Chapter 6

Processing the Economy's Financial Information

All finance involves parting with money now in return for a promise of reward in the future, whether it is the West African marketwoman entrusting her morning's takings to a collector for safekeeping, or an investor supplying funds to an Asian manufacturer seeking to expand exports. The promise may not be fulfilled, and when it is not, the consequences often extend well beyond the parties to the transaction. Any supplier of funds to the financial marketplace needs to assess the prospects of getting those funds back, along with a high enough return to compensate for the risk of loss.

It is because these exchanges of money now for money later are concluded only in the future that information about those prospects is always imperfect. Indeed, the rewards to gathering and processing information about risk and insulating against uncertainty have been the main force behind the development of financial markets and institutions. In this sense the financial system is central to how an economy copes with uncertainty, but it does so imperfectly. There is no guarantee that the outcome will be efficient, socially optimal, or even stable, for finance itself contributes to information-related economic problems.

Finance is important to every individual and firm, but good financial institutions are also vital for the functioning of the entire economy. If finance is an economy's nervous system, financial institutions are its brain. They make the decisions that tell scarce capital where to go, and they ensure that, once there, it is used in the most effective way. Research confirms that countries with more-developed financial institutions grow faster, and that countries with weak ones are more likely to have financial crises, with adverse effects on growth sometimes lasting years after.

The fixed costs of acquiring information about would-be borrowers and the difficulty of appropriating all the benefits of such information mean that lenders tend to have market power over borrowers and that less information is supplied than is socially optimal. The market for credit may not clear, because willingness to pay is a poor indicator of creditworthiness. And an economy can become highly vulnerable to small shifts in opinion or information, which can lead to large swings in asset prices.

A maxim among bank presidents is that a loan officer making good money for the bank needs to be watched closely; one making fantastic money should be fired, for the risks must be too great. If, as this maxim suggests, information failures are a familiar problem for financial intermediaries, they are even more of a problem for those outside: small shareholders, creditors of various types—and official regulators and supervisors.

For financial systems to cope with such information problems effectively requires supportive policies from government, especially in developing economies, where these problems are more severe. At the same time, the complexity of the incentive structures associated with handling financial information means that government needs to exert a restraining influence. Both these policy thrusts—the one supportive, the other restrictive—are crucial to good policy.

Chapter 5 has already discussed the high cost of accumulating information in informal finance. Certain informationally simple means of ensuring repayment—such as collateral, peer monitoring, and group lending—can help lower these costs and are covered in Chapter 8. Here we look at the many ways in which information supports the

formal financial system and the economy—and how there can be perverse outcomes, starting with an example from East Asia.

Information and the East Asian financial crash

The financial crash that swept many East Asian economies in 1997 shows how information deficiencies can contribute to and amplify crises in asset markets. Company accounts in many of these economies were not transparent. Official supervisors lacked sufficient information on the condition of banks' balance sheets. Even the true size of an economy's foreign exchange reserves was not always known to market participants. A common factor affecting all these economies was their exposure to short-term foreign borrowing—more by banks and firms than by government. Most of this debt was denominated in foreign currency, making the borrowers doubly vulnerable: sudden and widespread capital outflows could present them both with refinancing difficulties and with a capital loss if the domestic currency collapsed.

Widespread capital outflows and currency collapse are precisely what occurred, and their scale and breadth reflected the pervasive lack of information throughout the world about finance in the region. The belated realization that many financial institutions had lent too much to firms investing in real estate was, by common consensus, a reason for the heightened anxiety of foreign and domestic lenders to lend to financial and nonfinancial firms alike. Indeed, the collapse in early 1997 of Finance One, a major Thai finance company that had invested heavily in real estate, can be seen as the trigger.

Yet the crisis cannot be attributed entirely to lack of available information; also to blame was the market's failure to process well and fully the information it had. Information about the high levels of investment in speculative real estate, the large current account deficits, and the weakness in financial intermediaries—all factors often now cited as central to the crisis—had long been in the public domain. Similarly, observers had commented for years about the riskiness of the high debt-equity ratios of Korean firms.

Unsound lending had been common throughout the region, and the financial sector had become fragile. But how fragile? And who was really uncreditworthy? Because of the lack of transparency and the general paucity of information, investors could not tell which firms, which banks, which economies could survive the crisis. So they abandoned them all. A bandwagon effect caused funds to be withdrawn and asset prices to be marked down across a wide front. The turnaround in capital flows amounted to more than $100 billion, or 10 percent of GDP in the economies most affected. Declining asset prices made the panic self-fulfilling. Borrowers whose collateral value and earning power fell because of the general drop in asset prices became uncreditworthy. As some were forced to sell their assets, prices plummeted even more—a familiar pattern in financial crises.

One thing that might have helped avert the panic is greater accounting transparency, for greater confidence in the underlying information flows could have allowed a more discriminating response by investors. It could also have prompted much earlier corrective action, making the crisis less severe. Of course, transparency is not a foolproof protection against banking crises: the financial systems of the United States and Sweden were thought to be among the world's most transparent, yet both countries were hit with crises in recent years.

Even with the sophistication of modern information gathering and processing, then, information gaps and processing errors remain huge. The contagion that swept through industrial-country investors' holdings of emerging-market securities in the Asian crisis reflects a classic information failure and typifies the race for the exit when sentiment changes. Despite the public availability of much relevant information, the risk premium on Thai bonds before the crisis did not reflect that information, and the leading bond-rating agencies did not lower the rating of those bonds significantly until October 1997, three months after the Thai currency collapsed. Although some new information became available later—Thai reserves, it proved, were less than had been realized—the revision in risk premia seems larger than can be accounted for by this fact alone. Recalling Keynes' description of asset markets as beauty contests, it seems that market participants' concern was not with fundamental values but with what others thought.

How financial systems cope with information gaps

In financial markets the promised reward to a supplier of funds can take a variety of forms. Debt contracts promise to pay back a fixed amount, regardless of the circumstances. Equity contracts promise to pay a given fraction of the firm's profits. A wide variety of other promises are offered, many of which combine the features of debt and equity.

An essential problem facing the lender is assessing the value of the promise. For debt the question is, What is the probability of default, and if default occurs, how much will the lender be able to recover? For equity, the task is to estimate the future profits of the enterprise and their timing. These assessments are information problems, and institutions arise to address them. But they do so imperfectly, and the imperfections have important consequences.

Financial markets confront the usual information problems (raised in Chapter 5) of verifying quality and enforcing performance, and they deal with them in three related

steps. Quality verification comes at the stages of *selecting* projects (who gets the funds?) and *monitoring* them (how are the funds being used?). Information about which projects will pay off and how funds are being used is not freely available, so good selection and monitoring improve both the quality of the portfolio of projects financed and that of the intermediary. Market participants are also concerned about *enforcing* the contract. Even if they know that the debtor can repay the debt, and even if they know the true value of the equity issuer's profits, can they be sure that they will receive what has been promised? Rigorous monitoring is linked inextricably with enforcement. Indeed, without good monitoring, enforcement is not credible, and it may come too late—the assets may be gone.

Almost all financial intermediation in low-income economies is accomplished through the banking system. As income and financial development increase, nonbank intermediaries—insurance companies, pension funds, finance companies, mutual funds—develop progressively (Figure 6.1). It is largely because of the ability of banks to cope with information and contracting problems that they dominate finance at low levels of country income, where these problems loom larger. That was the pattern in Europe, where the banking business of the Lombard merchants and London goldsmiths relied heavily on their accumulated knowledge of their customers' business.

Gathering and processing information

Even outside of formal financial markets, information is important in guiding decisions about whom to trust with funds. Tight-knit communities and families possess a wealth of information about the activities and the physical, intellectual, and moral attributes of their members. Accordingly, until formal institutions develop, the most common source of working capital for trading companies, or of venture capital for new enterprises, is funding from family members and friends. But if funds are to be advanced further afield or in large amounts, one must look to the formal financial sector, and it is there that acquiring and processing information become more important.

