Economics of Financial Markets – Lecture 6

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Next Week – Midsemester Examination

- Family Name Starting at A-F -> 50 – T103
- Family Name Starting at G-Z -> 21 (Union Complex) – Heath
- Multiple-Choice Questions and Short Answers.
- Sample Multiple-Choice Questions and Study Guide are Available.
- The midsemester covers Lecture 1 to Lecture 5 (Inclusive).

Our Consultation Hours

- Shino: 11am-noon on Thursday in Room 617 Building 39
- Nhan: 8-10am Tuesday Consultation Room 1 in Building 39

  2:30-5:30pm Wednesday Room 651, Building 39
- Abhi: 3-4pm Tuesday Consultation Room 2 Building 39

  6-8pm Tuesday Consultation Room 1 Building 39

  5-7pm Consultation Room 2 Building 39
- Terence: 10-11am Tuesday Room 644 Building 39

Preview

- A healthy and vibrant economy requires a financial system that moves funds from **people who save** to **people who have productive investment opportunities**.

Learning Objectives

- Identify **eight basic facts** about the global financial system.
- Summarize how transaction costs affect **financial intermediaries**.
- Describe why **asymmetric information** leads to **adverse selection** and **moral hazard**.
- Recognize **adverse selection** and summarize the ways in which they can be reduced.

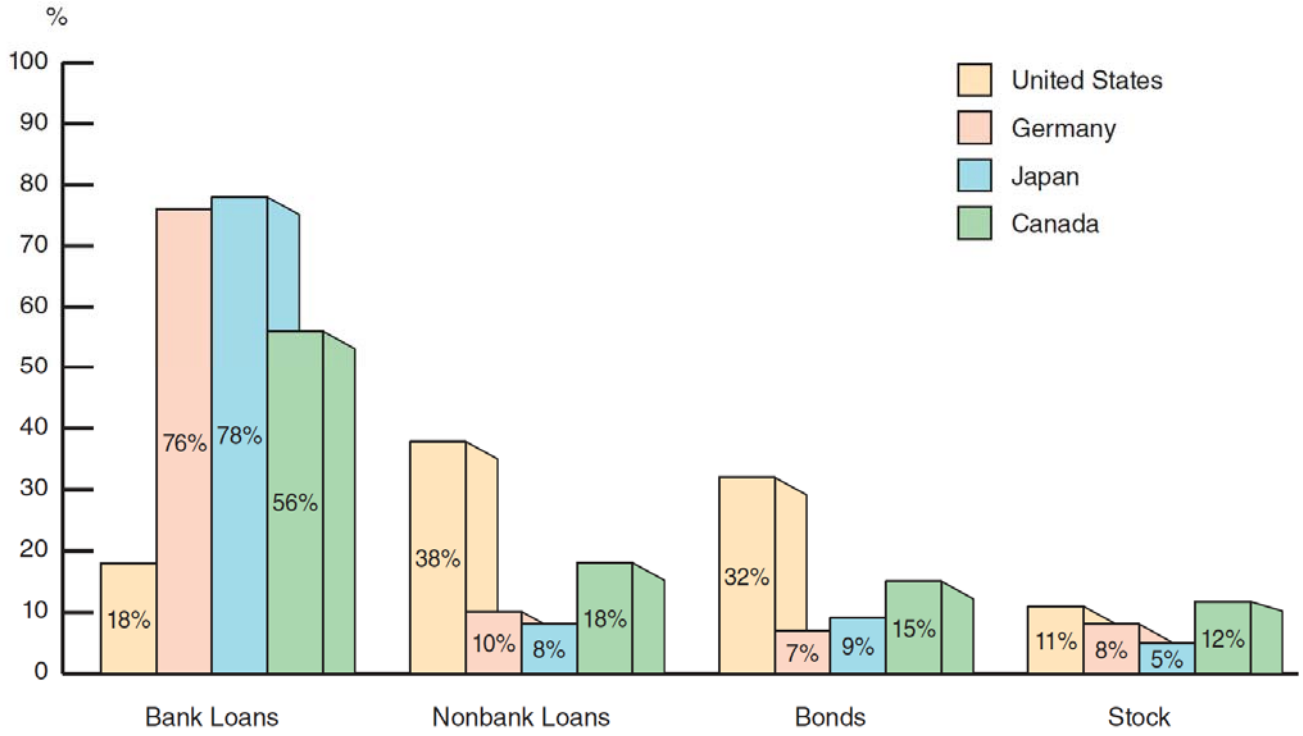
Learning Objectives

- Recognize the **principal-agent problem** arising from **moral hazard** in **equity contracts** and summarize the methods for reducing it.
- Summarize the methods used to reduce **moral hazard** in **debt contracts**

Basic Facts about Financial Structure Throughout the World

- This chapter provides an economic analysis of how our financial structure is designed to promote economic efficiency.
- The bar chart in Figure 1 shows how American businesses financed their activities using external funds (those obtained from outside the business itself) in the period 1970–2000 and compares U.S. data to those of Germany, Japan, and Canada.

