Finance and infrastructure

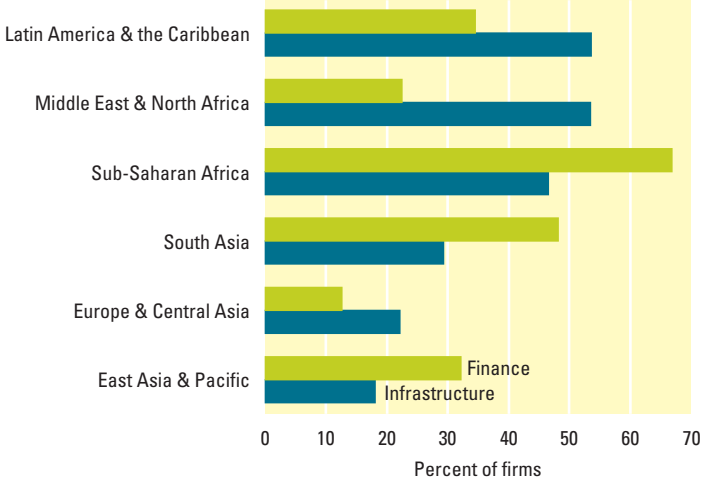
chapter 6

Financial markets, when functioning well, connect firms to lenders and investors willing to fund their ventures and share some of the risks. Good infrastructure connects them to their customers and suppliers and helps them take advantage of modern production techniques. Conversely, inadequacies in finance and infrastructure create barriers to opportunities and increase costs for rural microentrepreneurs as well as multinational enterprises. By impeding new entry into markets, these inadequacies also limit the competitive discipline facing incumbent firms, dulling their incentives to innovate and improve their productivity. Such inadequacies are large in developing countries (figure 6.1).

The underlying problem with both finance and infrastructure can be traced to a specific market failure—for finance it is information asymmetries, and for infrastructure, market power associated with economies of scale. But too often government interventions have made matters worse. Financial markets have been repressed and distorted by state ownership, monopolies, directed or subsidized credit, and other policies appealing to the short-term interests of politicians and favored groups. Those measures undermine financial sector development, firm-level productivity, and economic growth.[1] Infrastructure provision has been undermined by governments using state ownership or regulation to pursue objectives unrelated to efficient service delivery—typically favoring some groups over broader interests and introducing new sources of inefficiency.[2] The problems in both areas usually hit smaller firms the hardest.

Governments are confronting these issues, but progress is slow and uneven. They are pursuing new approaches that recognize that finance and infrastructure are not only part of the investment climate for other firms, but are also profoundly shaped by the investment climate for providers of financial and infrastructure services. That is why many governments are taking steps to increase competition among providers of finance and infrastructure, secure their property rights, and regulate them in ways that recognize the tradeoff between market failures and government failures. Governments are also working to improve management of public resources—to get more for their money when they finance or subsidize infrastructure services.

Figure 6.1 The inadequacies of finance and infrastructure are severe for many developing countries

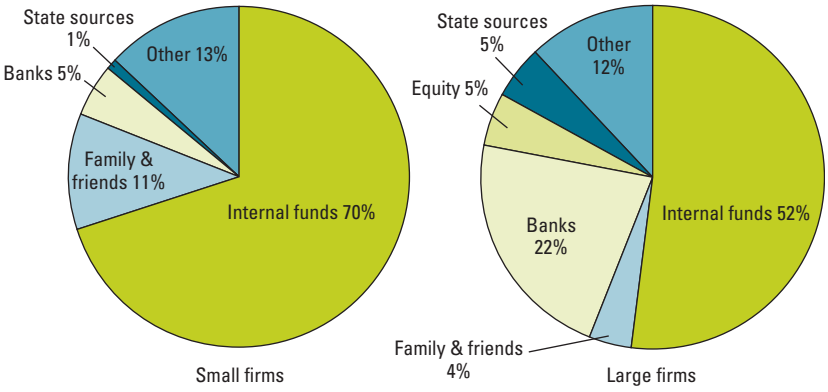


Note: Figure shows the share of firms that report access to finance, and any of electricity, telecommunications, or transportation as "major" or "severe" obstacles to the operation and growth of their business.
Source: World Bank Investment Climate Surveys.

Financial markets

Developed financial markets provide payment services, mobilize savings, and allocate financing to firms wishing to invest. When these markets work well, they give firms of all types the ability to seize promis-

Figure 6.2 Sources of fixed investment financing differ for small and large firms



Note: The data are for firms in Bangladesh, Brazil, Cambodia, Guatemala, India, Indonesia, Kenya, Pakistan, Tanzania, and Uganda. Small firms are defined as those employing fewer than 10 people, large firms as those employing 50 or more.
Source: World Bank Investment Climate Surveys, WDR Surveys of Micro and Informal Firms.

ing investment opportunities. They reduce firms' reliance on internally generated cash flows and money from family and friends—giving them access to external equity and debt, something that smaller firms in particular often lack (figure 6.2). They allow poor entrepreneurs to grow their businesses, even though they have little money themselves. Well-functioning financial markets also impose discipline on firms to perform, driving efficiency, both directly and by facilitating new entry into product markets. And they create opportunities for firms and households to manage risks. As a result, financial market development leads to faster growth in productivity and output.[3] Doubling private credit as a share of GDP is associated with an increase in average long-term growth of almost two percentage points.[4]

Developed financial markets also reduce poverty—directly and through their role in economic growth. They reduce income inequality by alleviating credit constraints and increasing access to investment opportunities for poor households.[5] By facilitating competition between firms that purchase goods produced by poor households, they can help poor households escape exploitation by those firms.[6] They can also stabilize the economy by reducing volatility: doubling private credit as a share of GDP can reduce the volatility of growth from four percent a year to three.[7] There is also evidence that child labor is lower in countries with greater access to financing.[8]

Getting financial markets to work well, however, runs into market failures and problems of political economy.[9] Market failure arises mainly from information asymmetries. Firms seeking to borrow promise to repay loans, but there is always a chance they will not. If lenders could accurately estimate the likelihood of default, they could protect themselves by calibrating interest rates to the risk of default. Lenders do charge more for riskier loans, but the fact that their knowledge of risk is imperfect, and poorer than that of borrowers, means that increasing interest rates cannot fully protect them: when lenders charge higher interest rates, they discourage borrowers with low-risk, low-return ventures, leaving them mainly with borrowers for high-risk projects. By its nature, then, raising interest rates increases the risks lenders are exposed to. The problem is heightened by the possibility of dishonesty and weak contract enforcement—only honest borrowers are discouraged by high interest rates.

Providers of debt and equity also have imperfect information about what the recipients are doing with the capital. Lenders cannot be sure that borrowers are steering clear of risks that increase the chance of default. Shareholders cannot be sure whether managers are investing wisely or merely enriching themselves.

