Lecture 3:
Financial Markets and Institutions

WHY FINANCIAL INSTITUTIONS EXIST?

Facts About Financial Structure Throughout the World

- The financial system is a complex structure including many different financial institutions: banks, insurance companies, mutual funds, stock and bonds markets, etc.
- A vibrant economy requires a financial system that moves funds from savers to borrowers.
- But how does it ensure that your hard-earned dollars are used by those with the best productive investment opportunities?

Sources of External Finance by Country

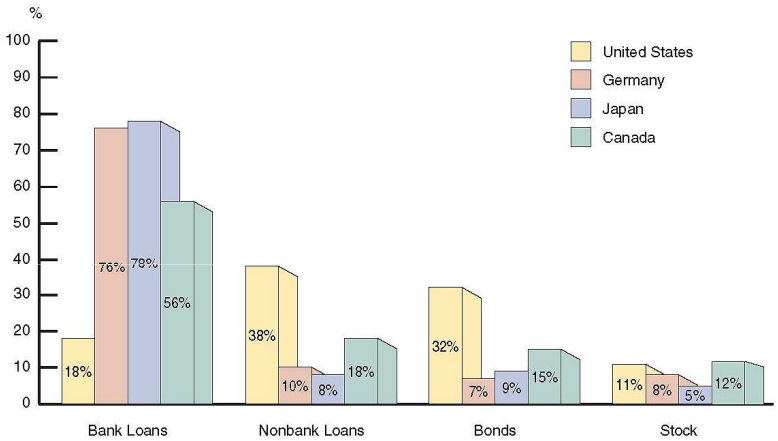


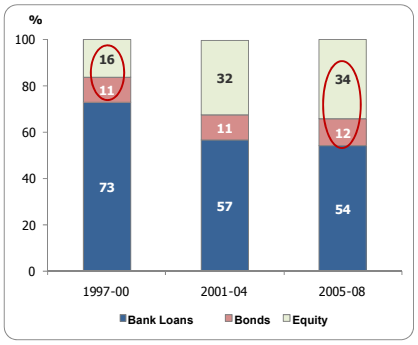
FIGURE 7.1 Sources of External Funds for Nonfinancial Businesses: A Comparison of the United States with Germany, Japan, and Canada

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 percentages of the total, not including trade and other credit data, which are not available.

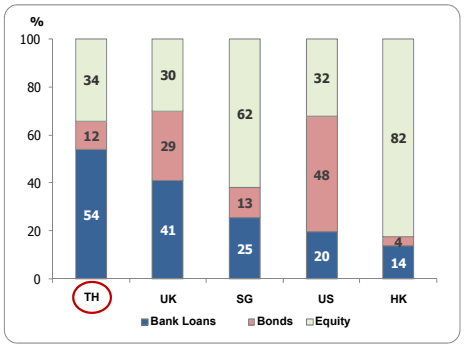
Breakdown of Financial Assets in Thailand

- **Size of Thai capital markets increased from 17% to 46% in the past 10 years.**

Thai Financial Assets



Financial Assets: 2005-08

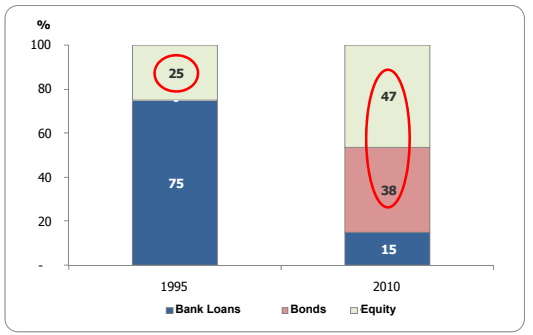


Source: SEC

Example: SCG

- **Before the crisis, SCG only fund 25% of its needs from capital markets**
- **Today, almost 80% come from capital markets.**

Structure of SCG External Finance



Source: SEC

Facts of Financial Structure

1. Stocks are not the most important source 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, which involves the activities of financial intermediaries, is many times more important than direct finance, in which businesses raise funds directly from lenders in financial markets.
4. Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.

Facts of Financial Structure

5. The financial system is among the most heavily regulated sectors of 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 typically extremely complicated legal documents that place substantial restrictions on the behavior of the borrowers.

Transaction Costs

- Transactions costs influence financial structure
  - E.g., a $5,000 investment only allows you to purchase 100 shares @ $50 / share (equity)
  - No diversification
  - Bonds even worse—most have a $1,000 size
- In sum, transactions costs can hinder flow of funds to people with productive investment opportunities. Name a few?
- A gap to be filled?

