Chapter 8

An Economic Analysis of Financial Structure

Money and Banking

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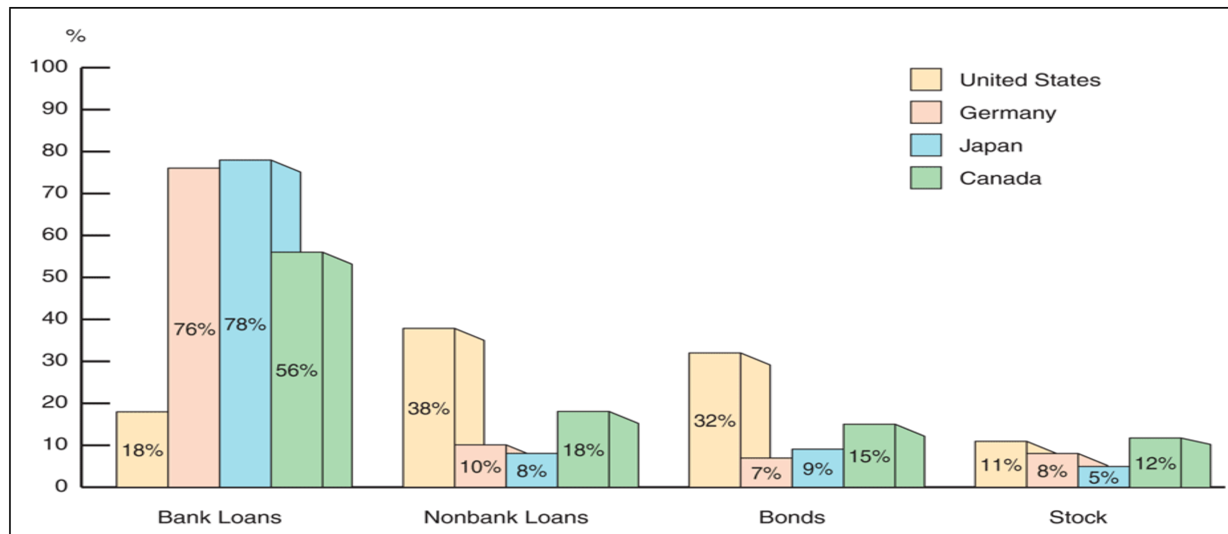
1 Introduction

- This chapter provides an economic analysis of **how our financial structure is designed to promote economic efficiency**.
  - The analysis focuses on **a few simple but powerful economic concepts (i.e., "transaction" and "information" costs)** that enable us to explain features of our financial system—for example, why financial contracts are written as they are and why financial intermediaries are more important than securities markets for getting funds to borrowers.
  - The analysis also demonstrates the important link between the financial system and the performance of the aggregate economy.

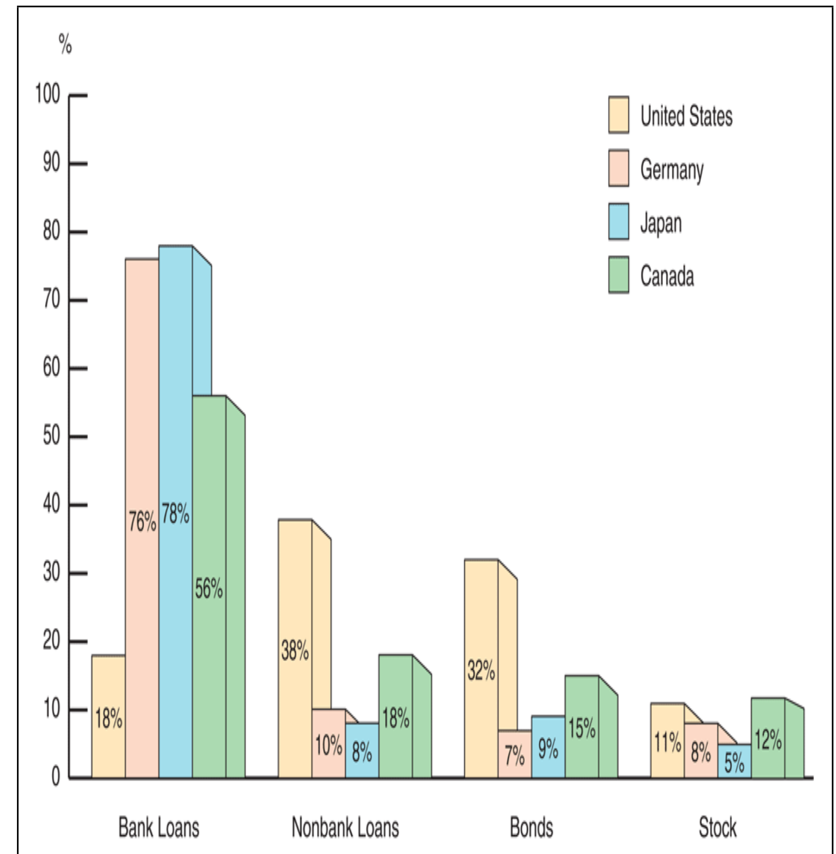
2 Basic Facts about Financial Structure throughout the World

