



## Chapter 5

# Information, Institutions, and Incentives

**P**ART ONE OF THIS REPORT showed that narrowing knowledge gaps—by acquiring, absorbing, and communicating knowledge—can go a long way toward spurring economic growth and improving well-being in developing countries. Part Two argues that even if they could completely close the gaps in technical knowledge, developing countries would still be at a disadvantage with respect to the second type of knowledge, knowledge about attributes: about the quality of products, the diligence of workers, the creditworthiness of firms. This stems from the fact that developing countries have fewer institutions to ameliorate information problems, and the institutions they do have are weaker than the counterpart institutions in industrial countries. These institutional deficiencies mean that markets often wither rather than thrive, because people lack the incentive to enter into the transactions fundamental to rapid, equitable, and sustainable growth. And as we shall see, that institutional weakness often hurts the poor most.

Information is the lifeblood of every economy. In more traditional economies, information may be less codified, more often conveyed in personal interaction, but it is vital nonetheless. A farmer has to know the propitious time to plant. A moneylender has to know whether someone seeking a loan is likely to repay it. A landlord hiring a worker has to know whether the worker is skillful and diligent. And as countries develop, the requirements for information increase. A new seed is being offered by a government extension agent. Will it work? A farmer hears that some crop other than the traditional one can be sold in the market. Will it pay to switch?

The ways people get information, and the incentives they have to gather and provide it, are affected by the way

society is organized: legal rules and social conventions, institutions and governments, all determine how much information people have and the quality (that is, the accuracy and completeness) of that information. Without reliable information, markets do not work well. If someone buying rice in a nearby market cannot tell whether stones have been added to increase the weight, sellers may be tempted to increase their profits by putting stones in. But then the buyer may decide to purchase rice only from a trusted seller, probably someone from the same village. That splinters markets, leaving them thin and less competitive. It can even make the market collapse, and otherwise profitable transactions will be forgone.

Traditional societies with little personal mobility often exhibit extraordinary information flows and an extraordinary ability to uphold social arrangements through various sanctions. But as countries develop, this traditional structure begins to disintegrate. People move from village to village, from village to town, from town to city in response to commerce and trade. Increasingly, they engage in transactions with strangers rather than neighbors. In this growing anonymity, traditional avenues of information sharing based on personal acquaintance must be replaced. But the new avenues—the sophisticated computer networks that track credit histories, or the efficient legal enforcement that makes contracts possible—may be a long time coming. So, in the course of development, information flows may deteriorate before they improve. Both traditional and modern societies may have a lot of good information, but societies in between may not.

This chapter sets out a simple, two-part taxonomy of information failure on which the rest of Part Two will

draw. The first type of failure arises from the difficulty of *verifying quality* and the need to gather as much information about quality as is feasible or to find ways of reducing the need for it. The second type arises from the difficulty of *enforcing performance* and the need to find mechanisms to monitor transactions. These problems are universal, but they are far worse in developing countries than in industrial countries—and they are worst for the poor.

### Verifying quality

Verifying quality means obtaining knowledge about the attributes of a good or service—the durability of a product, the productivity of a worker. In many transactions, such as those for durable goods, the problems associated with verifying quality—and the importance of doing so—are obvious. But goods, at least, can be inspected before purchase. Verifying the quality of services is harder, because a service comes into being only after it is purchased. An employer who is unsure of the skills of a prospective employee faces a difficult quality verification problem. So does the lender who is uncertain about the trustworthiness of a potential borrower.

Information about quality, like other forms of information examined throughout this Report, is costly to create but cheap to share. That is why societies typically exert considerable effort to make information about quality acquired by one person available to others. In small, closed communities, information about quality is spread by word of mouth. Buyers can identify and remember the supplier of a poor-quality good and warn their neighbors about that supplier. Employers can identify an inept worker and refuse to recommend that worker to other employers.