These failures can make it hard for firms to obtain financing unless they have collateral to secure a loan—or good connections. Failures also make it hard for people with savings to find attractive opportunities to invest or lend. The severity of the failures depends partly on factors outside government's immediate control, such as the effect of technology on the costs of getting better information, but it also depends on government policy.

Financial markets are also affected by political economy. Government policies toward financial markets are influenced by the wishes of powerful groups and the self-interest of politicians. Competition often suffers from that influence. In the United States, until the mid-1990s, state banks persuaded governments to shelter them from competition by maintaining unwarranted

restrictions on interstate banking. And in Japan until the mid-1980s established banks persuaded the government to protect them from competition from bond markets by maintaining a rule that required would-be bond issuers to first get approval from a committee that the banks controlled.[10] Financial markets have a long history of similar problems (box 6.1). Overcoming the problems presents policymakers with a challenge at least as difficult as that created by information failures.

Avoiding the pitfalls of traditional government interventions

Responding to market failures and political pressures, governments in the post–World War II period intervened heavily in financial markets—directing credit to favored groups, guaranteeing loans by private banks, and providing many financial services themselves through state-owned banks and development finance institutions (DFIs). To protect domestic banks, governments also restricted competition from foreign banks and other financial institutions. They often justified state ownership and other interventions in the financial sector as ways of ensuring that small and rural borrowers had access to funding. The overall record of these interventions is discouraging.

State ownership of banks. State-owned banks can be given broad mandates or the task of developing a specific industry, sector, or region—often making loans at subsidized rates. Their performance in the developing world has generally been poor. Having a large proportion of state ownership in the banking sector has been found to reduce overall access to financing, reduce competition, worsen the allocation of credit, and increase the likelihood of financial crises.[11] Studies of bank privatization in Brazil, Egypt, and Nigeria find less government ownership is associated with better bank performance.[12] State-owned banks are frequently associated with weak governance, corruption, and poor procedures for collecting debts from borrowers. As cross-country studies show, state ownership of banks, by impeding private competition, can also impede the development of the financial system, hurting small and medium firms particularly.[13] Although their importance has been diminishing, state-owned banks remain significant in many parts of the developing world (figure 6.3).

Development finance institutions. By subsidizing credit to customers unable to borrow from traditional banks, DFIs can be justified if they overcome a market failure cost-effectively. A few have been able to lend profitably and maintain high repayment rates without the use of traditional collateral.[14] More often, they have supported political projects with little economic value or benefited favored constituencies. They usually lack disciplining tools, such as active profit-motivated shareholders. Because they raise funds through the tax system or government-guaranteed borrowing rather than through deposits, they often have a weak sense of the cost of capital.

Improvements in governance can begin to change this. For example, the Thai Bank for Agriculture and Agricultural Cooperatives is an unusual case of a development

BOX 6.1 *Governments and finance markets: A long and difficult history*

Throughout history governments in need of funds have found it convenient to expropriate the financial assets of their citizens, often by repudiating debt. In England the cycle of expropriation was broken only when the monarchy recognized that the sums from taxing production on private property outweighed those from periodic expropriation. The Crown first seized and sold vast lands owned by its rivals—the church and the nobles—thus creating a market for land. A dispersed landholding gentry then emerged, which used parliament as a coordinating mechanism to protect their economic interests.

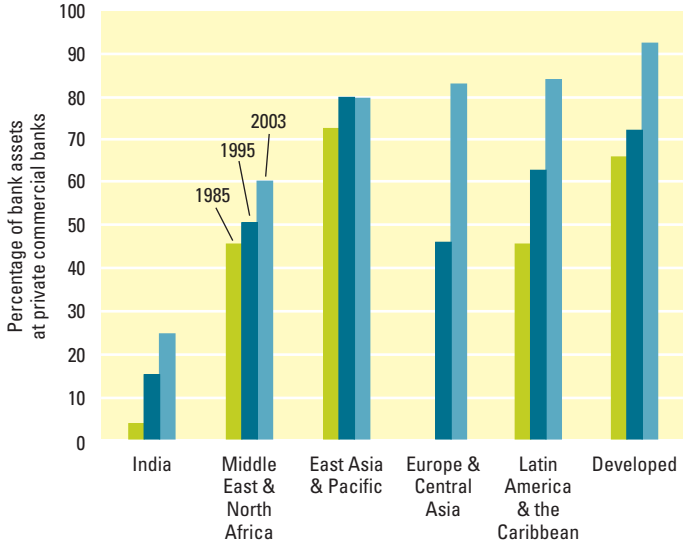
Over time the economic might of the gentry grew so much that they could openly defy the Crown and the nobles in parliament, in part because their wealth ensured that they could hire their own army if necessary. The gentry thus used Parliament to ensure that the Crown honored its commitment to respect property rights, the basis for their economic prosperity, despite occasional attempts to renege. A credible commitment to respect and enforce property rights helped the government borrow vast sums to finance the British Empire.

Not all governments solved their financial difficulties through taxation and widespread protection of property rights. In Mexico in 1876, President Porfirio Díaz was confronted with the twin problems of political disorder and economic stagnation. He needed resources to combat his political opponents immediately, but Mexico's long history of government defaults made borrowing from the private sector impossible. He could have forced loans and confiscated property, but that would hurt productivity in the long run.

Díaz opted instead to protect the rights of a select group of asset holders and use the rents generated to combat his political opponents. The largest bank, Banamex, the government's primary financier, enjoyed special protections, including reserve requirements half those of other banks, exemptions from taxes, and the sole right to open branches. While these arrangements might have suited Díaz, the lack of contestability in financial markets would dampen growth throughout the 20th century.

Source: Rajan and Zingales (2003) and Haber, Razo, and Maurer (2003).

Figure 6.3 State-owned banks are holding on, especially in India and in the Middle East and North Africa



Note: "East Asia" includes South Korea, Malaysia, Philippines, and Thailand. "Europe and Central Asia" includes Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, and Slovenia. "Latin America & the Caribbean" includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay, and República Bolivariana de Venezuela. "Middle East & North Africa" includes Algeria, Egypt, Jordan, Lebanon, Morocco, and Tunisia. "Developed" includes Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Greece, Italy, and Japan.
Source: Data for 2003 are from Clarke, Cull, and Shirley (2003); data for 1985 and 1995 are from La Porta, López-de Silanes, and Shleifer (2002).

bank with mandated lending objectives that does not depend on subsidies, yet succeeds in providing credit to farmers. In 1998 it extended loans to more than 80 percent of Thailand's farming households.[15] Its governance arrangements hold local managers accountable for their branch's performance and require managers to meet profit targets.