- The financial system is complex in structure and function throughout the world.
  - If we take a look at financial structure all over the world, we find **eight basic facts**, some of which are quite surprising, that we must explain to understand how the financial system works.
  - The bar chart in Figure 1 shows **how American nonfinancial 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.
    - In the figure, there are four categories for external funds:
      1. The **Bank Loans** is made up primarily of loans from depository institutions.
      2. The **Nonbank Loans** is primarily loans by other financial intermediaries.
      3. The **Bonds** includes marketable debt securities, such as corporate bonds and commercial paper.
      4. The **Stocks** consists of new issues of new equity (stock market shares).



- Here are the eight basic facts:

  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, 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.
  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 restrictions on the behavior of the borrower.



- Let's now explore each of the eight facts:

  1. **Stocks are not the most important source of external financing for businesses.**
     - Many people have the impression that stocks are the most important source of financing for (U.S. and other countries') corporations.
       * However, the stock market accounted for only a small fraction of the external financing of businesses in the 1970 – 2000 period: 11% in the U.S..
     - **Why is the stock market less important than other sources of financing in the U.S. and other countries?**
  2. **Issuing marketable debt and equity securities is not the primary way in which businesses finance their operations.**
     - Stocks and bonds combined (43%) still supply less than one-half of the external funds U.S. corporations need to finance their activities.
       * Other countries have a "much" smaller share of external financing supplied by marketable securities than does the U.S..
     - **Why don't businesses use marketable securities more extensively to finance their activities?**
  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.**
     - Because in most countries marketable securities (stocks and bonds) are an even less important source of external financing than in the U.S., direct finance is also far less important than indirect finance in the rest of the world.
     - **Why are financial intermediaries and indirect finance so important in financial market?**
       * In recent years, indirect finance has been declining in importance. Why is this happening?

4. **Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.**
   - The data suggest that banks in the countries other than the U.S. have the most important role in financing business activities.
     * In developing countries, banks play an even more important role in the financial system than they do in industrialized countries.
   - **What makes banks so important to the workings of the financial system?**
     * Although banks remain important, their share of external funds for businesses has been declining in recent years. What is driving this decline?
5. **The financial system is among the most heavily regulated sectors of the economy.**
   - The financial system is heavily regulated in the U.S. and all other developed countries.
   - **Why are financial markets so extensively regulated throughout the world?**
6. **Only large, well-established corporations have easy access to securities markets to finance their activities.**
   - Smaller businesses that are not well established are less likely to raise funds by issuing marketable securities. Instead, they most often obtain their financing from banks.
   - **Why do only large, well-known corporations find it easier to raise funds in securities markets?**

7. **Collateral is a prevalent feature of debt contracts for both households and businesses.**

   - Collateralized debt (also known as **secured debt**) to contrast it with **unsecured debt** (e.g., credit card debt that is not collateralized) is the predominant form of household debt and is widely used in business borrowing as well.

     * *Collateral* is property that is pledged to a lender to guarantee payment in the event that the borrower is unable to make debt payments.

   - **Why is collateral such an important feature of debt contracts?**

8. **Debt contracts are extremely complicated legal documents that place substantial restrictions on the behavior of the borrower.**

   - In all countries, bond or loan contracts typically are long legal documents with provisions (called restrictive covenants) that restrict and specify certain activities that the borrower can engage in.