As communities grow and establish links with other communities, institutions of various kinds come into existence to share information about quality. In medieval Europe and in the Arab world until the late 19th century, guilds provided quality control, inspecting inputs and production processes and punishing dishonesty. *Amims*, the heads of local craft guilds in major cities throughout the Middle East and North Africa, were knowledgeable, respected individuals to whom consumers could turn to test sellers' claims about the authenticity and quality of their goods.

The uncertainty that consumers face in determining quality can create severe inefficiencies or even destroy a market. Government action to reduce such uncertainty, for example by establishing and enforcing standards, can improve the functioning of markets, to the benefit of all. Such was the case when India's National Dairy Development Board acted to ensure the quality of milk. Its program doubled the incomes of a million milk producers (Box 5.1).

The national and international expansion of markets in perishable fruits and vegetables also required the develop-

### Box 5.1

#### Addressing information failures in India's milk market

In India in the 1950s, milk production could not keep pace with growing demand. Some milk vendors responded by watering down the milk. They could do this with relative impunity because consumers could not determine which milk was diluted before buying it. And because there were many vendors, and brand names were not clearly established, vendors who did not dilute their milk could not command a premium and were squeezed out of the market. The result was an overall drop in milk quality. Enter the National Dairy Development Board, which in the early 1970s launched Operation Flood, a multifaceted program to improve the functioning of the milk market by ensuring quality.

The board began by encouraging the creation of dairy cooperatives and helping them establish quality standards. The board distributed a simple, hand-operated device for testing butterfat content to each village cooperative that collected milk from farmers and to distributors and marketing agents. This strengthened the incentives for producing and marketing quality milk. Next the board took steps to improve and standardize milk quality by providing cooperatives with technical assistance, such as improved feed, veterinary services, and artificial insemination. The board also subsidized construction of modern processing plants and the provision of refrigerated transport. Finally, it encouraged the cooperatives to establish brand names. Taken together, these measures improved the quality of milk and by 1979 had doubled the incomes of a million milk producers in the target areas.

Who, in retrospect, was to blame for the widespread practice of watering down milk? Since any vendor in the unregulated market who did not dilute the milk would be at a competitive disadvantage, it is hard to blame the vendors, individually or collectively. The problem lay with the absence of institutions to verify quality. The National Dairy Development Board helped make the quality of milk verifiable and paid prices that reflected and rewarded quality. By defining standards, providing the means to meet and monitor them, and applying them honestly, the board helped India become the world's third-largest producer of milk. From 1970 to 1991, the number of milk producers participating in Operation Flood grew from 280,000 to 8 million.

ment of ways to monitor and assess quality. In the United States this process took several decades to complete. The innovation of refrigerated rail transport in the late 1800s transformed the American fresh fruit trade from a patchwork of small, isolated markets into a national market with fruit grown in regions far from major consumption centers. But shipping over long distances meant inserting middlemen between the farmers and the consumer, and this created opportunities for fraud. The farmer could deliver

low-quality fruit and escape blame by claiming that the fruit was damaged during shipping. If the railroad allowed the fruit to rot, it could plausibly blame the farmer. And the distributor in the receiving market could claim that the quality of the goods received was lower than it actually was.

Without a means to verify quality at both the shipping point and the receiving point, written contracts based on delivered quality could not solve the information problem. Growers therefore asked the U.S. government for assistance, and it responded by establishing a shipping point inspection service. Today, the U.S. Agricultural Marketing Service provides inspections at the shipping point and the destination point on a voluntary, fee-for-service basis.

For many consumer goods in a modern economy, a respected brand name often replaces third-party institutions as a guarantor of quality. The institutional responsibilities for quality control shift from externally imposed standards to individual producers with an incentive to maintain their reputations, as embodied in their brand names. But institutional burdens do not disappear entirely: properly functioning courts must ensure that fraudulent imitation is deterred by the threat of swift legal retribution.