More often, however, DFIs make poor quality loans and fail to ensure their repayment. A study of 18 industrial DFIs found that almost 50 percent of their loans were in arrears.[16] Credit does not always reach disadvantaged borrowers, either. In Brazil the rural finance credit program provides more than 57 percent of its loans to the largest 2 percent of borrowers, only 6 percent to the smallest 75 percent of borrowers. Interest rate subsidies and low repayment rates also strain government budgets. Mexico injected almost $23 billion into agricultural DFIs between 1983 and 1992.[17]

Directed lending. Governments have often directed banks to lend to specific regions and sectors, often singling out rural areas where lending is discouraged by sparse populations, high transaction costs, and a lack of traditional collateral. Japan, Singapore, and South Korea appear to have had some success with directed lending for manufacturing, but experience in most countries has been poor.[18]

Directing credit for some purposes means restricting it for others. In Colombia in the 1980s, a subsidized credit scheme required firms to show that they needed new capacity, so credit was directed to the building of new plants—and away from improving the efficiency of existing plants. Such direction works only when officials are better than bank managers—which is rarely the case—at deciding whether new plants are more valuable than greater efficiency.

Directing credit, even when it may help meet some social objective, is difficult in practice because it pushes against the current of market forces. Lenders and borrowers want to lend and invest where the returns are greatest, not in sectors deemed a priority by the government. So lenders reclassify loans to comply with the directions, and borrowers surreptitiously use credit for unintended purposes. Both lenders and borrowers might bribe officials to turn a blind eye. And as in South Korea during the height of its enthusiasm for directed credit, markets can develop for borrowers with access to directed credit to on-lend to those without it. In the extreme, directed-credit policies merely reallocate wealth and leave the ultimate allocation of credit unchanged. For these reasons, directed credit often fails to reach its intended beneficiaries.[19]

Directing credit has also slowed the development of financial markets. Many directed loans go to unprofitable projects and are not repaid. Some borrowers simply refuse to repay their loans, hoping that being in a favored sector will protect them from court action. And large, diverse firms can operate an internal credit market, bypassing the political direction of credit and cutting banks out of the picture. So banks suffer losses and financial markets falter.[20] Reflecting this experience, governments are now backing away from directing credit.

Credit Guarantees. Credit guarantees offered by governments can encourage more lending to riskier borrowers, including new and small firms. But shifting the risk of default to taxpayers raises several practical challenges. Because guarantees encourage banks to worry less about credit risk and monitoring borrowers, default rates can be high, raising issues of sustainability.[21] To better align incentives, programs can be designed that require banks to share in the default risk, involve independent screening of loan applications, and impose fees that are high enough to discourage banks from using the guarantee for loans that do not need it. These measures increase the costs facing borrowers, however, and so reduce participation by smaller firms, which are often the intended beneficiaries.[22] While many countries have experimented with these schemes, examples of unambiguous success stories in developing countries remain scarce.[23]

Better approaches

Governments are learning from the past and taking new approaches that involve five key elements:

- Ensuring macroeconomic stability
- Fostering competition
- Securing the rights of borrowers, creditors, and shareholders
- Facilitating the flow of information
- Ensuring that banks do not take excessive risks.

Ensuring macroeconomic stability. Macroeconomic stability—more specifically, low inflation, sustainable debt, and realistic exchange rates—is fundamental to the effective functioning of finance markets. Macroeconomic instability increases the volatility of interest rates, exchange rates, and relative prices, imposing additional costs and risks on financial institutions and their clients. High inflation erodes the capital of financial institutions and makes it difficult to mobilize savings or to expand services. High fiscal deficits increase interest rates and spreads. The increase in holdings of government paper by banks, mutual funds, and investment funds crowds out credit to the private sector, because these providers of finance find it more profitable to hold government securities than to make loans to firms. For example, in Brazil, the expansion of government borrowing between 1995 and 2003 was associated with a slowdown in expansion of private sector credit.

Fostering competition. Restrictions on competition between providers of finance can mean slower economic growth, reduced employment growth, and slower exit of mature firms in concentrated bank markets.[24] Policies that impede competition—such as entry restrictions, restrictions on foreign banks, and state ownership of banks—hurt the financial system and economic performance. Removing these barriers to competition has been shown to improve banking stability, reduce interest margins, and expand access to finance.[25]

One way to foster competition is to (prudently) issue new domestic banking licenses. In the United States the wave of mergers and acquisitions in the 1980s and 1990s created large banks, which reduced lending to new and small firms. Yet fairly liberal licensing policies allowed new banks to form to help offset the lack of supply and keep interest margins low.[26] Competition is also benefiting from technological innovation, as in India's rural areas (box 6.2).

Policymakers are sometimes concerned that the competition from foreign banks will weaken the banking system. However, evidence shows that foreign banks improve the efficiency and performance of domestic banks and reduce interest rate margins.[27] This is what happened when the Philippines allowed more foreign bank competition—interest rate spreads fell and the efficiency of domestic banks increased.[28] Foreign banks can also use their cross-border experience to introduce innovations. Citibank responded to the scarcity of good credit information on individual firms in many developing countries by finding other ways to assess creditworthiness. The company identifies industry segments with the potential to grow quickly and then seeks out borrowers in those segments. In India it has about 500 customers in 15 selected industrial segments.

BOX 6.2 *Expanding access to finance in rural areas—new approaches in India*

Firms operating in rural areas often have a hard time getting financing, but financial innovations and new technology are making a difference, as India shows.

The agricultural agency model uses a third-party intermediary to coordinate the financing of inputs, the delivery of produce to the end buyer, and the repayment to the bank before the farmer receives the proceeds. The intermediary improves information by advising farmers on crop decisions that affect the quantity and quality of the produce. The intermediary can also negotiate better prices on final goods than individual farmers can.

The Kisan Credit Card, offered by commercial, rural, and cooperative banks, is a technological innovation in providing credit to the agriculture sector in India, including small farmers. Since its introduction in 1998–99, some 31.6 million cards had been issued by April 2003. Though not truly credit cards, the cards have advantages for borrowers and lenders. They make it easier to get credit and renew loans, once the initial screening has been done. They reduce the number of visits to branches, and they increase the operation of accounts at designated supply branches.

The increasing sophistication of financial markets is helping farmers smooth their incomes in the face of fluctuating prices and harvests. Fledgling futures markets are allowing them to fix the prices they will receive in advance. Innovations in insurance are allowing them to protect themselves from losses caused by poor weather. The payouts are based on an index measuring local weather, which allows an objective determination of the payout and maintains farmers' incentives to maximize their output despite poor weather.

Source: Hess and Klapper (2003) and World Bank (2004j).

A second concern is that foreign entry might reduce access to financing by small and medium firms. But again, foreign banks have been found to improve access to credit for those firms. In Chile and Peru, foreign banks loaned more to small firms than domestic banks did, and in Argentina and Chile, real growth in lending to small firms was higher for foreign banks.[29]

While bank-to-bank competition is important, other sources of finance can also strengthen competition. For example, firms with access to public bond financing have 35 percent more debt (after controlling for other firm characteristics).[30] Nonbank financial intermediaries can also broaden financial markets. For example, leasing companies and finance companies often finance start-up firms unable to raise funds from banks. As nonbank financial intermediaries develop, they often securitize their assets, further deepening securities markets.[31] Pension funds and contractual savings can also compete to supply funds, increasing banking efficiency and lowering the cost of capital.[32] Finally, commercial microfinance is beginning to have an impact on financial services for microentrepreneurs and poor households (box 6.3).

