N. Gregory Mankiw

Principles of
Macroeconomics
Sixth Edition

16

The Monetary System

Premium PowerPoint Slides by Ron Cronovich

In this chapter, look for the answers to these questions:

- What assets are considered "money"? What are the functions of money? The types of money?
- What is the Federal Reserve?
- What role do banks play in the monetary system? How do banks "create money"?
- How does the Federal Reserve control the money supply?

What Money Is and Why It's Important

- Without money, trade would require ***barter***, the exchange of one good or service for another.
- Every transaction would require a ***double coincidence of wants***—the unlikely occurrence that two people each have a good the other wants.
- Most people would have to spend time searching for others to trade with—a huge waste of resources.
- This searching is unnecessary with ***money***, the set of assets that people regularly use to buy g&s from other people.
- Money is anything that is generally acceptable to sellers in exchange for goods and services.

The 3 Functions of Money

- ***Medium of exchange***: an item buyers give to sellers when they want to purchase g&s
- ***Unit of account***
- ***Store of value***: an item people can use to transfer purchasing power from the present to the future

The 2 Kinds of Money

Commodity money:
takes the form of a commodity with intrinsic value

Examples: gold coins, cigarettes in POW camps

Fiat money:
money without intrinsic value, used as money because of govt decree

Example: the U.S. dollar

The Money Supply

- The ***money supply*** (or ***money stock***): the quantity of money available in the economy
- What assets should be considered part of the money supply? Two candidates:
  - ***Currency***: the paper bills and coins in the hands of the (non-bank) public
  - ***Demand deposits***: balances in bank accounts that depositors can access on demand by writing a check

Measures of the U.S. Money Supply

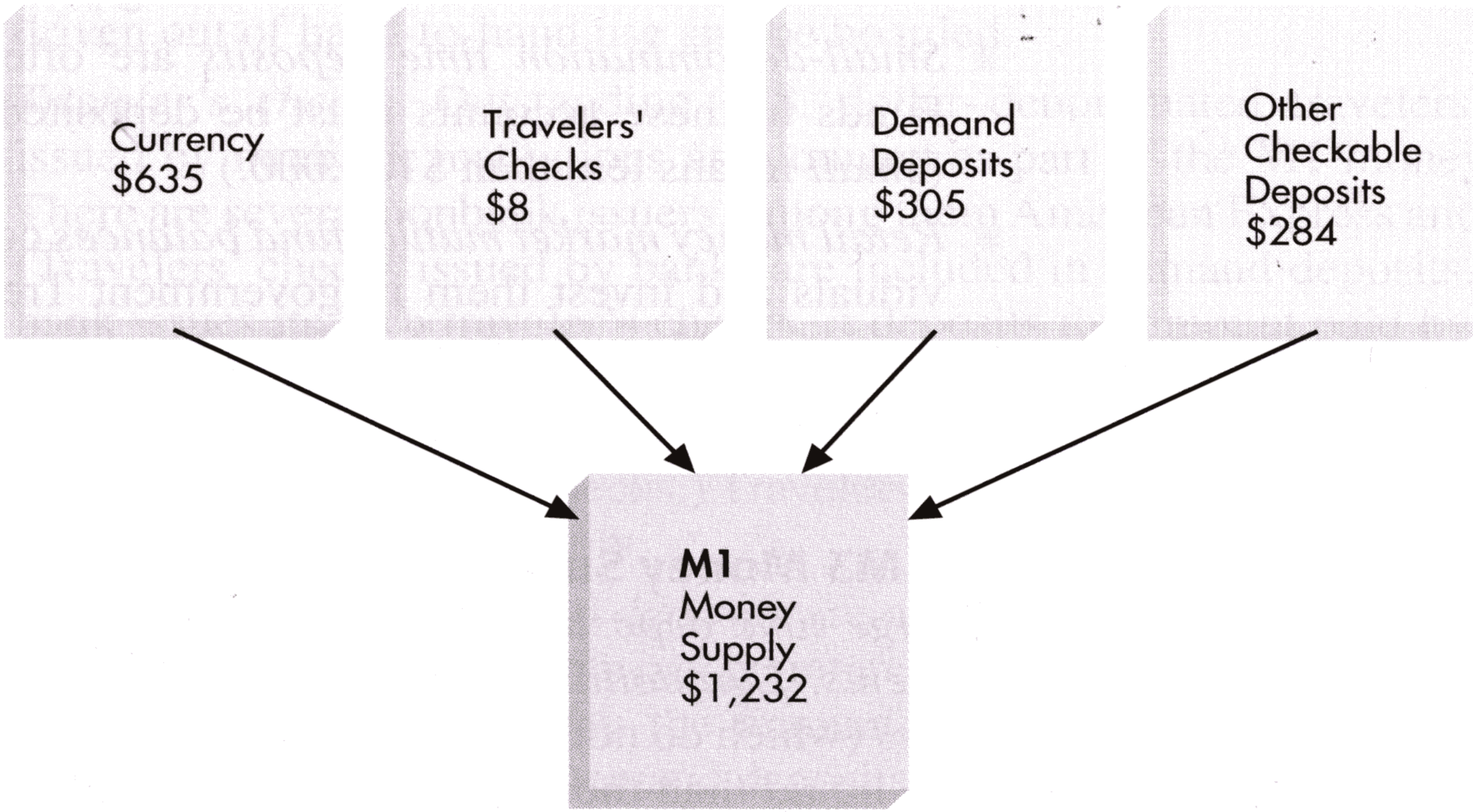
- ***M1***: currency, demand deposits, traveler's checks, and other checkable deposits.