These problems of verifying quality go beyond the market for commodities. Labor markets raise many of the same issues and some new ones as well. In tasks involving sophisticated skills usually acquired through education, the conferral of a degree can signal quality. But even in markets for manual labor, employers care about quality: they want to know how hard the worker will work. They can learn this from experience, but this learning, if not shared with others, informs the employer about only a relatively few workers. Since employers would often rather draw on workers they know than gamble on those they do not, labor markets can become highly segmented.

A 1986 study of 80 villages in the state of West Bengal, India, found evidence of territorial segmentation of the market for casual agricultural labor: landlords typically hired workers in their own or immediately adjacent villages. This suggests that personal connections and trust may be stronger than wage differences in influencing the movement of labor. The West Bengal study reported that:

... there are sometimes considerable wage differences on similar work across even neighbouring villages; and yet labourers often do not walk across to the next village to take advantage of higher wages. On the other hand, labourers occasionally go out to work in villages where the wage rate is not significantly higher. The boundaries of labour mobility across neighboring villages are sometimes significantly defined by territorial affinities and the relationships of trust and credit between labourers and their employers.

More generally, the problem of verifying quality may be resolved over time in communities with little personal mobility, through informal information-sharing and enforcement mechanisms based on personal exchange. The compactness of a small community also facilitates verification. With close and repeated contacts, people come to know the qualities of those they deal with. This extends not only to hiring workers but to other transactions as well: How much trouble will it be to get a loan repaid? How fertile is the land being put up for rent? But such a system is closed to outsiders, segmenting the market.

The problem of verifying quality is not restricted to goods or labor markets. It is especially acute in financial markets. The informational problem in a credit market may be reduced to a single question: how much, if any, of the loan will be repaid? The prudence of the borrower, whether he or she will repay, and the riskiness of the investment are the issues with which quality verification is concerned. The problem is compounded in poor communities where, whatever promises are made, liability is effectively limited: if the project fails, the loan taken out to finance it will not be repaid, because the borrower has few or no other resources. This limited liability is an important cause of high interest rates in informal credit markets, as it forces lenders to spend more time and effort to assess the creditworthiness of potential borrowers (Box 5.2). The high costs of verification in the case of the poor result in high interest rates, which in the end may be too high for the poor to pay.

The resulting segmentation in credit markets shows up in wide variations in interest rates and other terms of lending in the same geographical area. If information were perfect, a borrower being charged a high interest rate by one local lender might seek out another charging less. Arranging a new loan would make both of them better off. But the new lender will worry: is the current lender charging such a high interest rate because the borrower is unlikely to repay the loan? Thus the quality verification problem can keep capital markets highly segmented, with different borrowers paying markedly different interest rates, and with competitive forces remaining very weak.

As economies develop, they find various ways of reducing these problems of verifying quality. In many markets a variety of forms of certification evolve, from guild membership to membership in stock exchanges. A stock exchange, for example, certifies that firms raising funds on the exchange or whose shares trade there meet certain accounting requirements. By listing a firm, however, the exchange does not certify that the firm will not go bankrupt—indeed, many listed firms have gone bankrupt.

As a complement to these private efforts, to make them more effective, government action is often required. For example, brand names may be an important way of pro-

**Box 5.2****The credit market in Chambar, Pakistan**

Chambar is a flourishing commercial region in Pakistan served by roughly 60 moneylenders. Even though borrowers there seem to have access to many different lenders, each moneylender has built up a tight circle of trusted clients, outside of which the lender is rarely willing to lend because of the high cost of screening new clients.

Before accepting a new client, a moneylender usually takes certain precautions. Before advancing a loan, the lender often arranges to deal with the applicant in other transactions—for labor or for goods—for at least two seasons. Such dealings tell the moneylender much about the applicant's alertness, honesty, and ability to repay. New clients are also scrutinized extensively through visits to the client's village and through interviews with neighbors and previous business partners, to assess reliability and character.

If, after this intense screening and long wait, the lender decides to lend to the applicant (the rejection rate is around 50 percent), he usually begins with a small test loan. After all, no amount of inquiry can reveal what will happen in practice. Only when the test loan is repaid does the lender increase his trust and match the loan amount to the borrower's needs.