How, then, to encourage the development of nonbank lenders? By not overregulating lenders that do not take deposits, and by harmonizing the tax treatment of financial products. In Turkey, factoring companies pay a 5 percent transaction tax while

BOX 6.3 *Commercial microfinanciers enter the market*

Microfinanciers provide thrift, credit, and other financial services of very small amounts, mainly to the poor, in both rural and urban areas. They offer an alternative to banks, which in most developing countries serve only 5–20 percent of the population. They use noncollateralized loans to deliver short-term working capital to microentrepreneurs and households.

One of the key characteristics of microfinance, pioneered by Grameen Bank in Bangladesh and now replicated throughout the developing world, is substituting joint liability, access to future loans, and frequent repayment periods for traditional collateral. These alternatives to collateral are especially important for borrowers who do not have assets to pledge—and for lenders who operate in countries with weak secured-lending laws and enforcement.

Microfinance has demonstrated its success in reducing poverty. By 2002 more than 1,000 microfinance programs around the world had reached about 30 million borrowers, lending about $3.5 billion, with an average loan size of $280. Microfinance has helped the poor increase household income, build viable businesses, and reduce their vulnerability to external shocks. It can also empower the poor, especially women. Subsidized microfinance relying on donors, however, is unlikely to be big enough to reach all potential borrowers. That will require commercial microfinance that mobilizes the savings of the general public, raising questions about the appropriate role for governments.

Governments are sometimes tempted to mandate below-market interest rates, but this usually causes more problems than it solves. The removal of interest rate controls in Indonesia in 1983 allowed Bank Rakyat Indonesia to experiment with new financial products, most notably market-priced working capital and investment capital loans. By 1986 its microfinance business had turned from a chronic loss-maker to a profitable department.

Governments can also eliminate unfair competition from public institutions and change regulations to facilitate competition on a level playing field. In particular, they can allow microfinance institutions to transform themselves into licensed financial institutions and facilitate the provision of microfinance by commercial banks. In 1992 ProDem, a microfinance nongovernmental organization (NGO), became BancoSol, the first commercial bank in Latin America dedicated to microfinance. The transformation enabled the expansion from 14,300 clients to 70,000 within five years of commercialization, and by 1998 BancoSol was the most profitable licensed bank in Bolivia.

As in other segments of the credit market, allowing the sharing of credit information among microlenders can foster microfinance lending, especially by commercial lenders that may not have preexisting relationships with borrowers in rural areas. South Africa has two private credit bureaus operating in the microfinance sector. Information can be obtained by touch-tone phone, and the microfinance bureaus charge much lower fees than larger bureaus—making them affordable even for small microlenders.

Source: Ghatak and Guinnane (1999); Morduch (1997); Morduch, Littlefield, and Hashemi (2003); Hubka and Zaide (2004); CGAP (1997); Klapper and Kraus (2002); and www.mixmarket.org.

banks pay only 1 percent.[33] Pension rules can also be liberalized as capital markets mature and regulatory systems develop. For instance, investment in more asset classes, such as equities, can be allowed.[34] Better insurance regulations can also encourage insurance providers to innovate and operate efficiently—and to create a competitive market open to new firms and the exit of insolvent firms.[35] Mutual funds can be developed under strong accounting and auditing rules and strict disclosure requirements.[36]

Securing the rights of borrowers, creditors, and shareholders. Governments can mitigate the problems for creditors and shareholders—and increase their willingness to provide finance—by ensuring that the parties have clearly defined rights and can enforce them.[37] A strong legal environment and strong enforcement are important for access to external finance and the development of financial markets. When creditor rights are weak, financial institutions will be less willing to extend credit to firms that have a high risk of default. When shareholders' rights are weak, investors will be less willing to provide firms with equity.[38]

Securing borrowers' property rights to assets they can pledge as collateral (including land) can increase access to financing and investment (chapter 4). Secure property rights also allow firms to borrow longer-term and encourage more foreign lending.[39] The cost of external financing is also lower in countries with stronger property rights protection and less corruption. A study of 37 countries found that if a country improved its property rights protection from the 25th to the 75th percentile, loan spreads would decline by 87 basis points.[40]

Strong creditor rights—stemming, say, from laws guaranteeing secured creditors' priority in the case of default—allow lenders to reduce their risk of future losses, therefore encouraging them to make more loans. For example, one explanation offered for the low level of private credit in Mexico is that many social constituencies must be repaid before secured creditors, often leaving creditors with few assets to back their claims.[41] Studies in the United States show that small firms are 25 percent more likely to be denied credit if they are in states that provide creditors with less protection when the borrower is bankrupt.[42] The effectiveness of creditor rights also depends on strong enforcement of the laws. Russia, for example, has "imported" strong laws protecting shareholder and creditor rights, but the lack of an effective legal system to enforce these laws has been a big impediment.[43] Laws and registries permitting the collateralization of movable property can offer even greater benefits to smaller firms that are less likely to have fixed assets (box 6.4).

The need for strong shareholder rights and good corporate governance has been underscored by structural changes in most developing countries—including privatization and the widespread listing of firms on stock markets.[44] Improvements in corporate governance are associated with higher operational performance of firms, through better management, better allocation of resources, and other efficiency improvements.[45] Governance is particularly important for foreign investors, who may have informational disadvantages. A global investor opinion survey by McKinsey suggests that good governance matters most to investors (ranking higher than firm performance or growth prospects) and that institutional investors prefer to

BOX 6.4 *Establishing a registry for movable collateral in Romania*

Legal impediments previously restricted the use of movable property as collateral in Romania and thereby limited the access to credit. First, the system did not allow lenders to access information on whether other creditors or lenders had claims on the same goods. Second, the enforcement of agreements and repossession of collateralized goods was a long process (often exceeding the economic life of the movable good).

A new law, adopted in 1999, introduced a system for registering security interests. The registration, valid for five years, is required to secure new collateral. The law provides for both stronger enforcement and a new electronic archive of outstanding liens. This online collateral registry includes all registered security interests. Ten operators and 366 agents are licensed to register collateral in the electronic archive. The supervisory authority provides guidelines on the archive's operation and clarifies rules and regulations.

The archive functions efficiently, allowing financial intermediaries to access information about creditors, debtors, or assets securing a commercial or civil transaction in the country. This information, accessible by people all over the world, presents huge cost-saving and time-saving opportunities—improving the investment climate.