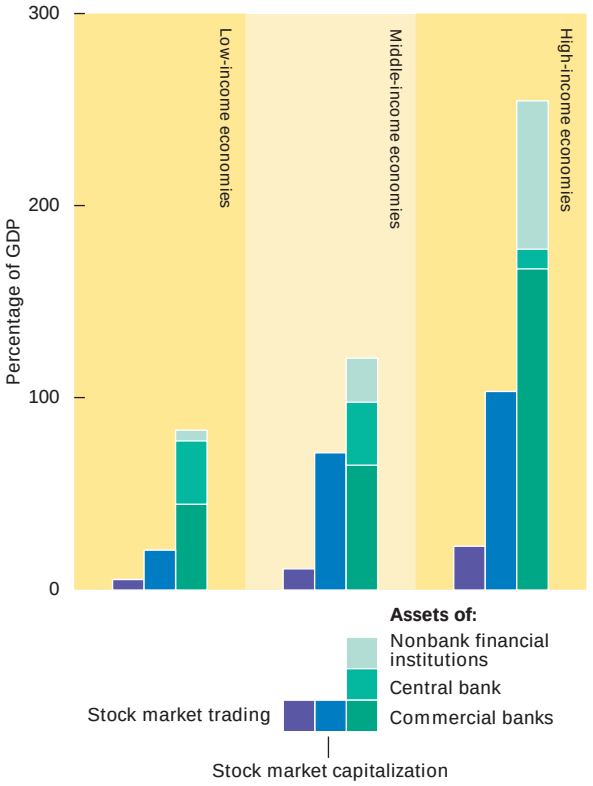
Lending markets are fundamentally different from other markets in that they are not run as simple auction markets, with the market interest rate determined at the intersection of the demand and supply curves. Nor can they be. The first rule of finance is that willingness to pay is no indicator of creditworthiness. On the contrary, those claiming to be willing to pay very high interest rates may be the least likely to repay the loan—if one expects to default anyway, what difference does a high interest rate make? Because charging a higher interest rate can lead to a worse mix of loan applicants, even after considerable screening, lenders may choose to charge a lower interest rate than would clear the market. Lenders also know that borrowers may behave in a riskier fashion once funds are disbursed—as happens in insurance markets. So they may ration credit.

Similar issues arise in equity markets. Those most willing to sell their shares at the market price may be those who believe that the market has overvalued those shares. The consequences are similar to credit rationing: since investors know that owners are most willing to sell shares when they are overpriced, the announcement of a sale of new shares typically leads to a fall in the share price. Concern about the adverse signal makes firms reluctant to issue shares. That partly explains why, despite the principle that equity should provide better risk sharing than debt, new equity issues remain a relatively small source of new finance, even in the industrial countries.

Figure 6.1

Financial structure of economies by income level

An economy's financial system tends to match its level of development.



Note: Data are for 1990 for 12 low-income, 22 middle-income, and 14 high-income economies. Source: Levine 1997.

Suppliers of credit sometimes seem to ignore the principle that willingness to pay high interest rates is a bad signal. For instance, Banco Latino in Venezuela was able to attract deposits by paying interest rates 5 percentage points above the rest of the market. Its collapse triggered one of the costlier episodes of bank failure. In this case depositors, counting on a government bailout, must have reasoned that there was little downside risk.

Assessing prospects. Unless convinced that the risks of their lending will be borne by others, bank loan officers—like investment fund managers, insurance underwriters, and venture capitalists—generally devote considerable resources to researching the prospects of would-be borrowers, policyholders, and startup companies. Although the growth in securitization and other means of reselling loans in the most advanced financial systems might suggest that this function is declining, closer examination reveals that much of the credit risk remains with the intermediary selling the loan. In the often riskier environment for entrepreneurs and their financiers in developing economies, risk assessment can be even more important.

In scrutinizing individual borrowers, a small set of objective indicators can go a long way toward predicting future capacity to repay. Proprietary software packages, used increasingly throughout the world, can automate much of the selection process (Box 6.1). For small corporate borrowers, however, such a mechanical approach is less reliable, implying the need for a heavy commitment of resources in preparing background, product, marketing, and macroeconomic appraisals.

Monitoring performance. Banks are particularly well placed to acquire ongoing information about the condition and performance of their borrowing clients. And they often prefer to lend short-term, so that, with good monitoring, they can intervene early if necessary to forestall a deteriorating situation. But what is good for the monitor is not always good for society. Evidence from countries as far apart as Ecuador and India suggests that borrowers with access to long-term credit (especially unsubsidized credit) achieve higher productivity. Furthermore, short-term credit, although it puts management on a short leash and thus prevents some kinds of abuses, also makes firms (and countries) highly vulnerable. A quick change in investor sentiment—which may have nothing to do with the firm's behavior or the release of new information about it—can lead to a withdrawal of credit and even bankruptcy. When sentiment changes in this way for many firms, the result can be a full-scale financial crisis. Once again, the financial system's solution to an information problem is—from the social point of view—at best partial.

Banks are not the only effective monitors. As financial markets deepen, they give rise to a coterie of specialized analysts who scrutinize various firms and securities. It is their close monitoring that opens the possibility for securities markets.

More generally, monitoring is multilayered, with many "watchful eyes." Managers monitor workers. Boards of directors and banks monitor management. Shareholders monitor the directors. Sometimes there is yet another level of monitoring: many corporate shares are owned by mutual funds, whose owners (the fund's shareholders) monitor the managers of the fund, who in turn monitor the directors and managers of the corporations they have invested in. Yet all this monitoring is imperfect, partly because of the public good problems discussed in earlier chapters, and partly because of inadequate legal protection.

Clearly, assessing borrowers' prospects and then monitoring them is not just a question of gathering and transmitting raw information. What is involved in all of this is *information processing*, or analyzing the implications of available information. Mathematical models of risk assessment are now being used quite widely, especially for marketed securities in at least the higher-income developing countries. Such models put risk assessment on a firmer basis, inasmuch as the available historical information is taken into account explicitly (Box 6.2).

Box 6.1

Technology eases credit decisions

Credit-scoring software packages try to approximate the information processing of seasoned credit professionals. Where there are enough data on borrowers' credit repayment history and other characteristics, they allow a high degree of automation in credit approvals, reducing processing costs and improving on conventional systems to screen credit risks. In place for consumer lending all over the world, and used by developing-country banks in all regions, these packages are also being used—although less extensively—for business loans and for pricing corporate bonds.

Automated credit scoring requires, as a first step, statistical analysis of the determinants of the probability of default. Attributes widely used for mortgage lending include the borrower's occupation, number of dependents, and income as a multiple of projected mortgage payments. Other factors typically entered include the terms of the loan (such as the loan-to-value ratio for a mortgage), the presence or absence of legal constraints on the bank's ability to foreclose, and prevailing economic conditions.

The next step is to use historical data to estimate the contribution of each factor to the probability of default. The bank uses the resulting equation to estimate the probability that each new applicant will prove slow-paying or delinquent, or will default. The prediction is sufficiently good on average (as good as the subjective judgments of trained loan officers) to lead to reliable decision rules for whether to lend and what default risk premium to apply to the interest rate.

Box 6.2

Value-at-risk: An approach to risk assessment

Until fairly recently most participants in financial markets controlled risk by procedural rules of thumb and qualitative assessments. The new complexity of financial instruments makes this approach inadequate. Fortunately, the cheaper computing power that contributed to this complexity has also made quantitative risk assessments more accessible, as Argentina, Canada, Chile, and other countries are finding.

One simple and attractive approach is to compute a portfolio's value-at-risk. Using historical asset price data, this approach projects the future variability of these asset prices and the degree to which they tend to move together. This is especially useful for derivative products, such as options and futures contracts, each of which represents a speculation on the future price of some underlying asset, whether equities, bonds, or foreign exchange. The method allows account to be taken of the correlation of a derivative with the price of its underlying security. Using calculations based on such projections, portfolio risk managers can arrive at statements such as "There is only a 1 percent chance that the portfolio will decline by more than $100 million over the next three months." This figure of $100 million would then be the value-at-risk, as estimated for the 1 percent level.

Attempts have also been made to determine the credit risk on nontraded bank loans. The attempt is complicated, however, by the fact that bank-customer relations are rarely long enough, or stable enough, to extract the necessary variability and correlation information reliably.

True, future variability cannot reliably be predicted on the basis of the past, and this method downplays the large occasional outliers that are really the source of serious problems to well-managed portfolios. Still, the method has value. Take Barings Bank, which lost $1.3 billion in unwise speculation by its Singapore subsidiary in 1995, wiping out its entire capital. The speculation had been that Japanese stock prices would rise, and that bond prices would fall. Official reports to Barings' senior management indicated no overall risk in the instruments being used to exploit this expectation (stock index futures leveraged by a short position in bond futures), suggesting instead that the leverage hedged the risk. But the correlation between these two asset prices was in fact negative, implying that the leveraged position was quite risky. A simple value-at-risk calculation would have shown a 5 percent probability of losing $800 million from the leveraged portfolio, not zero. That might have led management to take a different course.

