

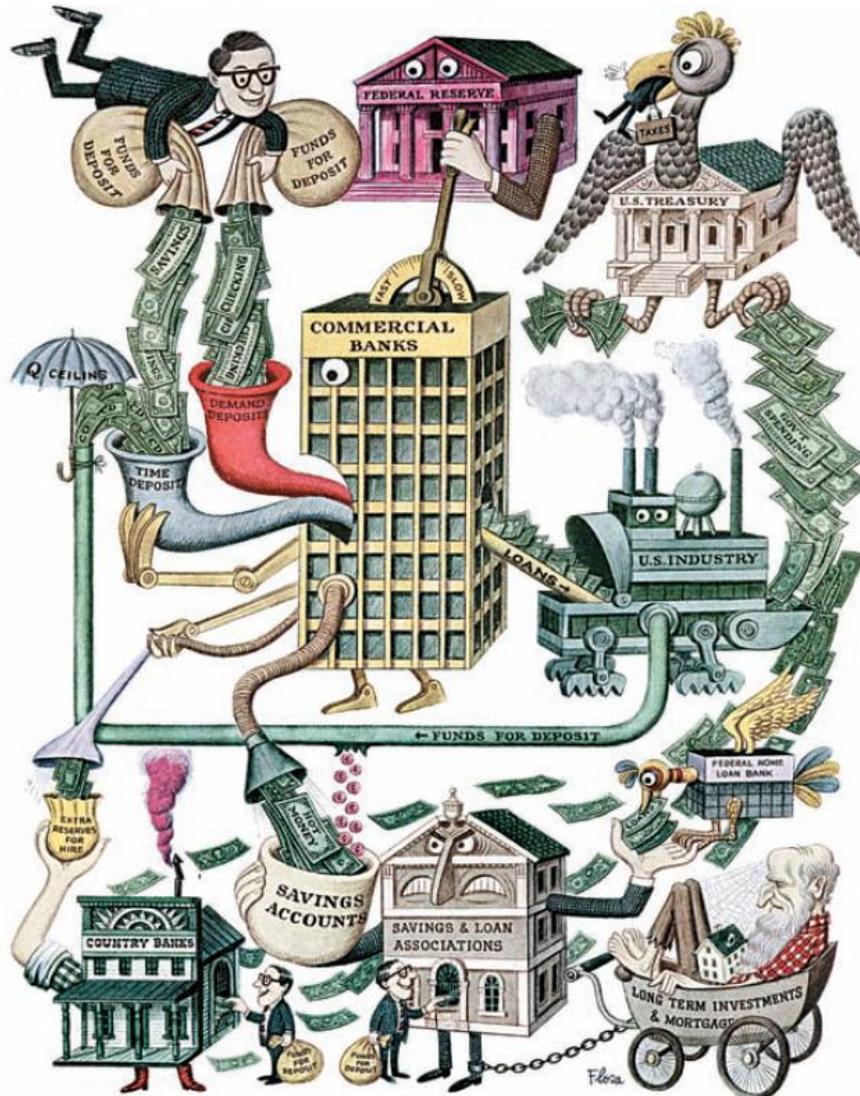
# chapter:

# 14

## >> **Money, Banking, and the Federal Reserve System**

**Krugman/Wells**

# The Meaning of Money



"The A Train is On the Banks," by James Flora, 1996. © Jim Flora Art LLC. Courtesy Irwin Chusid and Barbara Economon. www.jimflora.com

Money is the essential channel that links the various parts of the modern economy.

# The Meaning of Money

- **Money** is any asset that can easily be used to purchase goods and services.
- **Currency in circulation** is cash held by the public.
- **Checkable bank deposits** are bank accounts on which people can write checks.
- The **money supply** is the total value of financial assets in the economy that are considered money.

# Roles of Money

- A **medium of exchange** is an asset that individuals acquire for the purpose of trading rather than for their own consumption.
- A **store of value** is a means of holding purchasing power over time.
- A **unit of account** is a measure used to set prices and make economic calculations.

# Types of Money

- **Commodity money** is a good used as a medium of exchange that has other uses.
- **A commodity-backed money** is a medium of exchange with no intrinsic value whose ultimate value is guaranteed by a promise that it can be converted into valuable goods.
- **Fiat money** is a medium of exchange whose value derives entirely from its official status as a means of payment.

