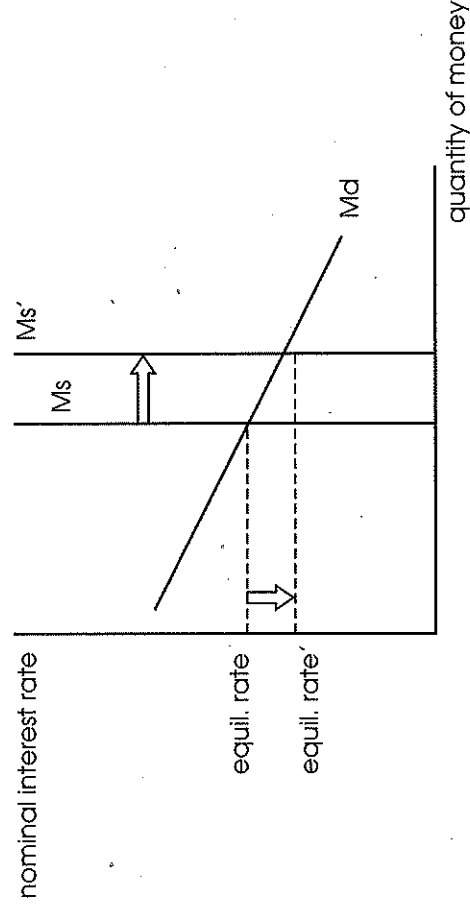


Fig. 17.4 An Increase in the Money Supply Lowers the Interest Rate

An increase in the money supply will shift the aggregate demand curve to the right, but only a small amount according to the Keynesian view (see Figure 17.5). This is because a change in the money supply affects spending through only one channel—interest rates—not many channels as the Monetarists believe. Moreover, the interest rate channel does not result in major changes in spending when the money supply is changed. Keynesians argue that fiscal policy should be used to close recessionary and inflationary gaps. Monetary policy is not that effective in their eyes.

TIP

The supply and demand for money diagrams often come up on exam questions. You should know what can shift the money supply and money demand curves.

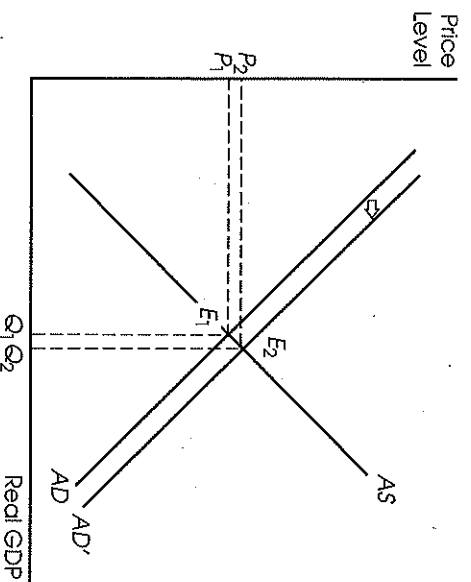


Fig. 17.5 An Increase in the Money Supply: Keynesian View

Targeting the Federal Funds Rate

When the Fed increases bank reserves, interest rates in the economy should fall since more money is available to loan out. One critical interest rate is the federal funds rate. This is the interest rate on loans from one bank to another. Several key interest rates in the economy tend to move in tandem with the federal funds rate.

The current practice of the Fed is to raise or lower bank reserves in order to peg the federal funds rate at some desired level. The Fed targets the federal funds rate in order to know if more or less money is required in the economy.

For example, if the federal funds rate began to rise, it would indicate that loanable funds are becoming more scarce. If the Fed wants to head off a recession, it would add reserves to the banking system, perhaps through open market operations, in order to keep the federal funds rate from rising.



SUMMARY

- The term “demand management policy” refers to both monetary and fiscal policy because, like fiscal policy, monetary policy shifts the aggregate demand curve. If the government decides to increase total spending in the economy, shifting the aggregate demand curve to the right, this could be accomplished by increasing the money supply, or increasing government spending, or reducing taxes.
- Most economists believe that a change in the money supply will affect both prices and output in the short run. Classical economic theory tells us that in the long run a change in the money supply will only affect prices. Only resources and technology can affect output in the long run; a change in the money supply cannot.
- Monetarists believe that changes in the money supply have a profound effect on the economy in the short run; for instance, a decrease in the money supply would result in lower prices and less output. Therefore, lowering the money supply would be a good way to fight inflation, but it could result in a recession since output decreases. The best thing the Fed could do is forget about trying to close recessionary and inflationary gaps with monetary policy and, instead, allow the money supply to grow at a steady, constant rate. This would result in an economy that grows at a steady, constant rate.
- The Keynesian economists disagree with the Monetarists on many points. A change in the money supply would affect the economy through just one channel, interest rates.