Contracts and institutions to insulate against information gaps

Financial systems have developed a variety of means of dealing with information gaps, including contracts and institutions ranging from the simple to the elaborate.

Simple contracts: Collateral and debt. Simple rules or constraints on behavior are widely used to reduce the cost of information deficiencies and, more generally, to protect financial market participants from unfavorable outcomes. The standard debt contract calls for a fixed payment regardless of circumstances and gives the creditor the right to seize collateral in the event of default. The unconditional promise and the use of collateral reduce the creditor's need to verify the debtor's claims about its financial condition. Assuming adequate contract enforcement, then, debtors normally have no incentive to conceal their true financial condition, because if they are truly in a position to repay, it is in their interest to do so. But as noted earlier, the debt contract does not deal with other information problems.

If collateral is correctly priced from the outset, if it retains its value, and if it can be seized, it can insulate banks from errors in assessing the creditworthiness of the borrower. As mentioned in Chapter 5, collateral simplifies but does not eliminate the information problem, for the value and recoverability of the collateral still need to be assessed. The key issue is not the value of the collateral at the time the loan is made, but its likely value under the various circumstances that could lead to a default.

Some kinds of collateral are subject to severe problems. Property may unlock credit, but heavy reliance on real estate as collateral can increase an economy's fragility and its vulnerability to an economic downturn or an interest rate hike. Banks may believe that, because they have enough collateral to cover the loan, they do not have to inquire further into the nature of the asset. But market values for real estate are highly volatile and can collapse rapidly. Collateral-based lending sets up a dynamic that amplifies these fluctuations in values: as values fall, loans get called, forcing more real estate onto the market, which further depresses prices. A large fraction of the financial crises around the world in the last two decades have followed the collapse of a real estate boom.

Collateral provides no comfort either to the borrower unable to furnish it or to the lender unable to take possession after a default. Both sets of circumstances are especially prevalent in developing countries. This is a serious structural problem where land registration is deficient, where individual ownership of land is not widespread, or where property rights are fuzzy. In Botswana the collective ownership of tribal lands inhibited their use as collateral until recent legislation gave lenders the chance to foreclose, subject to the approval of local land boards. In transition economies, too, the uncertainty of land ownership and the lack of a comprehensive land registry present a barrier to private mortgage lending. And in countries where men hold most property, women have almost no access to collateral-based credit.

Collateral poses yet another problem: when banks rely on collateral, they may limit credit to other activities that

yield high social returns but for which collateral is not available. Chapter 2 has already discussed the problems with financing R&D, and Chapter 3 the scarcity of credit (without government guarantees) to finance education.

Peer monitoring in informal markets. The screening processes of formal institutions do not seem to work well in many developing countries. Informal credit markets, however, have found some innovative and effective ways of solving the quality verification problem. One such solution is to recognize that relevant information may be available to third parties—say, to a borrower's neighbors who may themselves be interested in obtaining credit—and to give them a stake in the financial transaction. (Chapter 8 reviews the Grameen Bank and other group lending schemes.) The information available to these people helps lenders monitor and enforce lending contracts, even though they themselves have no direct access to it. Borrowers themselves have the incentive to use the information they have about each other to form groups for lending purposes. Knowing that they will be well monitored may actually make the monitoring easier. In a process known as self-selection, only those who believe they can repay and are planning to do so will choose to borrow.

Hedging, diversifying, and pooling risks. By facilitating the trading, hedging, diversifying, and pooling of risk, the financial system can reduce the cost of closing information gaps without actually gathering information. The simplest form is the insurance contract, where identifiable costly contingencies, such as the earlier-than-average death of a person, can be hedged explicitly. The insurance provider can offer such contracts by pooling diverse risks rather than by trying to fill the information gap about one policyholder.

Insurance intermediaries face other information problems, some of which they solve with simple contract rules. Policies often include covenants voiding the insurance if the insured party engages in risky behavior (such as driving a car off the road). This crude protection against cheating may have the additional advantage of greatly reducing monitoring requirements if violation can easily be detected in the case of a claim. Insurance contracts also routinely provide for voiding a contract if the insured's initial declarations prove to have been false. That reduces appraisal costs by removing the need to verify declarations unless and until a claim is made. (Lenders do not have this luxury, because it is too late to verify a borrower's condition when the loan has become unrecoverable.) Still, insurance lags behind banking in developing countries, not least where aggressive use of the "fine print" has meant that insurers are not trusted.

Organized markets and exchanges. Certain financial assets, such as commodity or currency futures, allow one to reduce or eliminate the risk of unknown future price movements in the underlying good. Or rather, they allow that risk to be transferred to others who can bear it better. This is useful, for example, for farmers waiting for their crop to ripen or for government debt managers trying to minimize the cost of exchange rate fluctuations. These instruments can also be used to speculate rather than to hedge, when investors feel they know which way prices are headed and want to bet on their beliefs or their superior information.

The market prices of financial assets can embody and communicate the information that first becomes available only to deep-pocketed, well-informed market participants. When news indicating an increase in the value of an asset becomes known to some, they find it advantageous to acquire that asset while it is still underpriced, bidding up its market price. But prices might not fully reveal such information. And to the extent they do, that reduces the incentive for market participants to expend resources in acquiring information about asset values. So capital markets are never perfectly efficient, in the sense that prices never perfectly aggregate or transfer the relevant information of participants.

The availability of liquid assets—whether in organized markets or from such intermediaries as banks—reduces the cost to savers of unforeseen needs for cash. In organized markets the main task is to pool the risk of unforeseen cash shortages. The bank in similar fashion pools the returns on many small loans extended to it (deposits) and acts as a monitor on behalf of the depositors, exploiting economies of scale in information processing.

Well-functioning payments systems dramatically reduce information costs, but they require confidence in the financial strength of the parties to the payments mechanism. Trade among the former Soviet republics suddenly collapsed by as much as 80 percent when the interrepublic payments system collapsed. Soon barter intermediaries emerged for both international and domestic trade to create and sustain elaborate multifirm chains of goods trading when money could not fully perform its normal function. Barter has also surfaced within the Russian Federation, especially outside the major cities, greatly increasing the costs of information processing (Box 6.3).

Why public action is required

The function of financial markets is to address information problems: to allocate scarce capital by selecting good projects and then monitoring them to ensure that the funds are used appropriately. But information is always imperfect. And no matter how good the contracting arrangements, information gaps will remain, and their consequences will be felt. Indeed, financial markets are rife with externalities, instances where the benefits and costs of transactions extend beyond the parties to the transaction, and these provide part of the reason for government action.

Box 6.3

Trading without banks: Money surrogates in the Russian Federation

Tax debtors in the Russian Federation are legally required to close all but one of their bank accounts, and that one must be registered with the tax authorities. So, once a firm becomes a tax debtor, the marginal tax rate on all of its revenues flowing through the banking system is 100 percent. Failure to make this transfer subjects the bank to criminal liability.

The stranglehold of these restrictions on the use of bank money is more serious than it would be in industrial market economies. Numerous taxes, onerous tax rates, excessive (until recently) penalty rates, and politically motivated exemptions encourage enterprises to evade taxes. Moreover, the State Tax Service estimates that 80 percent of firms are in arrears on their taxes. This estimate is probably high, but it shows that nearly all firms routinely confront blocked accounts, either their own or those of key trading partners. In response, many transactions are taking place outside the banking system, and barter has become common, having risen from 11 percent of sales in 1992 to 43 percent in 1997, according to a recent World Bank survey.

Barter, however, is very costly, particularly for firms that do not typically engage in repeated transactions and thus do not have good information about their trading partners. The cost of arranging most barter transactions is roughly 20 to 25 percent of the value of the transaction. To reduce this cost, private and public institutions use bills of exchange, or *veksels,* which after barter are the most common money surrogate. Banks, enterprises, and federal, provincial, and municipal authorities can issue these debt certificates, which in the spring of 1997 were estimated to amount to roughly two-thirds the stock of ruble-denominated money (as measured by the M2 monetary aggregate). They can perform the functions of a broad variety of debt instruments, including certificates of deposit, promissory notes, corporate bonds, and government bonds.

The value of a veksel depends on the reputation of the issuer and the ease with which it can be converted into a useful commodity. Enterprises typically view the veksels of well-regarded banks and firms with widely used products (such as natural monopolies) as close substitutes for money. Other veksels are subject to large discounts.

