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Gwartney - Stroup
Sobel - Macpherson

Money and the Banking System

Full Length Text — Part: 3 Chapter: 12
Macro Only Text — Part: 3 Chapter: 12

To Accompany "Economics: Private and Public Choice 12th ed."
James Gwartney, Richard Stroup, Russell Sobel, & David Macpherson
Slides authored and animated by:
James Gwartney, David Macpherson, & Charles Skipton

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What Is Money?

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What is Money?

"Money is whatever is generally accepted in exchange for goods and services — accepted not as an object to be consumed but as an object that represents a temporary abode of purchasing power to be used for buying still other goods and services."

— Milton Friedman (1992)

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What is Money?

- A **medium of exchange**:
an asset used to buy and sell goods and services.
- A **store of value**:
an asset that allows people to transfer purchasing power from one period to another.
- A **unit of account**:
a unit of measurement used by people to post prices and keep track of revenues and costs.

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Why Is Money Valuable?

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Why is Money Valuable?

- The main thing that makes money valuable is the same thing that generates value for other commodities:
 - the demand (*for money*) relative to its supply.
- People demand money because it reduces the cost of exchange.
- When the supply of money is limited relative to the demand, money will be valuable.
- If the purchasing power of money is to remain stable over time, then its supply must be limited.

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The Supply of Money

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How the Money Supply is Measured

- Two basic measurements of the money supply are **M1** and **M2**:
 - The components of **M1** are:
 - Currency,
 - Checking deposits, and, (including demand deposits and interest-earning checking deposits)
 - Traveler's checks .
 - **M2** (a broader measure of money) includes:
 - **M1**,
 - Savings,
 - Time deposits, and,
 - Money market mutual funds.

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The Composition of Money in the U.S.

*The M1 and M2 Money Supply of the U.S.
(as of December 2006)*

Money Supply, M1 (in billions)		
Currency (in circulation)	\$754	\$1,388
Demand deposits	318	
Other checkable deposits	309	
Traveler's checks	7	
Total M1	\$1,388	

Money Supply, M2 (in billions)		
M1	\$1,388	\$7,068
Savings deposits ^a	3,711	
Small time deposits	1,160	
Money market mutual funds	809	
Total M2	\$7,068	

^a Including money market deposit accounts. Source: <http://www.federalreserve.gov>.

- The size and composition of the two most widely used measures of U.S. money supply (**M1** & **M2**) are shown above.

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Credit Cards versus Money

- Money is an asset.
- The use of a credit card is merely a convenient way to arrange for a loan.
- Credit card balances are a liability.
- Thus, credit card purchases are not money.

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The Business of Banking

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The Business of Banking

- The banking industry includes:
 - commercial banks,
 - savings and loans, and,
 - credit unions.
- Banks are profit-seeking institutions:
 - Banks accept deposits and use part of them to extend loans and make investments. This is their major source of revenue.
- Banks play a central role in the capital market (*loanable funds market*):
 - They help to bring together people who want to save for the future with those who want to borrow for current investment projects.

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The Functions of Commercial Banking Institutions

Consolidated Balance Sheet of Commercial Banking Institutions
Year-end 2006 (billions of \$)

Assets		Liabilities	
Vault cash	\$ 28	Checking deposits	\$ 499
Reserves at the Fed	7	Savings and time deposits	5,811
Loans outstanding	6,086	Borrowings	1,959
U.S. government securities	1,198	Other liabilities	625
Other securities	1,027	Net worth	841
Other assets	1,389		
Total	\$ 9,735	Total	\$ 9,735

- Banks provide services and pay interest to attract checking, savings, and time deposits (*liabilities*).
- Most of these deposits are invested and loaned out, providing interest income for the bank.
- Banks hold a portion of their assets as reserves (*either as cash or deposits with the Fed*) to meet their daily obligations toward their depositors.

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How Banks Create Money by Extending Loans

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Fractional Reserve Banking

- The U.S. banking system is a **fractional reserve** system; banks are required to maintain only a fraction of their assets as reserves against the deposits of their customers (**required reserves**).
 - Vault cash and deposits held with the Federal Reserve count as reserves.
- **Excess reserves** (*actual reserves in excess of the legal requirement*) can be used to extend new loans and make new investments.
- Under a **fractional reserve** system, an increase in deposits will provide the bank with excess reserves and place it in a position to extend additional loans, and thereby expand the money supply.

