

Worksheet 27.1: Monetary Policy Cause and Effect

1. If the FED wants to increase the money supply, determine the use of the three FED tools and explain how the money supply increase would happen.

Increase the money supply...	Reserve Requirement	Discount Rate	Open Market operations
Action by FED?			
How is money supply change made?			

2. If the FED wants to decrease the money supply, determine the use of the three FED tools and explain how the money supply decrease would happen.

Decrease the money supply...	Reserve Requirement	Discount Rate	Open Market operations
Action by FED?			
How is money supply change made?			

Worksheet 27.1: Monetary Policy Cause and Effect Answer Key

1. If the FED wants to increase the money supply, determine the use of the three FED tools and explain how the money supply increase would happen.

Increase the money supply...	Reserve Requirement	Discount Rate	Open Market operations
Action by FED?	<i>Lower the requirement percentage</i>	<i>Lower the discount rate</i>	<i>Buy government securities</i>
How is money supply change made?	<i>When the requirement percentage is lower, banks have more excess reserves to make loans and money supply is increased.</i>	<i>When the discount rate is lower, banks can borrow funds at lower cost. They can make more loans and money supply is increased.</i>	<i>When the FED buys bonds, a deposit demand is created. Banks can make more loans after they set aside the required reserves and the money supply is increased.</i>

2. If the FED wants to decrease the money supply, determine the use of the three FED tools and explain how the money supply decrease would happen.

Decrease the money supply...	Reserve Requirement	Discount Rate	Open Market operations
Action by FED?	<i>Raise the requirement percentage</i>	<i>Raise the discount rate</i>	<i>Sell government securities</i>
How is money supply change made?	<i>When the requirement percentage is higher, banks have fewer excess reserves to make loans and money supply is decreased.</i>	<i>When the discount rate is higher, banks can borrow less at the higher cost. They make fewer loans and money supply is decreased.</i>	<i>When the FED sells bonds, buyers use their funds from a deposit demand. Banks have fewer excess reserves and the money supply is decreased.</i>

Worksheet 27.2: Bank Requirements

After reading the October 2013 Huffington Post article “Federal Reserve Toughens Requirements For Biggest Banks,” on liquidity coverage ratios found at www.huffingtonpost.com/2013/10/24/federal-reserve-liquidity_n_4158388.html, answer the following questions.

1. What is the liquidity coverage ratio?
2. Why is the Fed proposing this new policy?
3. Why might financial institutions oppose the new policy?
4. Do you think the new policy will replace the required reserve ratio? Explain.

Worksheet 27.2: Bank Requirements Answer Key

After reading the October 2013 Huffington Post article “Federal Reserve Toughens Requirements For Biggest Banks,” on liquidity coverage ratios found at www.huffingtonpost.com/2013/10/24/federal-reserve-liquidity_n_4158388.html, answer the following questions.

1. What is the liquidity coverage ratio?

The liquidity coverage ratio is a policy that requires banks to have a specific amount of liquid assets in order to withstand a run on the bank or a credit crunch.

2. Why is the Fed proposing this new policy?

The Fed is proposing this new policy to prevent another situation like the one from 2006-2007, when reduced lending and a system-wide move to hoard cash and safe securities such as U.S. government debt led the Fed to pump trillions of dollars directly into financial companies to ensure markets didn't collapse.

3. Why might financial institutions oppose the new policy?

Banks won't be able to count some assets as cash, decreasing the amount of money they can loan out.

4. Do you think the new policy will replace the required reserve ratio? Explain.

Answers will vary.

Worksheet 27.3: Tools of Monetary Policy

Use the tools of monetary policy and what you learned in previous lessons to answer each of the following questions.

1. The central bank would like to decrease unemployment in the economy. What open market operation would be appropriate?
2. Name two ways a central bank could decrease inflation in an economy.
3. Suppose that the reserve ratio is 10% when the Fed buys \$150,000 of U.S. Treasury bills from the banking system. If the banking system does NOT want to hold any excess reserves, calculate the change in the money supply.
4. Suppose that the reserve ratio is 10% when the Fed buys \$100,000 of U.S. Treasury bills from the banking system. If the banking system holds an additional 10% in excess reserves, calculate the change in the money supply.
5. Suppose the reserve requirement is 20% when the Fed sells \$20,000 of U.S. Treasury bills to the banking system. If the banking system does NOT want to hold any excess reserves, calculate the change in the money supply.
6. Suppose real GDP is \$750 trillion while potential GDP is \$1,000 trillion. What open market operation could the central bank use to close the gap? How much would open market operation need to be if the reserve requirement was 10%?
7. Suppose real GDP is \$2,500 trillion while potential GDP is \$1,000 trillion. What open market operation could the central bank use to close the gap? How much would open market operation need to be if the reserve requirement was 20%?

Worksheet 27.3: Tools of Monetary Policy Answer Key

Use the tools of monetary policy and what you learned in previous lessons to answer each of the following questions.