Transaction Costs

- Financial intermediaries make profits by reducing transactions costs
  1. Take advantage of economies of scale (example: mutual funds)
  2. Develop expertise to lower transactions costs
     - Also provides investors with liquidity, which explains Fact # 3

Asymmetric Information: Adverse Selection and Moral Hazard

- In your introductory finance course, you probably assumed a world of symmetric information—the case where all parties to a transaction or contract have the same information, be that little or a lot
- In many situations, this is not the case. We refer to this as asymmetric information.

Asymmetric Information: Adverse Selection and Moral Hazard

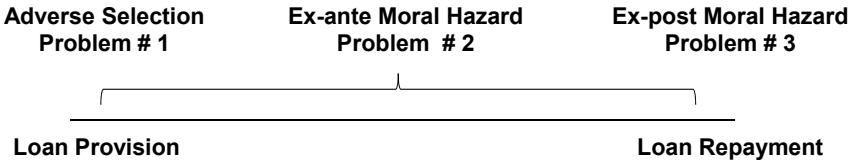
- Asymmetric information can take on many forms, and is quite complicated. However, to begin to understand the implications of asymmetric information, we will focus on two specific forms:
  - Adverse selection
  - Moral hazard

Asymmetric Information: Adverse Selection and Moral Hazard

- The analysis of how asymmetric information problems affect behavior is known as **agency theory**.
- We will now use these ideas of adverse selection and moral hazard to explain how they influence financial structure.

Asymmetric Information: Adverse Selection and Moral Hazard

- Efficiency of credit markets impeded by 3 main information problems
  1. information on borrowers' characteristics
  2. information on borrowers' actions
  3. information on borrowers' reimbursement capacity



Asymmetric Information: Adverse Selection and Moral Hazard

- Adverse Selection
  1. Occurs when one party in a transaction has better information than the other party
  2. Before transaction occurs
  3. Potential borrowers most likely to produce adverse outcome are ones most likely to seek loan and be selected

The Lemons Problem: How Adverse Selection Influences Financial Structure

- Lemons Problem in Used Cars
  1. If we can't distinguish between "good" and "bad" (lemons) used cars, we are willing pay only an average of good and bad car values
  2. Result: Good cars won't be sold, and the used car market will function inefficiently.
- What helps us avoid this problem with used cars?

Adverse Selection and lending

- Now, imagine there are two types of borrowers
  - Type 1 always choose a safe path
  - Type 2 always choose a risky path
  - Lenders can't tell the difference between the two.
- Clearly, lenders want to charge *higher* interest rate to type 2 lenders, but cannot distinguish the two ➔ can only offer one rate
  - $i^{risky} > i^{*} > i^{safe}$ seems reasonable. Or not?
  - Then no safe borrowers would borrow!
  - To the extreme, eventually $i^{risky} = i^{*}$, and there would be no safe borrower at all!
  - ***Lenders would then have little incentive to lend.***

The Lemons Problem: How Adverse Selection Influences Financial Structure

- Lemons Problem in Securities Markets
  - —If we can't distinguish between good and bad securities, willing pay only average of good and bad securities' value
  - —Result: Good securities undervalued and firms won't issue them; bad securities overvalued so too many issued

The Lemons Problem: How Adverse Selection Influences Financial Structure

- Lemons Problem in Securities Markets
  3. Investors won't want buy bad securities, so market won't function well
  - Explains Fact # 1 and # 2
  - Also explains Fact # 6: Less asymmetric info for well-known firms, so smaller lemons problem

Tools to Help Solve Adverse Selection (Lemons) Problems

1. Private Production and Sale of Information
   - Free-rider problem interferes with this solution
2. Government Regulation to Increase Information (explains Fact # 5,)
   - annual audits of public corporations
   - Disclosure of financial statements
3. Financial Intermediation
   - Analogy to solution to lemons problem provided by used car dealers
   - Avoid free-rider problem by making private loans (explains Fact # 3 and # 4)
   - Also explains fact #6—large firms are more likely to use direct instead of indirect financing
4. Collateral and Net Worth
   - Explains Fact # 7

Asymmetric Information: Adverse Selection and Moral Hazard

- Moral Hazard
  1. Occurs when one party has an incentive to behave differently once an agreement is made between parties
  2. After transaction occurs
  3. Hazard that borrower has incentives to engage in undesirable (immoral) activities making it more likely that won't pay loan back