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Creating Money from New Reserves

Bank	New cash deposits: Actual Reserves	New Required Reserves	Potential demand deposits created by extending new loans
Initial deposit (bank A)	\$1,000.00	\$200.00	\$800.00
Second stage (bank B)	800.00	160.00	640.00
Third stage (bank C)	640.00	128.00	512.00
Fourth stage (bank D)	512.00	102.40	409.60
Fifth stage (bank E)	409.60	81.92	327.68
Sixth stage (bank F)	327.68	65.54	262.14
Seventh stage (bank G)	262.14	52.43	209.71
All others (other banks)	1,048.58	209.71	838.87
Total	\$5,000.00	\$1,000.00	\$4,000.00

- When banks are required to maintain 20% reserves against demand deposits, the creation of \$1,000 of new reserves will potentially increase the supply of money by \$5,000.

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How Banks Create Money by Extending Loans

- The lower the percentage of the reserve requirement, the greater the potential expansion in the money supply resulting from the creation of new reserves.
- The fractional reserve requirement places a ceiling on potential money creation from new reserves.
- The actual deposit multiplier will be less than the potential because:
 - some persons will hold currency rather than bank deposits, and,
 - some banks may not use all their excess reserves to extend loans.

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Questions for Thought:

- What is money? What are the three major functions of money?
- What are the major services provided by money? Would money provide its users with more service if there was twice as much of it?
- Is money an asset or a liability? Are outstanding credit card balances counted as part of the money supply? Why or why not?
- What is the primary source of earnings of commercial banks?
- What is a fractional reserve banking system? How does it influence the ability of banks to create money? Is it likely that banks will hold excess reserves? Why or why not?

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Questions for Thought:

6. Suppose you withdraw \$1,000 from your checking account. How does this affect

- (a) the supply of money,
- (b) the reserves of your bank, and,
- (c) the excess reserves of your bank?

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The Federal Reserve System

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The Federal Reserve

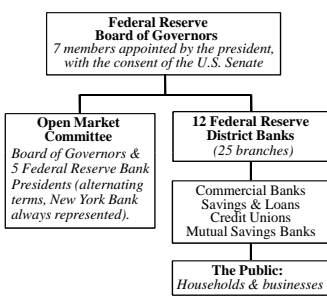
- The Federal Reserve (the Fed), created in 1913, is *the* central bank for the United States.
- The Federal Reserve is responsible for the creation of a stable monetary climate for the entire U.S. economy.
 - It controls the money supply of the U.S.,
 - serves as a “banker’s bank” or “bank of last resort” for commercial U.S. banks, and,
 - regulates the commercial banking sector.
- In short, the Federal Reserve is responsible for the conduct of U.S. *monetary policy*.

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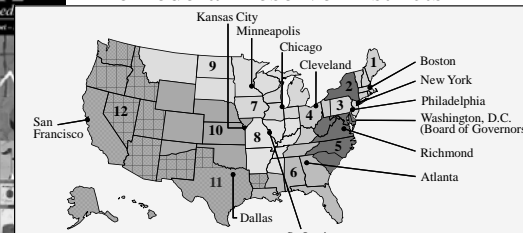
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The Federal Reserve System

- The **Board of Governors** is at the center of Federal Reserve operations.
 - The board sets all the rates and regulations for the depository institutions.
- The seven members of the Board of Governors also serve on the **Federal Open Market Committee (FOMC)**.
- The **FOMC** is a 12-member board that establishes Fed policy regarding the buying and selling of government securities.



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The Federal Reserve Districts



- The map indicates the 12 Federal Reserve districts and the cities in which the district banks are located.
- Each district bank monitors the commercial banks in their region and assists them with the clearing of checks.
- The Board of Governors of the Federal Reserve System is located in Washington D.C.


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The Independence of the Fed

- The independence of the Federal Reserve system strengthens its ability to pursue long-term monetary policies.
- This stems from:
 - the lengthy terms of the members of the **Board of Governors** (14 years), and,
 - the fact that the Fed’s revenues are derived from interest on the bonds that it holds rather than allocations from Congress.

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How the Fed Controls the Money Supply

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The Three Tools the Fed Uses to Control the Money Supply

- The Fed has three major tools that it can use to control the money supply:
 - **Reserve requirements**
 - setting the fraction of assets that banks must hold as reserves (vault cash or deposits with the Fed), against their checking deposits,
 - **Open market operations**
 - the buying and selling of U.S. government securities in the open market, and,
 - **Discount rate**
 - setting the interest rate at which it loans funds to commercial banks and other depository institutions.