This widespread use of veksels complicates the conduct of monetary policy by weakening the central bank's direct control over liquidity in the economy. The move from money into barter and veksels reduces tax collections and dampens economic growth by increasing the cost of transactions. Just as damaging, their use clouds the financial position of enterprises, allowing managers to steal their income and assets. Property rights cannot be protected, and fraud is rampant.

Externalities and public goods in financial markets

Information externalities in finance take a variety of forms. When a bank grants a loan to a firm, and that information becomes public, others may presume that the bank has engaged in a screening process and that the firm has passed the test. Moreover, they know that, if the bank is solid, it is likely to monitor the firm while the loan is outstanding, preventing some of the worst abuses. Research shows that firms that establish good banking relationships do well. They pay less for their credit, pledge less collateral, and respond better to investment opportunities. The value of this accumulation of information also shows up in evidence that announcing a bank loan agreement tends to boost the stock market price of the borrowing firm.

If a large depositor closely monitors the managers of a bank and ensures that they neither engage in excessively risky behavior nor loot the bank's assets, all depositors benefit. Monitoring of banks is thus a public good, and one of the reasons why government should take primary responsibility for this function. But if the depositor discovers that there has been looting and withdraws funds before others do, this reduces what other stakeholders can recover—the positive externality becomes a negative one. And whether the depositor's judgment is correct or not, the withdrawal can set off a run on the bank, with adverse effects on other stakeholders.

Perhaps of greatest concern are the systemic risks of bank failures. The failure of one large or several medium-size banks can result in a financial crisis, precipitating a sharp and profound economic downturn. Although the effects can be mitigated through macroeconomic management, they are never eliminated, because policies take time to work their effect. Meanwhile innocent bystanders, such as bank employees and borrowers not engaged in activities that contributed to the crisis, may face heavy costs.

These systemic risks are important enough that governments typically act to contain bank crises, and those actions are typically costly. The costs, however, are borne only in part by those who caused the crisis. This large externality warrants government action to reduce the likelihood of such a crisis and its magnitude.

Contagion

One externality that has drawn broad attention in recent years is the so-called contagion effect: disturbances in one country's financial market can have consequences in others. Contagion can spread through trade: disturbances in the economy in financial crisis can affect its trading partners. It

can also pass through the terms of trade: a financial crisis can affect the prices of commodities produced or purchased by the country or countries affected. But the most virulent contagion occurs through financial flows. Why a financial crisis in Mexico should affect Argentina, or why a crisis in Thailand should affect Russia, has often seemed a mystery. The direct contagion effects, through trade flows or terms-of-trade changes, are likely to be small. Contagion through the behavior of assetholders, hard though it is to observe or forecast, surely is part of the answer.

A well-known example of contagion is the bank panic. To see how a panic can occur, suppose that depositors cannot observe whether individual banks are solvent, but they can observe a shock that affects banks' portfolios and that causes at least one bank to close. They may then start runs on all banks, solvent and insolvent, causing even solvent banks to fail.

The idea that the price mechanism cannot cope easily with this kind of shock was put forward more than 100 years ago by Walter Bagehot, who emphasized the difficulty that a bank faces in transmitting credible information to the market during a crisis: "Every banker knows that if he has to prove that he is worthy of credit, however good may be his argument, in fact his credit is gone." If the price mechanism worked as it should in such cases, an increase in interest rates would compensate depositors for the increased risk of lending to a bank facing a crisis. But the same rise in interest rates may also signal an unsound position and therefore discourage potential depositors—as already noted, willingness to pay high interest is no indication of creditworthiness. The market fails because of limited information on the bank's solvency.

Monopoly power

In loan markets borrowers typically face a very limited number of suppliers of funds, and they may not be able to switch easily from one to another. The reason is that information about whether a potential borrower is a good risk is costly to obtain, and easy for a bank to keep to itself once obtained. Thus different lenders are likely to face different costs for a new loan to any given borrower, and the borrower's current lender will be at an advantage. Each bank thus has specialized information about its customer base. A customer that has a long track record with one bank—and whom that bank therefore views as a good loan prospect—may be viewed as an unknown by another bank, and therefore a riskier prospect. To compensate for that risk, the second bank has to charge a higher interest rate, or it may simply refuse to lend.

Other considerations may deter a borrower from switching lenders. For example, the new bank may wonder why the customer wishes to switch banks. Is the old bank, with its superior knowledge, restricting credit to this customer? And does that mean it no longer regards the customer as creditworthy? Although customers can often persuade the new bank that there are good reasons for the switch, sometimes they cannot. Moreover, as Chapter 5 noted, many of the costs of information are sunk costs, which cannot be recovered if the loan is not made. This leads to a "local monopoly" relationship between a lender and a borrower.

The effect of screening, administrative, and enforcement costs on interest rates—and the imperfect competition that results—are also evident in recent studies of rural credit markets (see Box 5.2). As usual in monopolistic competition, each lender is operating at too small a scale of operation, spreading fixed costs over too small a clientele, and pushing interest rates up.

Undersupply of information

Markets by themselves are unlikely to supply enough of many types of information (although as we will see, they occasionally supply too much). This undersupply results from the public good nature of information already mentioned: the person or firm gathering it cannot capture all the returns. Even when the returns to information can be captured, the externalities can be large.

Those who have invested in acquiring information face two types of problems in trying to benefit from it. First, if they try to sell the information directly, they face a classic credibility problem: the potential buyer may not believe that the information is true. Second, the profits they might obtain from trading on their information might be too small relative to the cost of obtaining it. The profits might even be zero if prices in securities markets fully reveal an individual trader's private information.

Banks are generally better equipped than other financial intermediaries to address selection and monitoring problems for the projects they finance. They can profit from the information they produce by making private loans that are not traded. Other investors then have difficulty free-riding off their actions. Also, the costs to banks of collecting information are reduced by their ability to enter into long-term relationships with customers. And monitoring is easier because they can scrutinize the transactions of their borrowers who are also depositors. To discourage opportunism by borrowers during the life of the loan, banks can threaten to cut off future lending. The absence of a large supply of alternative lenders makes such threats effective. In developing countries, the greater difficulty of acquiring information on private firms makes banks an even more important part of the financial system than in industrial countries.

Some types of information, however, can be oversupplied. Examples are those that largely result in private returns for some and private losses for others, in redistri-

butions that are neither wealth-creating nor productivity-enhancing. A trader who finds out a minute before everyone else that the government will soon issue a regulation affecting the value of XYZ stock may be able to buy or sell that stock at a profit, but these gains come at the expense of others. Much information gathering in secondary markets is directed at obtaining such information slightly before other market participants. Still, secondary markets provide liquidity, which is linked to financial and economic development. Shallow markets deter investors—the less the liquidity, the more difficult to get out of the market on short notice—encouraging them to hold wealth in safer forms.

Calls for greater transparency in financial markets—far greater disclosure of undersupplied information—reflect the belief that firms generally will not voluntarily disclose all the information that the market would like. Ironically, greater transparency can sometimes lead to greater volatility, as changing conditions or judgments quickly show up in market prices. Just as crying fire in a crowded theater can create a panic, whether or not the "fundamentals" are amiss, so too calling attention to certain financial variables may create a self-fulfilling crisis anytime those variables enter a "danger zone."

One of the most important pieces of information in chronic short supply is the total return to a project. Lenders focus not on the total return, but only on the return they expect to receive. That return is simply the principal plus the interest rate received, multiplied by the probability that it will be received, less the opportunity cost of funds. The total return to the project includes the (incremental) surplus accruing to the entrepreneur. The project with the highest expected return to the lender may not be the project with the highest total expected return. But it is the project with the highest expected return to the lender that gets funded. Thus, good projects may be rationed out of the market.

Supporting the financial system

The institutional and legal systems designed to address information issues in finance vary widely from country to country. In some countries, for example, the scope of activities permitted to banks is sharply circumscribed. Other countries (and not only developing ones) rely more heavily on banks, permitting them to carry out a broad range of commercial and investment activities, including owning and trading in stocks and placing directors on the boards of companies to which they have provided funds. Countries also differ in their approaches to achieving fair competition in securities markets and protecting the rights of shareholders. Some countries use government agencies for this, whereas others rely on self-regulation by the market.

Economies in transition face a particular challenge. Under central planning, banks did not perform the key functions associated with banking in market economies. They did not choose projects, nor did they make decisions about which firms should expand. They were not responsible for monitoring. Little more than bookkeepers, they provided finance at the direction of the planners. In moving to a market economy, these banks have had to transform themselves totally, and this has proved difficult.

