# EE432 Monetary Theory and Policy

**Lecture 1 Money and the Financial System**

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# Course Evaluation

- EE432 is textbook-based.
- Students are required to read all lecture notes and should have access to this online textbook. The primary text book is:

Cecchetti, Stephen and Schoenholtz, Kermit. (2017) Money, banking, and financial markets. McGraw-Hill.

# Course Evaluation

The course will be assessed by

- Pre-class reading quizzes 15%
- After-class quiz assignments 20%
- Mid-term examination 25%

  9 Mar 2019 1.00-3.00 PM

- Final examination 40%

  25 May 2019 9 AM - noon

# Course Evaluation

- Individual pre-class reading quizzes (multiple choices) 15%
  - 13 times throughout semester as details shown in the class schedule below
- Individual after-class quiz assignments (multiple choices) 20%

  4 times throughout semester, each worth 5%.

  The dates below are the due dates for the out-of-class quiz assignments:
  - Quiz assignment 1 (covering textbook chapter 1-7): 15 February
  - Quiz assignment 2 (covering textbook chapter 8,9,11,12,13,14): 1 March
  - Quiz assignment 3 (covering textbook chapter 15,17,18): 6 April
  - Quiz assignment 4 (covering textbook chapter 19,21): 27 April

# Class Schedule

| Week | Topic | Date |
|---|---|---|
| 1 | Money and the Financial System<br>(Cecchetti & Schoenholtz Textbook Chapter 1-3) | 19 Jan 2019 |
| 2 | Present value, interest rate and risk<br>(Cecchetti & Schoenholtz Textbook Chapter 4-5)<br># Pre-class reading quiz 1 for Chapter 4-5, worth 1% | 26 Jan 2019 |
| 3 | Bond price and term structure of interest rates<br>(Cecchetti & Schoenholtz Textbook Chapter 6-7)<br># Pre-class reading quiz 2 for Chapter 6-7, worth 1% | 2 Feb 2019 |
| 4 | Stocks and Derivatives<br>(Cecchetti & Schoenholtz Textbook Chapter 8-9)<br># Pre-class reading quiz 3 for Chapter 8-9, worth 1% | 9 Feb 2019 |
| 5 | The Economics of Financial Intermediation<br>(Cecchetti & Schoenholtz Textbook Chapter 11-12)<br># Pre-class reading quiz 4 for Chapter 11-12, worth 1% | 16 Feb 2019 |
| 6 | Financial Industry Structure<br>(Cecchetti & Schoenholtz Textbook Chapter 13-14)<br># Pre-class reading quiz 5 for Chapter 13-14, worth 1% | 23 Feb 2019 |
| 7 | Foreign Exchange<br>(Cecchetti & Schoenholtz Textbook Chapter 10)<br># Pre-class reading quiz 6 for Chapter 10, worth 1% | 2 Mar 2019 |

| Week | Topic | Date |
|---|---|---|
| 8 | Central banks<br>(Cecchetti & Schoenholtz Textbook Chapter 15, 17)<br>*# Pre-class reading quiz 7 for Chapter 15&17, worth 1%* | 16 Mar 2019 |
| 9 | Monetary policy: stabilizing the domestic economy<br>(Cecchetti & Schoenholtz Textbook Chapter 18)<br>*# Pre-class reading quiz 8 for Chapter 18,* ***worth 2%*** | 23 Mar 2019 |
| 10 | Output, inflation, and monetary policy<br>(Cecchetti & Schoenholtz Textbook Chapter 21)<br>*# Pre-class reading quiz 9 for Chapter 13-14,* ***worth 2%*** | 30 Mar 2019 |
| 11 | Exchange rate policy<br>(Cecchetti & Schoenholtz Textbook Chapter 19)<br>*# Pre-class reading quiz 10 for Chapter 19, worth 1%* | * 28 Mar 2019<br>5-8 PM (Make-up class) |
| 12 | Understanding business cycle fluctuations<br>(Cecchetti & Schoenholtz Textbook Chapter 22)<br>*# Pre-class reading quiz 11 for Chapter 22, worth 1%* | 20 Apr 2019 |
| 13 | Money growth and money demand<br>(Cecchetti & Schoenholtz Textbook Chapter 20)<br>*# Pre-class reading quiz 12 for Chapter 20, worth 1%* | 27 Apr 2019 |
| 14 | Modern monetary policy and the challenges<br>(Cecchetti & Schoenholtz Textbook Chapter 23)<br>*# Pre-class reading quiz 13 for Chapter 23, worth 1%* | 4 May 2019 |
| 15 | Special topic: New Keynesian monetary economics | 11 May 2019 |

# Chapter 1

# An Introduction to Money and the Financial System

# Introduction

- Every financial transaction has a story.
- There is a complex web of interdependent institutions and markets making up the foundation of daily financial transactions:
  1. The Six Parts of the Financial System.
  2. The Five Core Principles of Money and Banking.