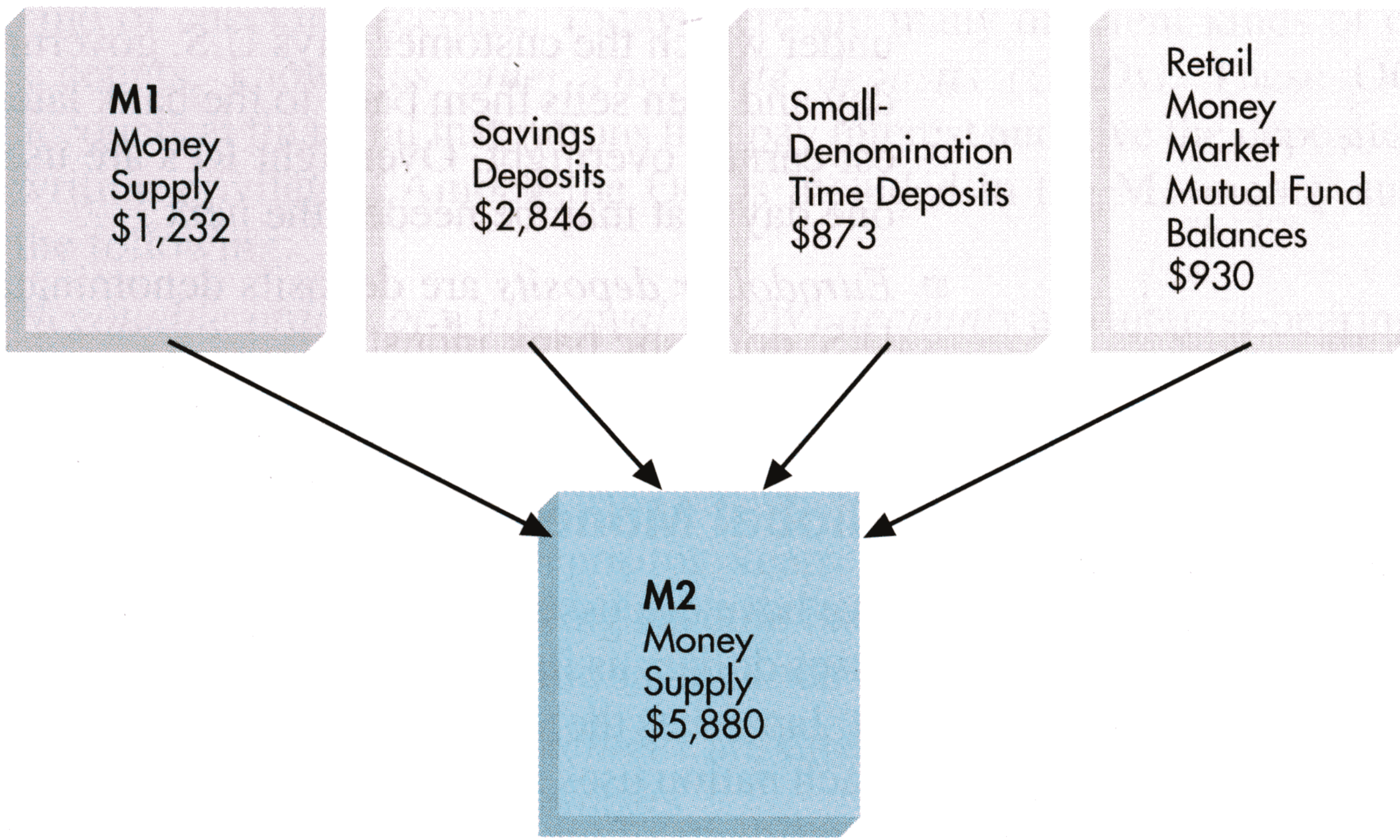
  M1 = $1.9 trillion (February 2011)