Moral Hazard Case 1: Involuntary Default on Loans

- Assume
  - Borrower has to choose between **2 projects**, and lender cannot observe the choice
  - Borrower is subject to *limited liability* and his wealth = 0
  - Both projects require L=100 and i=10% and
  - Project P1 yields 120 with certainty
  - Project P2 yields 230 w/ prob ½ and 0 w/ prob ½
- **Which maximizes social welfare?**
  - Clearly P1 maximizes social welfare
  - E(P1)=120 > E(P2)=115 (230* ½)

Moral Hazard Case 1: Involuntary Default on Loans

- **Is it optimal for the lender to finance either project?**
  - LP(1) =110-100=10
  - LP(2) = ½ (110-100)+ ½(-100) =-45
  - The lender will want to finance P1 but not P2!
- **What will the borrower choose?**
  - BP(1)=120-100*(1.1)=10
  - BP(2)= ½ (230-100*(1.1)) +½ (0)=60
  - BP(2)>BP(1) so borrower chooses P2
- **So? Will lender lend?**
  - Borrower prefers P2. Anticipating this, **lender won't lend.**

Because of limited liability, borrower repays 0 if project fails

Ex-ante Moral Hazard

Moral Hazard Case 2: Voluntary Default on Loans ("take the money and run")

- Assume
  - Borrower can only choose P1, which yields 120 for sure, again requiring L=100 and i=10%
  - Borrower is subject to *limited liability* and his wealth = 0
  - Borrower can choose between "honest" (i.e. repay) or "cheat" (i.e. running away with 100)
    - If he runs he *gets caught* with a positive probability, say p=0.6, in which case *the lender seizes the project return* (120)
- **So? Will the borrower run?**
  - "Honest" payoff =120 - 100*(1.1) = 10
  - "Cheat" payoff = 0.4*100 + 0.6*0 = 40
- Borrower prefers to run, so **lender won't lend.**

Ex-post Moral Hazard

Why limited liability matters?

- Assume in contrast that the borrower has *assets worth 110* that can be expropriated in case of default (i.e. collateral).
- **In case 1 (involuntary default) payoffs are:**
  - BP(1)=10
  - BP(2)=1/2*(230-110)+1/2*(-110)=5
- **In case 2 (voluntary default) payoffs are:**
  - Honesty payoff =120-100(1.1)=10
  - Cheat payoff= .4*100+.6*(-110)= -26
- Collaterals *helped align* interest between lenders and borrowers.

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- Moral Hazard in Equity Contracts: the Principal-Agent Problem
  1. Result of separation of ownership by stockholders (*principals*) from control by managers (*agents*)
  2. Managers act in own rather than stockholders' interest

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

An example of this problem is useful. Suppose you become a silent partner in an ice cream store, providing 90% of the equity capital ($9,000). The other owner, Aj.Namo, provides the remaining $1,000 and will act as the manager. If Aj.Namo works hard, the store will make $50,000 after expenses, and you are entitled to $45,000 of it (i.e. 90% of profit).

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

However, Aj.Namo doesn't really value the $5,000 (his share of the profit), so he goes to the beach, relaxes, and even spends some of the "profit" on art for his office. How do you, as a 90% owner, give Aj.Namo the proper incentives to work hard?

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- Tools to Help Solve the Principal-Agent Problem
  1. Production of Information: Monitoring
  2. Government Regulation to Increase Information
  3. Financial Intermediation (e.g, venture capital)
  4. Debt Contracts
- Explains Fact # 1: Why debt is used more than equity
- Even with the advantages just described, debt is still subject to moral hazard. In fact, debt may create an incentive to take on very risky projects. This is important to understand. Let's looks at a simple example.

How Moral Hazard Influences Financial Structure in Debt Markets

- Most debt contracts require the borrower to pay a fixed amount (interest) and keep any cash flow above this amount (Think of loan and bond).
- For example, what if a firm owes $100 in interest, but only has $90? It is essentially bankrupt. The firm "has nothing to lose" by looking for "risky" projects to raise the needed cash. → problem of limited liability.

