KEY IDEAS

- Throughout history, there have been four basic types of money: commodity money, representative money, fiat money and checkbook money.
- Money has three main functions: a medium of exchange, a standard of value (or unit of account) and a store of value.
- To accomplish its functions, the characteristics of money include portability, uniformity, acceptability, durability, divisibility and stability in value.
- M1 is the narrowest definition of money and consists of checkable deposits, traveler's checks and currency. Checkable deposits include demand deposits and account for about 75 percent of M1.
- M2 and M3 are broader definitions of money and include savings accounts and other time deposits.
- The demand for money is the sum of transactions demand, precautionary demand and speculative demand. The demand for money is determined by interest rates, income and the price level.
- MV = PQ is the equation of exchange: Money times velocity equals price times quantity of goods. PQ is the nominal GDP.
- Velocity is the number of times a year that the money supply is used to make payments for final goods and services:

$$V = \frac{GDP}{M}$$

- Money is created when banks make loans. One bank's loan becomes another bank's demand deposit. Demand deposits are money. When a loan is repaid, money is destroyed.
- Banks are required to keep a percentage of their deposits as reserves. Reserves can be currency in the bank vault or deposits at the Federal Reserve Banks. This reserve requirement limits the amount of money banks can create.
- The simple deposit expansion multiplier is equal to 1 divided by the required reserve ratio (rr).

$$\text{Deposit expansion multiplier} = \frac{1}{rr}$$

- The higher the reserve requirement, the less money can be created; the lower the reserve requirement, the more money can be created.
- The Federal Reserve regulates financial institutions and controls the nation's money supply. The three main tools that the Fed uses to control the money supply are buying and selling government bonds on the open market (open market operations), changing the discount rate and changing the reserve requirement.
- If the Fed wants to encourage bank lending and increase the money supply, it will buy bonds on the open market, decrease the discount rate or decrease the reserve requirement. This is referred to as expansionary monetary policy or an easy money policy and is used by the Fed to reduce unemployment.
- If the Fed wants to hold down or decrease the money supply, it will discourage bank lending by selling bonds on the open market, increasing the discount rate or increasing the reserve requirement. This is called a contractionary monetary policy or a tight money policy and is used by the Fed to discourage bank lending during periods of inflation.

KEY IDEAS

- Open market operations are the most frequently used tool because they permit the Fed to make small changes in the money supply and can be implemented immediately.
- Changes in the reserve requirement can have substantial economic effects, and thus the Fed rarely changes the reserve requirement. The Fed uses changes in the discount rate primarily as a signal of a change in the direction of monetary policy.
- The Fed cannot target both the money supply and interest rates simultaneously, so it must choose which variable to target.
- The Fed currently targets the federal funds rate rather than the money supply to implement monetary policy. It targets the federal funds rate because the Fed believes that this rate is closely tied to economic activity.
- The federal funds rate is the interest rate a bank charges when it lends excess reserves to other banks.

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Money

Throughout history, a wide variety of items have served as money. These include gold, silver, large stone wheels, tobacco, beer, dog teeth, porpoise teeth, cattle, metal coins, paper bills and checks. All of these types of money should be judged on how well they accomplish the functions of money. Money is what money does!

The functions of money are to serve as a medium of exchange, a standard of value and a store of value.

To be a good *medium of exchange*, money must be *accepted by people* when they buy and sell goods and services. It should be *portable* or easily carried from place to place. It must also be *divisible* so that large and small transactions can be made. It must also be *uniform* so that a particular unit such as a quarter represents the same value as every other quarter.

To be a good *standard of value*, or *unit of account*, money must be useful for quoting prices. To accomplish this, money must be *familiar, divisible* and *accepted.*

To be a good *store of value*, money must be *durable* so it can be kept for future use. It also should have a *stable value* so people do not lose purchasing power if they use the money at a later time.

Money is any item or commodity that is generally accepted in payment for goods and services or in repayment of debts, and serves as an asset to its holder.