A study of moneylending activity in Chambar in the early 1980s found that the average interest rate charged was 79 percent a year. But this high average conceals considerable variation: from 18 percent (still higher than the 12 percent charged by banks) to 200 percent. Much of the interest covers the high costs of information and administration in the informal market. The researchers concluded that the rate of interest was roughly the same as the moneylenders' average cost of funds, implying that lenders made close to zero profit. The ease of entry into the lending business kept profits low, yet moneylenders enjoy some monopoly power over their established clientele, because their superior information about the characteristics of their longstanding clients gave them an edge over competing lenders.

viding quality assurance. But they also provide an incentive for the production of shoddy counterfeits. Governments can do much to protect firms against this theft of their reputation. Indeed, brand-name and trademark protection is an important aspect of intellectual property rights protection, as discussed in Chapter 2.

Moreover, whereas good firms have an incentive to disclose the attributes of their products, and even offer a guarantee of quality, less reputable firms may make false claims or fail to live up to their guarantees. How is a buyer to know whether the disclosures are truthful or the guarantees meaningful? Again, governments pass laws against

fraud and to ensure truth in advertising, to provide customers some assurance, but these laws have to be enforced.

Governments sometimes act more directly to mitigate the quality verification problem. They may do so through disclosure requirements—for example, requiring manufacturers of food products to disclose their ingredients (again, laws need to ensure that the disclosures are honest). Or governments themselves may provide the certification. Government meat inspection arose at the demand of meat producers, who worried that concerns about food safety would deter consumers from buying meat. Government building inspectors verify that the builder has followed established building codes. Through all these actions, governments help make markets work.

**Enforcing performance**

Many transactions involve promises: a borrower promises to repay a loan, an employee to work hard. If such transactions are to occur and recur—as they must for an economy to function—these promises must be kept. If good information is not available on whether each party to the transaction has kept his or her side of the bargain, either the transaction will not occur, or an alternative mechanism must be found that demands less information. And even if perfect information were available, an enforcement mechanism is needed to ensure that promises are kept. Imperfect monitoring and difficulties with ensuring compliance together comprise the “enforcement problem.” The ways of dealing with them are similar. For example, reputation, so important for quality assurance, can also enforce performance. A worker who risks losing his reputation (and hence the chances of finding another job) if he fails to work hard has an incentive to keep his promise to be diligent.

How do societies ensure the enforcement of performance in such transactions? And how do they cope with the fact that some enforcement will be imperfect at best? Incentives are at the core: rewards for fulfilling the promise, punishments for failing. Often the government plays an important role in enforcement: those who break a contract—a formal promise—can be taken to court. If there is enough information to prove this breach of promise legally, the contract breaker will be punished. The nature of the punishments that may be imposed is a key public policy issue, and the legal system has provided a variety of remedies, all of which depend on judgments about the cause and consequences of failure to live up to one's promises.

But resorting to legal remedies is costly, and in the normal course of affairs there is a clear preference to encourage compliance by other means. Firms, for instance, provide incentives to encourage workers to work hard and threaten to fire workers who shirk. Here we look at how developing economies address the problems of informa-

tion and enforcement, and explore what their responses imply for economic performance and policy.

### *Sharecropping*

Sharecropping provides a classic example of the information problems in a developing country, the way people cope with them, and the new problems to which the solution gives rise. Land ownership is often highly unequal in developing countries, with many poor farmers holding little or no land, and a few rich landowners holding more land than they can farm. To make full use of both the land and the labor available, either landlords have to hire workers, or workers have to rent land, or some other arrangement for matching land and workers has to be found. The arrangement that has evolved over much of the world is sharecropping, where land-poor farmers cultivate land belonging to a landlord, to whom they turn over a share of the harvest, keeping the rest for themselves. Typically the landlord's share is large, between one-third and two-thirds. The proportion of land under share tenancy is 30 percent in Thailand, 50 percent in India, and 60 percent in Indonesia. It is generally much lower in Latin America, except in Colombia (50 percent).