# Six Parts of the Financial System

1. **Money**

   To pay for purchases and store wealth.

2. **Financial Instruments**

   To transfer resources from savers to investors and to transfer risk to those best equipped to bear it.

3. **Financial Markets**

   To buy and sell financial instruments.

4. **Financial Institutions**

   To provide access to financial markets, collect information & provide services.

5. **Regulatory Agencies**

   To provide oversight for financial system.

6. **Central Banks**

   To monitor financial Institutions and stabilize the economy.

# Six Parts of the Financial System

1. **Money**
   - Money has changed from gold/silver coins to paper currency to electronic funds.
   - Cash can be obtained from an ATM any where in the world.
   - Bills are paid and transactions are checked online.

# Six Parts of the Financial System

## 2. Financial instruments

- Transfers resources from savers to investors
- Buying and selling individual stocks used to be only for the wealthy.
- Today we have mutual funds and other stocks available through banks or online.
- Putting together a portfolio is open to everyone.

# Six Parts of the Financial System

## 3. Financial Markets

- Allow the buying and selling of financial instruments easily
- Went from being in coffee houses and tavern to well organized markets like the New York Stock Exchange.
- Now transactions are mostly handled by electronic markets.
  - This has reduced the cost of processing financial transactions making the way for a much broader array of financial instruments available.

# Six Parts of the Financial System

## 4. Financial Institutions

- Provide all the services of the financial system like providing access to financial markets and gathering information
- Banks began as vaults, developed into institutions that accepted deposits and gave loans, and evolved to today's financial supermarket.

# Six Parts of the Financial System

5. **Government regulatory agencies**
   - Make sure the elements of the financial system operate safely and reliably.
   - Government regulatory agencies were introduced by federal government after the Great Depression.
   - They provide wide-ranging financial regulation, rules, and supervision; and examine the systems a bank uses to manage its risk.
   - The 2007-2009 financial crises has led governments to greater regulation, such as the Dodd-Frank Wall Street Reform and Consumer Protection Act

# Six Parts of the Financial System

6. **Central banks**
   - They monitor and stabilize the financial system
   - Central banks began as large private banks to finance wars.
   - Central banks control the availability of money and credit to promote low inflation, high growth and stability of financial system.
   - Today's policymakers strive for transparency in their operations.
   - The financial crisis of 2007-2009 have lead the U.S. central bank to try many new policy tools.

# Five Core Principles of Money and Banking

1. Time has value.
2. Risk requires compensation.
3. Information is the basis for decisions.
4. Markets determine prices and allocate resources.
5. Stability improves welfare.

# Five Core Principles of Money and Banking


**Core Principle 1: Time has value**

- Time affects the value of financial instruments.
- Interest is paid to compensate the lenders for the time the borrowers have their money.
- Chapter 4 develops an understanding of interest rates and how to use them.

# Five Core Principles of Money and Banking


**Core Principle 2: Risk requires compensation**

- In a world of uncertainty, individuals will accept risk only if they are compensated.
- In the financial world, compensation comes in the form of explicit payments: the higher the risk the bigger the payment.

# Five Core Principles of Money and Banking


**Core Principle 3: Information is the basis for decisions**

- The more important the decision, the more information we gather.
- Collection and processing of information is the foundation of the financial system.

# Five Core Principles of Money and Banking


**Core Principle 4: Markets determine prices and allocate resources**

- Markets are the core of the economic system.
- Markets channel resources and minimize the cost of gathering information and making transactions.
- In general, the better developed the financial markets, the faster the country will grow.

# Five Core Principles of Money and Banking


**Core Principle 5: Stability improves welfare**

- A stable economy reduces risk and improves everyone's welfare.
- Financial instability in the autumn of 2008 triggered the worse global downturn since the Great Depression.
- A stable economy grows faster than an unstable one.
- One of the main roles of central banks is stabilizing the economy.

# Chapter 2

# Money and the Payments System

# Money and How We Use It

- Money is *an asset that is generally accepted as payment for goods and services or repayment of debt.*
- Income is a flow of earnings over time
- Wealth is the value of assets minus liabilities.
  - Money is one of those assets.