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Controlling the Money Supply: Setting Reserve Requirements

- **Reserve requirements:** a percent of a specified liability category (for example checking deposits) that banking institutions are required to hold as reserves against that type of liability.
 - When the Fed **lowers the required reserve ratio**, it creates excess reserves for commercial banks allowing them to extend additional loans, expanding the money supply.
 - **Raising the reserve requirements** has the opposite effect.

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Controlling the Money Supply: Open Market Operations

- **Open Market Operations:** the buying and selling of U.S. Treasury bonds by the Fed.
 - This is the primary tool used by the Federal Reserve to control the money supply.
 - Note: the U.S. Treasury bonds held by the Fed are part of the *national debt*.

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Controlling the Money Supply: Open Market Operations

- **Open Market Operations:** the buying and selling of U.S. Treasury bonds by the Fed.
 - When the **Fed buys bonds** ... the *money supply expands* because:
 - bond buyers acquire money
 - bank reserves increase, placing banks in a position to expand the money supply through the extension of additional loans
 - When the **Fed sells bonds** ... the *money supply contracts* because:
 - bond buyers give up money for securities
 - bank reserves decline, causing them to extend fewer loans

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Controlling the Money Supply: The Discount Rate

- **Discount Rate:** the interest rate the Fed charges banking institutions for borrowed funds
- The discount rate is closely related to the interest rate in the **federal funds market**, a private loanable funds market where banks with excess reserves extend short-term loans to other banks trying to meet their reserve requirements.
 - The interest rate in this market is called the *federal funds rate*.

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Controlling the Money Supply: The Discount Rate

- Under the operating procedures adopted in 2003, the Fed now charges most banks a discount rate that is slightly higher than the federal funds rate.
- If the Fed wanted to reduce the supply of money it would **increase the differential** between the discount and federal funds interest rates.
 - A **decrease in the differential** would have the opposite affect.

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Controlling the Federal Funds Rate

- Announcements after the regular meetings of the *Federal Open Market Committee* often focus on the Fed's target for the fed funds rate.
- The Fed controls the federal funds rate through open market operations.
 - The Fed can **reduce the fed funds rate** by **buying bonds**, which will inject additional reserves into the banking system.
 - The Fed can **increase the fed funds rate** by **selling bonds**, which drains reserves from the banking system.
- Thus, though the media often focuses on the Fed's target fed funds rate, the Fed is still using open market operations to influence this rate and control the money supply.

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Monetary Base and Money Supply


monetary base = \$797
(currency + bank reserves)

* Traveler's checks are included in this category.

- The **monetary base** is currency plus bank reserves.
- Bank reserves provide the base for checking deposits and the currency in circulation is also part of the money supply.
- Fed actions that alter the monetary base affect money supply:
 - The Fed **reduces the money supply** by increasing reserve requirements, selling bonds, or increasing the discount rate.
 - The Fed **increases the money supply** by decreasing reserve requirements, buying bonds, or decreasing the discount rate.

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Difference between the Fed and Treasury

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The Functions of the Fed and Treasury

- **The U.S. Treasury:**
 - is concerned with the finance of the federal government
 - issues bonds to the general public to finance the budget deficits of the federal government
 - does not determine the money supply
- **The Federal Reserve:**
 - is concerned with the monetary climate for the economy
 - does not issue bonds
 - determines the money supply — primarily through its buying and selling of bonds issued by the *U.S. Treasury*

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Questions for Thought:

1. How will the following actions affect the money supply?
 - a. a reduction in the discount rate
 - b. an increase in the reserve requirements
 - c. the purchase by the Fed of \$100 million of U.S. securities from a commercial bank
 - d. the sale by the U.S. Treasury of \$100 million of newly issued bonds to a commercial bank
 - e. the sale by the Fed of \$200 million of U.S. securities to a private investor

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Questions for Thought:

2. Are the following statements true or false?

- a. Interest earned on its bond holdings provides the Fed with income that is substantially greater than the cost of its operation.
- b. Congressional appropriations provide the Fed with the funds to cover the cost of its operations.
- c. After deducting its expenses, the net earnings of the Federal Reserve System are turned over to the U.S. Treasury.

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Questions for Thought:

3. "The Fed controls the federal funds interest rate by imposing legal restrictions that prohibit exchanges at interest rates other than the one imposed by the Fed."
-- Is this statement *true*?

4. Are the following statements *true or false*?

- a. "When the Fed sells bonds, this action will provide banks with additional reserves and thereby place downward pressure on short term interest rates."
- b. "If the Fed wanted to expand the money supply, it could do so by increasing its purchases of U.S. Treasury bonds."