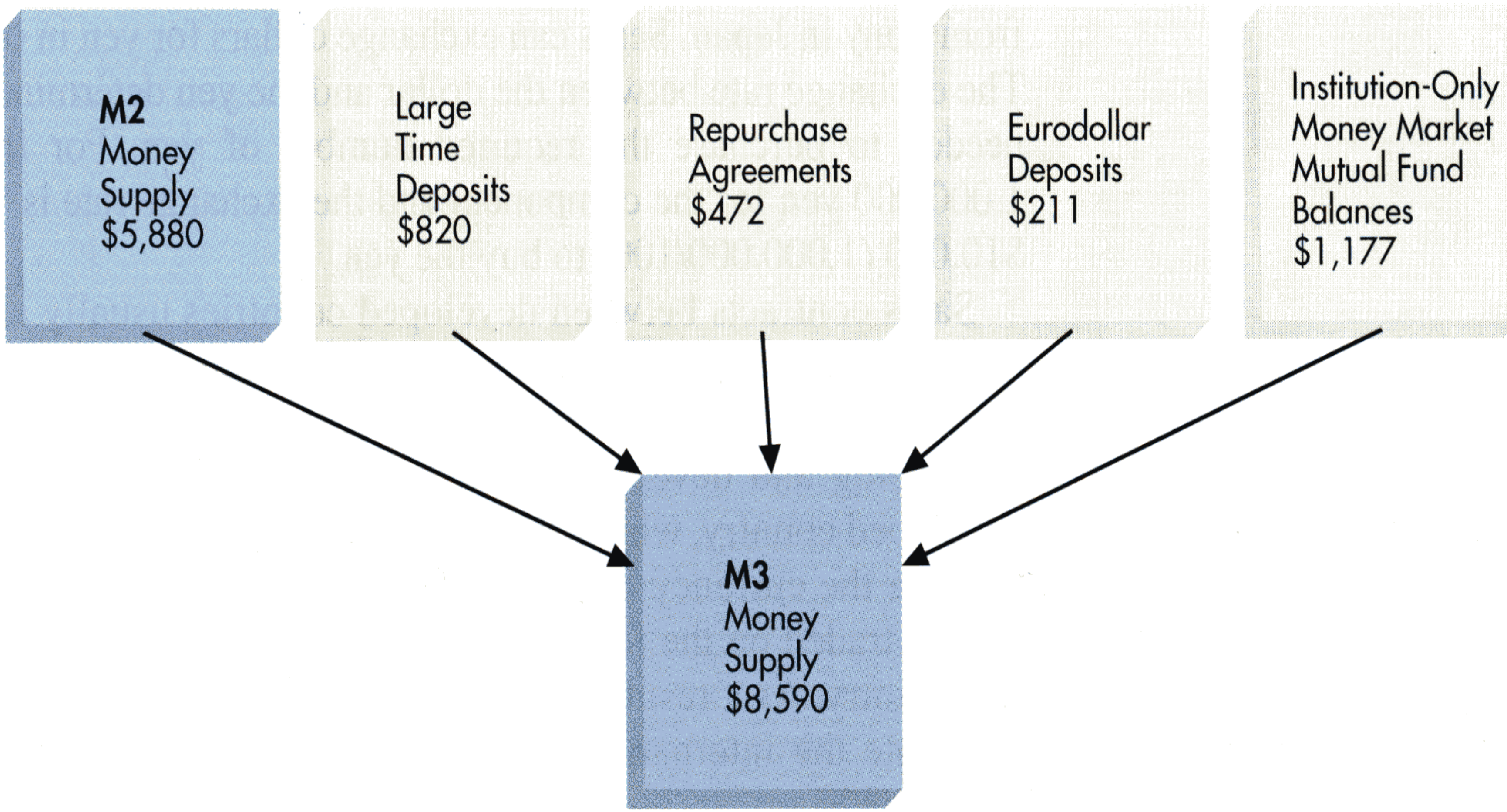
- ***M2***: everything in M1 plus savings deposits, small time deposits and a few minor categories.