# Money and How We Use It

Money has three characteristics:

1. It is a **means of payment**
2. It is a **unit of account**, and
3. It is a **store of value**.

The first of these characteristics is the most important

# Money and How We Use It

**Means of Payment**

- People insist on payment in money.
  - Barter requires a "double coincidence of wants".
- Money is easier and finalizes payments so there is no further claim on buyers and sellers.
- The increase in the numbers of buyers and sellers requires something like "money" to make transactions smoother.

# Money and How We Use It

**Unit of Account**

- Money is used to quote prices and record debts - it is a standard of value.
- Prices provide the information needed to ensure resources are allocated to their best uses.
- Using dollars makes relative price comparisons easier.

# Money and How We Use It

**Store of Value**

- A means of payment has to be durable and capable of transferring purchasing power from one day to the next.
- Paper currency does degrade, but is accepted at face value in transactions.
- Other forms of wealth are also a store of value: stocks, bonds, houses, etc.

# Money and How We Use It

**Store of Value (cont.)**

- Although other stores of value are sometimes better than money, we hold money because it is liquid.
- Liquidity is *a measure of the ease with which an asset can be turned into a means of payment.*
  - The more costly it is to convert an asset into money, the less liquid it is.

# Money and How We Use It

**Store of Value (cont.)**

- Financial institutions use:
  - Market liquidity - the ability to sell assets for money.
  - Funding liquidity - ability to borrow money to buy securities or make loans.

# The Payments System

- The payments system is a web of arrangements that allow for the exchange of goods and services, as well as assets.
  - The efficient operation of the economy depends on the payments system.
- The possible methods of payment are:
  1. Commodity and Fiat Monies
  2. Checks
  3. Electronic Payments

# Commodity and Fiat Monies

- Commodity monies are things with intrinsic value.
  - Included items like silk and salt.
- To be successful, a commodity money must be:
  - Usable by most people
  - Can be made into standardized quantities
  - Durable
  - Easily transportable
  - Divisible into smaller units

# Commodity and Fiat Monies

- Gold has been the most common commodity money as it meets these requirements.
- In 1661, Stockholm Banco issued Europe's first paper money
  - King of Sweden printed too many to try to finance a war and the bank failed.
- In 1775, the Continental Congress of the United States of America issued "continentals" to finance the Revolutionary War.
  - Both governments issued too much and the currency became worthless.

# Commodity and Fiat Monies

- Because of the failures, people became suspicious of government-issued paper money.
- In 1862, the Confederate and the Union governments printed money with no explicit backing.
- After the Civil War, the U.S. reverted to using gold as money.

# Commodity and Fiat Monies

- Gold coins and notes, backed by gold, were used into the 20th century.
- Today's paper money is called fiat money, because its value comes from government decree, or *fiat*.
- We are willing to accept these bills as payment because the U.S. government stands behind its paper money.
- In the end, money is about trust.

# Checks

- A check is an instruction to the bank to take funds from your account and transfer them to another account.
  - A check is therefore not a final payment as currency is - it sets in motion a series of transactions.

# Electronic Payments

- Electronic payments take the form of:
  - Credit and debit cards
  - Electronic funds transfers
  - Stored-value card
  - E-money

# Electronic Payments

- Debit Cards
  - Works like a check - tells the bank to transfer funds from your account to another.
- Credit Cards
  - A promise by a bank to lend the cardholder money to make a purchase.
  - They do not represent money.

# Electronic Payments

- Electronic funds transfers
  - Movements of funds directly from one account to another.
  - Banks use electronic transfers for bank to bank transactions

# Electronic Payments

- Stored-value card
  - Take it to a bank or an ATM, transfer money to the card, then use the card at a merchant.
  - Limited usefulness so far, although use has grown rapidly.
  - Limited in what can be purchased with them.
  - Require specific hardware by businesses

# Electronic Payments

- E-money
  - Can be used to pay for purchases on the Internet or by mobile phone.
  - You open an account by transferring funds to the issuer of the e-money.
  - When shopping online, you instruct the issuer to send your e-money to the merchant.
  - Really a form of private money, so not guaranteed by the government

# Measuring Money

Different definitions of money are based upon degree of liquidity.

Drawing the line in different places has led to several measure of money called the money aggregates: M1 and M2.

**M1:** Narrowest definition.

Only the most liquid assets.

**M2:** Broader definition.

Includes assets not used as means of payment.