# Measuring the Money Supply

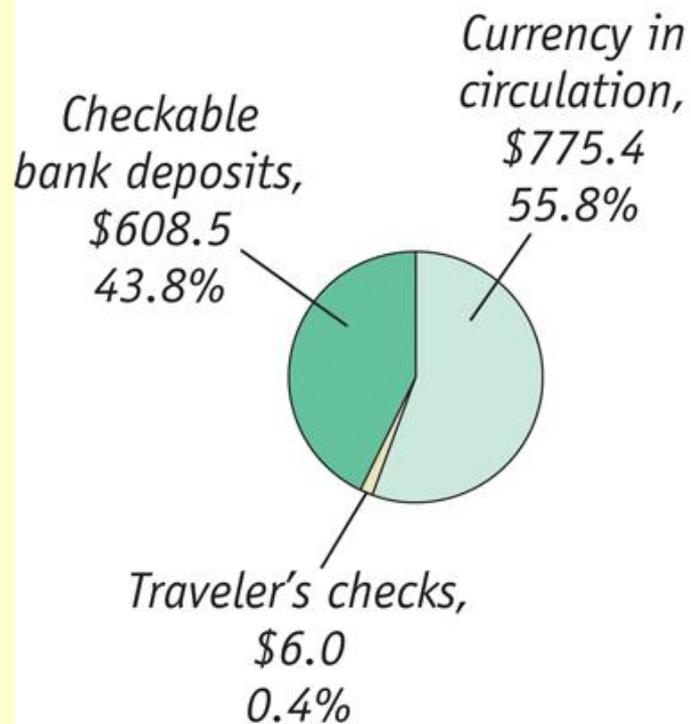
- A **monetary aggregate** is an overall measure of the money supply.
- **Near-moneys** are financial assets that can't be directly used as a medium of exchange but can readily be converted into cash or checkable bank deposits.

## What's not in the money supply

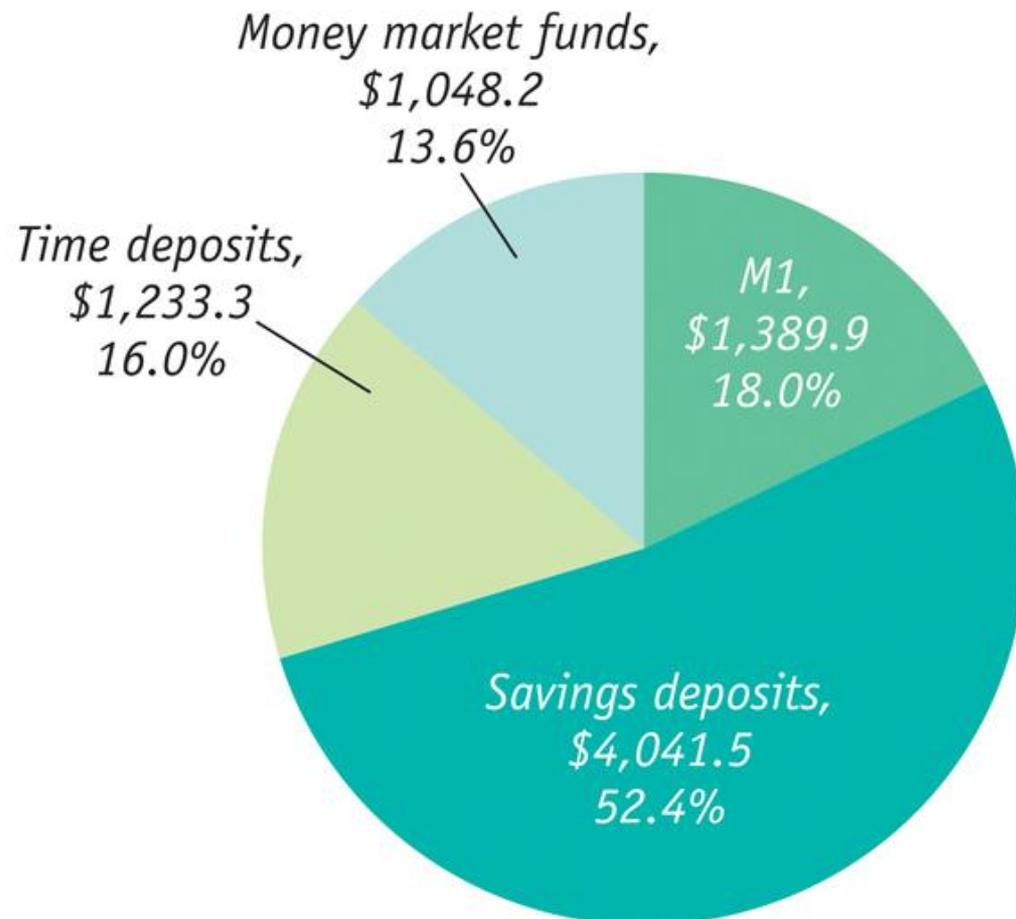
- Are financial assets like stocks and bonds part of the money supply? No, not under any definition, because they're not liquid enough. M1 consists, roughly speaking, of assets you can use to buy groceries: currency, traveler's checks, and checkable deposits. M2 is broader, because it includes things like savings accounts that can easily and quickly be converted into M1.
- Normally, for example, you can switch funds between your savings and checking accounts with a click of a mouse or a call to an automated phone service.
- By contrast, converting a stock or a bond into cash requires selling the stock or bond. That makes these assets much less liquid than bank deposits. So stocks and bonds, unlike bank deposits, aren't considered money.