   - **Why debt contracts so complex and restrictive?**

- As you may recall from Chapter 2, an important feature of financial markets is that they have substantial **"transaction" and "information" costs**.

  - **An economic analysis of how these costs affect financial markets** provides us with explanations of the eight facts, which in turn enable a much deeper understanding of how our financial system works.

  In what follows, we do the following things:

  1. We first examine the impact of transaction costs on the structure of our financial system.

  2. We then turn to the effect of information costs on financial structure.

3 Transaction Costs

- Transaction costs are a major problem in financial markets.
  - Transaction costs freeze many small savers out of direct involvement with financial markets.
    - Suppose you have only $5,000 to invest in buying stocks or bonds.
      - The smallest denomination for some bonds you might want to buy is as much as $10,000, and then you even can't use debt markets to earn a return on your savings.
      - You can buy a small number of shares, but the brokerage commission for buying the stock will be a large percentage of the purchase price of the shares.
  - The presence of transaction costs in financial markets explains in part why financial intermediaries and indirect finance play such an important role in financial markets (**Fact 3**).
- Fortunately, **financial intermediaries** can take advantage of "**economies of scale**" and are better to develop "**expertise**" to lower transaction costs, thus allowing savers and borrowers to benefit from the existence of financial markets.
  1. The presence of economies of scale in financial markets helps explain why financial intermediaries developed and have become such an important part of our financial structure.
     - The clearest example of a financial intermediary that arose because of economies of scale is a *mutual fund*.
  2. Financial intermediaries' expertise in computer technology enables the intermediaries to offer customers convenient services like being able to write checks on their checks.
     - 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.

4 Asymmetric Information: Adverse Selection and Moral Hazard

- To understand financial structure more fully, we turn to the **role of information** in financial markets.
  - **Asymmetric information** is an important aspect of financial markets.
    - It is a situation that arises when one party's insufficient knowledge about the other party involved in a transaction makes it impossible to make accurate decisions when conducting the transaction.
    - For example, managers of a corporation know whether they have better information about how well their business is dong than the stockholders do.
- Asymmetric information results in two problems, which were introduced in Chapter 2.
  1. **Adverse selection**, which occurs *before* the transaction, refers to the fact that potential bad credit risks are the ones most likely to seek loans.
     - Because adverse selection increases the chances that a loan might be made to a bad credit risk, lenders might decide not to make any loans, even though good credit risks can be found in the marketplace.
     - A particular aspect of adverse selection is the **lemons problem**.
  2. **Moral hazard**, which occurs *after* the transaction, refers to the risk of the borrower's engaging in activities that are undesirable from the lender's point of view.
     - Because moral hazard lowers the probability that the loan will be repaid, lenders may decide that they would rather not make a loan.
     - A particular type of moral hazard is the **principal-agent problem** in **"equity" contracts**.
- The analysis of how asymmetric information problems affect economic behavior is called **agency theory**.
  - **We will apply this theory here to explain why financial structure takes the form it does, thereby explaining the facts outlined at the beginning of the chapter.**

4.1 The Lemons Problem: How Adverse Selection Influences Financial Structure

- A particular aspect of the way the adverse selection problem interferes with the efficient functioning of a market is the "**lemons problem**," because it resembles the problem created by lemons in the used-car market.
  - Potential buyers of used cars are frequently unable to tell whether a particular used car is on that will run well or a lemon that will continually give them grief.
    - Therefore, the price that a buyer pays must reflect the "*average*"quality of the cars in the market, *somewhere between the low value of a bad car (lemon) and the high value of a good car (peach)*.
  - The owner of a used car, by contrast, is more likely to know whether the car is a peach or a lemon.
    - If the car is a lemon, the owner is more than happy to sell it at the price the buyer is willing to pay, which is greater than the lemon's value.
    - If the car is a peach, however, the owner knows that the car is undervalued at the price the buyer is willing to pay, and so the owner may not want to sell it.
  - As a result of this adverse selection, few good used cars will come to the market.
    - Because the average quality of a used car available in the market will be low and because few people want to buy a lemon, there will be few sales.
    - That is, *the used-car market will function poorly, if at all*.

