GLOBAL EDITION

THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS

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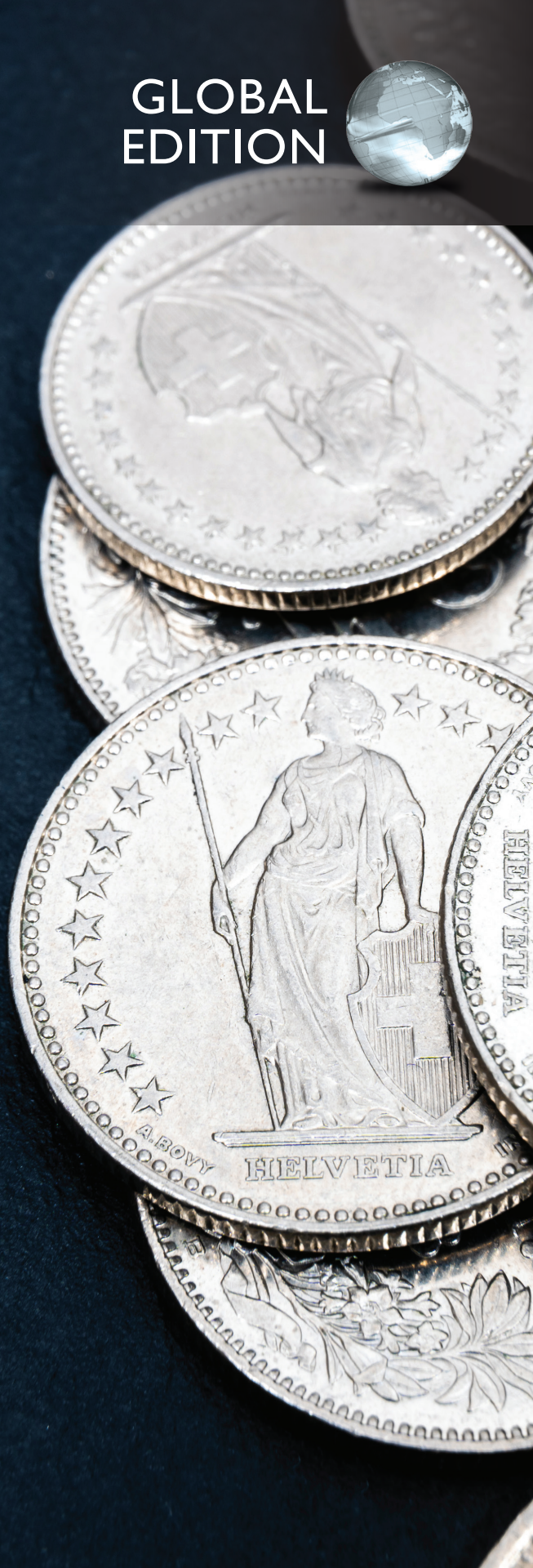

APPLYING THEORY TO THE REAL WORLD: APPLICATIONS AND BOXES

Global Boxes

Inside the Fed Boxes

FYI Boxes

7. ***Collateral is a prevalent feature of debt contracts for both households and businesses.*** **Collateral** is property that is pledged to a lender to guarantee payment in the event that the borrower is unable to make debt payments. Collateralized debt (also known as **secured debt** to contrast it with **unsecured debt**, such as credit card debt, which is not collateralized) is the predominant form of household debt and is widely used in business borrowing as well. The majority of household debt in the United States consists of collateralized loans: Your automobile is collateral for your auto loan, and your house is collateral for your mortgage. Commercial and farm mortgages, for which property is pledged as collateral, make up one-quarter of borrowing by nonfinancial businesses; corporate bonds and other bank loans also often involve pledges of collateral. Why is collateral such an important feature of debt contracts?
8. ***Debt contracts typically are extremely complicated legal documents that place substantial restrictions on the behavior of the borrower.*** Many students think of a debt contract as a simple IOU that can be written on a single piece of paper. The reality of debt contracts is far different, however. 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. Restrictive covenants are not just a feature of debt contracts for businesses; for example, personal automobile loan and home mortgage contracts include covenants that require the borrower to maintain sufficient insurance on the automobile or house purchased with the loan. Why are debt contracts so complex and restrictive?

As you may recall from Chapter 2, an important feature of financial markets is their substantial transaction and information costs. An economic analysis of how these costs affect financial markets will help us understand the eight facts, which will in turn give us a much deeper understanding of how our financial system works. In the next section, we examine the impact of transaction costs on the structure of our financial system. Then we turn to the effects of information costs on financial structure.