Figure 1 Sources of External Funds for Nonfinancial Businesses: A Comparison of the United States with Germany, Japan, and Canada



Source: Andreas Hackethal and Reinhard H. Schmidt, "Financing Patterns: Measurement Concepts and Empirical Results," Johann Wolfgang Goethe-Universitat Working Paper No. 125, January 2004. The data are from 1970–2000 and are gross flows as percentage of the total, not including trade and other credit data, which are not available.

Basic Facts about Financial Structure Throughout the World

1. Stocks are not the most important sources of external financing for businesses.
2. Issuing marketable debt and equity securities is not the primary way in which businesses finance their operations.
3. Indirect finance is many times more important than direct finance
4. Financial intermediaries, particularly **banks**, are the most important source of external funds used to finance businesses.

Basic Facts about Financial Structure Throughout the World

5. The financial system is among the most heavily regulated sectors of the economy.
6. Only large, well-established corporations have easy access to securities markets to finance their activities.
7. **Collateral** is a prevalent feature of debt contracts for both households and businesses.
8. **Debt contracts** are extremely complicated legal documents that place substantial restrictive covenants on borrowers.

Restrictive Covenants: Provisions that restrict and specify certain activities that the borrower can engage in.

Transaction Costs: Economies of Scale

- Financial intermediaries have evolved to reduce transaction costs.
- Economies of scale
  - To bundle the funds of many investors together so that they can take advantage of *economies of scale*, the reduction in transaction costs per dollar of investment as the size (scale) of transactions increases.
  - Economies of scale exist because the total cost of carrying out a transaction in financial markets increases only a little as the size of the transaction grows.
  - Mutual Funds: a financial intermediary that sells shares to individuals and then invests the proceeds in bonds or stocks.
  - Because it buys large blocks of stocks or bonds, a mutual fund can take advantage of lower transaction costs.

Transaction Costs: Expertise

- Financial intermediaries are also better able to develop expertise to lower transaction costs.
- Their expertise in computer technology enables them to offer customers convenient services like being able to call a toll-free number for information on how well their investments are doing and to write checks on their accounts.
- An important outcome of a financial intermediary's low transaction costs is the ability to provide its customers with *liquidity services*, services that make it easier for customers to conduct transactions.

Asymmetric Information: Adverse Selection and Moral Hazard

- **Adverse selection** occurs before a transaction occurs.
- **Moral hazard** arises after the transaction has developed.
- **Agency theory** analyses how **asymmetric information** problems affect economic behavior.

The Lemons Problem: How Adverse Selection Influences Financial Structure

- If quality cannot be assessed, the buyer is willing to pay at most a price that reflects the average quality.
- Sellers of good quality items will not want to sell at the price for average quality.
- The buyer will decide not to buy at all because all that is left in the market is poor quality items.
- This problem explains fact 2 and partially explains fact 1.

Tools to Help Solve **Adverse Selection** Problems

- Private production and sale of information
  - The solution to the adverse selection problem in financial markets is to eliminate asymmetric information by furnishing people supplying funds with full details about the individuals or firms seeking to finance their investment activities.
  - Free-rider problem: when people who do not pay for information take advantage of the information that other people have paid for.
- Government regulation to increase information
  - Not always works to solve the adverse selection problem
  - Explains Fact 5

Tools to Help Solve Adverse Selection Problems

- Financial intermediation
  - Explains facts 3, 4, & 6
  - A financial intermediary, such as a bank, becomes an expert in the production of information about firms, so that it can sort out good credit risks from bad ones.
  - Then it can acquire funds from depositors and lend them to the good firms.
- Collateral and net worth
  - Explains fact 7
  - *Collateral*, property promised to the lender if the borrower defaults, reduces the consequences of adverse selection because it reduces the lender's losses in the event of a default.
  - **Net worth** (also called **equity capital**), the difference between a firm's assets (what it owns or is owed) and its liabilities (what it owes), can perform a similar role to collateral.

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- Moral hazard is the asymmetric information problem that occurs after the financial transaction takes place, when the seller of a security may have incentives to hide information and engage in activities that are undesirable for the purchaser of the security.
- Called the Principal-Agent Problem:
  - Principal: less information (stockholder)
  - Agent: more information (manager)
- Separation of ownership and control of the firm
  - Managers pursue personal benefits and power rather than the profitability of the firm.