Creating the preconditions for an effective equities market in these countries may be even more difficult. The early history of equity markets in today's industrial economies— before the establishment of strong government oversight—is replete with scandals that undermined confidence in these markets. Typically these debacles led to long periods in which equity markets almost ceased to be a source of new funds for corporations. Unfortunately, some of the economies in transition seem to be encountering the same problems (see Box 6.4 below).

For financial market participants to process information and design contracts that insulate the remaining information gaps, they need the support of public policies to develop accounting and disclosure systems and fraud (to help in information gathering) and to improve legal infrastructure (if contracts are to have any bite). Without these building blocks, the development of the formal financial system will be stymied. If instead countries provide reliable and comprehensive information about firms, and if their legal systems enforce contracts rapidly, effectively, and transparently, imposing penalties for fraud and breach of contract, they will enjoy greater financial development and faster economic growth.

Empirical evidence now shows (see next section) that, after taking account of all the usual factors that influence growth, the development of legal and accounting systems significantly explains the development of financial intermediaries. Countries with legal systems that give a high priority to secured creditors, rigorously enforce contracts, protect minority shareholders, and set accounting standards that produce comprehensive and comparable corporate financial statements have better-developed financial intermediaries and enjoy faster growth (Figure 6.2).

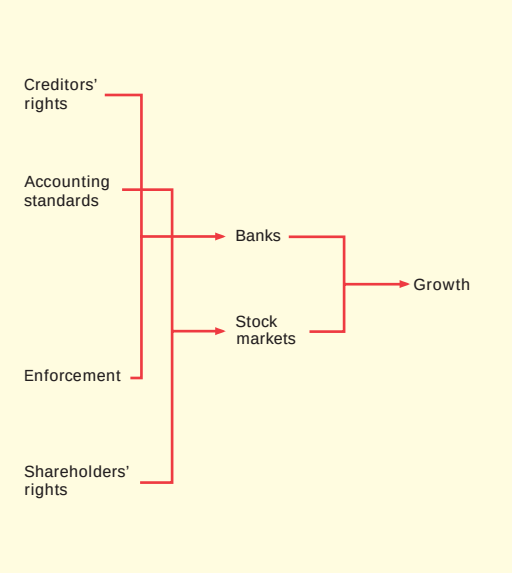
Accounting and auditing to ensure the flow of information

Accounting standards make it easier to interpret information about firms and compare it against information from other firms. They thus make it easier for investors to identify worthy firms and evaluate their managers. Many types of contracts also rely on accounting measures to trigger certain actions. For example, loan and bond covenants commonly include the option of immediate repayment if income or cash flow falls below a specified level. Such contracts can be enforced and will be written only if

Figure 6.2

Factors leading to financial development and growth

The pathway to financial development starts with the legal foundations.

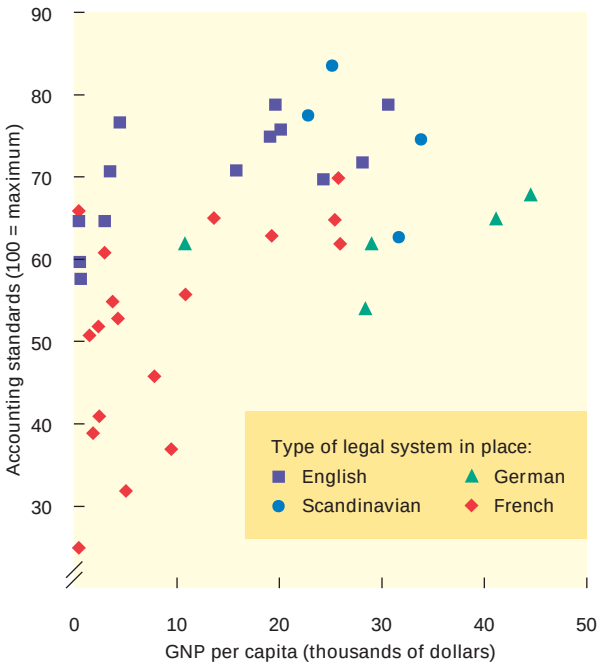


Source: Based on Levine, Loayza, and Beck 1998.

Figure 6.3

Accounting standards and GNP per capita

Poor countries tend to have weak legal and accounting systems.



Note: Data are for 1996 for 39 countries worldwide. Source: La Porta and others 1998; Levine, Loayza, and Beck 1998; World Bank 1998d.

accounting measures are reasonably unambiguous and if auditors can verify them. Assessing the health of banks requires reliable information on loan classification and concentration, on the realistic valuation of collateral, on loan-loss provisioning, and on the rules for accruing interest in the bank's accounts when borrowers are in arrears. Accounting standards help in this regard as well.

Financial statements provide a wealth of information about a firm's past and present operations. Without them it is virtually impossible to assess the condition and creditworthiness of an enterprise:

- Balance sheets show the breakdown of physical and financial assets and liabilities, including short- and long-term debt.
- Income statements portray revenues and expenses, including various costs and taxes.
- Cash flow statements, by showing the amount of cash flowing into and out of firms, can highlight when even solvent firms are experiencing liquidity difficulties.
- Notes to these statements can include additional information, for example about the off-balance-sheet activities of firms.

There are, of course, limits to the information revealed by financial statements. New financial instruments such as derivatives, other contingent liabilities, and stock options make it more difficult to provide accurate and timely assessments of the net worth of firms and financial institutions. Many types of derivatives are not regularly reported on the balance sheet, and their market value can change markedly in response to small changes in circumstances.

Accounting standards in the early 1990s differed significantly across countries, even countries with comparable incomes per capita (Figure 6.3). They also vary strongly with the type of legal system in effect (see below). Many of the lowest-income economies (not shown in the figure for lack of data) have the weakest accounting systems, often with few trained accountants and in some cases no uniform system of accounts. In these settings, formal markets are dominated by interchanges between foreign entities that have good sources of information (and recourse to offshore enforcement).

Despite recent gains by equities, financial markets in developing countries are still bank-dominated, partly be-

cause reliable information on company performance is lacking. In industrial countries, too, banks are the main source for net new finance. Governments around the world—especially after the recent rash of financial crises—are beginning to recognize the importance of the information they gather. Mexico embarked in 1997 on a major reform of its accounting disclosure standards aimed at convergence toward U.S. Generally Accepted Accounting Principles (GAAP). Authorities in some East Asian economies, having seen the damage done by high debt-equity ratios and too little arm's-length finance, are moving to improve their information environment as well. Better information alone will not prevent financial crises, however—the GAAP did not save Texas from a crisis in its banks and savings and loans in the 1980s—and as mentioned above, at times an abundance of information can itself trigger a crisis. But a better information environment can mitigate these costs, and this explains in part why crises generally have been less expensive in OECD countries than in other parts of the world.

One study suggests that had Argentina raised its accounting standards from levels prevailing in the early 1990s to the OECD average, it would have boosted the country's projected annual GDP growth rate by 0.6 percentage point. If the Arab Republic of Egypt could improve its enforcement to the level of that in Greece, its growth rate would be expected to rise by 0.9 percentage point a year. Overwhelmingly, growth is strongly influenced by infrastructure to support information gathering and by enforcing contracts based on such information.

Growth leads to financial market development. On this there is no doubt. But financial development also leads to growth. That is the conclusion of sophisticated economic studies at the industry and at the firm level. That conclusion is supported by historical case studies, as well as by the fact that countries with better-developed bank and equity markets at the start of a long period saw significantly faster development over that period, other factors held constant. It turns out that banking and equity markets are complements, most likely because both demand better-quality information and both supply it: banks through their decisions to make new loans or reschedule old ones, equity markets by revealing the worth of companies.

Balancing the interests of creditors, shareholders, and managers

The ability to write and enforce contracts confidently and inexpensively is fundamental to a well-functioning financial system. To the extent that the legal system makes it difficult to design mutually beneficial financial contracts and to settle claims quickly, surely, and fairly, financial services will be the poorer. The degree to which the interests of shareholders are protected also influences the degree to which equity funds are forthcoming.

Different legal systems protect creditors, shareholders, and managers in different ways—through their essential features and through the vigor of their enforcement (Table 6.1). Countries that use the British system of common law, whether adopted under colonial rule or by emulation, afford the best protection to creditors and shareholders. In contrast, the French code, used not just in its former colonies but also in those of Spain and Portugal (an enduring Napoleonic legacy), provides greater protection for managers and debtors. The Scandinavian and German systems afford the strongest enforcement.