8.2 TRANSACTION COSTS

LO 8.2 Summarize how transaction costs affect financial intermediaries.

Transaction costs are a major problem in financial markets. An example will make this clear.

How Transaction Costs Influence Financial Structure

Say you have $5,000 that you would like to invest, and you are thinking about investing in the stock market. Because you have only $5,000, you can buy only a small number of shares. Even if you use online trading, your purchase is so small that the brokerage commission for buying the stock you pick will be a large percentage of the purchase price of the shares. If, instead, you decide to buy a bond, the problem becomes even worse; the smallest denomination offered on some bonds that you might want to buy is as large as $10,000, and you do not have that much money to invest. You are disappointed and realize that you will not be able to use financial markets to earn a return on your hard-earned savings. You can take some consolation, however, in the fact that you are not alone in being stymied by high transaction costs. This is a fact of life for many of us: About one-half of American households own any securities.

You also face another problem related to transaction costs. Because you have only a small amount of funds available, you can make only a restricted number of

investments, because a large number of small transactions would result in very high transaction costs. That is, you have to put all your eggs in one basket, and your inability to diversify will subject you to a lot of risk.

How Financial Intermediaries Reduce Transaction Costs

This example of the problems posed by transaction costs, along with the example outlined in Chapter 2, in which legal costs kept you from making a loan to Carl the Carpenter, illustrates that small savers like you are frozen out of financial markets and are unable to benefit from them. Fortunately, financial intermediaries, an important part of the financial structure, have evolved to reduce transaction costs and allow small savers and borrowers to benefit from the existence of financial markets.

Economies of Scale One solution to the problem of high transaction costs is 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. Bundling investors' funds together reduces transaction costs for each individual investor. 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. For example, the cost of arranging a purchase of 10,000 shares of stock is not much greater than the cost of arranging a purchase of 50 shares of stock.

The presence of economies of scale in financial markets helps explain the development of financial intermediaries and why financial intermediaries 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. A *mutual fund* is 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. These cost savings are then passed on to individual investors after the mutual fund has taken its cut in the form of management fees for administering their accounts. An additional benefit for individual investors is that a mutual fund is large enough to purchase a widely diversified portfolio of securities. The increased diversification for individual investors reduces their risk, making them better off.

Economies of scale are also important in lowering the costs of resources that financial institutions need to accomplish their tasks, such as computer technology. Once a large mutual fund has invested a lot of money in setting up a telecommunications system, for example, the system can be used for a huge number of transactions at a low cost per transaction.

Expertise Financial intermediaries are also better able to develop expertise that can be used to lower transaction costs. Their expertise in computer technology, for example, enables them to offer their customers convenient services such as check-writing privileges on their accounts and toll-free numbers that customers can call for information on how well their investments are doing.

Low transaction costs enable financial intermediaries to provide their customers with *liquidity services*, which are services that make it easier for customers to conduct transactions. Money market mutual funds, for example, not only pay shareholders relatively high interest rates but also allow them to write checks for convenient bill paying.

8.3 ASYMMETRIC INFORMATION: ADVERSE SELECTION AND MORAL HAZARD

LO 8.3 Describe why asymmetric information leads to adverse selection and moral hazard.

The presence of transaction costs in financial markets partly explains why financial intermediaries and indirect finance play such an important role in financial markets (fact 3). To understand financial structure more fully, however, we turn to the role of information in financial markets.

Asymmetric information—a situation that arises when one party's insufficient knowledge about the other party involved in a transaction makes it impossible for the first party to make accurate decisions when conducting the transaction—is an important aspect of financial markets. For example, managers of a corporation know whether they are honest and usually have better information about how well their business is doing than stockholders do. The presence of asymmetric information leads to adverse selection and moral hazard problems, which were introduced in Chapter 2.

Adverse selection is an asymmetric information problem that occurs *before* a transaction occurs. Adverse selection occurs when one party to a transaction has information about a hidden characteristic and takes economic advantage of this information by engaging in a transaction with less informed parties. Specifically, potential bad credit risks are the ones who most actively seek out loans. Thus the parties who are most likely to produce an undesirable outcome are also the ones most likely to want to engage in the transaction. For example, big risk takers or outright crooks are often the most eager to take out a loan because they know they are unlikely to pay it back. 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.