Source: Fleisig (1998) and Stoica and Stoica (2002).

invest in countries where legal rules and enforcement are both strong.[46]

In countries where laws do not guarantee strong protection of shareholders, firms may be able to improve their access to external equity financing by voluntarily improving their governance through greater transparency, preparing financial reports according to international accounting standards, and appointing independent directors. So governance standards need not be legislated for all corporations. Governments can still facilitate shareholder monitoring by requiring all large and listed firms to disclose financial and ownership information. Stricter regulation (in the form of high disclosure requirements set by the stock exchange or government) and strong enforcement are associated with greater market liquidity, lower costs of capital, and higher valuations of firms (box 6.5).[47]

Transparency and disclosure requirements for listed firms are generally set and supervised by the local exchange, but the government may need to enforce exchange standards.[48] Differences in enforcement help explain why the Czech Republic, whose government took a relatively hands-off approach to the enforcement of regulation of the capital markets, had an inactive equity market—while Poland, which had stricter enforcement of regulation and disclosure, witnessed strong growth in its capital market.[49] In countries with developed financial intermediaries—such as brokers, accounting firms, and investment advisers—exchanges may be able to delegate some disclosure enforcement to these intermediaries and reduce the cost of enforcement. In emerging markets, however, government prosecution may be necessary to protect investors and promote market development. Internationally agreed principles for corporate governance create opportunities for governments to signal the quality of their regulatory systems in this area (chapter 9).

Using credit bureaus to facilitate the flow of information. One way lenders can address their information disadvantage is to collect information about their customers directly through costly screening and monitoring. Lenders in most developed countries—and more now in developing countries—can also rely on reports from credit information bureaus. These reports include loan payment histories that allow lenders to use information on how borrowers met past loan obligations to better predict future loan performance. Credit reporting also improves borrowers' incentives to repay loans promptly, because late payment with one lender can result in sanctions by many institutions.[50]

Credit bureaus can increase bank lending and reduce default rates. They also benefit small and new firms by alleviating credit rationing based on the lack of a credit history.[51] In one survey more than half the credit bureaus indicated that credit history information reduced the processing time, costs, and default rates in their country by more than 25 percent.[52] On average, countries without credit registries have a private-credit-to-GDP ratio of about 16 percent, those with publicly owned credit registries about 40 percent, and those with private bureaus about 67 percent.[53]

Governments can create a supportive environment for credit bureaus by enacting

BOX 6.5 *Improving corporate governance in Brazil and South Korea*

South Korea is leading corporate governance reforms in East Asia. Ceilings have been removed on foreign ownership. The minimum shareholding required to undertake class actions has been reduced, prompting many instances of shareholder activism (for instance, People's Solidarity Participatory Democracy challenged Samsung Electronics and SK Telecom). The appointment of outside directors on the boards of financial institutions and major conglomerates is required. Some exchange listing requirements were also added, which apply to firms with an asset size greater than W2 trillion (about $2 billion). Those firms must have an audit committee with at least two-thirds of the directors from outside the firm and an outside director as chairman. These reforms promise to ease the mobilization of investment capital.

In 2001 BOVESPA (the São Paulo Stock Exchange) established a new market segment, Novo Mercado, modeled on the Neuer Market in Germany. To attract smaller enterprises, new market segments in other exchanges usually loosen listing requirements. But Novo Mercado goes against this trend, requiring corporate governance requirements far stricter than in the old segment. At least 25 percent of the capital stock must be floating in the market and listed companies must adopt internationally recognized accounting standards (U.S. generally accepted accounting principles or International Financial Reporting Standards). In a merger both controlling and minority shareholders must be treated equally. The companies can issue only common shares—something particularly important in Latin America, where the use of non-voting preferred stock is commonplace and allows certain shareholders to exert control disproportionate to their financial commitment. The migration to the Novo Mercado lifted the market value of companies around the migration date.

Source: McKinsey & Company (2002); Dyer (2001a, 2001b); Weiss (2002); BOVESPA Web site; Nova Mercado regulations 10.303; and de Carvalho (2003).

and enforcing data protection and credit reporting laws that allow the sharing of credit information. The laws can safeguard consumer rights by allowing consumers to obtain data about themselves, requiring disclosure of information on who gets the credit report, and providing mechanisms for resolving disputes and correcting erroneous information. Laws that allow the sharing of both positive and negative information do more to improve lenders' information and thus facilitate more lending. Credit reports that contain only negative information (such as cases of late payment) have less predictive power than reports with both positive and negative information.[54] Because credit reports are more important for borrowers with limited collateral, limits on data collection disproportionately harm smaller borrowers.

Controlling risk-taking. Governments limit risk-taking by banks and other financial institutions for various reasons. Limited liability can cause banks to take excessive risks and, unlike in other industries, such problems can lead to systemic crises—failure of one bank can lead to a run on all banks, undermining the payments and credit system. Deposit insurance can reduce the risk of bank runs. But the expectations of government bailouts from explicit or implicit deposit insurance can make the problem worse, by causing depositors and others to monitor banks less carefully.

Prudential regulation limits the financial risks banks can take by requiring them to diversify and maintain at least a minimum ratio of capital to loans. It is administered by prudential supervisors who monitor banks on behalf of depositors and take action to avert problems. Prudential regulation can serve a useful purpose—reducing the risk of government bailouts and systemic banking crises—but doesn't always work in practice.

As in other areas, choosing appropriate regulations and administering them effectively requires financial resources and technical capacity that are usually scarce. In addition, good intentions may later be perverted by corruption and clientelism. Supervisors can direct loans to favored firms, or banks can "capture" their supervisors, dissuading them from taking action when a regulation has been violated.[55]

Because of such problems, several studies have cast doubt on the effectiveness of prudential regulation and supervision. On the one hand, indicators of its strength, such as supervisory power, the stringency of minimum capital ratios, and the tenure of supervisors, are not strongly linked to bank performance and financial stability.[56] On the other, intensive official supervision is associated with corruption, financing constraints, and the need for political connections to get finance.[57] Effectively regulating risk-taking therefore calls for a cautious approach—adapting it to fit the institutional features of the country at hand. Indeed, an alternative school of thought stresses the efficacy of "sunshine" regulations that force information disclosure and so strengthen the ability of depositors and other stakeholders to monitor banks directly.[58]

Indeed, banking systems seem to work better when market discipline is encouraged through market monitoring—not strong supervisors.[59] Possible private monitoring agents include large depositors, subordinated debt holders, shareholders, and rating agencies. A study of banks in Argentina found that those with a higher share of nonperforming loans (seen as a measure of risk) lose market share.[60] In addition, Argentine banks were required (until the recent crisis) to issue subordinated debt for 2 percent of their deposits every year. After the introduction of subordinated debt in 1998, complying banks paid lower deposit rates and had faster growth in deposits, lower capital ratios, and fewer nonperforming loans. Banks that failed to comply were penalized by having to increase capital and liquidity.[61] The market also punished poorly performing banks in Thailand: equity prices of listed Thai banks predicted their difficulties in 1997—before rating agency downgrades.[62]

The effectiveness of private monitoring depends on how well information disclosure regulations are enforced, whether rating agencies compete with each other, the proportion of state ownership of banks, and the nature of deposit insurance.[63] Banks

can be required to disclose standard financial information and governance information, such as the compensation structure of bank management (to better understand how risk-taking is rewarded). In addition, the credibility and independence of rating agencies can be augmented by requiring the disclosure of all business relationships and track records, such as the number of times a firm receiving a favorable rating later developed problems.