Secured credit forms the bulk of intermediated finance, and the legal system can help by giving secured creditors a higher priority in claims against corporations going through a bankruptcy or reorganization. In Mexico, workers and government are first in line for repayment, ahead of secured creditors. Mexican law also imposes an automatic stay on the assets of firms filing for reorganization, so that lenders cannot easily take possession of collateral or liquidate a firm. Major banks in Mexico have tens of thousands of legal suits outstanding to collect past-due loans, many of which have been in the courts for years. Little surprise, then, that debt finance is not well developed.

Table 6.1

Ranking of legal systems on strength of protections and enforcement

Origin	Protection of creditors' rights	Protection of shareholders' rights	Enforcement
British	1	1	3
French	4	4	4
German	2	3	2
Scandinavian	3	2	1

Note: A ranking of 1 indicates best, and 4 worst, as calculated from average scores for countries with the indicated system in an assessment of 49 industrial and developing countries. For scores by country see Table A.2 in the Appendix.
Source: World Bank staff calculations based on La Porta and others 1998; Levine, Loayza, and Beck 1998.

In Malaysia, by contrast, secured creditors come first, and automatic stays on assets are not imposed. For a failing company pending reorganization, a party appointed by the court or the creditors replaces management. In some other countries existing management remains in charge pending the outcome of reorganization or bankruptcy proceedings. That reduces the likelihood that bank loans will be repaid and provides opportunities for managerial looting of the firm.

Shareholders also demand information from managers. A growing literature suggests that access to liquid stock exchanges—those where securities can be traded cheaply and confidently at posted prices—spurs economic development. And where shareholders are not well protected, equity markets tend to be underdeveloped and poorly functioning. Recent research also shows the concentration of ownership to be greater where minority shareholders are poorly protected.

Legal checks and transparency

The legal system can provide some check against gross abuse. If minority shareholders believe that the majority shareholders have deprived them of their fair share, they may be able to sue. And shareholders may be able to sue management for a violation of its fiduciary responsibilities. But strong protection of shareholders is far from universal. In Venezuela a minority shareholder cannot vote by mail, is not protected from expropriation by the directors, and needs to amass 20 percent of the share capital to call an extraordinary shareholders' meeting. Shareholders in Colombia, Ecuador, Jordan, and Mexico need 25 percent of shares to call such a meeting, compared with 10 percent or less in countries with laws favoring minority shareholders.

Even where legal protections are in place, abuse of shareholder rights can remain a concern. The Czech Republic shows that these abuses can be greater in the absence of shareholder protections (Box 6.4). In the Russian Federation a widespread perception that minority shareholders have been poorly protected is thought to have contributed, along with poor transparency, to low stock market valuations of many Russian firms.

Laws are important, but so is their enforcement, and laws governing secured creditors and shareholders matter only if courts enforce them. Deficiencies in enforcement can manifest themselves as corruption, as uncertainty, and most commonly (as already noted in Mexico's case) as delay. Some legal districts in Mexico, however, have recently been enforcing contracts more effectively than others. Not surprisingly, banks are more active in those districts.

Recognizing the potential gains, a number of developing countries have been undertaking significant legal reforms. Argentina recently changed its bankruptcy law to

Box 6.4

Shareholders' rights and enterprise efficiency in the Czech privatization

In the hope of developing a robust equities market based on "people's capitalism," in the early 1990s the Czech Republic undertook voucher privatization, in which citizens were given vouchers to acquire shares in various firms. A concern, however, was that with share ownership thus dispersed, there would be too little oversight of managers. Since, as this chapter has shown, monitoring corporate managers is a kind of public good, there is a strong presumption that the Czech approach would lead to too little oversight. Having a single majority shareholder could go some way to rectifying this problem but would create another, for such a shareholder might advance his or her interests at the expense of the minority.

To head off this oversight problem, large holding companies (mutual funds) were formed, which would have an incentive to monitor the firms whose shares they held. Those that did a better job would have higher returns and would attract more investors. Market competition would thus ensure the efficiency of the capital market, and that of firms.

That was the theory; the experience turned out differently. Con artists promised far-fetched returns to those who turned over their vouchers to them. In a typical pyramid scheme, they then used funds from new investors to provide those returns to old investors—for a while. In the absence of effective fraud and security laws, the more honest funds had to compete against the scurrilous ones. Some fund managers also diverted resources to themselves in a process called tunneling, whereby the underlying assets are removed, leaving nothing but a shell behind.

The holding companies were structured as closed-end mutual funds: shareholders could not redeem their shares at the net asset value but could only sell them in the secondary market, possibly at a discount. In fact, by 1997 shares in these companies were selling at discounts of 40 to 80 percent, no doubt reflecting the market's estimate of tunneling. Not surprisingly, confidence in the securities market declined, and it failed to perform its key function, that of raising capital for the creation of new enterprises and the expansion of existing ones.

Of equal importance, the funds failed to induce needed restructuring in the enterprises whose shares they held. Although the closed-end funds succeeded in buying firms with higher profit rates (they may have been effective in screening), they did not improve those profit rates. Firms with a strategic (large majority) owner often did improve their performance, but firms owned by the closed-end funds tended to let their performance slide. Opening the funds would make it easier for shareholders to exit and for corporate governance to improve.

give priority to secured creditors rather than workers. Many transition economies have had to establish bankruptcy and corporate laws to support a modern capitalist system, all in the context of far-ranging legal changes.

Even without far-reaching reforms in their legal codes, countries can take steps that improve the confidence of creditors and shareholders. Creditors can be protected in reorganization and bankruptcy courts that operate efficiently, quickly, and fairly. Even without strong legal codes, better reorganization and bankruptcy procedures would strengthen the position of secured lenders and bolster the development of financial intermediaries. Argentina materially improved its procedures in the 1990s, so that claims on troubled firms could be settled much more quickly and equitably than before.

Many countries have implemented reforms to improve the transparency and efficiency of their equity markets. Argentina, Brazil, and Chile have clarified the rules of conduct of participants in financial markets generally—and improved the functioning of their stock markets.

Many transition economies and others where the rule of corporate law is weak are finding it necessary to move beyond industrial-country models to devise a legal framework suitable for their situation. There is much to be said in such contexts for combining easily understood rules with strong sanctions for noncompliance. That kind of structure can be self-enforcing, because the higher penalties increase compliance, and behavior is more easily monitored. To the extent possible, the law should rely on action by direct participants in the corporate enterprise (shareholders, directors, managers) rather than by indirect participants (judges, regulators, legal and accounting professionals). For example, a better balance between shareholder protection and the need for business flexibility can be attained through procedural protections. Requiring that actions be approved by, say, independent directors could achieve a better balance than would flat prohibitions on entire categories of transactions.

The importance of ensuring transparency and consistency in the disclosure of information—and of improving creditors' and shareholders' confidence in exercising their rights—is clear. The supportive role of government in sustaining this informational infrastructure as a public good can hardly be questioned, even by proponents of laissez-faire. But more than support is needed.

Restraining the financial system

The failures and vulnerabilities of the financial system point clearly to the need for government to restrain its activities in certain specific ways. Financial markets are subject to major systemic risks, for example where failure in one bank can spill over to others—either directly through balance sheet linkages or through psychological contagion—to the detriment of the economy. There are also the direct losses to depositors, most of which are often covered by public finances, whether through an explicit deposit protection scheme or through ad hoc compensation. The borrowers from failed banks suffer, too, as the informational capital they have built up through sustained dealings with the bank suddenly loses its value.

In the 1980s and early 1990s, priority went to reducing intrusive policy intervention that had distorted financial intermediation and had become counterproductive, especially in the face of technological developments that had outflanked the old regulatory regime. But such financial liberalization can increase enormously the informational requirements for financial stability and make it more difficult to collect information. These are two of the reasons behind the successive waves of banking crises in recent years, which have led to a reexamination of policies to restrain individual financial intermediaries.

Today, the issue is not deregulation but finding the *appropriate* regulatory structure. That structure should reflect the circumstances of the country, including the strengths and weaknesses of its financial system and the capacities of its regulators. Here the focus is on prudential regulation, to ensure a safe and sound banking system. But other important regulatory functions include promoting competition, protecting investors and depositors, and encouraging the provision of credit to underserved groups. Many of these functions are interlinked. If investors feel that they are fairly treated, that there is a level playing field, financial markets are likely to be deeper and more effective, and thus sounder.

Financial intermediaries help address information problems (such as determining which firms are good ones in which to invest), but they also give rise to a new set of information problems. Central among them is the difficulty that depositors and the authorities face in predicting bank failures.