1. The central bank would like to decrease unemployment in the economy. What open-market operation would be appropriate?

Buy treasury bills

2. Name 2 ways a central bank could decrease inflation in an economy.

Any 2: Sell treasury bills, increase the reserve requirement, or increase the discount rate

3. Suppose that the reserve ratio is 10% when the Fed buys \$150,000 of U.S. Treasury bills from the banking system. If the banking system does NOT want to hold any excess reserves, calculate the change in the money supply.

MM = $1/.10 = 10$; $10 \times \$150,000 = \$1,500,000$ increase in the money supply

4. Suppose that the reserve ratio is 10% when the Fed buys \$100,000 of U.S. Treasury bills from the banking system. If the banking system holds an additional 10% in excess reserves, calculate the change in the money supply.

MM = $1/.2 = 5$; $5 \times \$100,000 = \$500,000$ increase in the money supply

5. Suppose the reserve requirement is 20% when the Fed sells \$20,000 of U.S. Treasury bills to the banking system. If the banking system does NOT want to hold any excess reserves, calculate the change in the money supply.

MM = $1/.2 = 5$; $5 \times \$20,000 = \$200,000$ decrease in the money supply

6. Suppose real GDP is \$750 trillion while potential GDP is \$1,000 trillion. What open market operation could the central bank use to close the gap? How much would open market operation need to be if the reserve requirement was 10%?

To fix the recessionary gap of \$250 trillion, the central bank should buy T-bills. MM = $1/.1 = 10$. $\$250/10 = \25 trillion purchase of T-bills.

7. Suppose real GDP is \$2,500 trillion while potential GDP is \$1,000 trillion. What open market operation could the central bank use to close the gap? How much would open market operation need to be if the reserve requirement was 20%?

To fix an inflationary gap of \$1,500 trillion, the central bank should sell T-bills. MM = $1/.2 = 5$. $\$1,500/5 = \300 trillion sale of T-bills.

Exit Slip: Module 27

1. Suppose the Federal Reserve were to engage in open-market operations by buying \$100 million of U.S. Treasury bills. Which of the following would be the end result of such an action?
 - A. The money supply would stay the same.
 - B. The money supply would decrease by \$100 million.
 - C. The money supply would increase by \$100 million.
 - D. The money supply would increase by more than \$100 million.
 - E. The money supply would increase, but by less than \$100 million.

2. When the Fed decreases bank's reserves through an open-market operation:
 - A. deposits increase, currency in circulation increases, and the monetary base remains the same.
 - B. the monetary base decreases, the money multiplier decreases, and the money supply increases.
 - C. loans increase, the federal funds rate rises, and the discount rate rises.
 - D. the monetary base decreases, loans decrease, and the money supply decreases.
 - E. the monetary base decreases, loans decrease, and the money multiplier decreases.

3. When a bank borrows from the Federal Reserve, it pays the
 - A. required reserve ratio.
 - B. discount rate.
 - C. federal funds rate.
 - D. prime rate.
 - E. mortgage rate.

Exit Slip: Module 27
Answer Key

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(D)

2. When the Fed decreases bank's reserves through an open-market operation:
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 - B. the monetary base decreases, the money multiplier decreases, and the money supply increases.
 - C. loans increase, the federal funds rate rises, and the discount rate rises.
 - D. the monetary base decreases, loans decrease, and the money supply decreases.
 - E. the monetary base decreases, loans decrease, and the money multiplier decreases.

(D)

3. When a bank borrows from the Federal Reserve, it pays the
 - F. required reserve ratio.
 - G. discount rate.
 - H. federal funds rate.
 - I. prime rate.
 - J. mortgage rate.

(B)

MODULE 27: THE FEDERAL RESERVE SYSTEM: MONETARY POLICY

In-Class Presentation of Module and Sample Lecture

Suggested time: This module can be covered in two hour-long class sessions, with additional time spent on more examples or possibly a video.

One possibility for a video is titled “Inside the World’s Mightiest Bank”:

<https://www.youtube.com/watch?v=4rus-GP-74g>

- I. The Federal Reserve System
 - A. The Functions of the Federal Reserve System
 - 1. Financial Services
 - 2. Supervise and Regulate Banking Institutions
 - 3. Maintain Stability of the Financial System
 - 4. Conduct Monetary Policy
- II. What the Fed Does
 - A. The Reserve Requirement
 - B. The Discount Rate
 - C. Open-Market Operations

I. The Federal Reserve System

The Fed has two parts: the Board of Governors, which is part of the U.S. government, and the 12 regional Federal Reserve Banks, which are privately owned.

But what is it that the Fed actually does?

A. The Functions of the Federal Reserve System

There are four basic categories: providing financial services to depository institutions, supervising and regulating banks and other financial institutions, maintaining the stability of the financial system, and conducting monetary policy.