# Monetary Aggregates, August 2008

(a) M1 = \$1,389.9  
(billions of dollars)



(b) M2 = \$7,712.9  
(billions of dollars)



## What's with All the Currency?

- \$775.4 billion of currency in circulation. That's \$2,570 in cash for every man, woman, and child in the United States. How many people do you know who carry \$2,570 in their wallets? Not many. So where is all that cash? Part of the answer is that it isn't in individuals' wallets: it's in cash registers.
- Economists also believe that cash plays an important role in transactions that people want to keep hidden. Small businesses and the self-employed sometimes prefer to be paid in cash so they can avoid paying taxes by hiding income from the Internal Revenue Service.
- The most important reason for those huge currency holdings, however, is foreign use of dollars. The Federal Reserve estimates that 60% of U.S. currency is actually held outside the United States.

## **The History of the Dollar**

- U.S. dollar bills are pure fiat money: they have no intrinsic value, and they are not backed by anything that does. But American money wasn't always like that. In the early days of European settlement, the colonies that would become the United States used commodity money, partly consisting of gold and silver coins minted in Europe. Later in American history, commodity-backed paper money came into widespread use.
- In 1933, when President Franklin D. Roosevelt broke the link between dollars and gold, his own federal budget declared ominously, "This will be the end of Western civilization." It wasn't. The link between the dollar and gold was restored a few years later, then dropped again—seemingly for good—in August 1971. Despite the warnings of doom, the U.S. dollar is still the world's most widely used currency.

# The Monetary Role of Banks

- A bank is a **financial intermediary** that uses liquid assets in the form of bank deposits to finance the illiquid investments of borrowers.
- A **T-account** is a tool for analyzing a business's financial position by showing, in a single table, the business's assets (on the left) and liabilities (on the right).
- **Bank reserves** are the currency banks hold in their vaults plus their deposits at the Federal Reserve.
- The **reserve ratio** is the fraction of bank deposits that a bank holds as reserves.

# Assets and Liabilities of First Street Bank

- A **T-account** summarizes a bank's financial position. The bank's assets, \$900,000 in outstanding loans to borrowers and reserves of \$100,000, are entered on the left side. Its liabilities, \$1,000,000 in bank deposits held for depositors, are entered on the right side.

Assets		Liabilities	
Loans	\$900,000	Deposits	\$1,000,000
Reserves	\$100,000		

# The Problem of Bank Runs

- A **bank run** is a phenomenon in which many of a bank's depositors try to withdraw their funds due to fears of a bank failure.
- Historically, they have often proved contagious, with a run on one bank leading to a loss of faith in other banks, causing additional bank runs.