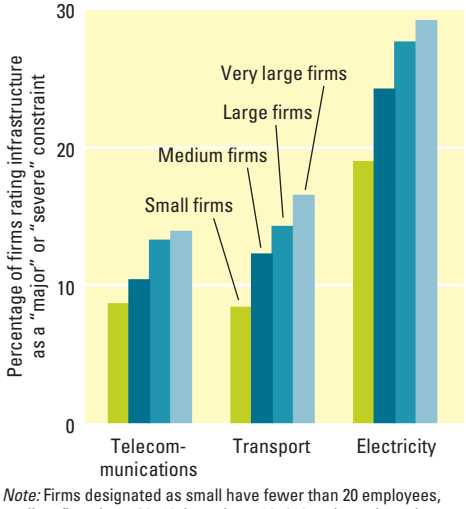
Information constraints in many developing countries raise questions about how well market monitoring can work.[64] However, commercial rating companies now provide some form of rating for 439 banks in 50 developing countries.[65] There is also evidence that market discipline, defined as market reactions to bank risk, can work well in developing countries. Argentines pulled out their peso and dollar deposits in response to increases in an individual bank's exposure to a government default.[66] Better disclosure is also associated with higher valuations of banks in emerging markets.[67]

Infrastructure—connecting firms and expanding opportunities

Firms with access to modern telecommunications services, reliable electricity supply, and efficient transport links stand out from firms without them. They invest more, and their investments are more productive. Yet in most developing countries, many firms must cope with infrastructure that fails to meet their needs. The problems, as expressed by firms, vary by region, with Sub-Saharan Africa and South Asia having poorer infrastructure than Europe and Central Asia (see figure 6.1). They also tend to vary by infrastructure service and firm size—electricity is often the biggest problem, and larger firms express more concerns than smaller firms about all services (figure 6.4).

All types of infrastructure—including airports, railways, and distribution networks for water and natural gas—matter to some firms. This Report looks at four that matter to a very wide range of them: roads, ports, electricity, and telecommunications. Although the Report focuses on the impact of infrastructure services on firms, improvements in the coverage and quality of these services also benefit households.

Figure 6.4 Infrastructure concerns expressed by firms vary by size and sector



Note: Firms designated as small have fewer than 20 employees, medium firms have 20–49, large have 50–249 and very large have 250 or more.
Source: World Bank Investment Climate Surveys.

Common challenges in infrastructure

Building and maintaining roads, ports, electricity grids, and telecommunications networks is expensive, so it is no surprise that poor countries in Africa, South Asia, and elsewhere have worse infrastructure than rich countries. But the challenge of improving infrastructure is not just one of finding more money.[68]

Market power, irreversible investments, and politics. The problem of infrastructure provision has its roots in the potential for market power that results from economies of scale. It rarely makes sense to have two competing roads between two points—or competing electricity grids. Indeed, all infrastructure activities were once thought to be "natural" monopolies, so that a particular market could be served at least cost by a single supplier. However, the potential abuse of market power in services that affect many consumers creates pressure for governments to intervene, either through intensive regulation of private suppliers or through provision by the public sector.

Whether provision is public or private, governments tend to tightly control the prices that infrastructure providers charge and are often reluctant to allow prices to rise even when costs have.

This reluctance can create problems because of another feature of many infrastructure services—long-lived, immobile investments. Once built, a road or hydroelectric dam cannot sensibly be dismantled and moved elsewhere. Investors in infrastructure are often vulnerable, therefore, to changes in government regulations, including those limiting prices. Before they invest, the government may promise them prices high enough to cover the costs of investment, but afterward the government will be tempted to please customers and voters by keeping prices low. So long as prices cover operating costs, the investors cannot credibly threaten to withdraw their services.

The underlying problem in the provision of much infrastructure is thus the combination of two reasonable concerns: customers fear that firms will use their market power to overcharge, and firms fear that governments will use their regulatory power to prevent them from covering their costs. Private firms originally created much of the world's infrastructure, but the playing out of these fears, combined with a prevailing skepticism about markets and private ownership, led to widespread nationalization of infrastructure after World War II.[69]

Under public provision, however, the problems reemerged in different guises and were joined by others. Infrastructure services remained highly politicized, and governments frequently kept prices below costs. The low prices were sometimes presented as necessary to help the poor, but the beneficiaries tended to be those who had access to services, so the poorest members of the community usually missed out. To take just one example, a study of the incidence of "lifeline" electricity tariffs in Honduras, under which the government subsidized the first block of household electricity consumption, found that about 80 percent of the subsidies went to households that were not poor.[70] Governments also used their infrastructure agencies to channel assistance to particular regions and give jobs to favored groups, increasing the agencies' costs and frustrating attempts to hold them accountable for the efficient delivery of services. With high costs and low prices, the agencies were unable to finance investment from their own cash flows or borrow on their own credit (box 6.6).

As long as governments heavily subsidized public infrastructure agencies, the agencies could still operate and expand. Fiscal pressures and mounting dissatisfaction with public services, however, made governments reluctant to go on providing large subsidies. That—combined with a change in the prevailing views about markets and private ownership—led many governments to turn again to the private sector for at least some infrastructure services. While public provision remains important, private participation has now spread throughout much of the developing world (figure 6.5).

BOX 6.6 *The political economy of electricity in India*

Indian electricity utilities generally provide unsatisfactory service to their customers, whether firms or households. In a recent budget document the central government noted that electricity shortages routinely lead to outages and voltage fluctuations that disrupt all aspects of economic life—and require substantial investments in voltage stabilizers, generators, and new motors.

Most electricity is generated and supplied by state-owned electricity boards, which are experiencing severe financial difficulties and draining state budgets. Before privatizing its electric utility in 2002, for example, the Delhi government provided it with implicit subsidies of $200 to $300 million a year, in loans unlikely to be repaid. Even so, the company still faced financial problems and provided poor service: power cuts were common in summer and winter.

The problems in Delhi, in other parts of India, and indeed in much of the developing world are political. Under pressure from well-organized groups of voters, governments have kept average prices below average costs, allowing politically influential customers to pay especially low prices. Farmers often receive electricity for irrigation pumps at prices well below costs.