4.1.1 Lemons in the Stock and Bond Markets

- **A similar lemons problem arises in the debt (bond) and equity (stock) market.**
  - For example, suppose that an investor Irving considers purchasing a corporate debt instrument in the bond market.
    - He can't distinguish between good and bad firms, so he will buy a bond only if its interest rate is high enough to compensate him for the "*average*" default risk of the good and bad firms trying to sell the debt.
      - The knowledgeable owners of a good firm realize that they will be paying a higher interest rate than they should, so they are unlikely to want to borrow in this market.
      - Only the bad firms will be willing to borrow, and because investors like Irving are not eager to buy bonds issued by bad firms, they will not buy any bonds at all.
    - As a result, few bonds are likely to sell in this market, so it will not be a good source of financing.
  - The similar analysis is applied to the equity market.
- The analysis above explains
  - explains **Fact 2**: why marketable securities are not the primary source of external financing for businesses in any country in the world.
  - partly explains **Fact 1**: why stocks are not the most important source of financing for American businesses.
- The presence of the lemons problem keeps securities markets such as the stock and bond markets from being effective in channeling funds from savers to borrowers.

4.1.2 Tools to Help Solve Adverse Selection Problems

- **If purchasers of securities can distinguish goods firms from bad ones,** they will pay the full value of securities issued by good firms, and good firms will sell their securities in the market.
  - Then, the securities market will be able to move funds to the good firms that have the most productive investment opportunities.

1. **Private Production and Sale of Information**
   - The solution to the adverse selection in financial markets is to reduce asymmetric information by furnishing the people supplying funds with *more details about firms* seeking to finance their investment activities.
     - One way to get this material to saver-lenders is to **have "private companies" collect and produce information that distinguishes goods from bad firms and then sell it**.
       - Companies such as Standard and Poor's and Moody's
   - However, the system of private production and sale of information *does not completely solve* the adverse selection problem in securities markets because of the **free-rider problem**.
     - The free-rider problem occurs when people who do not pay for information take advantage of the information that other people have paid for.
     - To see why, suppose that you have just purchased private information about good firms, which is worthwhile because you can make up the cost of acquiring this information by purchasing the securities of good firms that are undervalued.
       - *If other many "free-riding" investors see you buying certain securities and buy right along with you,* the increased demand for the undervalued good securities will cause their low prices to be bid up immediately. As a result, you will not gain any profits from purchasing the information and realize that you never should have paid for this information "in the first place."
       - If other investors like you come to the same realization, private companies may not be able to sell

enough of this information to make it worth their while to gather and produce it.

* *Thus, the free-rider problem weakens the ability of private firms to profit from selling information, which means that less information is produced in the marketplace.*

2. **Government Regulation to Increase Information**

- The government could produce information to help investors distinguish good from bad firms and provide it to the public free of charge
  - However, this solution would involve the government in releasing negative information about firms, a practice that might be politically difficult.
- On the other hand, the government regulates securities markets in a way that encourages firms to reveal honest information about themselves so that investors can determine how good or bad the firms are.
  - For example, in the U.S., the Securities and Exchange Commission (SEC) is the government agency that requires firms selling their securities to disclose accurate information about sales, assets, and earnings.
    * However, disclosure requirements do not always work well.
- Thus, government regulation to increase information for investors is needed to reduce the adverse selection problem, which helps explain why financial markets are among the most heavily regulated sectors in the economy (**Fact 5**).

3. **Financial Intermediation**

- **A financial intermediary, such as a bank, becomes an expert in producing 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.
  - By doing so, the bank earns a high return, which gives it the *incentive to engage in this information production activity*.

- More importantly, **the bank avoids the free-rider problem by primarily making "private" loans** rather than by purchasing securities that are traded in the open market, which is the key to its success in reducing the adverse selection problem in financial markets.

- Our analysis of adverse selection indicates that because they hold a large fraction of nontraded loans, financial intermediaries in general – and banks in particular – should play a greater role in moving funds to corporations than securities markets do.
  - Thus, our analysis explains **Facts 3 and 4**: why indirect finance is so much more important than direct finance and why banks are the most important source of external funds for financing businesses.
- On the other hand, our analysis of adverse selection also explains **Fact 6**: why large firms are more likely to obtain funds from securities markets (direct finance) than from banks and financial intermediaries (indirect finance).
  - The better known a corporation is, the more information about its activities is available in the marketplace.
  - Thus, investors have fewer worries about adverse selection with well-known corporations, and will be willing to invest directly in their securities.