# Bank Regulations

- **Deposit Insurance** - guarantees that a bank's depositors will be paid even if the bank can't come up with the funds, up to a maximum amount per account. The FDIC currently guarantees the first \$250,000 of each account.

# Bank Regulations

- **Capital Requirements** - regulators require that the owners of banks hold substantially more assets than the value of bank deposits. In practice, banks' capital is equal to 7% or more of their assets.

# Bank Regulations

- **Reserve Requirements** - rules set by the Federal Reserve that determine the minimum reserve ratio for a bank. For example, in the United States, the minimum reserve ratio for checkable bank deposits is 10%.
- The **discount window** is an arrangement in which the Federal Reserve stands ready to lend money to banks in trouble.

## **It's a Wonderful Banking System**

- There was a wave of bank runs in the early 1930s. To bring the panic to an end Franklin Delano Roosevelt declared a national “bank holiday,” closing all banks for a week to give bank regulators time to close unhealthy banks and certify healthy ones.
- Since then, regulation has protected the United States and other wealthy countries against most bank runs.
- There are some limits on deposit insurance; in particular, currently only the first \$250,000 of any bank account is insured. As a result, there can still be a rush out of a bank perceived as troubled.

# Determining the Money Supply

**Effect on the Money Supply of a Deposit at First Street Bank**  
**Initial Effect Before Bank Makes New Loans:**

Assets		Liabilities	
Loans		Deposits	+\$1,000
Reserves	+ \$1,000		

# Determining the Money Supply

**Effect on the Money Supply of a Deposit at First Street Bank**  
**Effect After Bank Makes New Loans:**

Assets		Liabilities
Loans	+ \$900	No change
Reserves	- \$900	

# How Banks Create Money

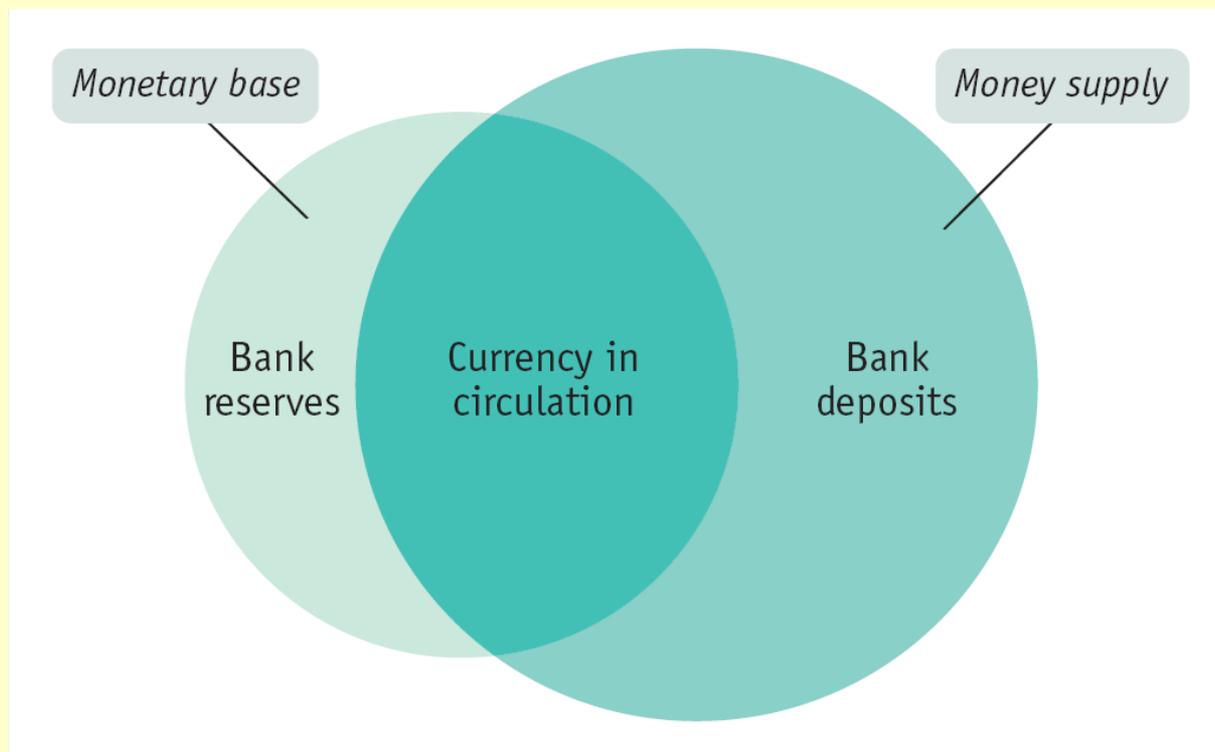
	Currency in circulation	Bank deposits	Money supply
<b>First stage</b> (Silas keeps his money under the bed)	\$1,000	0	\$1,000
<b>Second stage</b> (Silas deposits cash in First Street Bank, which lends out \$900 to Mary)	900	1,000	1,900
<b>Third stage</b> (Ann Acme deposits loan of \$900 in Second Street Bank, which lends out \$810)	810	1,900	2,710