# Table 2.1: The Monetary Aggregates

| Monetary Aggregates | | | Value as of March 2016 (US$ billions) |
|---|---|---|---|
| M1 | = | Currency in the hands of the public | 1,358.9 |
| | + | Traveler's checks | 2.4 |
| | + | Demand deposits | 1,266.7 |
| | + | Other checkable deposits | 519.3 |
| | | **Total M1** | **3,147.3** |
| M2 | = | M1 | |
| | + | Small-denomination time deposits | 394.8 |
| | + | Savings deposits and money-market deposit accounts | 8,312.0 |
| | + | Retail money-market mutual fund shares | 714.6 |
| | | **Total M2** | **12,568.6** |

# Chapter 3

# Financial Instruments, Financial Markets, and Financial Institutions

# Introduction

- Indirect Finance: An institution stands between lender and borrower.
  - We get a loan from a bank or finance company to buy a car.
- Direct Finance: Borrowers sell securities directly to lenders in the financial markets.
  - Direct finance provides financing for governments and corporations.
- Asset: Something of value that you own.
- Liability: Something you owe.

# Introduction

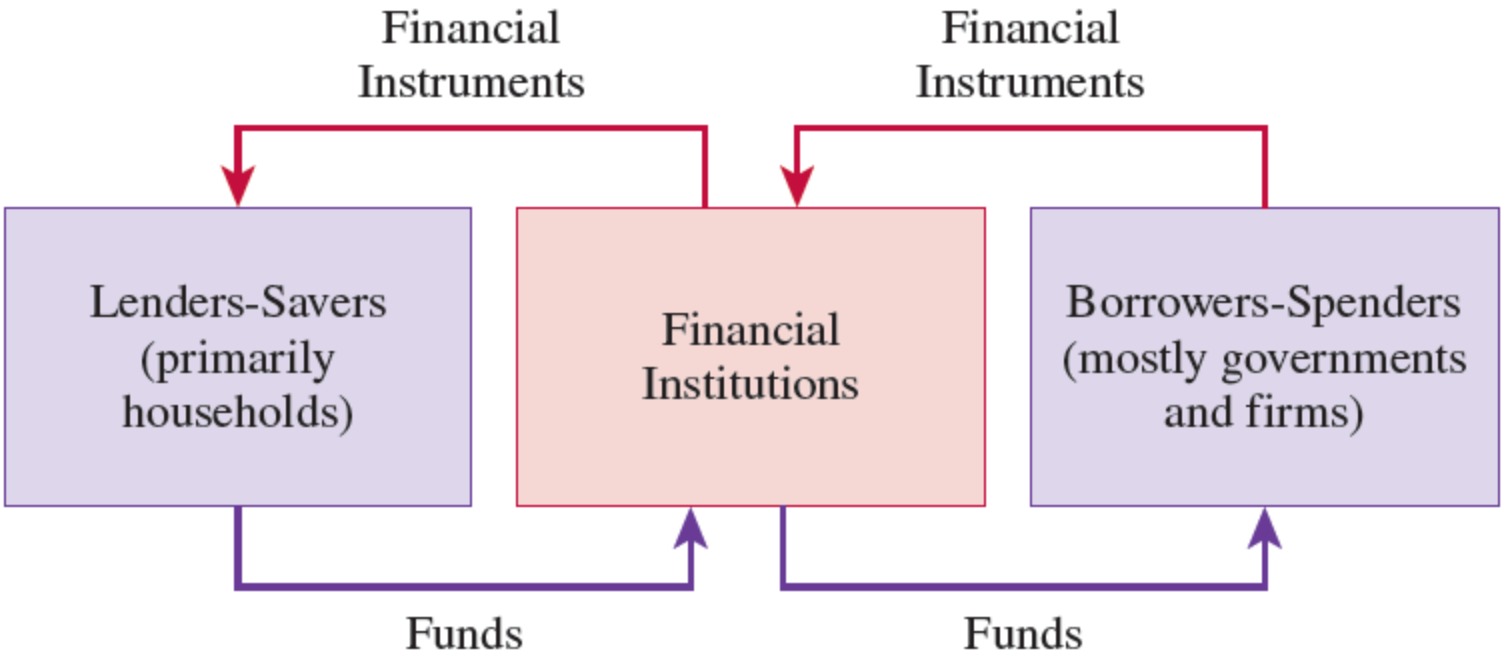
- Financial development is linked to economic growth.
- The role of the financial system is to facilitate production, employment, and consumption.
- Resources are funneled through the system so resources flow to their most efficient uses.