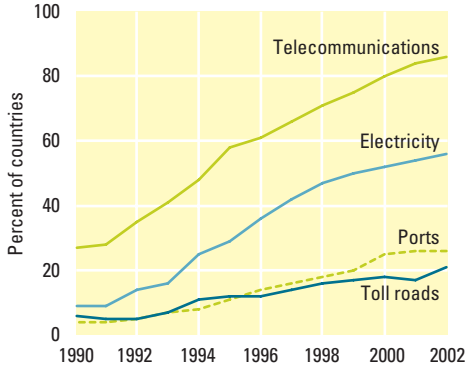
The subsidies became popular in the late 1970s. In Andhra Pradesh the government offered flat-rate tariffs to farmers as an election promise. Soon after, in Tamil Nadu, demonstrations by the Agriculturalists Association led to the provision of free electricity to some farmers. Other states then followed with their own agricultural subsidy programs. Many of the recipients are fairly well-off land-owning farmers.

Farmers are not the only beneficiaries: many customers steal their electricity, costing suppliers an estimated $4 billion a year. According to one report, utility employees who conspire in the theft of electricity can receive many times their annual salary in bribes.

Although some farmers, employees, and politicians benefit, low prices discourage both the conservation of power and further investment in increasing supply and improving its reliability. That is why other users, including many firms, have to pay more.

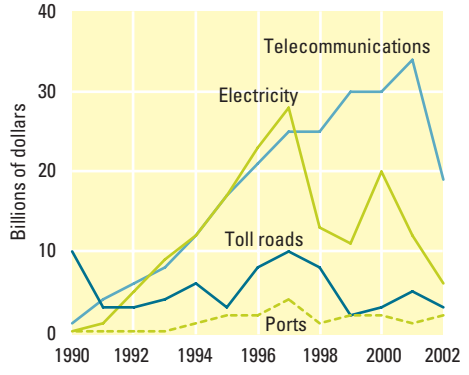
Source: Agarwal, Alexander, and Tenenbaum (2003); Dubash and Rajan (2001); India–Ministry of Finance (2003); and Lal (2004).

Figure 6.5 More developing countries are involving the private sector in infrastructure provision



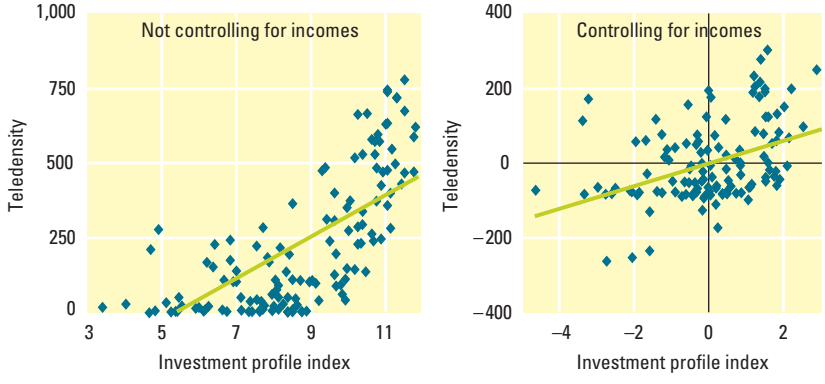
Note: The number of countries in the database varies over the period, starting at 128 in 1990 and ending at 151 in 2002. Private participation includes management and lease contracts, concessions, and divestitures.
Source: World Bank Private Participation in Infrastructure Project Database.

Figure 6.6 Investment in infrastructure projects with private participation has recently fallen



Note: Data show total investment in facilities with private participation and exclude privatization revenues and similar payments.
Source: World Bank Private Participation in Infrastructure Database.

Figure 6.7 Teledensity increases with the quality of the investment climate, even controlling for incomes



Note: Data are for 2001. The second graph controls for incomes by plotting the residuals of regressions of teledensity and the investment profile index, respectively, on GDP per capita. Investment profile is a measure of risk to investment (higher values mean lower risk).
Source: International Country Risk Guide, International Telecommunication Union.

Although private provision has often lowered costs and improved services, the problems of political economy remain. Many customers have opposed privatization, believing it will do more to enrich big business and its political allies than improve public services. At the same time, many infrastructure investors have been disappointed by their returns in developing countries, often believing that governments have broken their promises on regulation for fear of losing votes. Partly because of these problems, the amount of investment in private infrastructure projects in developing countries has declined in the last few years (figure 6.6).

Improving infrastructure by improving the climate for investment in infrastructure. Addressing these problems requires recognition that the performance of infrastructure providers is shaped by their investment climate: a good investment climate helps improve infrastructure (figure 6.7).[71]

In some respects, the concerns of infrastructure firms—whether private or publicly owned but commercially run—are no different from those of other firms. All firms worry about the security of their property rights and the burdens imposed by regulation, taxation, and corruption. They want to be able to hire good workers without having to keep them if business turns down. And they want access to financing.[72]

The problems arising specifically from market power and immobile investments in infrastructure highlight the central role of secure property rights. Infrastructure firms are concerned not only about outright expropriation, but also about whether governments will progressively undermine their profitability by imposing ever more severe regulation. The problems affect small providers as well as multinationals (box 6.7). Governments must therefore take care to craft rules and institutions that constrain market power without unduly weakening property rights.

With this aim, governments often set out regulations and infrastructure investors' rights in contracts that cannot be changed unilaterally and allow disputes to be settled

BOX 6.7 *Improving the investment climate for small private providers of infrastructure*

Much private investment in infrastructure comes from multinationals from rich countries in Asia, Europe, and North America. When concerns are expressed about the investment climate for infrastructure providers, it is these firms that most naturally come to mind. However, small (often informal) infrastructure providers are also important for electricity and telecommunications, especially in rural areas, and the investment climate for them matters, too.

Phone operations in Bangladesh

In many countries small entrepreneurs buy a mobile phone and then run a small business charging others to use it. In Bangladesh, with one of the world's lowest telephone densities and waiting times of many years for a fixed connection, village phone operators, most of them women, provide mobile phone access to their rural neighbors. Benefiting in many cases from loans from the Grameen Bank, village phone operators are present in thousands of villages. At fairly low cost they enable villagers to communicate with people in markets in neighboring towns—avoiding the need to walk there to find out the prices of commodities. This valuable service has been hampered by the state-owned company BTTB, which has used its monopoly over fixed lines to restrict interconnections between mobile phones and the fixed-line network.

Small electricity suppliers in Cambodia

In Cambodia the biggest electricity supplier is the state-owned Electricité du Cambodge, which supplies Phnom Penh and a few towns. But several hundred small private providers supply electricity to more than 100,000 households and small firms in rural areas, sometimes by recharging batteries and sometimes through metered connections to small electricity grids. Although charging fairly high prices, they supply customers who would otherwise have to supply themselves or go without.