# Reserves, Bank Deposits, and the Money Multiplier

- **Excess reserves** are bank reserves over and above its required reserves.
- Increase in bank deposits from \$1,000 in excess reserves =  
$$\$1,000 + \$1,000 \times (1 - rr) + \$1,000 \times (1 - rr)^2 + \$1,000 \times (1 - rr)^3 + \dots$$
- This can be simplified to:  
Increase in bank deposits from \$1,000 in excess reserves =  $\$1,000/rr$

# The Money Multiplier in Reality

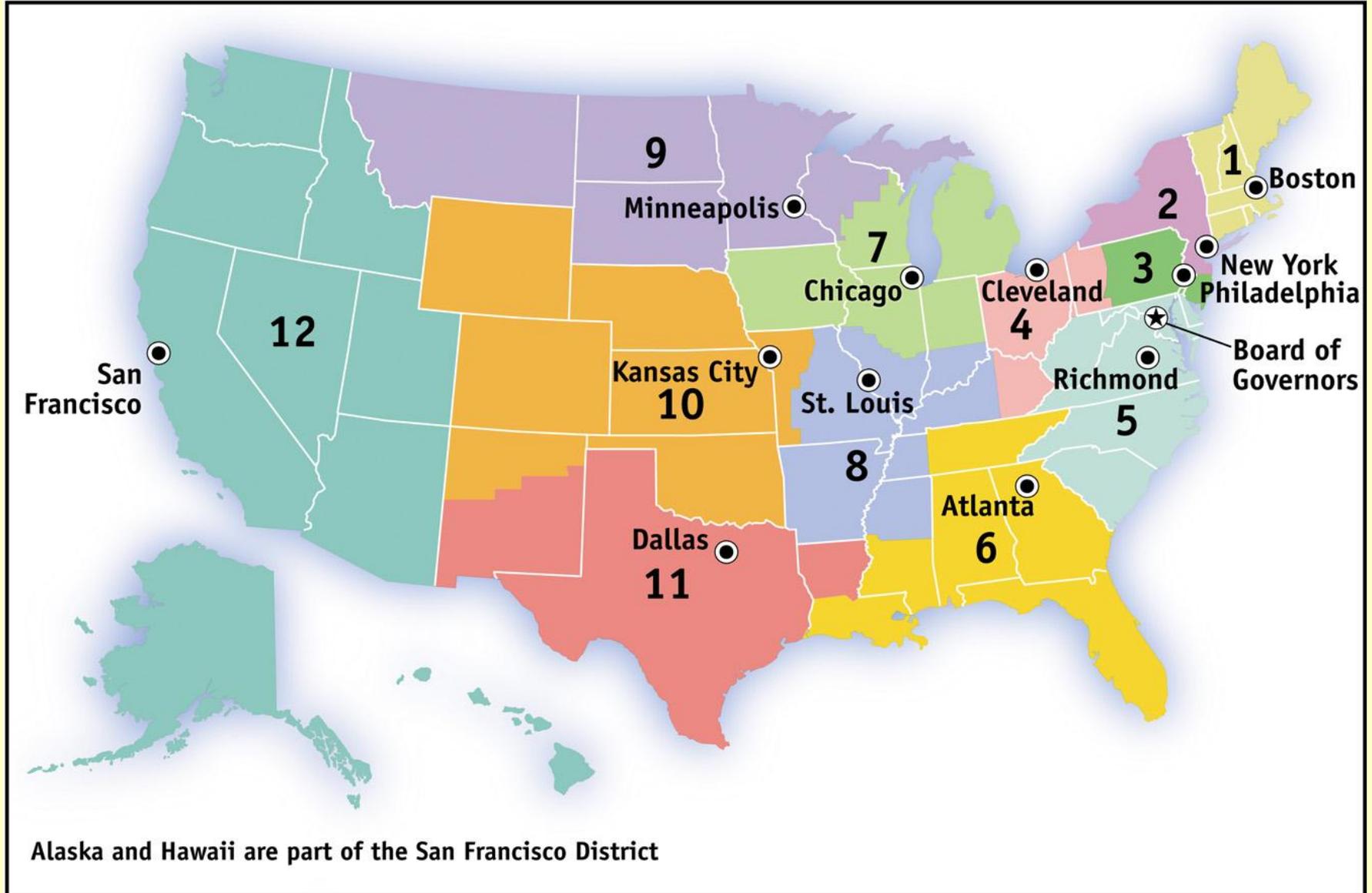
- The **monetary base** is the sum of currency in circulation and bank reserves.
- The **money multiplier** is the ratio of the money supply to the monetary base.