# Introduction

We will survey the financial system in three steps:

1. Financial instruments or securities
   - Stocks, bonds, loans and insurance.
   - What is their role in our economy?
2. Financial Markets
   - New York Stock Exchange, Nasdaq.
   - Where investors trade financial instruments.
3. Financial institutions
   - What they are and what they do.

# Figure 3.1: Funds Flowing through the Financial System



# Financial Instruments

**Financial Instruments**: *The written legal obligation of one party to transfer something of value, usually money, to another party at some future date, under specified conditions*.

- The enforceability of the obligation is important.
- Financial instruments *obligate one party* (person, company, or government) to transfer something to another party.
- Financial instruments specify payment will be made at *some future date*.
- Financial instruments *specify conditions* under which a payment will be made.

# Uses of Financial Instruments

- Three functions:
  - Financial instruments act as a means of payment (like money).
    - Employees take stock options as payment for working.
  - Financial instruments act as stores of value (like money).
    - Financial instruments can be used to transfer purchasing power into the future.
  - Financial instruments allow for the transfer of risk (unlike money).
    - Futures and insurance contracts allows one person to transfer risk to another.

## LESSONS FROM THE CRISIS
### LEVERAGE

- The use of borrowing to finance part of an investment is called *leverage.*
  - Leverage played a key role in the financial crisis of 2007-2009.
- The more leverage, the greater the risk that an adverse surprise will lead to bankruptcy.
  - During the crisis, some financial firms leveraged more than 30 times their net worth.
  - For those important firms, small declines in assets made these firms vulnerable.

## LESSONS FROM THE CRISIS
### LEVERAGE

- When losses are experienced, firms try to *deleverage* to raise net worth.
  - As many institutions deleveraged, prices fell, losses increased, and net worth fell.
  - This is called the "paradox of leverage".
    - Reinforces the leverage spiral
    - Both spirals fed the cycle of falling prices and widespread deleveraging - the hallmark of the financial crisis of 2007-2009.

# Characteristics of Financial Instruments

- These contracts are very complex.
- This complexity is costly, and people do not want to bear these costs.
- *Standardization* of financial instruments overcomes potential costs of complexity.
- Financial instruments also communicate *information*, summarizing certain details about the issuer.

# Characteristics of Financial Instruments

- Mechanisms exist to reduce the cost of monitoring the behavior of *counterparties*.
  - A counterparty is the person or institution on the other side of the contract.
- The solution to the high cost of obtaining information is to standardize both the instrument and the information about the issuer.
- Financial instruments are designed to handle the problem of *asymmetric information*.
  - Borrowers have some information they don't disclose to lenders.

# Underlying Versus Derivative Instruments

- Underlying instruments are used by savers/lenders to transfer resources directly to investors/borrowers.
  - This improves the efficient allocation of resources.
    - Examples: stocks and bonds
- Derivative instruments are those where their value and payoffs are "derived" from the behavior of the underlying instruments.
  - Examples are futures, options, and swaps.
  - The primary use is to shift risk among investors.

# A Primer for Valuing Financial Instruments

Four fundamental characteristics influence the value of a financial instrument:

1. Size of the payment:
   - Larger payment - more valuable.
2. Timing of payment:
   - Payment is sooner - more valuable.
3. Likelihood payment is made:
   - More likely to be made - more valuable.
4. Conditions under with payment is made:
   - Made when we need them - more valuable.

# A Primer for Valuing Financial Instruments

We organize financial instruments by how they are used:

- Primarily used as stores of value

1. Bank loans
   - Borrower obtains resources from a lender to be repaid in the future.
2. Bonds
   - A form of a loan issued by a corporation or government.
   - Can be bought and sold in financial markets.

# A Primer for Valuing Financial Instruments

3. Home mortgages
   - Home buyers usually need to borrow using the home as collateral for the loan.
     - A specific asset the borrower pledges to protect the lender's interests.
4. Stocks
   - The holder owns a small piece of the firm and entitled to part of its profits.
   - Firms sell stocks to raise money.
   - Primarily used as a stores of wealth.

# A Primer for Valuing Financial Instruments

5. Asset-backed securities
   - Shares in the returns or payments arising from specific assets, such as home mortgages and student loans.
   - Mortgage backed securities bundle a large number of mortgages together into a pool in which shares are sold.
     - Securities backed by *sub-prime mortgages* played an important role in the financial crisis of 2007-2009.