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Questions for Thought:


5. The Fed's ability to purchase U.S. securities and thereby expand the money supply is

- a. *limited* by the gold requirement; the Fed cannot write a check unless it has a sufficient amount of gold to back the newly created money.
- b. *limited* by reserve requirements; the Fed must maintain 20 percent of its assets in the form of cash against the deposits that it is holding for commercial banks.
- c. *unlimited*; the Fed can create money simply by writing a check on itself.

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Ambiguities in the Meaning and Measurement of Money

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The Changing Nature of Money

- In the past, economists have often used the growth rate of the money supply to gauge the direction of monetary policy.
 - **rapid growth** was indicative of *expansionary* monetary policy, while,
 - **slow growth** (or a contraction in the money supply) was indicative of *restrictive* policy.
- Recent financial innovations and structural changes have changed the nature of money and reduced the reliability of money growth figures as an indicator of monetary policy.

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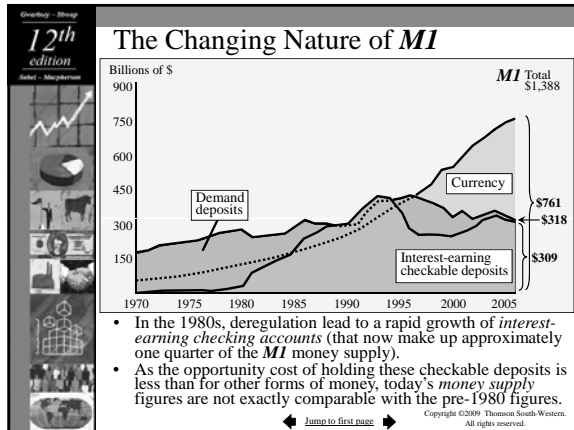


The Changing Nature of Money

- The introduction of *interest earning checking accounts* in the early 1980s reduced the opportunity cost of holding checking deposits and thereby changed the nature of the *M1* money supply.
- In the 1990s, many depositors shifted funds from interest earning checking accounts to *money market mutual funds*. Because *money market mutual funds* are not included in *M1* this also reduced the comparability of the *M1* figures across time periods.

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Three Factors that have Changed the Nature of Money

- In addition, three other factors are altering the nature of money and reducing the value of the money growth figures as an indicator of monetary policy:
 - **Widespread use of the dollar abroad:**
At least one-half and perhaps as much as two-thirds of U.S. dollar currency is held abroad, and these holdings appear to be increasing. These dollars are included in the M1 money supply even though they are not circulating in the U.S..

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Three Factors that have Changed the Nature of Money (cont.)

- **Increasing availability of low-fee stock and bond mutual funds:**
Because stock and bond mutual funds are not included in any of the money aggregates, movement of funds from various M1 and M2 components into these mutual funds distorts both the M1 and M2 figures.
- **Debit cards and electronic money:**
Increased use of debit cards and various forms of electronic money will reduce the demand for currency. Like other changes in the nature of money, these innovations will reduce the reliability of the money supply figures as an indicator of monetary policy.

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The Changing Nature of Money Around the World

- Twelve European nations (*Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain*) now use a single European currency called the *euro*. Monetary policy for this currency is conducted by the European central bank.
- Several countries (*Panama and Ecuador for example*) either directly use the dollar or tie their domestic currency to the dollar.
- As international trade expands and people around the world search for access to sound money, the number of currencies is likely to decline in the future.

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Questions for Thought:

1. Which of the following is true?
 - a. In recent years, financial innovations have altered the nature of money and reduced the reliability of the money supply figures as an indicator of monetary policy.
 - b. Currency held outside of the United States is excluded from the M1 money supply figures.
 - c. There is no reason to believe that the nature of money will change much in the future.
2. How has the nature of the M1 money supply changed in recent years? How have these changes influenced the usefulness of M1 as an indicator of monetary policy?

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Questions for Thought:

3. Why do foreigners often hold U.S. dollars? How does the holding of dollars by foreigners affect the welfare of Americans?
4. "The U.S. Treasury expands the supply of money when it runs a budget deficit."
-- Is this statement *true*?
5. Suppose all banks are subject to a uniform reserve requirement of 20% and that the First Guarantee Bank has no excess reserves. If a new customer deposits \$50,000, the bank could extend new loans up to a maximum of:
a. \$40,000 b. \$50,000 c. \$250,000

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Questions for Thought:

6. (a) How has the adoption of the euro throughout much of Europe affected the cost of trade across national boundaries in Europe? How does this affect their income level and living standards?

(b) What is the currency of Panama? How does the use of this currency affect the ability of Panamanians to trade with people in other countries?

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**End
Chapter 12**

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