How Moral Hazard Influences Financial Structure in Debt Markets

- Tools to Help Solve Moral Hazard in Debt Contracts
  1. Net Worth and Collateral
  2. Monitoring and Enforcement of Restrictive Covenants. Examples are covenants that …
     - discourage undesirable behavior
     - encourage desirable behavior
     - keep collateral valuable
     - provide information
  3. Financial Intermediation—banks and other intermediaries have special advantages in monitoring (Explains Facts # 1–4)

Asymmetric Information Problems and Tools to Solve Them

Asymmetric Information Problem	Tools to Solve It	Explains Fact Number
Adverse selection	Private production and sale of information	1, 2
	Government regulation to increase information	5
	Financial intermediation	3, 4, 6
	Collateral and net worth	7
Moral hazard in equity contracts (principal–agent problem)	Production of information: monitoring	1
	Government regulation to increase information	5
	Financial intermediation	3
	Debt contracts	1
Moral hazard in debt contracts	Collateral and net worth	6, 7
	Monitoring and enforcement of restrictive covenants	8
	Financial intermediation	3, 4

Note: List of facts:
1. Stocks are not the most important source of external financing.
2. Marketable securities are not the primary source of finance.
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.

Conflicts of Interest

- Conflicts of interest are a type of moral hazard that occurs when a person or institution has multiple interests, and serving one interest is detrimental to the other.
- Three classic conflicts developed in financial institutions. Looking at these closely offers insight in avoiding these conflicts in the future.

Conflicts of Interest: Underwriting and Research in Investment Banking

- Investment banks may both research companies with public securities, as well as underwrite securities for companies for sale to the public.
- Research is expected to be **unbiased and accurate**, reflecting the facts about the firm. It is used by the public to form investment choices.
- Underwriters will have an easier time if research is positive. Underwriters can better serve the firm going public if the firm's outlook is optimistic by command a better price for securities issued by the firm.
- An investment bank acting as both a researcher and underwriter of securities for companies clearly has a conflict—serve the interest of the issuing firm or the public?

Conflicts of Interest: Underwriting and Research in Investment Banking

- During the tech boom, research reports were clearly distorted to please issuers. Firms with no hope of ever earning a profit received favorable research.
- This also lead to **spinning**, where underpriced equity was allocated to executives who would promise future business to the investment bank.

Conflicts of Interest: Auditing and Consulting in Accounting Firms

- Auditors check the assets and books of a firm for the quality and accuracy of the information. The objective in an unbiased opinion of the firm's financial health.
- Consultants, for a fee, help firms with variety of managerial, strategic, and operational projects.
- An auditor acting as both an auditor and consultant for a firm clearly is not objective, especially if the consulting fees exceed the auditing fees.

Conflicts of Interest: Auditing and Consulting in Accounting Firms

- The case of Arthur Andersen, of course, epitomizes this conflict. A myriad of conflicts with its client Enron resulted in the eventual demise of Arthur Andersen when Enron collapsed. You can read further about that incident in the Mini-case box on page 197.

Conflicts of Interest: Credit Assessment and Consulting in Rating Agencies

- Rating agencies assign a credit rating to a security issuance of a firm based on projected cash flow, assets pledged, etc. The rating helps determine the riskiness of a security.
- Consultants, for a fee, help firms with variety of managerial, strategic, and operational projects.
- An rating agency acting as both an rater and consultant for a firm clearly is not objective, especially if the consulting fees exceed the rating fees.

Conflicts of Interest: Credit Assessment and Consulting in Rating Agencies

- Rating agencies, such as Moody's and Standard and Poor, were caught in this game during the housing bubble.
- Firms asked the rater to help structure debt offering to attain the highest rating possible.
- When the debt subsequently defaulted, it was difficult for the agency to justify the original high rating. Perhaps it was just error.
- But few believe that—most see the rating agencies as being blinded by high consulting fees.

Conflicts of Interest: Credit Assessment and Consulting in Rating Agencies

- The details of this scandal appear in the Mini-Case on page 198. In short, the SEC stepped in and proposed new regulation. For example, a rating agency can no longer rate a security that they helped structure. But the steps go further, creating a real regulatory reporting hassle for these firms.
- You should read both of these Mini-Cases. You will see these conflicts arise again as memory of these conflicts fades with time.

Remedies?

- Has much been done to remedy conflicts? Yes.
  - For example, a rating agency can no longer rate a security that they helped structure. But the steps go further, creating a real regulatory reporting hassle for these firms.
- Sarbanes-Oxley Act of 2002
  - Established an oversight board to supervise accounting firms
  - Increased the SEC's budget for supervisory activities
  - Limited consulting relationships between auditors and firms
  - Enhanced criminal charges for obstruction
  - Improved the quality of the financial statements and board

Remedies?

- Global Legal Settlement of 2002
  - Required investment banks to sever links between research and underwriting
  - Spinning is explicitly banned
  - Imposed a $1.4 billion fine
  - Added additional requirements to ensure independence and objectivity of research reports