# The Federal Reserve System

- A **central bank** is an institution that oversees and regulates the banking system and controls the monetary base.
- The **Federal Reserve** is a central bank—an institution that oversees and regulates the banking system, and controls the monetary base.
- The Federal Reserve system consists of the Board of Governors in Washington, D.C., plus regional Federal Reserve Banks, each serving its district; of the 12 Federal Reserve districts:

# The Federal Reserve System



# Reserve Requirements and the Discount Rate

- The **federal funds market** allows banks that fall short of the reserve requirement to borrow funds from banks with excess reserves.
- The **federal funds rate** is the interest rate determined in the federal funds market.
- The **discount rate** is the rate of interest the Fed charges on loans to banks.

# Crisis in American Banking

- In response to the Panic of 1907, the Fed was created to centralize holding of reserves, inspect banks' books, and make the money supply sufficiently responsive to varying economic conditions.

# Responding to Banking Crises

- The Great Depression sparked widespread bank runs in the early 1930s, which greatly worsened and lengthened the depth of the Depression.
- Federal deposit insurance was created, and the government recapitalized banks by lending to them and by buying shares of banks.
- By 1933, banks had been separated into two categories: **commercial** (covered by deposit insurance) and **investment** (not covered).
- Public acceptance of deposit insurance finally stopped the bank runs of the Great Depression.

# The Savings and Loan Crisis of the 1980s

- The **savings and loan (thrift)** crisis of the 1980s arose because insufficiently regulated S&Ls engaged in overly risky speculation and incurred huge losses.
- Depositors in failed S&Ls were compensated with taxpayer funds because they were covered by deposit insurance.
- The crisis caused steep losses in the financial and real estate sectors, resulting in a recession in the early 1990s.

# Mid-1990s

- During the mid-1990s, the hedge fund LTCM (Long-Term Capital Management) used huge amounts of **leverage** to speculate in global financial markets, incurred massive losses, and collapsed.
- LTCM was so large that, in selling assets to cover its losses, it caused **balance sheet effects** for firms around the world, leading to the prospect of a **vicious cycle of deleveraging**.
- As a result, credit markets around the world froze.
- The New York Fed coordinated a private bailout of LTCM and revived world credit markets.

# The Financial Crisis of 2008

- **Subprime lending** during the U.S. housing bubble of the mid-2000s spread through the financial system via **securitization**.
- When the bubble burst, massive losses by banks and nonbank financial institutions led to widespread collapse in the financial system.
- To prevent another Great Depression, the Fed and the U.S. Treasury expanded lending to bank and nonbank institutions, provided capital through the purchase of bank shares, and purchased private debt.