Note: The AP Macro exam will stress monetary policy over all other functions of the Fed.

1. Financial Services

The Federal Reserve is sometimes referred to as the “banker’s bank” because it holds reserves, clears checks, provides cash, and transfers funds for commercial banks—all services that banks provide for their customers.

The Federal Reserve also acts as the banker and fiscal agent for the federal government.

The U.S. Treasury has its checking account with the Federal Reserve, so when the federal government writes a check, it is written on an account at the Fed.

2. Supervise and Regulate Banking Institutions

The Federal Reserve System is charged with ensuring the safety and soundness of the nation’s banking and financial system. The regional Federal Reserve banks examine and regulate commercial banks in their district. The Board of Governors also engages in regulation and supervision of financial institutions.

3. Maintain Stability of the Financial System

The Fed is charged with maintaining the integrity of the financial system. As part of this function, Federal Reserve banks provide liquidity to financial institutions to ensure their safety and soundness.

4. Conducting Monetary Policy

One of the Federal Reserve's most important functions is the conduct of monetary policy.

As we will see, the Federal Reserve uses the tools of monetary policy to prevent or address extreme macroeconomic fluctuations in the U.S. economy.

II. What the Fed Does

The Federal Reserve has three main policy tools at its disposal: *reserve requirements*, the *discount rate*, and, perhaps most importantly, *open - market operations*. These tools play a part in how the Fed performs each of its functions as outlined below.

A. The Reserve Requirement

Banks that fail to maintain at least the 10% required reserve ratio on average over a two-week period, face penalties.

Suppose a bank looks as if it has insufficient reserves to meet the Fed's reserve requirement. The bank can borrow additional reserves from other banks via the **federal funds market**, a financial market that allows banks that fall short of the reserve requirement to borrow reserves (usually just overnight) from banks that are holding excess reserves.

The **federal funds rate**, the interest rate at which funds are borrowed and lent in the federal funds market, plays a key role in modern monetary policy.

To alter the money supply, the Fed can change reserve requirements. How?

- If the Fed reduces the required reserve ratio, banks will lend a larger percentage of their deposits, leading to more loans and an increase in the money supply via the money multiplier.
- If the Fed increases the required reserve ratio, banks are forced to reduce their lending, leading to a fall in the money supply via the money multiplier.
- Under current practice, however, the Fed doesn't use changes in reserve requirements to actively manage the money supply. The last significant change in reserve requirements was in 1992.

B. The Discount Rate

Alternatively, banks in need of reserves can borrow from the Fed itself via the discount window. **The discount rate** is the rate of interest the Fed charges on those loans. Normally, the discount rate is set 1 percentage point above the federal funds rate in order to discourage banks from turning to the Fed when they are in need of reserves. This is called the "spread".

To alter the money supply, the Fed can change the spread between the discount rate and the federal funds rate. How?

- If the Fed reduces the spread between the discount rate and the federal funds rate, the cost to banks of being short of reserves falls; banks respond by increasing their lending, and the money supply increases via the money multiplier.

- If the Fed increases the spread between the discount rate and the federal funds rate, bank lending falls—and so will the money supply via the money multiplier.
- The Fed normally doesn't use the discount rate to actively manage the money supply. The Fed typically sets the discount rate at a certain gap above the federal funds rate. As the federal funds rate moves, the discount rate is adjusted to maintain the gap.

C. Open-Market Operations

In an **open-market operation** the Federal Reserve buys or sells U.S. Treasury bills, normally through a transaction with *commercial banks*—banks that mainly make business loans, as opposed to home loans.

To alter the money supply, the Fed can buy or sell U.S. Treasury bills. How?

- When the Fed buys U.S. Treasury bills from a commercial bank, it pays by crediting the bank's reserve account by an amount equal to the value of the Treasury bills.
- For example, if the Fed buys \$100 million of U.S. Treasury bills from commercial banks, this increases the monetary base by \$100 million because it increases bank reserves by \$100 million.
- When the Fed sells U.S. Treasury bills to commercial banks, it debits the banks' accounts, reducing their reserves.
- For example, when the Fed sells \$100 million of U.S. Treasury bills, bank reserves and the monetary base decrease.

Note: Remind the students that the change in bank reserves caused by an open-market operation doesn't directly affect the money supply. Instead, it starts the money multiplier in motion.

If the Fed buys \$100 million in T-bills from the commercial banks, the banks would lend out their additional reserves, immediately increasing the money supply by \$100 million. Some of those loans would be deposited back into the banking system, increasing reserves again and permitting a further round of loans, and so on, leading to a rise in the money supply.

An open-market sale has the reverse effect: bank reserves fall, requiring banks to reduce their loans, leading to a fall in the money supply.

Note: It should be noted that when the Fed directly injects money into a bank after buying Treasuries, that the bank is not required to hold a fraction of those dollars as required reserves. The money multiplier takes over on the entire amount.