Why has this arrangement come to predominate in so much of the world? The answer has to do with information, risk, and, most important, contract enforcement. Consider the landowner who hires workers and pays them a fixed wage. This arrangement minimizes risk for the workers but maximizes it for the landlord. How can the landowner ensure that the workers will work hard? The landlord cannot spend all his time in the field supervising each worker. Nor can the landowner tell whether the workers have done a good job of weeding or whether seedlings have been planted with sufficient care. Even the size of the harvest does not tell whether the workers have done their job—a low yield could reflect poor weather, insect damage, or other factors. The landowner could hire many supervisors, but that would be costly, and in any case the same problem arises—how to supervise the supervisors?

The alternative possibility—the workers pay the landlord a fixed rent to use the land—simply shifts risk to the workers. In principle, the landlord gets the same share, regardless of the weather or the workers' effort. If the weather is bad and the harvest fails, the workers may starve or be forced to borrow. But credit markets in developing countries are typically highly imperfect—again for information reasons—and interest rates very high (as Box 5.2 showed). Without land of their own to offer as collateral, tenants may simply be unable to obtain credit. The alternative, practiced in some poor countries, is for tenants to sell themselves or their families into bonded labor. For the poor, in short, the risks of a rental contract may simply be intolerable.

In practice, however, the landlord may find the rental contract scarcely more attractive than the workers do. The landlord knows that if the crop is very bad, he will not receive the rent he is owed. Although unlike the workers he can bear the risk, the rent the landlord has to charge to compensate for this risk may be quite high. This may encourage the tenant to engage in risky methods of production, because if production fails, the rent is not paid, whereas if it succeeds, the tenant retains all the surplus.

One way to counter these problems is for the landlord to lower the rent when the crop fails and raise it when the harvest is good. This gives the tenant a stake when outcomes are bad, thereby curtailing the tendency to engage in high-risk production. And it provides incentives for effort, and so does not require the kind of close supervision that the wage contract does. Sharecropping is precisely such an arrangement. It is a compromise that works.

But sharecropping has a cost. If the sharecroppers' share of the harvest is 50 percent, they receive only 50 percent of the extra return from exerting greater effort. In some cases the sharecropping contract does not require that the landlord provide other inputs such as fertilizer. Then the sharecroppers will not have enough incentive to provide fertilizer, or higher-quality seed, or other inputs—again because they must pay the entire cost but will reap only 50 percent of the gain. It is not surprising, then, that sharecropped land is less productive than other land (Box 5.3).

This difference in productivity explains why, when tenants are wealthy enough to absorb the risk of renting land, they usually choose to do so. A study of farm tenancy in Tunisia found that richer tenants, with more working capital, tend to enter into fixed-rent tenancy arrangements, where they finance in advance both the land rental and the costs of other inputs, and they bear all the risk. The probability that tenants with twice the sample-average working capital will have a rental contract is two-thirds; that for households with no working capital is less than half. Thus the poor are more often obliged to accept share contracts, and the lower output that goes with that form of contract.

Problems with enforcement also help explain other aspects of the rural economy. In many cases the landlord provides credit as well as land. Landlords are in a better position to collect on loans to their sharecroppers than are outsiders: they are already engaged in enforcing sharecropping contracts, which requires being able to monitor output. The Tunisia study showed that poorer tenants were more likely not only to be sharecroppers, but also to obtain credit from the landlord and to repay in the form of a larger share of the crop (a kind of "equity" loan).

Where the landlord does not provide credit, the miller often does, again because of the ability to enforce performance. Because of high transport costs, a farmer typically

**Box 5.3****Is sharecropping associated with lower yields?**

A 1987 study in India tested the efficiency of sharecropping in inducing effort by carefully controlling for several other factors, such as irrigation and soil quality. The data, provided by the International Crops Research Institute for the Semi-Arid Tropics, permitted the study of households that own some land of their own and lease other plots under sharecropping. Because in such cases the sharecropper and the farmer who farms his or her own land are the same person, this experimental design automatically controls for systematic differences between households that own and those that sharecrop, such as ability to buy inputs up front.