Activity written by John Morton, National Council on Economic Education, New York, N.Y., and revised by Charles A. Bennett, Gannon University, Erie, Pa.

1. Use the table below to evaluate how well each item would perform the functions of money in today's economy. If an item seems to fulfill the function, put a + sign in the box; if it does not fulfill a function in your opinion, place a − sign in the box. Put a **?** sign in the box if you are unsure whether the item fulfills the functions of money. The item with the most + signs would be the best form of money for you. In the space below the table, list the top six forms of money, according to your evaluation.

Item	Medium of Exchange	Store of Value	Standard of Value
Salt			
Large stone wheels			
Cattle			
Gold			
Copper coins			
Beaver pelts			
Personal checks			
Savings account passbook			
Prepaid phone card			
Debit card			
Credit card			
Cigarettes			
Playing cards			
Bushels of wheat			
$1 bill			
$100 bill			

Your top six forms of money:

2. After you finish the evaluation in Question 1, rate the various items in the table below. Evaluate how well they meet the characteristics of money. Again, if an item seems to fit a characteristic, use a + sign; if the item does not seem to fit a characteristic, use a − sign. If there is a difference of opinion or if you are uncertain, use a ? sign. The item with the most + signs would best fit the characteristics of money. In the space below the table, list your six top items.

Item	Portability	Uniformity	Acceptability	Durability	Stability in Value
Salt					
Large stone wheels					
Cattle					
Gold					
Copper coins					
Beaver pelts					
Personal checks					
Savings account passbook					
Prepaid phone card					
Debit card					
Credit card					
Cigarettes					
Playing cards					
Bushels of wheat					
$1 bill					
$100 bill					

Your top six items:

3. Why might factors such as ease of storage, difficulty in counterfeiting and security of electronic transfer of funds also be characteristics that you might use in evaluating money?

What's All This About the Ms?

While monetary policy is the subject of debates that capture the public's attention, the first steps in the formulation of policy may appear relatively mundane. We must first define and measure the money supply. Defining and measuring money has become an increasingly difficult task because of reforms in the financial system, and because people and banks hold money in myriad different forms.

Money Defined . . .

There is general agreement on a simple conceptual *definition* of money. However, the complexity of the real world and our rapidly evolving financial system prevent agreement on a single *measure* of money, and this can cause confusion.

The Federal Reserve defines monetary aggregates by grouping assets that the public uses in roughly similar ways. In defining these measures of money, the Fed draws somewhat arbitrary lines between groups of assets that serve in varying degrees as both the medium-of-exchange and store-of-value functions of money.

Depository institutions such as banks, savings and loan associations and credit unions report to the Fed the value of their time and savings deposits, vault cash and transaction accounts such as checkable deposits.

The data on checkable deposits are the primary source for the calculation of required reserves and the construction of the monetary aggregates. The Fed's Board of Governors and the Federal Open Market Committee use this information in the formulation of monetary policy.

. . . and Measured

M1 is the narrowest definition and measure of the money supply. It includes assets used primarily for transactions or as a medium of exchange. M1 includes currency and coin held by the nonbank public, demand deposits, other checkable deposits and traveler's checks.

M2 is a broader measure of money stock. In addition to the items included in M1, M2 includes the amount held in savings and small time deposits, money market deposit accounts (MMDAs), noninstitutional money market mutual funds (MMMFs) and certain other short-term money market assets.

M3 is an even broader definition of the money supply. It includes all of the components of M2 plus a number of financial assets and instruments generally employed by large businesses and financial institutions.

We can look at the three definitions of money in the following terms:

- M1 includes items that are primarily used as a medium of exchange.
- M2 includes items that are used as a store of value.
- M3 includes items that serve as a unit of account.

Activity from *Econ Ed* (New York: The Federal Reserve Bank of New York, September 1987) and revised by Robert Wedge, Massachusetts Council on Economic Education, Waltham, Mass.