The authorities can serve depositors by monitoring banks on their behalf, much as the well-managed bank monitors its borrowers. But government regulation goes beyond processing information and publishing the results. The regulator must not allow a bank to continue functioning when it is insolvent. One reason to step in is to avoid the fiscal costs when depositors are covered explicitly or implicitly by deposit insurance. Another is to avoid the wider systemic risks already discussed (Box 6.5). And in responding to banking failures, regulators need to ensure that the flow of credit is maintained and that the informational capital residing in banks—their knowledge of who is a good credit risk and of how to supervise borrowers—is preserved. Indeed, the inability of even the surviving banks in Indonesia to raise anything like enough capital to maintain the dollar value of their outstanding foreign currency lending led to a sharp credit squeeze there in the first half of 1998.

Box 6.5

Deposit insurance and risk taking

Depositors need to be reasonably confident about the safety of their deposits. Even having a central bank to act as lender of last resort did not provide enough assurance to U.S. depositors in the Great Depression. It is only since deposit insurance was instituted in the 1930s that bank runs have become a rarity in the United States.

Deposit insurance has its drawbacks, however. If governments do not provide adequate supervision, banks with deposit insurance have an incentive to engage in excessively risky activities. Their depositors have nothing to lose if the risks do not pan out, whereas the bank has everything to gain if they do. So depositors follow high interest rates, paying little or no attention to the riskiness of the bank's assets. Indeed, banks engaging in risky activities may be able, by offering higher interest rates, to drive rivals following a more conservative strategy out of business.

Three lines of defense can mitigate these risks:

- One is close supervision, to ensure that banks are not engaging in excessively risky behavior.
- Another is incentives to ensure that banks have enough of their own capital at risk so that they, too, have much to lose from a bankruptcy. Charging insurance premiums or imposing minimum capital requirements that vary with the riskiness of a bank's assets can help induce banks reduce their risks. Similarly, requiring a tier of externally held, uninsured debt brings in investors with an incentive to monitor the bank. The information so revealed can be of use to regulators and can itself put pressure on the bank.
- A third is to limit the bank's opportunities to invest in excessively risky assets (such as speculative real estate) or to offer high interest rates that can be justified only by high risk taking.

The notion that simply eliminating deposit insurance would restore discipline to the market and eliminate problems in the financial sector by reducing risk taking is misguided. Crises have hit numerous countries without explicit deposit insurance in recent times. Besides, most governments find it difficult in practice to avoid rescuing a major financial institution in crisis. As one commentator put it, there are two kinds of countries: those that have deposit insurance and know it, and those that have it but don't yet know it.

The fact that small depositors are not in a position to regularly inspect their bank's books makes monitoring a public good calling for collective action. Even without deposit insurance, banks with limited liability have to be adequately supervised to prevent excessive risk taking.

In addressing the information problems presented by the risk of financial institution failure, the authorities can draw on the same types of tools that the private financial system does. For this they need to work both directly to acquire and process information and indirectly to set policy rules and incentive structures that help align the banks' incentives with the social good. Informal finance, as Chapter 8 notes, solves the information problems by peer monitoring—the "watchful eyes" of many village members who stand to lose access to credit if any one of them defaults. In such settings enforcement is less problematic and more direct—although potentially more brutal.

Verifying and controlling transactions

Both direct and indirect tools have been used in supervising and regulating financial intermediaries. In many developing countries the banking authority was long concerned mainly with verifying mechanical compliance with simple constraints: to control inflation, for example, or to achieve sectoral policy goals. Many countries deployed a huge staff of bank regulators almost entirely devoted to such tasks. The regulator was not primarily concerned with ensuring sound banking.

Some simple constraints can reduce the risk of bank failure while requiring fairly little in the way of information acquisition or processing. For instance, rapid credit expansion is a definite warning signal of bank solvency problems, whether in one bank or the whole system. Nowadays, attempts to manage the rate of credit expansion of individual banks on a continuous basis will often be evaded or bypassed, at least in the more open and sophisticated financial systems. But it may be possible to make the financial system more robust by setting fairly high limits on credit growth. Countries might set those limits at a level that would not normally be reached but that could restrain occasional bursts of overexuberant and risky expansion, such as the unwise burst of credit to the property sector that led to solvency problems in Thailand and other East Asian economies.

Moving highly risky activities outside the banking system altogether could be desirable, even if it reduces the size of the banking sector. Crises in banks, which serve as the economy's payments mechanism and are thus central to its functioning, have larger systemic effects than losses in nonbank intermediaries. In practice, however, the less-regulated nonbank intermediaries are often owned by

banks, which end up bearing the losses. Such financial connections can exist even if the subsidiaries move offshore. The issue, however, is not the location but the lack of regulation and the interdependence of balance sheets. Bank regulators need to monitor banks' consolidated balance sheets. They also need adequate information about the condition of large borrowers, notably about their foreign exchange exposure, which needs to be consolidated with that of the bank for an adequate overall picture.

With financial contracts becoming more complex, the traditional, transactions-based approach to assessing bank soundness becomes less effective. For example, countries commonly have simple rules limiting the exposure of banks to foreign exchange risk. The cost of such exposure shows up in crisis after crisis. The exposure also puts severe constraints on the scope of macroeconomic policy. Countries may face (or believe they face) the dilemma of either raising interest rates, inducing a recession, or allowing the exchange rate to fall, inducing a financial crisis and thereby also risking an economic downturn.

This provides a compelling reason for putting limits on the foreign exchange exposure of banks. But can such limits work? Consider the financial derivatives acquired by some Mexican banks shortly before that country's exchange rate crisis of late 1994. Although these derivatives were recorded as U.S. dollar claims, and as such did not appear to violate rules limiting each bank's net foreign exchange exposure, the complex contract terms defining the maturity value of these derivatives made them more like U.S. dollar liabilities. As long as the exchange rate remained stable, these instruments yielded a good return to Mexican banks. But when the peso fell, the contracts imposed severe losses. Only fantastically detailed and frequent on-site scrutiny of the files for these assets could have revealed their true riskiness, and then only to highly skilled supervisors, let alone the market.

Limiting such evasion of simple rules obviously requires more complex prohibitions. For example, such contracts could be made legally unenforceable against the banks unless fully disclosed on their balance sheets. Or such contracts could be assigned junior status in the event of a bank's liquidation. But some other, still simple rules, such as "speed bumps" restricting the rate of growth of lending to real estate, can do much in developing countries.

Assessing risk

The focus of regulation and supervisory practice is shifting toward risk assessment—and toward setting policy rules that better align the incentives of the supervised banks with the social good. This involves quite different types of information acquisition. Risk assessment for bank supervision uses a more forward-looking approach to solvency. It is designed to verify not just that the current financial situation of the bank is sound, but that the bank will continue to be sound and solvent. Statistical risk assessment techniques weigh the relative riskiness of different types of activity and different balance sheet components. But complementing these techniques is a greater emphasis on management and systems, including a qualitative assessment of the character and ability of the bank's directors and managers.

Supervisors have begun to prefer assessing the adequacy of a bank's internal risk control procedures over directly assessing its financial condition. The risk control department of a well-run bank should be the first to identify emerging problems and take corrective action. It is also best placed to establish operational rules and procedures that limit risk in the particular environment facing the bank. In this approach, then, much of the key information gathered and processed by the supervisor is about the bank's information-processing capacity and incentive structure.

Developing countries need to incorporate these risk assessment procedures into their operating procedures. Training bank personnel in the use of risk assessment techniques should be high on the agenda. But going down this road may require tougher penalties for infractions. Furthermore, the fact that many financial institutions in the industrial countries have failed dramatically in their risk management should serve as a caution against dismantling more direct supervision altogether.

Other arrangements

More subtle regulatory and institutional arrangements (that is, subtler than simple credit ceilings and other ratio controls) are also part of the toolbox of the prudential authorities. Risk-based capital adequacy requirements encourage banks to favor less risky forms of activity. There have also been some new experiments with rules to promote a parallel assessment of bank soundness by other market participants. Like the contractual arrangements devised by the private financial system, these rules help minimize the cost of the remaining information gaps facing the authorities. They work by aligning the incentives of market participants more closely with those of the authorities.

But in practice the ways in which capital adequacy standards are adjusted for risk have been very limited. Until recently, for example, international standards focused on credit risks to the exclusion of risks associated with capital asset values. For example, long-term U.S. Treasury bonds were treated as safe even though they carry significant interest rate risk. Furthermore, in arriving at rules for a bank's capital requirements, insufficient attention has gone to the correlation of returns on its various assets.