  M2 = $8.9 trillion (February 2011)

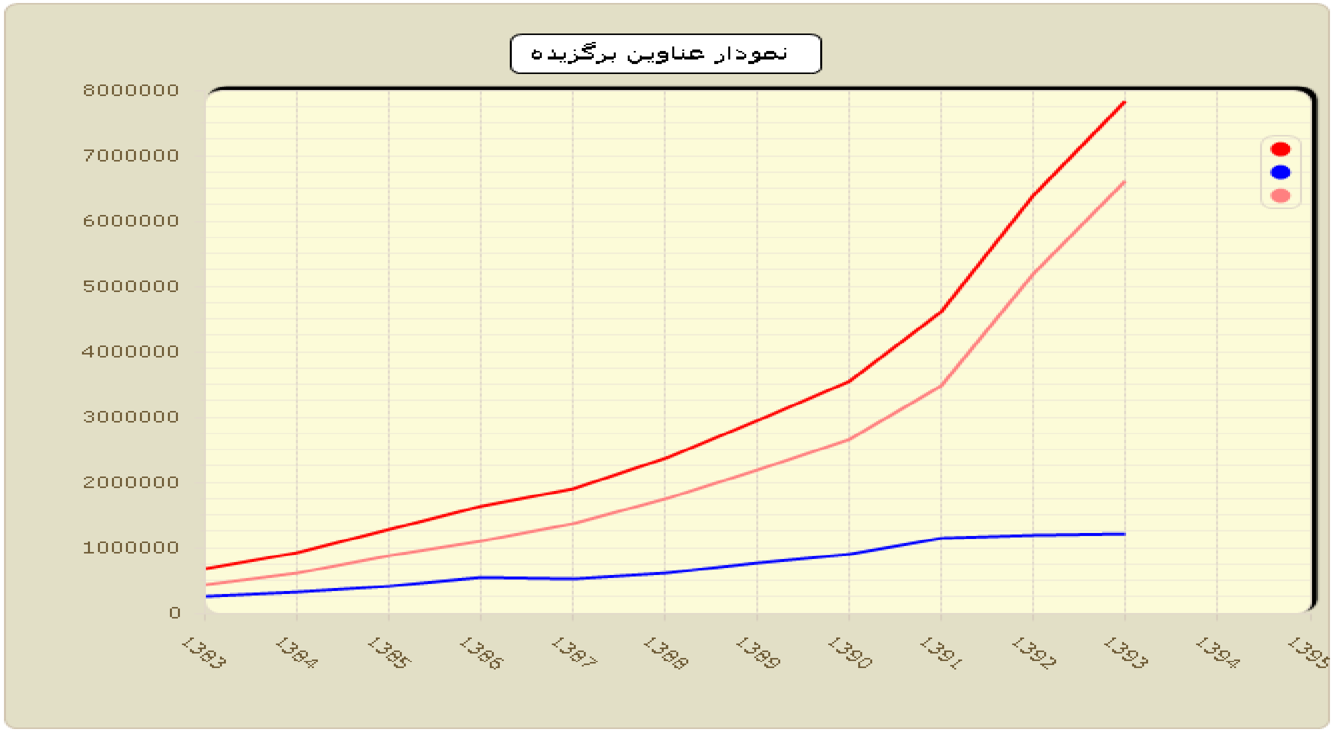
The distinction between M1 and M2 will often not matter when we talk about "the money supply" in this course.