The only remaining differences stem from the form of the tenancy contract—and they are striking: output per acre is 16 percent higher on owned than on sharecropped plots. Use of family male labor is 21 percent higher, that of family female labor 47 percent higher, and that of bullock labor 17 percent higher. The differences persist even when attention is restricted to sharecropper-owners who grow a single crop on the two types of plots. The study also found no systematic differences between plots under fixed rent and plots under owner cultivation.

has access to no more than a few millers, and farmers often develop an established relationship with a single miller. Millers are often willing to provide seeds and often other credit, because they are in a good position to ensure repayment at the time of milling.

One consequence of such interlinked transactions—between land rental and credit provision, or between milling and credit provision—is reduced competition. New moneylenders cannot easily enter the market, because they will find enforcement far more difficult and costly than do the already-established creditors. And tenants are reluctant to leave their landlord in search of better terms. The contractual arrangements may be highly stable, but they are also highly rigid.

Sharecropping has been a durable institution in low-income developing countries. Is there not some way to avoid the inefficiencies associated with it? If owner-cultivated farms are more productive than sharecropped farms, why don't landlords sell their land to the tenants? The reason is that the poor tenant would have to borrow the funds to buy the land, and this simply shifts the burden of enforcement from the landlord to the creditor. If the crop fails, the creditor will not be repaid. All the problems that applied to rental contracts for the land apply to the rental contract for money (the loan). As before, the poor tenant does not want to bear all the risk. Of course, the tenant might try to persuade the creditor to enter into a risk-

sharing contract, in which the creditor gets, say, a fixed share of the output (as in an equity contract). But then the contract becomes just like a sharecropping contract, and all the efficiency advantages of ownership disappear.

Can government do anything to increase the efficiency of sharecropping? Land reform might seem the obvious solution, but experience with land reform has often not been successful. Productivity actually seems to fall, and in many cases land ownership again becomes concentrated after a while.

One reason why land reforms have foundered is that they failed to take into account the nature of rural institutions and the information-related market imperfections. Productivity depends not just on land but on such other inputs as fertilizer and seeds. Obtaining these other inputs requires funds that poor tenants simply do not have. Nor can they obtain funds on credit markets, at least not at reasonable cost. So productivity falls. Today's land reforms in Brazil recognize these problems and, with World Bank assistance, are directly addressing them. The Land Reform and Poverty Alleviation Pilot Project, now being implemented in five northeastern Brazilian states, is designed to make loans available to groups to purchase land and inputs for production. Some 5,000 families are already taking part in the pilot, which will eventually involve some 15,000 families.

*Labor contracts*

The enforcement problem in the land market carries over, practically unchanged, to labor markets. Even in agriculture, where it might appear that harvesting and weeding are easy to monitor, several activities do not lend themselves to easy observation and monitoring. Plowing, regulating the flow of irrigation water, driving and looking after tractors, supervising and recruiting casual labor, operating threshers, tending livestock—all these tasks are difficult to monitor.

The problem is even more serious in industry and services, and sometimes sharecropping-style contracts are the response. Top-level managers who receive equity in the firm as part of their compensation package may be viewed as participating directly in the fortunes of the firm, and this increases their incentive to work hard. A variety of more or less easily monitorable services may be rewarded on a commission basis, an arrangement akin to sharecropping.

But in many situations it is not feasible to offer incentive contracts. There is then no substitute for direct monitoring of the worker's actions. But this monitoring is costly in two senses. First is the direct cost: someone's time must be devoted to observing the worker. Second is the question of what to do with a worker who has been caught shirking. The typical penalty for shirking is not to renew the worker's contract. But nonrenewal is costly to the

worker only if his or her current contract offers more than the next-best alternative: for the stick of nonrenewal to be effective, the contract must have already offered a carrot.