Banking crises in Chile and Mexico revealed, for newly privatized banks, that formal compliance with capital requirements is possible without the owners truly having as much at stake as it appears. For example, if owners finance their capital investment with a loan from the bank they are acquiring, they then have no real capital at stake. That the quality of capital was inadequate could not be verified until it was too late.

In some instances, increases in capital requirements could even lead banks to take *more* risks, because what is of concern to them is their total capital, which includes their franchise value, the present discounted value of future profits. Since the cost of the capital required to meet the capital adequacy standards may be high, increasing the capital adequacy requirements lowers the franchise value. In some cases the loss in franchise value may more than offset the increased capital, so that the bank actually assumes more risk. Normally, however, the net effect of increased capital requirements is to reduce the risk of failure without imposing excessive information costs on supervisors. This effect is strengthened when accompanied by graduated early intervention rules mandating the authorities to take corrective action when risk-weighted capital falls below the established threshold, even if capital is comfortably positive.

Capital requirements do not eliminate the need for supervisors to evaluate banks' assets, including the loan portfolio, and so do not eliminate the need for the regulator's information gathering. But by introducing a margin for error, they enhance the incentive for sound management of the bank—and help limit excessive risk taking (Box 6.6).

Enforcing more public disclosure of banks' accounts and requiring a tier of uninsured subordinated debt in each bank's portfolio are two ways of increasing the scope and incentive for complementary monitoring of bank soundness by the private sector. The holders of subordinated debt, first to lose in an insolvency, have a particularly strong incentive to watch for problems, especially if they have an arm's-length relationship with the bank owners. Although they may have little direct influence over management policy, a fall in the market price of this debt will indirectly communicate their concern to the regulator and to the market. The information burden is thus shared between the public regulator and other market participants. But the burden does not disappear, for regulators still have to ensure that the holders of subordinated debt are truly independent of the bank's insiders.

Multiplying the number of watchful eyes greatly reduces the risk that a bank will slip into insolvency without the problem becoming apparent in time to take corrective action. The same considerations apply to entire banking systems. More watchful eyes, including enhanced global surveillance by the International Monetary Fund and the initiatives of the Bank for International Settlements, combined with greater information in the hands of market participants, should help reduce the frequency and magnitude of crises. But if history is any guide, these measures almost surely will not eliminate them.

These elements do not exhaust the regulator's toolbox, nor can they. Financial technology keeps moving in response to regulatory change. The strategic game between regulator and regulated is ongoing. Market participants are always seeking ways to reduce the cost that regulation imposes, and the regulator must respond in turn.

Box 6.6

Better bank regulation in Argentina

Reforms advanced significantly in Argentina after financial crises there in the 1980s resulted in losses estimated at 20 to 55 percent of GDP. As a result of additional measures in recent years, some as part of the fallout from the 1994–95 tequila crisis, Argentine banks are now characterized by:

- A minimum capital adequacy ratio of 11.5 percent, among the highest in the world
- A dramatic increase in the importance of foreign banks (about 45 percent of banking assets)
- Enhanced disclosure, including on-line information from the central bank on firms' balance sheets and income statements
- A requirement that banks issue uninsured subordinated debt
- High liquidity requirements (20 percent for most liabilities), and
- A much-strengthened supervisory function, with weaker banks closed or merged in the past three years.

Part of this drive to improve the safety and soundness of the banking system comes from the Argentine authorities' commitment to a fixed exchange rate with the U.S. dollar (evidenced by their adoption of a currency board). But it also reflects the shift to a "multiple eyes" approach. Higher capital requirements put owners' funds at risk. Reliance on reputable foreign banks gives the authorities some comfort that the quality of capital is high. Holders of subordinated debt provide market oversight and, with better information disclosure, a firmer basis for assessing creditworthiness. Supervision is now serious, and the liquidity cushion contributes to banking stability. Although it is too early to tell how successful this system will be, it has sailed on smoothly thus far despite the Asian storm, and in marked contrast to the shock Argentina experienced from the Mexican crisis.

Supervisors and regulators are unlikely to gather the necessary early-warning information needed to prevent bank failure if the incentive structure discourages early intervention—as it does when imprudent bankers have too much political influence. It may not be possible to turn the clock back to the early 19th century, when private bank supervisors in the highly successful Suffolk Bank system in New England had a strong incentive to avoid losses. Any such losses were paid out of the supervisors' deferred bonuses, which were thus similar to the bonds that senior bank officers used to post. But it is clear that the circle can be closed only where governments also have the incentive to act early on information that a bank is being run unsoundly.

Is the period immediately after financial liberalization associated with a significantly higher probability of financial crisis? The answer is yes, at least for countries with weak legal and regulatory institutions. One of the reasons is that such liberalizations erode franchise value and have not been accompanied by appropriate tightening of supervision. And one of the important lessons is that the pacing and sequencing of reforms—introducing better supervision before other restrictions are reduced—need more attention.

Imposing some constraints that increase franchise value could lead to safer and sounder banks. There is some evidence that mild restraints on deposit interest rates in some East Asian economies in earlier periods contributed to their growth. Although financial restrictions that lead to negative real interest rates hurt growth, and significant departures from market interest rates lead to actions to evade the constraints, mild financial constraints might be effective.

The East Asian crisis reopens the question of whether prudential regulation of banks is enough to insulate economies from the vulnerability that comes with high foreign currency indebtedness, especially short-term indebtedness, of banks and corporations. Beyond what is needed to finance trade, short-term capital flows may contribute little to economic growth while adding considerably to economic instability. Recent empirical studies find that capital account liberalization is associated with financial market vulnerability, but not with growth, and that international investors chase trends. And clearly there is a reluctance to undertake high-productivity, long-term investments with volatile short-term capital.

Outflows of short-term funds have imposed huge systemic risks on economies. Some have therefore recommended that the monetary authorities maintain enough foreign exchange reserves to cover the country's short-term foreign exchange liabilities in full. But if that were done, the country as a whole would be borrowing from the industrial world at high interest rates and redepositing the proceeds at the lower rates typically paid on liquid reserve assets.

It would appear that the social risks resulting from such borrowings are markedly greater than the private risks perceived and assumed by market participants. Whenever there are such large discrepancies between social and private costs—whenever, that is, private actions impose large externalities—there is a case for government action to realign incentives. This is as true for financial flows as it is for air or water pollution. Although there are real difficulties in restraining short-term foreign currency borrowing, given the ease with which regulations in this area can be evaded, with potentially harmful side effects, the search for a better policy mix must continue.

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Economies with better financial institutions grow faster; those with weak ones are more vulnerable to financial crises and the slow growth that typically follows. How well countries address the information problems that they are supposed to address—screening and monitoring loans and enforcing repayment—has much to do with the overall performance of the economy. But how well they perform these functions depends on the incentives and new constraints they face, for financial markets both solve and create information problems.

If banks and security markets are monitors, who will monitor the monitors? Investors who entrust their funds to the financial market do some of the monitoring, but only imperfectly, partly because they have limited information. Governments have long sought to increase the information available to investors (through disclosure requirements). Governments have also gathered information themselves (through supervision) and acted on it. They also have created legal systems to discourage looting, fraud, pyramid schemes, the violation of minority shareholder rights, and the myriad other behaviors that undermine the efficiency and effectiveness of capital markets (where the private returns of some are at the expense of others).

Governments perform these roles through active support of the financial system and through the restraints they impose on the system. The exact policy and the best mix of policies depend on the capacities of the government and the circumstances of the country. As *World Development Report 1997* emphasized, one of the key tasks of governments is to strengthen its own capacities—and to better match its actions with those capacities and with circumstances.

The central role of finance in the economy has important implications for how countries respond to economic crises, particularly those associated with financial crises. Many of the lessons learned painfully from repeated financial crises around the globe have been reinforced by

the recent experience in East Asia. It is important to preserve the informational and organizational capital of financial intermediaries, to the extent it has value. Because information is limited, suppliers of funds are not perfect substitutes, and it takes time to reestablish banking relationships. In the meantime the decline in finance can wreak havoc on the economy. So, without compromising the principle that shareholders and senior managers must lose when financial institutions fail, it is often preferable to have failed banks taken over by (or merged into) stronger banks, or even recapitalized. It is because they recognize the importance of preserving the information held in banks that industrial countries experiencing bank crises have typically handled bank failure in other ways than by outright closure. As this chapter has suggested, it matters even more to developing countries to preserve and build upon the information that financial institutions contain.