The Fed considers a number of factors when it measures the monetary aggregates, but ultimately what matters is how the public uses the different forms of money available. For example, depositors can write checks on their MMDAs or their MMMFs. The public, however, primarily uses these types of accounts for savings and only secondarily for transactions. Therefore, these accounts are typically placed in M2 with savings accounts and time deposits, which also primarily serve the store-of-value function of money.

On the other hand, deposits in NOW (negotiable order of withdrawal) accounts are included in M1 because they are primarily used as a medium of exchange, even though they earn interest and depositors use them for savings.

1. What are the three basic functions of money?

2. Why is it important for the Fed to know the size and rate of growth of the money supply?

   (A) What are the effects if the money supply grows too slowly?

   (B) What are the effects if the money supply grows too rapidly?

3. Name a type of money that serves primarily as a medium of exchange.

4. Name a type of money that serves primarily as a store of value.

5. With the use of credit cards becoming more prominent and the availability of credit broader than ever, why are credit cards not included in the Ms?

6. Why is it difficult for the Fed to get an accurate measure of the money supply?

7. Why must the Fed continue to develop new ways to track the money supply?

8. Use the data in Figure 35.1 to calculate M1, M2 and M3. Assume that all items not mentioned are zero. Show all components for your answers.

Figure 35.1
Calculating the Ms

Checkable deposits (demand deposits, NOW, ATM and credit union share draft accounts)	$850
Currency	$200
Large time deposits	$800
Noncheckable savings deposits	$302
Small time deposits	$1,745
Institutional money market mutual funds	$1,210

M1 = _____

M2 = _____

M3 = _____

The Federal Reserve: The Mechanics of Monetary Policy

To manage the money supply, the Federal Reserve uses the tools of monetary policy to influence the quantity of reserves in the banking system. Increasing (decreasing) reserves tends to expand (contract) a bank's ability to make loans. Thus, reserve management gives the Fed powerful influence over the money supply and, in turn, over the general price level. The primary tool for reserve management today is open market operations (OMO). Discount rate changes serve primarily as signals; reserve requirements are rarely changed. Using T-accounts, Figures 38.1 and 38.2 show how the Fed could use open market operations to increase the money supply by $100.

Example: Baseline case

Figure 38.1 shows a baseline T-account. The required reserve ratio is 10 percent of checking deposits. With $26 in reserve accounts and $4 in Federal Reserve notes (vault cash), total bank reserves equal $30, exactly 10 percent of checkable deposits (in other words, no excess reserves). Net worth = assets – liabilities.

Figure 38.1
Baseline Case

Assets			Liabilities
	The Fed		
Treasury securities	$83	$26	Reserve accounts of banks
		$57	Federal Reserve notes
	Banks		
Reserve accounts	$26	$300	Checkable deposits
Federal Reserve notes	$4		
Loans	$405	$135	Net worth (to stockholders)
	Bank Customers		
Checkable deposits	$300	$405	Loans
Federal Reserve notes	$53		
Treasury securities	$52		
Money supply = $353 ($300 + $53)			

Activity written by Robert Graboyes, University of Richmond, Richmond, Va.

Example: Expansionary policy via open market purchases

Suppose the Fed believes the economy is heading into a recession and wishes to increase the money supply by $100. Using open market operations, the Fed purchases $10 worth of Treasury securities from the public.

Figure 38.2 shows the consolidated accounts after the changes of this Fed action work their way through the economy. Changes are shown in boldface. Be sure to compare Figure 38.1 with Figure 38.2 to see the changes. The Fed's $10 increase in reserve accounts yields a $100 increase in the money supply.