In farming, an employer can carry out production tasks in any of several ways. First, the employer might entrust these tasks to family members, who have an interest in the farm's welfare. This is a good idea for small farms, but if the scale of operations is large, outsiders have to be hired. Second, the employer might hire casual labor to carry out these tasks. But then direct supervision becomes necessary, and even then it is not possible to keep track of the laborer's activities during every passing moment. So, to judge success or failure, one must rely on the final output, which is often an imprecise indicator of the worker's diligence. Third, the employer can hire workers on a permanent or "attached" basis, under the implicit or explicit understanding that this long-term relationship will be terminated if performance is consistently low. From this point of view, permanent labor may be seen as a response to the enforcement problem. And indeed, studies of permanent labor provide evidence that such contracts pay better than casual labor contracts.

How might one expect the prevalence of permanent labor arrangements to evolve with countries' development? Several factors are at work here, some running in opposite directions. The opening of markets for a product may increase the value of a stable labor force, leading to a rise in permanent labor. Similarly, certain types of technological change may increase the number of activities that go into the production process, causing monitoring difficulties. The mechanization of agriculture is one such shift. The use of large-scale, mechanized farming methods clearly brings more complexity into production. It may be more difficult to figure out who is to blame—person or machine—if something goes wrong (or, if more tasks are carried out jointly and with coordination, *which* person or machine). And if a mistake is made, the costs can be far higher; the need to ensure the development of reliable, job-specific knowledge then makes the need for long-term contracts all the greater.

The experience of some developing countries is consistent with these observations. The opening of markets for Chilean agricultural products in the late 19th century led to an increase in the proportion of permanent labor contracts there. It also appears that, in some regions of northern India where new technology was more widely diffused, permanent contracts constituted a larger share of the total than elsewhere.

But the increased mobility that comes with economic development may make it more difficult to shore up permanent contracts through the threat of firing or eviction. In closed societies with low mobility, a laborer's misdeeds

are recognized. The stigma of evicting a tenant worker who has failed to perform adequately is thus stronger, making it easier to support permanent contracts. Where mobility is on the increase, the stigma is likely to fade. This may help explain the long downward trend in the prevalence of permanent labor relationships in some places: the share of workers with permanent contracts fell from 52 percent to 21 percent between 1952 and 1976 in the Indian village of Kumbapettai, and from 74 percent to 20 percent in nearby Kirripur.

#### *Collateral*

Collateral is a widespread and straightforward means of ensuring the repayment of loans (thereby mitigating the problem of enforcement) and reducing the lender's need for information about the borrower (thereby mitigating the problem of quality verification). It may take many forms. Certain property rights may be transferred: land may be mortgaged to the lender, or use rights to the output of that land may be put in the lender's hands while the loan is outstanding. Labor may be mortgaged as well and used to pay off the loan. Useful though collateral is, it has its drawbacks. A lack of land registries may make it difficult to offer land as collateral. The slowness of courts to enforce the transfer of land after a default may also impede the collateralization of land.

More important, the use of collateral once again illustrates the tendency for information failures—and for attempts to overcome them—to work to the disadvantage of the poor. Poorer borrowers have less wealth to use as collateral and therefore less access to credit. Evidence from Thailand supports the contention that borrowers do not have equal access to all credit sources, particularly those in the formal sector, and that borrowers appear to be sorted by wealth and income (Table 5.1). In one survey 42 percent of households reported no credit transactions in the survey period, and these households included the poorest. Among people who did not borrow at all, only a small minority reported that they would like to borrow but were unable to, and their mean income was lower than that of those who were able to borrow. Well-to-do farmers were found more apt to obtain credit from formal sources, and households that borrowed from commercial banks clearly belonged to the richest strata. That different strata sort themselves in this way is not a choice of the borrowers but the result of sorting by lenders according to the availability of collateral. Poorer borrowers will have limited access to credit markets than wealthier borrowers with equally promising projects.

In some credit markets excessive reliance on collateral brings another set of problems. As Chapter 6 shows, many financial crises have their origins in real estate bubbles.