And the effect would be mild since changes in interest rates do not have a profound effect on aggregate demand. Fiscal policy should be used to close recessionary and inflationary gaps. Monetary policy is ineffective.

- The Fed targets the federal funds rate. That is to say, the Fed increases or decreases bank reserves in order to put the interbank loan rate at the desired level. For instance, increasing bank reserves lowers the federal funds rate. This should stimulate borrowing and spending.

At the outset of this chapter we asked if households and corporations don't want to increase spending, would an increase in the money supply force them to spend more? Hopefully at this point you can see that the answer is Yes, although "induce" may be a better word than "force." Monetarists think that a significant amount of spending would be induced by an increase in the money supply. Keynesians disagree.

Table 17.2 Perspectives on the Money Supply

	Classical	Monetarist	Keynesian
A change in the money supply affects through	the price level	the price level and output	the price level and output
The effect is	many variables strong but limited to prices and wages	many variables strong	the interest rate weak
V and Q are	constant	stable	variable



TERMS

Board of Governors executive board of the Fed that makes major monetary policy decisions

Demand Management Policy monetary and fiscal policy

Equation of Exchange $M \times V = P \times Q$; the money supply times its velocity equals the price level times output

Federal Funds Rate the interest rate charged when a bank makes a loan to another bank

Federal Open Market Committee (FOMC) a committee within the Fed that designs and executes the particulars of monetary policy

Monetarist one who believes that changes in the money supply have a profound effect on the economy

Monetary Neutrality (Quantity Theory of Money) policy in which a change in the money supply would result in a proportional change in prices while real variables, such as the unemployment rate, would be unaffected

Monetary Policy changes in the money supply to fight recessions or inflations

Money Demand the amount that households and firms want to hold in currency and deposits

Velocity of Money describing the number of times the typical dollar of M_1 or M_2 is used to make purchases during a year

FORMULAS

Equation of Exchange: $M \times V = P \times Q$

MULTIPLE-CHOICE REVIEW QUESTIONS

1. The Federal Open Market Committee
 - (A) advises the President of the United States.
 - (B) is part of the Federal Reserve System.
 - (C) has seven members.
 - (D) promotes free trade.
 - (E) is part of the legislative branch of government.
2. According to Classical economic theory, a decrease in the money supply would
 - (A) raise the price level and output in the economy.
 - (B) lower the price level and output in the economy.
 - (C) raise the price level in the economy.
 - (D) lower the price level in the economy.
 - (E) raise the price level and lower output in the economy.
3. According to Monetarist analysis, a decrease in the money supply would
 - (A) raise the price level and output in the economy.
 - (B) lower the price level and output in the economy.
 - (C) raise the price level in the economy.
 - (D) lower the price level in the economy.
 - (E) raise the price level and lower output in the economy.
4. According to Keynesian analysis, a decrease in the money supply would
 - (A) raise the price level and output in the economy.
 - (B) lower the price level and output in the economy.
 - (C) raise the price level in the economy.
 - (D) lower the price level in the economy.
 - (E) raise the price level and lower output in the economy.
5. In the equation of exchange
 - (A) M stands for the money supply and Q stands for quality.
 - (B) V stands for the velocity of GDP and Q stands for quality.
 - (C) P stands for the price level and Q stands for quarter.
 - (D) P stands for the price level and V stands for the velocity of money.
 - (E) P stands for population and V stands for the velocity of money.
6. The velocity of money
 - (A) cannot be calculated for an actual economy.
 - (B) is how fast money can be transferred.
 - (C) is required to calculate the money multiplier.
 - (D) is the number of times a typical dollar changes hands.
 - (E) is the number of times a typical dollar is used to make a purchase in a year.
7. In the equation of exchange, if V and Q are constant, then
 - (A) changes in the price level must be proportional to changes in the money supply.
 - (B) changes in the money supply have no effect on the price level.
 - (C) changes in the price level cause changes in the money supply.
 - (D) the equation is invalid.
 - (E) the money supply must be zero.
8. An increase in the price level shifts the
 - (A) money supply curve leftward.
 - (B) money supply curve rightward.
 - (C) demand for money curve leftward.
 - (D) demand for money curve rightward.
 - (E) aggregate demand curve leftward.