Figure 38.2
After $10 Open Market Purchase

Assets			Liabilities
	The Fed		
Treasury securities (**+$10**)	**$93**	**$36**	Reserve accounts of banks (**+$10**)
		$57	Federal Reserve notes
	Banks		
Reserve accounts (**+$10**)	**$36**	**$400**	Checkable deposits (**+$100**)
Federal Reserve notes	$4		
Loans (**+$90**)	**$495**	$135	Net worth (to stockholders)
	Bank Customers		
Checkable deposits (**+$100**)	**$400**	**$495**	Loans (**+$90**)
Federal Reserve notes	$53		
Treasury securities (**– $10**)	**$42**		
Money supply = **$453 ($400 + $53)**			

For Questions 1 through 4, start with the baseline case in Figure 38.1. The Fed wishes to *decrease* the money supply from $353 to $303 by open market operations. The reserve requirement is 10 percent.

1. Will the Fed want to buy or sell existing Treasury securities? _____

2. What is the money multiplier? _____

3. What is the value of Treasury securities that need to be bought or sold? _____

4. Fill in Figure 38.3 to show the accounts after open market operations are finished and all changes have worked their way through the economy:

Figure 38.3
After Open Market Operations Are Finished

Assets		Liabilities
The Fed		
Treasury securities		Reserve accounts of banks
	$57	Federal Reserve notes
Banks		
Reserve accounts		Checkable deposits
Federal Reserve notes		
Loans	$135	Net worth (to stockholders)
Bank Customers		
Checkable deposits		Loans
Federal Reserve notes	$53	
Treasury securities		
Money supply = _____		

For Questions 5 through 7, suppose banks keep zero excess reserves and the reserve requirement is 15 percent.

5. What is the deposit expansion multiplier? _____

6. A customer deposits $100,000 in his checking account.

   (A) How much of this can the bank lend to new customers? _____

   (B) How much must the bank add to its reserves? _____

   (C) In what two forms can a bank hold the new required reserves?

7. Suppose that the $100,000 had previously been held in Federal Reserve notes under the customer's mattress and that banks continue to hold no excess reserves. By how much will the customer's deposit cause the money supply to grow? _____

8. A very low discount rate may *(encourage banks to borrow / discourage banks from borrowing)* from the Federal Reserve. Underline the correct answer and explain why.

9. The federal funds rate is the interest rate at which financial institutions can borrow from other financial institutions. Suppose the federal funds rate is 5 percent and the discount rate is 4.5 percent. Why is it that a bank might choose to borrow in the federal funds market, rather than getting the lower interest rate available through the discount window?

10. In a foreign country, the reserve requirement is 100 percent. What will be the deposit expansion multiplier? _____

11. If the Fed decided to implement a policy action designed to increase the money supply, in which direction would bank reserves and the federal funds rate change and why?

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12. Circle the correct symbol (↑ for increase, ↓ for decrease) in Figure 38.4.

Figure 38.4
Fed Actions and Their Effects

Federal Reserve Action	Bank Reserves	Money Supply	Fed Funds Rate
A. Sold Treasury securities on the open market	↑ ↓	↑ ↓	↑ ↓
B. Bought Treasury securities on the open market	↑ ↓	↑ ↓	↑ ↓
C. Raised the discount rate	↑ ↓	↑ ↓	↑ ↓
D. Lowered the discount rate	↑ ↓	↑ ↓	↑ ↓
E. Raised the reserve requirement	↑ ↓	↑ ↓	↑ ↓
F. Lowered the reserve requirement	↑ ↓	↑ ↓	↑ ↓

13. Indicate in the table in Figure 38.5 how the Federal Reserve could use each of the three monetary policy tools to pursue an expansionary policy and a contractionary policy.

Figure 38.5
Tools of Monetary Policy

Monetary Policy	Expansionary Policy	Contractionary Policy
A. Open market operations		
B. Discount rate		
C. Reserve requirements		

14. Why do banks hold excess reserves, which pay no interest?

15. Why does the Fed rarely use the reserve requirement as an instrument of monetary policy?

16. What does it mean to say that the Fed changes the discount rate mostly as a *signal* to markets?

17. Why does the Fed currently target the federal funds rate rather than the money supply?

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