Table 5.1

## Assets and income of borrowers and nonborrowers in Nakhon Ratchasima Province, Thailand

Borrowing behavior	Number of households	Average assets or income (baht)		
		Assets per household	Gross income per household	Net income per capita
<i>Borrowers</i>				
From both sectors	26,671	204,702	47,673	4,413
From formal sector only	43,743	188,697	45,558	4,141
From informal sector only	88,145	126,754	30,626	3,171
<i>Nonborrowers</i>				
Unable to borrow	4,670	116,927	25,016	2,583
Unwilling to borrow	111,976	145,022	32,400	4,094

Note: Extrapolated on the basis of data from a 1984–85 survey of households in 52 villages. Gross income is income before deducting farm production costs.

Source: Hoff and Stiglitz 1990.

High real estate prices are sustained by, and help sustain, high levels of borrowing. Lenders get a false sense of security from the collateral they receive. This leads them to fail to verify the ability of the borrower to repay—whether the investment will yield a stream of returns. And they fail to recognize that if the real estate bubble crashes, the collateral may be worth only a fraction of the value of the loan, and that this decline will happen just when the borrower is unable to repay, and just when the lender would like to draw on the collateral. The reliance on collateral feeds the excessive volatility of these markets: once the market starts to crash, borrowers are forced to sell their assets, and as these assets get dumped on the market, their prices plummet further.

### Policy support for institutional development

Thus a variety of institutional arrangements emerges over time in response to verification and enforcement problems. These include, as we have seen, the guilds of medieval Europe and the premodern Arab world, long-term trading relationships, sharecropping, the interlinking of contracts across markets, permanent labor contracts, and collateral. Institutions that suffice at one time to support market exchange may not be adequate at another time. Modern economies face the same problems but have developed other solutions—such as sophisticated credit checks, brand names, stock exchanges, and accreditation of educational standards—while retaining some traditional solutions such as collateral. Thus, in order to grow, a country needs to have not only a good set of institutions but the capacity to change those institutions over time. In this sense, all countries are still developing.

Government can play an important role in developing institutions to address quality verification and enforcement problems. It can establish and enforce standards such as uniform weights and measures, disclosure rules, and credentialing systems. It can use law to facilitate credible commitments, for example by creating penalties for fraud. It can reform slow and corrupt courts. It can regulate banks to ensure their soundness. It can support land titling and registration programs. All these actions strengthen markets. And they provide the foundation for private efforts to flourish and contribute in their own right to resolving information problems.

This chapter has provided several examples of both verifying quality and enforcing performance. The next three chapters provide many more, covering three areas where information problems are especially severe: in financial markets, in environmental protection, and among the poor.

The informal financial sector has figured prominently throughout this chapter because finance is usually acknowledged to be the most information-intensive sector in the economy. Chapter 6 looks in more detail at how formal financial markets deal with information failures. It also examines how government can contribute to the smoother functioning of financial markets by insisting on good accounting practices and other forms of information disclosure (verifying quality) and by building a credible legal system (enforcing performance).

Providing information, setting standards, and enforcing performance are at the core of any sound environmental strategy. And nowhere are knowledge gaps likely to be larger—people often do not know about the pollution caused by a nearby factory; the world does not yet know the

true impact of global warming. Chapter 7 shows how better knowledge is improving our ability to manage the environment, and how we are learning more about informationally efficient measures for environmental protection.

Whether in the labor market, the credit market, the land market, or commodity markets, the poor often suffer most from the consequences of information failure, and especially from the resulting market failure. It is the poor who are most likely to have difficulty gaining access to credit because they lack collateral, or who have to pay

what seem like usurious interest rates when they do get loans. It is the poor who must resort to sharecropping contracts, which lower their productivity. It is the poor who are often limited to job opportunities in their immediate vicinity, where market segmentation holds their wages down. And it is the poor who are impoverished in many other ways, not least in their lack of access to information, which contributes to their sense of isolation. Chapter 8 shows how information failures and knowledge gaps hurt the poor, and what government can do to help.