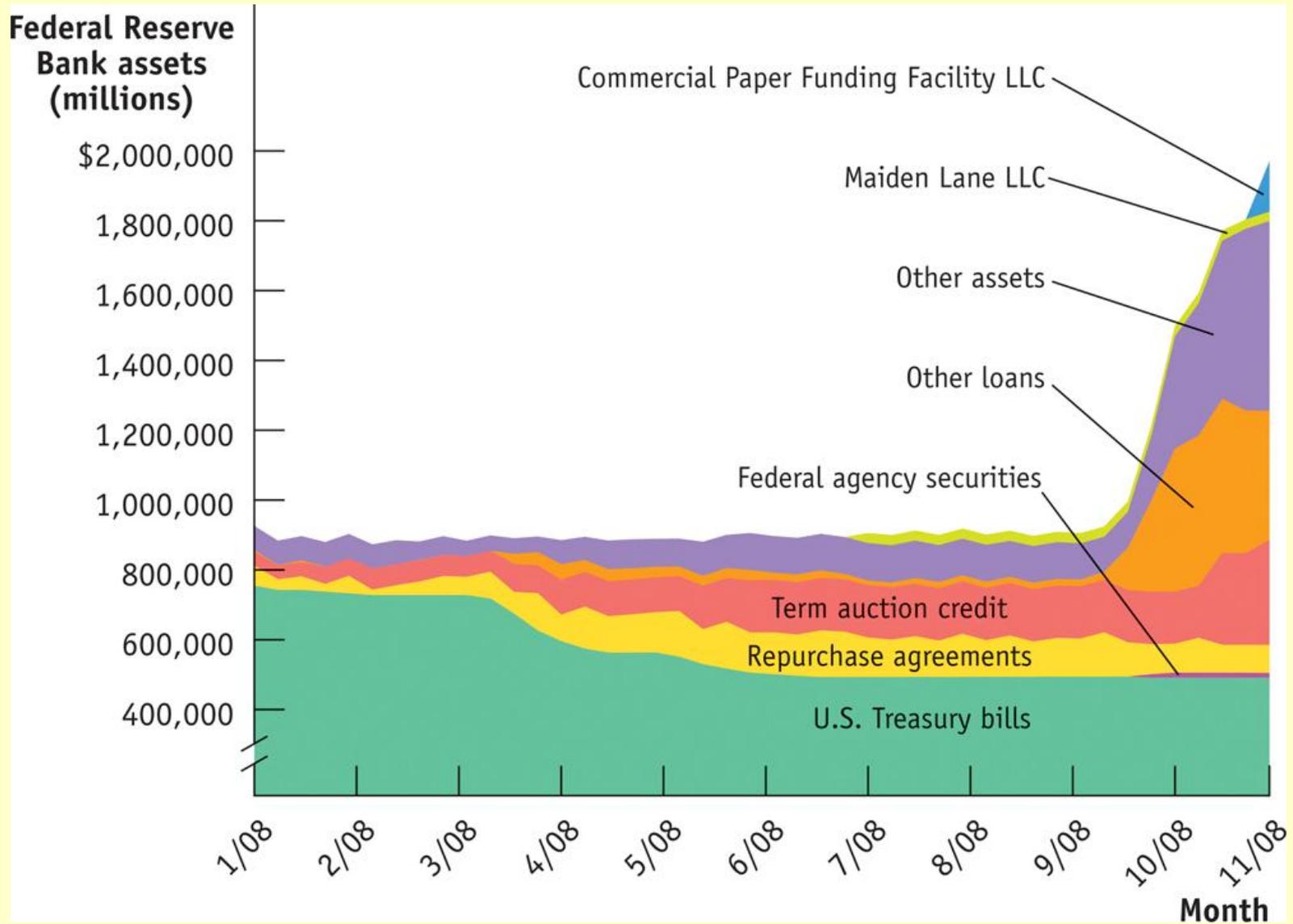
# The Financial Crisis of 2008

- Because much of the crisis originated in nontraditional bank institutions, the crisis of 2008 indicated that a wider safety net and broader regulation are needed in the financial sector.