4. **Collateral and Net Worth**
   - **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. Thus, lenders are more willing to make loans secured by collateral.
     - The presence of adverse selection in credit markets thus provides an explanation for why collateral is an important feature of debt contracts (**Fact 7**).
   - **Net worth** (also called **equity capital**), *the difference between a firm's asset and its liabilities*, can perform a similar role to that of collateral.
     - If a firm has a high net worth, then even if it engages in risky investments and defaults on its debt

payments, the lender can take title to the firm's net worth, sell it off, and use the proceeds to recoup some of the losses from the loan.

– Hence, when firms seeking credit have high net worth, the consequences of adverse selection are less important and lenders are more willing to make loans.

4.2 How Moral Hazard Affects the Choice between Equity and Debt Contracts

- Moral hazard has important consequences for whether **a firm find it easier to raise funds with debt than with equity contracts**.

4.2.1 Moral Hazard in Equity Contracts

Moral Hazard in Equity Contracts: The Principal-Agent Problem

- **Equity contracts**, such as common stock, are claims to a share in the profits and assets of a business. Especially, equity contracts are subject to a particular type of moral hazard call the **principal-agent problem**.
  - When managers (the agents) own only a small fraction of the firm they work for, the stockholders (the principals) who own most of the firm's equity are not the same people as the managers of the firm.
  - This separation of ownership and control involves moral hazard, in that **the managers in control may act in their own interest rather than in the interest of the stockholder-owners** because the managers have less incentive to maximize profits than the stockholder-owners do.
    * For example, the managers pursue their personal benefits. They also pursue corporate strategies that enhance their personal power but do not increase the corporation's profitability.
- The principal-agent problem would not arise **if the owners of a firm had complete information about what the managers were up to and could prevent wasteful expenditures or fraud**.

Tools to Help Solve the Principal-Agent Problem

1. **Production of Information: Monitoring**
   - One way for stockholders to reduce the principal-agent problem is for them to engage in a particular type of information production, the **monitoring of the firm's activities**: auditing the firm frequently and checking on what the management is doing.

- However, the monitoring process can be expensive in terms of time and money, as reflected in the name economists give it, **costly state verification**.
    * **Costly state verification makes the equity contract less desirable, and it explains partly why equity is not an important element in financial structure.**

2. **Government Regulation to Increase Information**

- As with adverse selection, the government has an incentive to try to reduce the moral hazard problem resulting from the principal-agent problem.
    - For example, governments everywhere pass laws to impose stiff criminal penalties on people (managers) who commit the fraud of hiding and stealing profits.
    - However, such a measure can be only partly effective: fraudulent managers have incentives to make it very hard for government agencies to find or prove fraud.

3. **Financial Intermediation**

- One financial intermediary that helps reduce the moral hazard problem arising from the principal-agent problem is the **venture capital firm**.
    - The venture capital firm usually have several of their own people participate as members of the managing body of the firm receiving venture capital, so that they can keep a close watch on the firm's activities.

4. **Debt Contracts**

- If a contract could be structured so that moral hazard would exist only in certain situations, the need to monitor managers would be reduced, and the contract would be more attractive than the equity contract.
- The *debt contract* has exactly these attributes because it is a contractual agreement by the borrower to pay the lender fixed dollar amounts at periodic intervals.
    - If the managers are hiding profits or pursuing activities that are personally beneficial but don't increase

profitability, the lender does not care as long as these activities do not interfere with the ability of the firm to make its debt payments on time.

- Only when the firm cannot meet its debt payments does the lender need to verify the state of the firm's profits.

- **The less frequent need to monitor the firm and thus the lower cost of state verification, helps explain why debt contracts are used more frequently than equity contracts to raise capital** – this analysis of moral hazard therefore helps **Fact 1**, why stocks are not the most important source of financing for businesses.