Principal-Agent Problem: Example

- Suppose that your friend Steve asks you to become a silent partner in his ice-cream store.
- The store requires an investment of $10,000 to set up and Steve has only $1,000.
- So you purchase an equity stake (stock shares) for $9,000, which entitles you to 90% of the ownership of the firm, while Steve owns only 10%.
- If Steve makes good efforts, after all expenses (including Steve's salary), the store will have $50,000 in profits per year.
- Then Steve receives 10% ($5,000) and you receive 90% ($45,000).

Principal-Agent Problem: Example

- If Steve doesn't provide good service to his customers, uses the $50,000 in income to buy artwork for his office, the store will not earn any profit.
- Steve can earn the additional $5,000 (his 10% share of the profits) over his salary only if he works hard and forgoes unproductive investments (such as art for his office).
- Steve might decide that the extra $5,000 just isn't enough to make him expend the effort to be a good manager.
- Because the store won't show any profits, Steve's decision not to act in your interest will cost you $45,000 (your 90% of the profits if he had chosen to be a good manager instead).
- A worse scenario is possible: Because his ice-cream store is a cash business, Steve has the incentive to pocket $50,000 in cash and tell you that the profits were zero.
- He now gets a return of $50,000, but you get nothing.

Debt Contract: Example

- Instead, you lend Steve the $9,000 he needs to set up his business and have a debt contract that pays you an interest rate of 10%.
- Risky Investment Opportunity for Steve
  - Instead of opening up the ice-cream store, Steve might use your $9,000 loan to invest in chemical research equipment.
  - If Steve is successful, he will become a multimillionaire.
- You would clearly be very unhappy if Steve used your loan for the riskier investment, because if he were unsuccessful, which is highly likely, you would lose most, if not all, of the money you gave him.
- And if he were successful, you wouldn't share in his success—you would still get only a 10% return on the loan because the principal and interest payments are fixed.
- Because of the potential moral hazard (that Steve might use your money to finance a very risky venture), you would probably not make the loan to Steve, even though an ice-cream store in the neighbourhood is a good investment that would provide benefits for everyone.

Net Worth: Example

- When borrowers have more at stake because their *net worth* (the difference between their assets and their liabilities) is high, the risk of moral hazard—the temptation to act in a manner that lenders find objectionable—will be greatly reduced because the borrowers themselves have a lot to lose.
- Suppose that the cost of setting up either the ice-cream store or the research equipment is $100,000 instead of $10,000.
- So Steve needs to put $91,000 of his own money into the business (instead of $1,000) in addition to the $9,000 supplied by your loan.
- Now if Steve is unsuccessful, he has a lot to lose—the $91,000 of net worth ($100,000 in assets minus the $9,000 loan from you).
- He will think twice about undertaking the riskier investment

Net Worth and Debt Contract: Example

- Steve is more likely to invest in the ice-cream store, which is more of a sure thing.
- Hence when Steve has more of his own money (net worth) in the business, you are more likely to make him the loan.

Tools to Help Solve the Principal-Agent Problem

- Monitoring (Costly State Verification)
  - Auditing the firm frequently and checking on what the management is doing.
  - The problem is that the monitoring process can be expensive in terms of time and money.
  - Free-rider problem
  - Fact 1
- Government regulation to increase information
  - Governments everywhere have laws to force firms to adhere to standard accounting principles that make profit verification easier.
  - They also pass laws to impose stiff criminal penalties on people who commit the fraud of hiding and stealing profits.
  - Fact 5

Tools to Help Solve the Principal-Agent Problem

- Financial Intermediation
  - Financial intermediaries have the ability to avoid the free rider problem in the face of moral hazard, and this is another reason why indirect finance is so important
  - Venture Capital
  - Fact 3
- Debt Contracts
  - If a contract could be structured so that moral hazard would exist only in certain situations, there would be a reduced need to monitor managers, and the contract would be more attractive than the equity contract.
  - Fact 1

How Moral Hazard Influences Financial Structure in Debt Markets

- Borrowers have incentives to take on projects that are riskier than the lenders would like.
  - This prevents the borrower from paying back the loan.

Tools to Help Solve **Moral Hazard** in **Debt Contracts**

- Net worth and collateral
  - Incentive compatible (it aligns the incentives of the borrower with those of the lender.)
  - The greater the borrower's net worth, the greater the borrower's incentive to behave in the way that the lender expects and desires, the smaller the moral hazard problem in the debt contract is, and the easier it is for the firm to borrow.
- Monitoring and enforcement of restrictive covenants
  - Discourage undesirable behavior (Restricted Use)
  - Encourage desirable behavior (Life Insurance)
  - Keep collateral valuable (Automobile Theft Insurance)
  - Provide information (Right to See Firm's Book)

Financial intermediation

- Facts 3 & 4
- Financial intermediaries—particularly banks—have the ability to avoid the free-rider problem as long as they make primarily private loans.
- The intermediary making private loans thus receives the benefits of monitoring and enforcement and will work to shrink the moral hazard problem inherent in debt contracts.
- The concept of moral hazard has provided us with additional reasons why financial intermediaries play a more important role in channelling funds from savers to borrowers than marketable securities do.