## **The 2008 Crisis and the Fed**

- Fed officials believed that this change in standard operating procedure was necessary to stave off an even more severe financial crisis.
- Usually, the Fed invests only in U.S. government debt, which is considered a very safe asset; the same could not be said of many of the loans made during 2008.
- Normally, the Federal Reserve holds almost no assets other than U.S. Treasury bills.
- In response to the 2008 financial crisis, however, the Fed created an alphabet soup of special “facilities” to lend money to troubled financial institutions, leading to a dramatic shift in its balance sheet.

# The Fed Responds to the Crisis



**1. Money** is any asset that can easily be used to purchase goods and services. **Currency in circulation** and **checkable bank deposits** are both considered part of the **money supply**. Money plays three roles: it is a **medium of exchange** used for transactions, a **store of value** that holds purchasing power over time, and a **unit of account** in which prices are stated.

**2.** Over time, **commodity money**, which consists of goods possessing value aside from their role as money, such as gold and silver coins, was replaced by **commodity-backed money**, such as paper currency backed by gold. Today the dollar is pure **fiat money**, whose value derives solely from its official role.

3. The Federal Reserve calculates two measures of the money supply. M1 is the narrowest **monetary aggregate**, containing only currency in circulation, traveler's checks, and checkable bank deposits. M2 includes a wider range of assets called **near-moneys**, mainly other forms of bank deposits, that can easily be converted into checkable bank deposits.

4. Banks allow depositors immediate access to their funds, but they also lend out most of the funds deposited in their care. To meet demands for cash, they maintain **bank reserves** composed of both currency held in vaults and deposits at the Federal Reserve. The **reserve ratio** is the ratio of bank reserves to bank deposits. A **T-account** summarizes a bank's financial position.

5. Banks have sometimes been subject to **bank runs**, most notably in the early 1930s. To avert this danger, depositors are now protected by **deposit insurance**, bank owners face capital requirements that reduce the incentive to make overly risky loans with depositors' funds, and banks must satisfy **reserve requirements**.

6. When currency is deposited in a bank, it starts a multiplier process in which banks lend out **excess reserves**, leading to an increase in the money supply—so banks create money. If the entire money supply consisted of checkable bank deposits, the money supply would be equal to the value of reserves divided by the reserve ratio. In reality, much of the **monetary base** consists of currency in circulation, and the **money multiplier** is the ratio of the money supply to the monetary base.

7. The monetary base is controlled by the Federal Reserve, the **central bank** of the United States. The Fed regulates banks and sets reserve requirements. To meet those requirements, banks borrow and lend reserves in the **federal funds market** at the **federal funds rate**. Through the **discount window** facility, banks can borrow from the Fed at the **discount rate**.
8. **Open-market operations** by the Fed are the principal tool of monetary policy: the Fed can increase or reduce the monetary base by buying U.S. Treasury bills from banks or selling U.S. Treasury bills to banks.
9. In response to the Panic of 1907, the Fed was created to centralize holding of reserves, inspect banks' books, and make the money supply sufficiently responsive to varying economic conditions.

**10.** The Great Depression sparked widespread bank runs in the early 1930s, which greatly worsened and lengthened the depth of the Depression. Federal deposit insurance was created, and the government recapitalized banks by lending to them and by buying shares of banks. By 1933, banks had been separated into two categories: **commercial** (covered by deposit insurance) and **investment** (not covered). Public acceptance of deposit insurance finally stopped the bank runs of the Great Depression.

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**12.** During the mid-1990s, the hedge fund LTCM used huge amounts of **leverage** to speculate in global financial markets, incurred massive losses, and collapsed. LTCM was so large that, in selling assets to cover its losses, it caused **balance sheet effects** for firms around the world, leading to the prospect of a **vicious cycle of deleveraging**. As a result, credit markets around the world froze. The New York Fed coordinated a private bailout of LTCM and revived world credit markets.

**13. Subprime lending** during the U.S. housing bubble of the mid-2000s spread through the financial system via **securitization**. When the bubble burst, massive losses by banks and nonbank financial institutions led to widespread collapse in the financial system. To prevent another Great Depression, the Fed and the U.S. Treasury expanded lending to bank and nonbank institutions, provided capital through the purchase of bank shares, and purchased private debt. Because much of the crisis originated in nontraditional bank institutions, the crisis of 2008 indicated that a wider safety net and broader regulation are needed in the financial sector.