Currency
$635
Travelers'
Checks
$8
Demand
Deposits
$305
Other
Checkable
Deposits
$284
M1
Money
Supply
$1,232


M1
Money
Supply
$1,232
Savings
Deposits
$2,846
Small-
Denomination
Time Deposits
$873
Retail
Money
Market
Mutual Fund
Balances
$930
M2
Money
Supply
$5,880


M2
Money
Supply
$5,880
Large
Time
Deposits
$820
Repurchase
Agreements
$472
Eurodollar
Deposits
$211
Institution-Only
Money Market
Mutual Fund
Balances
$1,177
M3
Money
Supply
$8,590

- نقدینگی= پول +شبه پول
- پول شامل اسکناس و مسکوک در دست اشخاص و سپرده‌های دیداری بخش غیر دولتی نزد بانکها و موسسات اعتباری غیر بانکی می‌باشد.
- شبه پول شامل سپرده‌های غیردیداری بخش غیر دولتی نزد بانکها و موسسات اعتباری غیر بانکی می‌باشد.



عرضه پول و سیاست پولی

- The ***money supply*** is the quantity of money available in the economy.
- ***Monetary policy*** is the control over the money supply.

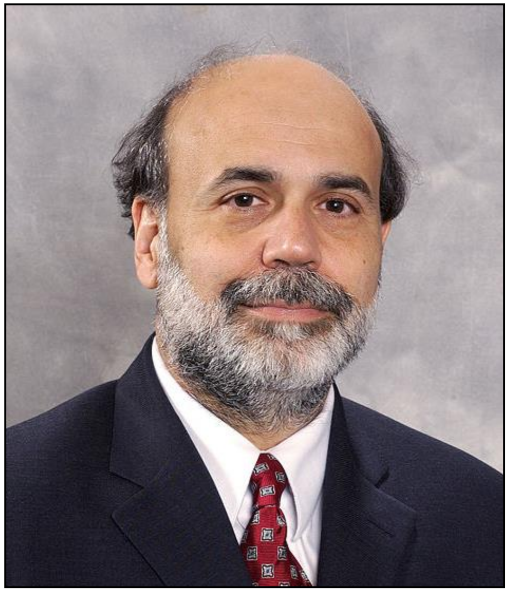
بانک مرکزی و سیاست پولی

- ***Central bank***: an institution that oversees the banking system and regulates the money supply
- ***Monetary policy***: the setting of the money supply by policymakers in the central bank
- ***Federal Reserve (Fed)***: the central bank of the U.S.

The Structure of the Fed

The Federal Reserve System consists of:

- ***Board of Governors*** (7 members), located in Washington, DC
- ***12 regional Fed banks***, located around the U.S.
- ***Federal Open Market Committee (FOMC)***, includes the Bd of Govs and presidents of some of the regional Fed banks
  The FOMC decides monetary policy.



Ben S. Bernanke
Chair of FOMC,
Feb 2006 – present

عرضه و تقاضای پول

- Money supply
  - how the banking system “creates” money
  - three ways the Fed can control the money supply
- Theories of money demand (****)
  - a portfolio theory
  - a transactions theory: the Baumol-Tobin model

بانک و عرضه پول

- The money supply equals currency plus demand (checking account) deposits:

$$M = C + D$$

- Since the money supply includes demand deposits, the banking system plays an important role.

بانک و عرضه پول

- ***Reserves* (*R*)**: the portion of deposits that banks have not lent.
- To a bank, liabilities include deposits, assets include reserves and outstanding loans
- ***100-percent-reserve banking***: a system in which banks hold all deposits as reserves.
- ***Fractional-reserve banking***:
  a system in which banks hold a fraction of their deposits as reserves.