Moral hazard arises *after* the transaction occurs. Moral hazard occurs when an informed party takes a hidden (unobserved) action that harms the less informed party. A lender runs the risk that the borrower will engage in activities that are undesirable from the lender's point of view, because such activities make it less likely that the loan will be paid back. For example, once borrowers have obtained a loan, they may take on big risks (which have possible high returns but also run a greater risk of default) because they are playing with someone else's money. Because moral hazard lowers the probability that the loan will be repaid, lenders may decide that they would rather not make a loan.

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.

8.4 THE LEMONS PROBLEM: HOW ADVERSE SELECTION INFLUENCES FINANCIAL STRUCTURE

LO 8.4 Recognize adverse selection and summarize the ways in which it can be reduced.

A particular aspect of the way the adverse selection problem interferes with the efficient functioning of a market was outlined in a famous article by Nobel Prize winner George Akerlof. It is called the "lemons problem" because it resembles the problem created by

"lemons," that is, bad cars, in the used-car market.[2] Potential buyers of used cars are frequently unable to assess the quality of a car; that is, they can't tell whether a particular used car is one that will run well or a lemon that will continually give them grief. The price that a buyer pays must therefore reflect the *average* quality of the cars in the market, somewhere between the low value of a lemon and the high value of a good car.

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, being somewhere between the value of a lemon and that of a good car, is greater than the lemon's value. However, if the car is a peach, that is, a good car, 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 problem, fewer 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 very few people want to buy a lemon, there will be few sales. The used-car market will function poorly, if at all.

Lemons in the Stock and Bond Markets

A similar lemons problem arises in securities markets—that is, the debt (bond) and equity (stock) markets. Suppose that our friend Irving the Investor, a potential buyer of securities such as common stock, can't distinguish between good firms with high expected profits and low risk and bad firms with low expected profits and high risk. In this situation, Irving will be willing to pay only a price that reflects the *average* quality of firms issuing securities—a price that lies between the value of securities from bad firms and the value of those from good firms. If the owners or managers of a good firm have better information than Irving and *know* that they have a good firm, then they know that their securities are undervalued and will not want to sell them to Irving at the price he is willing to pay. The only firms willing to sell Irving securities will be bad firms (because his price is higher than the securities are worth). Our friend Irving is not stupid; he does not want to hold securities in bad firms, and hence he will decide not to purchase securities in the market. In an outcome similar to that in the used-car market, this securities market will not work very well because few firms will sell securities in it to raise capital.

The analysis is similar if Irving considers purchasing a corporate debt instrument in the bond market rather than an equity share. Irving 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 probably not buy any bonds at all. Few bonds are likely to sell in this market, so it will not be a good source of financing.

The analysis we have just conducted explains fact 2—why marketable securities are not the primary source of financing for businesses in any country in the world. It also 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.

[2]George Akerlof, "The Market for 'Lemons': Quality, Uncertainty and the Market Mechanism," *Quarterly Journal of Economics* 84 (1970): 488–500. Two important papers that have applied the lemons problem analysis to financial markets are Stewart Myers and N. S. Majluf, "Corporate Financing and Investment Decisions: When Firms Have Information That Investors Do Not Have," *Journal of Financial Economics* 13 (1984): 187–221; and Bruce Greenwald, Joseph E. Stiglitz, and Andrew Weiss, "Information Imperfections in the Capital Market and Macroeconomic Fluctuations," *American Economic Review* 74 (1984): 194–199.

Tools to Help Solve Adverse Selection Problems

In the absence of asymmetric information, the lemons problem goes away. If buyers know as much about the quality of used cars as sellers, so that all involved can tell a good car from a bad one, buyers will be willing to pay full value for good used cars. Because the owners of good used cars can now get a fair price, they will be willing to sell them in the market. The market will have many transactions and will perform its intended job of channeling good cars to people who want them.

Similarly, if purchasers of securities can distinguish good firms from bad, they will pay the full value of securities issued by good firms, and good firms will sell their securities in the market. The securities market will then be able to move funds to the good firms that have the most productive investment opportunities.

Private Production and Sale of Information The solution to the adverse selection problem in financial markets is to reduce asymmetric information by furnishing the people supplying funds with more details about the individuals or firms seeking to finance their investment activities. One way for saver-lenders to get this information is through private companies that collect and produce information distinguishing good firms from bad firms and then sell it to the saver-lenders. In the United States, companies such as Standard & Poor's, Moody's, and Value Line gather information on firms' balance sheet positions and investment activities, publish these data, and sell them to subscribers (individuals, libraries, and financial intermediaries involved in purchasing securities).