4.2.2 Moral Hazard in Debt Contracts

How Moral Hazard Influences Financial Structure in Debt Markets

- Even with the advantages described previously (i.e., the less frequent need to monitor the firm and the lower cost of state verification), **debt contracts are still subject to moral hazard.**
  - For example, because as an investor you are concerned about the problem of verifying the profits of the firm you will invest in, you decide not to become an equity partner. Instead, you just lend the firm your money and have a debt contract that pays you an interest rate of 10%.
  - **However, once you give the firm the funds, the firm could use them in very risky investment.**
  - Thus, you would probably not make the loan to the firm.

Tools to Help Solve Moral Hazard in Debt Contracts

1. **Net Worth and Collateral**
   - When borrowers have more at stake because their net worth is high or the collateral they have pledged to the lender is valuable, 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.

- One way of describing the solution that high net worth and collateral provides to the moral hazard problem is to say that it makes the debt contract **"incentive compatible"**; that is, **it aligns the incentives of the borrower with those of the lender.**
  - The greater the borrower's net worth and collateral pledged, then 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, and the easier it is for the firm/household to borrow.

2. **Monitoring and Enforcement of Restrictive Covenants**

- By monitoring the firm's activities to see whether it is complying with the restrictive covenants and enforcing the covenants if he is not, the lender can make sure that the firm will not take on risks at the lender's expense.
  - **Thus, restrictive covenants are directed at reducing moral hazard either by ruling out undesirable behavior or by encouraging desirable behavior**
- There are four types of restrictive covenants that achieve this objective:

  (a) **Covenants to discourage undesirable behavior**
  - Some covenants mandate that a loan can be used only to finance specific activities, such as the purchase of particular equipment or inventories.

  (b) **Covenants to encourage desirable behavior**
  - Restrictive covenants of this type form businesses focus on encouraging the borrowing firm to keep its net worth high because higher net worth reduces moral hazard and make it less likely that the lender will suffer losses.

  (c) **Covenants to keep collateral valuable**
  - The recipient of a home mortgage must have adequate insurance on the home and must pay off the mortgage when the property is sold.

(d) **Covenants to provide information**

- Restrictive covenants also require a borrowing firm to provide information about its activities periodically in the form of quarterly accounting and income reports.

- From the above, we see why debt contracts are often complicated legal documents with numerous restrictions on the borrower's behavior (**Fact 8**): debt contracts require complicated restrictive covenants to lower moral hazard.

3. **Financial Intermediation**

- A problem with restrictive covenants is that they must be monitored and enforced.
  - Because monitoring and enforcement of restrictive covenants are "costly," **the free-rider problem arises in the debt securities (bond) market** just as it does in the stock market.
    * If you know that other bondholders are monitoring and enforcing the restrictive covenants, you can free-ride on their monitoring and enforcement. But other bondholders can do the same thing, so the likely outcome is that not enough resources are devoted to monitoring and enforcing restrictive covenants.
    * Thus, moral hazard continues to be a severe problem for marketable debt.
- Financial intermediaries – particularly banks – have the ability to avoid the free-rider problem **as long as they make primarily "private" loans.**
  - Private loans are "not" traded so that no one else can free-ride on the intermediary's monitoring and enforcement of the restrictive covenant.
    * Thus, the intermediary making private loans receives the benefits of monitoring and enforcement and will work to shrink the moral hazard problem inherent in debt contracts.
  - This analysis provides us with additional reasons why financial intermediaries play a more important role in channeling the funds than marketable securities do, as described in **Facts 3 and 4**.

4.3 Summary

- Asymmetric information in financial markets leads to adverse selection and moral hazard problems that interfere with the efficient functioning of those markets.
  - Tools to help solve these problems involve (a) the private production and sale of information, (b) government regulation to increase information in financial markets, (c) the importance of collateral and net worth to debt contracts, and (d) the use of monitoring and restrictive covenants.
  - A key finding from our analysis is that the existence of the free-rider problem for traded securities such as stocks and bonds indicates that financial intermediaries – particularly banks – should play a greater role than securities markets in financing the activities of businesses.
- Table 1 summarizes the asymmetric information problems and tools that help solve them, along with the notes on how these tools and asymmetric information problems explain the eight facts of financial structure.

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.