SCENARIO 1: No Banks

With no banks,
$D = 0$ and $M = C = \$1000$.

سپرده دیداری=۰

SCENARIO 2: 100 Percent Reserve Banking

- Initially **C** = $1000, **D** = $0, **M** = $1000.
- Now suppose households deposit the $1000 at "Firstbank."

FIRSTBANK'S
balance sheet

دارایی ها	بدهی ها
reserves $1000	deposits $1000

- After the deposit,
  C = $0,
  D = $1000,
  M = $1000.
- 100% Reserve Banking has no impact on size of money supply.

SCENARIO 3: Fractional-Reserve Banking

- Suppose banks hold 20% of deposits in reserve, making loans with the rest.
- Firstbank will make $800 in loans.

FIRSTBANK'S
balance sheet

Assets	Liabilities
reserves $200	deposits $1000
loans $800	

The money supply now equals $1800:

The depositor still has $1000 in demand deposits,

but now the borrower holds $800 in currency.

SCENARIO 3: Fractional-Reserve Banking

Thus, in a fractional-reserve banking system, banks create money.

FIRSTBANK'S
balance sheet

Assets	Liabilities
reserves $200	deposits $1000
loans $800	

The money supply now equals $1800:

The depositor still has $1000 in demand deposits,

but now the borrower holds $800 in currency.

SCENARIO 3: Fractional-Reserve Banking

- Suppose the borrower deposits the $800 in Secondbank.
- Initially, Secondbank's balance sheet is:

SECONDBANK'S
balance sheet

Assets		Liabilities
reserves	$160	deposits $800
loans	$640	

- But then Secondbank will loan 80% of this deposit
- and its balance sheet will look like this:

SCENARIO 3: Fractional-Reserve Banking

- If this $640 is eventually deposited in Thirdbank,
- then Thirdbank will keep 20% of it in reserve, and loan the rest out:

THIRDBANK'S
balance sheet

Assets		Liabilities	
reserves	$128	deposits	$640
loans	$512		

Finding the total amount of money:

	Original deposit	= \$1000
+	Firstbank lending	= \$ 800
+	Secondbank lending	= \$ 640
+	Thirdbank lending	= \$ 512
+	other lending…	

Total money supply = $(1/\boldsymbol{rr}) \times \$1000$

where $\boldsymbol{rr}$ = ratio of reserves to deposits

In our example, $\boldsymbol{rr} = 0.2$, so $\boldsymbol{M} = \$5000$

خلق پول در نظام بانکی

A fractional reserve banking system creates money,

but it doesn't create wealth:

bank loans give borrowers some new money

and an equal amount of new debt.

Bank Reserves

- In a ***fractional reserve banking system***, banks keep a fraction of deposits as ***reserves*** and use the rest to make loans.
- The Fed establishes ***reserve requirements***, regulations on the minimum amount of reserves that banks must hold against deposits.
- The ***reserve ratio***, ***R***
  = fraction of deposits that banks hold as reserves
  = total reserves as a percentage of total deposits

ACTIVE LEARNING 1

Banks and the money supply

While cleaning your apartment, you look under the sofa cushion and find a $50 bill. You deposit the bill in your checking account.

The Fed's reserve requirement is 20% of deposits.

A. What is the maximum amount that the money supply could increase?

B. What is the minimum amount that the money supply could increase?

Answers

You deposit $50 in your checking account.

A. What is the maximum amount that the money supply could increase?

If banks hold no excess reserves, then

money multiplier = 1/***R*** = 1/0.2 = 5

The maximum possible increase in deposits is

5 x $50 = $250

But money supply also includes currency, which falls by $50.

Hence, max increase in money supply = $200.

ACTIVE LEARNING 1

Answers

You deposit $50 in your checking account.

A. What is the maximum amount that the money supply could increase?

Answer: $200

B. What is the minimum amount that the money supply could increase?

Answer: $0

If your bank makes no loans from your deposit, currency falls by $50, deposits increase by $50, money supply does not change.

Three instruments of monetary policy

1. Open market operations
2. Reserve requirements
3. The discount rate

Open market operations

- *definition:*
  The purchase or sale of government bonds by the Federal Reserve.
- *how it works:*
  If Fed buys bonds from the public,
  it pays with new dollars, increasing M.