Summary Table 1 Asymmetric Information Problems and Tools to Solve Them

1	Stocks are not the most important source of external financing.
2	Marketable securities are not the primary source of financing.
3	Indirect finance is more important than direct finance.
4	Banks are the most important source of external funds.
5	The financial system is heavily regulated.
6	Only large, well-established firms have access to securities markets.
7	Collateral is prevalent in debt contracts.
8	Debt contracts have numerous restrictive covenants.

Problem	Tools to Solve	Fact Numbers
Adverse Selection	Private production and sale of information Government regulation to increase information Financial intermediation Collateral and next worth	1,2 5 3,4,6 7
Moral Hazard in Equity Contracts (Principal-agent Problem)	Production of information: monitoring Government regulation to increase information Financial intermediation Debt Contracts	1 5 3 1
Moral Hazard in Debt Contracts	Collateral and net worth Monitoring and enforcement of restrictive covenants Financial intermediation	6,7 8 3,4

Application: Financial Development and Economic Growth

- ***Financial repression*** created by an institutional environment is characterized by:
  - Poor system of property rights (unable to use collateral efficiently)
  - Poor legal system (difficult for lenders to enforce restrictive covenants)
  - Weak accounting standards (less access to good information)
  - Government intervention through directed credit programs and state owned banks (less incentive to proper channel funds to its most productive use)

Application: Financial Development and Economic Growth

- The financial systems in developing and transition countries face several difficulties that keep them from operating efficiently.
- In many developing countries, the system of property rights (the rule of law, constraints on government expropriation, absence of corruption) functions poorly, making it hard to use these two tools effectively.
- Two tools: Collateral and Restrictive Covenants

Expected Value

- Unless specified, we will use the fact that the expected value of an event is a probability weighted average, the sum of each possible outcome multiplied by the probability of the event occurring.

End-of-Chapter Q22

- *You are in the market for a used car.*
- *At a used car lot, you know that the Blue Book value of the car you are looking at is between $15,000 and $19,000.*
- *If you believe the dealer knows as much about the car as you do, how much are you willing to pay? Why?*
- *Assume that you care only about the expected value of the car you will buy and that the car values are symmetrically distributed.*

End-of-Chapter Q22 - Answer

- You are willing to pay the average price. If the distribution of car values is symmetric, you are willing to pay $17,000 for a randomly selected car.
- For example, if $15,000 with 0.5 chance, and $19,000 with 0.5 chance, then
  - $15{,}000 \times 0.5 + 19{,}000 \times 0.5 = 17{,}000$.

End-of-Chapter Q22 - Continued

- *Now you believe the dealer knows more about the car than you do. How much are you willing to pay?*
- You are willing to pay $ 15,000.
- In a competitive market, all relevant information is assumed to be available.

End-of-Chapter Q24

•*You wish to hire Ron to manage your Dallas operations. The profits from the operations depend partially on how hard Ron works, as follows.*

Profit Probabilities		
	Profit = $20,000	Profit = $40,000
Lazy	70%	30%
Hard worker	30%	70%

- *If Ron is lazy, he will surf the Internet all day, and he views this as a zero cost opportunity*
- *However, Ron views working hard as a "personal cost" valued at $2,000.*
- *What fixed percentage of the profits should you offer Ron? Assume Ron cares only about his expected payment less any "personal cost."*

End-of-Chapter Q24 - Answer

- Your expected profit is:
  - If Lazy, $20,000 × 0.7 + $40,000 × 0.3 = $26,000.
  - If Hard Worker, $20,000 × 0.3 + $40,000 × 0.7 = $34,000
- Suppose you offer ***R*** portion of the profits.
- For Ron,
  - If Lazy, $(20,000 × ***R***) × 0.7 + $(40,000 × ***R***) × 0.3
  - If Hard Worker, $(20,000 × ***R***) X 0.3 + $(40,000 × ***R***) × 0.7 - $2000
- You want Ron to Hard Work. Thus,

$(20,000 × ***R***) × 0.7 + $(40,000 × ***R***) × 0.3 ≤ $(20,000 × ***R***) × 0.3 + $(40,000 × ***R***) × 0.7 - $2000

- You should offer Ron at least 25% of the profits.