9. An increase in the supply of money shifts the
- money supply curve leftward and lowers the nominal interest rate.
 - money supply curve leftward and raises the nominal interest rate.
 - money supply curve rightward and lowers the nominal interest rate.
 - money supply curve rightward and raises the nominal interest rate.
 - aggregate demand curve leftward.
10. According to Keynesian theory, a decrease in the money supply would
- lower interest rates, which would encourage borrowing and, therefore, increase spending.
 - raise interest rates, which would discourage borrowing and, therefore, increase spending.
 - raise interest rates, which would discourage borrowing and, therefore, reduce spending.
 - lower interest rates, which would discourage borrowing and, therefore, reduce spending.
 - raise interest rates, which would encourage borrowing and, therefore, reduce spending.
11. Which of the following could cause the aggregate demand curve to shift to the left?
- An increase in the money supply
 - Contractionary demand management policies
 - Expansionary demand management policies
 - An increase in government spending
 - There is more than one correct answer here
12. According to Monetarist theory,
- the Fed should actively conduct monetary policy.
 - changes in the money supply do not have significant effects.
 - fiscal policy is the preferred way of shifting the aggregate demand curve.
 - the Fed should allow the money supply to grow at a constant rate.
 - the Fed should randomly change the money supply.
13. According to Keynesian theory,
- the Fed should not conduct monetary policy.
 - changes in the money supply have significant effects.
 - fiscal policy is the preferred way of shifting the aggregate demand curve.
 - the Fed should allow the money supply to grow at a constant rate.
 - the Fed should randomly change the money supply.
14. In order to conduct expansionary monetary policy, the Fed could use open market operations to
- buy Treasury bonds in order to raise the federal funds rate.
 - buy Treasury bonds in order to lower the federal funds rate.
 - sell Treasury bonds in order to raise the federal funds rate.
 - sell Treasury bonds in order to lower the federal funds rate.
 - buy Treasury bonds in order to lower the discount rate.
15. Monetarists believe that V and Q are
- constant.
 - stable.
 - variable.
 - not critical for understanding how money affects the economy.
 - unstable.

FREE-RESPONSE REVIEW QUESTIONS

1. Suppose the money supply is increased. What would happen to the equilibrium price level, the equilibrium quantity of output, and the unemployment rate according to
 - (a) Classical economic theory?
 - (b) Monetarist theory?
 - (c) Keynesian theory?

2. Explain why the three schools of economic thought in Part 1. reach different or similar conclusions concerning how an increase in the money supply will affect the economy.

Multiple-Choice Review Answers

- | | | | |
|--------|--------|---------|---------|
| 1. (B) | 5. (D) | 9. (D) | 13. (C) |
| 2. (D) | 6. (E) | 10. (C) | 14. (B) |
| 3. (B) | 7. (A) | 11. (B) | 15. (B) |
| 4. (B) | 8. (D) | 12. (D) | |

Free-Response Review Answers

1. If the money supply were increased then
 - (a) according to Classical economic theory the equilibrium price level would increase and the equilibrium quantity of output would remain unchanged. Since the quantity of output is unchanged, the unemployment rate is unchanged.
 - (b) according to Monetarist theory the equilibrium price level would increase and the equilibrium quantity of output would increase as well. Since the quantity of output increased, the unemployment rate would fall.
 - (c) according to Keynesian theory the equilibrium price level would increase slightly and the equilibrium quantity of output would increase slightly as well. Since the quantity of output increased slightly, the unemployment rate would decrease slightly.
2. All three schools of thought agree that an increase in the money supply will raise the equilibrium price level. However, the Keynesians believe that the price level will only rise slightly. This is because they believe that an increase in the money supply will stimulate only a small amount of extra spending. Another way of saying this is that the Keynesians feel that an increase in the money supply will shift the aggregate demand curve to the right, but only by a small amount.

Similarly, the Keynesians feel that the equilibrium level of output will increase only slightly because total spending is not that sensitive to changes in the money supply. Therefore, unemployment falls modestly. The Monetarists, on the other hand, believe that an increase in the money supply has a significant impact on the economy. The equilibrium quantity of output rises substantially because spending is boosted by the increase in the money supply. Therefore, unemployment falls significantly.

Only the Classical thinkers believe that the equilibrium level of output and the unemployment rate will be completely unaffected by the increase in the money supply. This is because of the Classical emphasis on the long-run effects of any change in the economy. The amount of output that an economy can generate depends on the amount of resources available and the state of technology. An increase in the money supply affects neither of these and so the Classical conclusion is that output is not affected by an increase in the supply of money. It only serves to raise prices.