The system of private production and sale of information does not completely solve the adverse selection problem in securities markets, however, 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. The free-rider problem suggests that the private sale of information is only a partial solution to the lemons problem. To see why, suppose you have just purchased information that tells you which firms are good and which are bad. You believe that this purchase is worthwhile because you can make up the cost of acquiring this information, and then some, by purchasing the securities of good firms that are undervalued. However, when our savvy (free-riding) investor Irving sees you buying certain securities, he buys right along with you, even though he has not paid for any information. If many other investors act as Irving does, the increased demand for the undervalued good securities causes their low price to be bid up immediately to reflect the securities' true value. Because of all these free riders, you can no longer buy the securities for less than their true value. Now, because you will not gain any profit from purchasing the information, you realize that you never should have paid for the information in the first place. If other investors come to the same realization, private firms and individuals may not be able to sell enough of this information to make it worth their while to gather and produce it. The weakened ability of private firms to profit from selling information will mean that less information is produced in the marketplace, so adverse selection (the lemons problem) will still interfere with the efficient functioning of securities markets.

Government Regulation to Increase Information The free-rider problem prevents the private market from producing enough information to eliminate all the asymmetric information that leads to adverse selection. Could financial markets benefit from government intervention? The government could, for instance, produce information to help investors distinguish good from bad firms and provide it to the public free of charge. This solution, however, would involve the government releasing negative information about firms, a practice that might be politically difficult. A second possibility (and one followed by the United States and most governments throughout the world) is for the

FYI The Enron Implosion

Until 2001, Enron Corporation, a firm that specialized in trading in the energy market, appeared to be spectacularly successful. It controlled a quarter of the energy-trading market and was valued as high as $77 billion in August 2000 (just a little over a year before its collapse), making it the seventh largest corporation in the United States at that time. However, toward the end of 2001, Enron came crashing down. In October 2001, Enron announced a third-quarter loss of $618 million and disclosed accounting "mistakes." The SEC then engaged in a formal investigation of Enron's financial dealings with partnerships led by its former finance chief. It became clear that Enron was engaged in a complex set of transactions by which it was keeping substantial amounts of debt and financial contracts off its balance sheet. These transactions enabled Enron to hide its financial difficulties. Despite securing as much as $1.5 billion of new financing from J. P. Morgan Chase and Citigroup, the company was forced to declare bankruptcy in December 2001, up to that point the largest bankruptcy declaration in U.S. history.

The Enron collapse illustrates that government regulation can lessen asymmetric information problems but cannot eliminate them. Managers have tremendous incentives to hide their companies' problems, making it hard for investors to know the true value of firms.

The Enron bankruptcy not only increased concerns in financial markets about the quality of accounting information supplied by corporations but also led to hardship for many of the firm's former employees, who found that their pensions had become worthless. Outrage against the duplicity of executives at Enron was high, and several of them were convicted and sent to jail.

government to regulate 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. In the United States, the Securities and Exchange Commission (SEC) is the government agency that requires firms selling their securities to undergo independent audits, in which accounting firms certify that the firm is adhering to standard accounting principles and disclosing accurate information about sales, assets, and earnings. Similar regulations are found in other countries. However, disclosure requirements do not always work well, as the collapse of Enron and accounting scandals at other corporations, such as WorldCom and Parmalat (an Italian company), suggest (see the FYI box "The Enron Implosion").

The asymmetric information problem of adverse selection in financial markets helps explain why financial markets are among the most heavily regulated sectors of the economy (fact 5). Government regulation aimed at increasing the information available to investors is necessary to reduce the adverse selection problem, which interferes with the efficient functioning of securities (stock and bond) markets.

Although government regulation lessens the adverse selection problem, it does not eliminate it entirely. Even when firms provide information to the public about their sales, assets, or earnings, they still have more information than investors: A lot more is involved in knowing the quality of a firm than statistics alone can provide. Furthermore, bad firms have an incentive to make themselves look like good firms because this enables them to fetch a higher price for their securities. Bad firms will slant the information they are required to transmit to the public, thus making it harder for investors to sort out the good firms from the bad.

Financial Intermediation So far we have seen that private production of information and government regulation to encourage provision of information lessen, but do not eliminate, the adverse selection problem in financial markets. How, then, can