How the Fed Influences Reserves

- ***Open-Market Operations (OMOs)***:
  the purchase and sale of U.S. government bonds by the Fed.
  - If the Fed buys a government bond from a bank, it pays by depositing new reserves in that bank's reserve account.

    With more reserves, the bank can make more loans, increasing the money supply.
  - To decrease bank reserves and the money supply, the Fed sells government bonds.

Reserve requirements

- *definition:*
  Fed regulations that require banks to hold a minimum reserve-deposit ratio.
- *how it works:*
  Reserve requirements affect ***rr*** :
  If Fed reduces reserve requirements, then banks can make more loans and "create" more money from each deposit.

How the Fed Influences the Reserve Ratio

- Recall: reserve ratio = reserves/deposits, which inversely affects the money multiplier.
- The Fed sets ***reserve requirements***: regulations on the minimum amount of reserves banks must hold against deposits.

  Reducing reserve requirements would lower the reserve ratio and increase the money multiplier.

The discount rate

- *definition:*
  The interest rate that the Fed charges on loans it makes to banks.
- *how it works:*
  When banks borrow from the Fed, their reserves increase, allowing them to make more loans and "create" more money.

How the Fed Influences Reserves

- The Fed makes loans to banks, increasing their reserves.
  - Traditional method: adjusting the ***discount rate***—the interest rate on loans the Fed makes to banks—to influence the amount of reserves banks borrow
  - New method: *Term Auction Facility*—the Fed chooses the quantity of reserves it will loan, then banks bid against each other for these loans.
- The more banks borrow, the more reserves they have for funding new loans and increasing the money supply.

Which instrument is used most often?

- Open market operations:
  Most frequently used.
- Changes in reserve requirements:
  Least frequently used.
- Changes in the discount rate:
  Largely symbolic;

Problems Controlling the Money Supply

- If households hold more of their money as currency, banks have fewer reserves, make fewer loans, and money supply falls.
- If banks hold more reserves than required, they make fewer loans, and money supply falls.
- Yet, Fed can compensate for household and bank behavior to retain fairly precise control over the money supply.

Bank Runs and the Money Supply

- A ***run on banks***:
  When people suspect their banks are in trouble, they may "run" to the bank to withdraw their funds, holding more currency and less deposits.
- Under fractional-reserve banking, banks don't have enough reserves to pay off ALL depositors all at once, hence banks may have to close.

Bank Runs and the Money Supply

- This can happen even if the bank is not bankrupt, meaning that the assets are equal in value to the liabilities. The problem is that many of the assets are in ***illiquid*** form, such as loans that can't be called in instantaneously. These assets can't be converted to cash quickly enough to satisfy the demand for withdrawals.

Bank Runs and the Money Supply

- Banks that fear runs may make fewer loans and hold more reserves to satisfy depositors.
- These events increase $\boldsymbol{R}$, reverse the process of money creation, cause money supply to fall.

Bank Runs and the Money Supply

- During 1929–1933, a wave of bank runs and bank closings caused money supply to fall 28%.
- Many economists believe this contributed to the severity of the Great Depression.
- Since then, federal deposit insurance has helped prevent bank runs in the U.S.

SUMMARY

- Money serves three functions: medium of exchange, unit of account, and store of value.
- There are two types of money: commodity money has intrinsic value; fiat money does not.
- The U.S. uses fiat money, which includes currency and various types of bank deposits.

SUMMARY

- In a fractional reserve banking system, banks create money when they make loans. Bank reserves have a multiplier effect on the money supply.
- Because banks are highly leveraged, a small change in the value of a bank's assets causes a large change in bank capital. To protect depositors from bank insolvency, regulators impose minimum capital requirements.

SUMMARY

- The Federal Reserve is the central bank of the U.S., is responsible for regulating the monetary system.
- The Fed controls the money supply mainly through open-market operations. Purchasing govt bonds increases the money supply, selling govt bonds decreases it.
- In recent years, the Fed has set monetary policy by choosing a target for the federal funds rate.