# Financial Instruments Used Primarily to Transfer Risk

1. Insurance contracts.
   - Primary purpose is to assure that payments will be made under particular, and often rare, circumstances.
2. Futures contracts.
   - An agreement between two parties to exchange a fixed quantity of a commodity or an asset at a fixed price on a set future date.
   - A *price* is always specified.
   - This is a type of derivative instrument.

# Financial Instruments Used Primarily to Transfer Risk

3. Options
   - Derivative instruments whose prices are based on the value of an underlying asset.
   - Give the holder the right, not obligation, to buy or sell a fixed quantity of the asset at a pre-determined price on either a specific date or at any time during a specified period.

# Financial Instruments Used Primarily to Transfer Risk

4. Swaps
   - Agreements to exchange two specific cash flows at certain times in the future.
   - Come in many varieties reflecting differences in maturity, payment frequency, and underlying cash flows

# Financial Markets

- Financial markets are places where financial instruments are bought and sold.
- These markets are the economy's central nervous system.
- These markets enable both firms and individuals to find financing for their activities.
- These markets promote economic efficiency

# The Role of Financial Markets

1. Market liquidity:
   - Ensure owners can buy and sell financial instruments cheaply.
   - Keeps transactions costs low.
2. Information:
   - Pool and communication information about issuers of financial instruments.
3. Risk sharing:
   - Provide individuals a place to buy and sell risk.

# The Structure of Financial Markets

1. Distinguish between primary or secondary markets
2. Categorize by the way they trade
3. Group based on the type of instrument they trade

# Primary versus Secondary Markets

- A primary market is one in which a borrower obtains funds from a lender by selling newly issued securities.
- Secondary financial markets are those where people can buy and sell existing securities.

# Debt and Equity versus Derivative Markets

- Used to distinguish between markets where *debt and equity* are traded and those where *derivative instruments* are traded.
- Debt markets are markets for loans, mortgages, and bonds.
- Equity markets are the markets for stocks.
- Derivative markets are the markets where investors trade instruments like futures, options, and swaps.

# Debt and Equity versus Derivative Markets

- In debt and equity markets, actual claims are bought and sold for immediate cash payments.
- In derivative markets, investors make agreements that are settled later.
- Debt instruments categorized by the loan's maturity
  - Repaid in less than a year - traded in money markets.
  - Maturity of more than a year - traded in bond markets.

# Characteristics of a Well-Run Financial Market

- Essential characteristics of a well-run financial market:
  - Must be designed to keep transaction costs low.
  - Information the market pools and communicates must be accurate and widely available.
  - Borrowers promises to pay lenders much be credible.
  - Lenders must be able to enforce their right of repayment quickly and at low cost.

# Financial Institutions

- Firms that provide access to the financial markets, both
  - to savers who wish to purchase financial instruments directly and
  - to borrowers who want to issue them.
- Also known as financial intermediaries.
  - Examples: banks, insurance companies, securities firms, and pension funds.

# The Role of Financial Institutions

- To reduce transaction costs by specializing in the issuance of standardized securities.
- To reduce the information costs of screening and monitoring borrowers.
  - They curb asymmetries, helping resources flow to most productive uses.
- To give savers ready access to their funds.

# The Structure of the Financial Industry

- We can divide intermediaries into two broad categories:
  - Depository institutions,
    - Take deposits and make loans
    - What most people think of as banks
  - Non-depository institutions.
    - Include insurance companies, securities firms, mutual fund companies, hedge funds, private equity or venture capital firms, finance compnaies, and pension funds.

# The Structure of the Financial Industry

1. Depository institutions take deposits and make loans.
2. Insurance companies accept premiums, which they invest, in return for promising compensation to policy holders under certain events.
3. Pension funds invest individual and company contributions in stocks, bonds, and real estate in order to provide payments to retired workers.

# The Structure of the Financial Industry

4. Securities firms include brokers, investment banks, underwriters, mutual fund companies private equity firms, and venture capital firms.
   - Brokers and investment banks issue stocks and bonds to corporate customers, trade them, and advise customers.
   - Mutual-fund companies pool the resources of individuals and companies and invest them in portfolios - passive investing.
   - Hedge funds do the same for small groups of wealthy investors.
   - Private equity and venture capital firms also serve wealthy investors by acquiring controlling stakes in a few firms and manage them actively.

# The Structure of the Financial Industry

5. Finance companies raise funds directly in the financial markets in order to make loans to individuals and firms.
6. Government-sponsored enterprises (GSEs) are federal credit agencies that provide loans directly for farmers and home mortgagors.

# End of lecture