By law these private providers require licenses, which the government issues for a renewable term of three years. Because the capital invested in electricity grids can have a useful life of more than three years and the assets cannot be costlessly dismantled and moved elsewhere, uncertainty about license renewals creates a policy risk that can discourage investment and increase electricity prices. (It also encourages the substitution of easily moved investments for those less costly but less easily moved.) The providers do not know whether their license will be renewed—or what bribe they might be asked to pay to ensure its renewal. Most of the small providers are, in fact, unlicensed. They thus face a different policy risk: being prosecuted and closed down—or having to pay a bribe to avoid that.

All providers are also vulnerable to a change in government policy that would give either Electricité du Cambodge or other providers exclusive rights to provide service. All are vulnerable to the possibility that, as they grow and become better established, the government will come under pressure to regulate the prices they charge in a way that undermines their profitability.

Source: PPIAF and World Bank (2002); Burr (2000); and Cohen (2001).

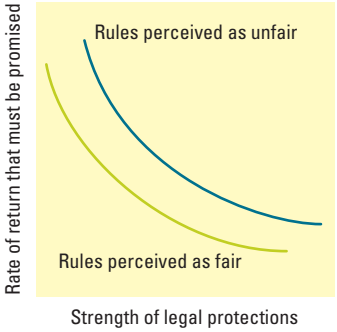
by domestic or international arbitration when investors do not trust the independence or reliability of local courts (chapter 4). Decisionmaking about the implementation of rules is often delegated to independent regulatory agencies more insulated than politicians from day-to-day political pressures (see box 5.2).[73]

To work well, however, the government's approach must not only secure investors' property rights on paper. To be credible to firms, the arrangement must be sustainable, which means it must be perceived as reasonably fair and legitimate by consumers (chapter 2). Arrangements widely perceived as legitimate and fair thus reduce risks faced by providers, lower the returns that commercial investors must be promised, and so lower the prices that customers must pay, for any given degree of legal protection (figure 6.8).

One cause of popular resistance to private participation in infrastructure in the 1990s was the opacity of some procedures used to privatize infrastructure businesses and adjust the tariffs the privatized business could charge. In the absence of transparency, suspicions were reasonably raised about whether bribes or the public interest had motivated policy. Responding to these concerns, most countries have turned to transparent competitive bidding to award contracts. Such countries as Brazil, Panama, and Peru now publish many infrastructure concession contracts on the Internet.[74] In 2002 Mexico passed a freedom-of-information law that will require information about such contracts to be made public.

The creation of independent regulatory agencies can be viewed as an attempt to reconcile the partly competing demands for investor protection and public legitimacy. If legitimacy could be ignored, investors' property rights would be most secure if contractual tariff adjustment rules were interpreted by independent international experts and serious disputes resolved by international arbitration. Using national regulatory agencies, courts, or arbitration increases one type of risk for investors, because the national institutions are more susceptible to political pressures to keep prices below costs—but decisions made by national institutions may be viewed as more legitimate, enhancing the sustainability of the arrangements.

Figure 6.8 Perceived fairness allows lower rates of return to be promised for a given legal protection



BOX 6.8 *Better government accounting, better government policy*

Traditional government accounting emphasizes the cash deficit as a measure of fiscal performance and the level of ordinary public debt as a measure of fiscal position. The focus on these two indicators—at the expense of measures that incorporate noncash costs, assets, and traditionally "off-balance-sheet" debt—encourages two biases in infrastructure provision.

First, it discourages profitable public investment and maintenance. Even when investment or maintenance is expected to generate future revenues for the government that outweigh the initial expenditure, the immediate effect is to increase the cash deficit and debt. Other biases, such as politicians' desire for ribbon cutting and big bribes, may encourage public investment projects, but there is evidence that governments sometimes invest too little in infrastructure, especially when under pressure to reduce cash deficits and debt.

Second, the focus on cash deficits and debt encourages governments to seek private financing for infrastructure projects, irrespective of their merits, and then subsidize the projects in ways that don't show up in budgets and accounts. For example, such a focus encourages a government to get a toll road privately financed, and to ensure its creditworthiness by guaranteeing the project company's debt or providing a minimum revenue guarantee under which the government tops up the toll revenue if it falls below a threshold. Although the guarantees are valuable to the project company and costly to the government, they typically leave the cash deficit and public debt unchanged—unless and until the guarantee is called.

In another manifestation of the second bias the focus on ordinary public debt can encourage governments to prefer off-balance-sheet debt. Instead of borrowing money to have a new power plant constructed, for example, a government can ask a private company to finance the plant, in return for the government's signing a long-term power-purchase agreement that commits it to making monthly payments to the private company for, say, 20 years—with the monthly payments having a present value equal to the cost of the power plant. In substance the "privately financed" arrangement is similar to the government's having the power plant constructed with borrowed money and repaying the loan in monthly installments over 20 years: the government's obligations to make payments may be the same. Moreover, the arrangement does little to address the problems of political economy discussed earlier. Yet under traditional accounting rules the "private" option spares the government from disclosing new debt.

Government guarantees and long-term payment commitments can help get good projects under way, but as long as a government's accounting fails to pick up the effects on the government's financial performance and financial position, doubts may reasonably remain about the government's motivation for using them. In the long run the only way to remove the biases is for governments to adopt accounting rules that take into account the value of the assets created or enhanced by public investment and maintenance and the costs of guarantees and long-term payment commitments given to private investors.

Source: Easterly and Servén (2003); Irwin (2004); and Tanzi and Davoodi (1997).

Competition has the power to transform infrastructure industries by increasing legitimacy and strengthening investors' property rights. It pushes firms to become more efficient and cut prices. As a result, it helps assure customers that they are getting a reasonable deal. This in turn reduces pressure on governments to regulate in ways that weaken investors' property rights. Where competition works, it can thus help infrastructure provision escape the problems that have traditionally afflicted it under both public and private provision.

Private participation is often advocated because it provides an alternative source of financing to governments that have limited resources. Such reasoning is flawed—and can encourage privatization with few real benefits (box 6.8). The big problem is paying for services, not financing them, and though private investors may finance services, they don't pay for them.[75]

The real advantage of well-designed private participation is different and deeper: it lies in changing the political economy of infrastructure provision. First, when the government is no longer a provider of services, it can more easily allow genuine competition (see box 5.1). So private participation can be part of a strategy to help garner the benefits of competition—reducing costs and the property-rights problems of intensive regulation. Second, to attract private investment, a government needs to make a credible commitment to allow prices to cover costs and not interfere in commercial operations—a commitment it cannot make under public provision, because it can renege on commitments to public agencies with impunity. If a government can credibly make this commitment to investors by using the policies described above—and simultaneously persuade customers that their interests are being protected—it will have gone much of the way toward creating a good investment climate for infrastructure providers, thereby doing much to provide good infrastructure services to all firms and to their broader societies.

Improving public management. Although private participation plays a powerful role, governments remain major financiers and

providers of much infrastructure, especially roads. Even in sectors where a good deal of investment is private, complementary public investment in the parts of the sector owned by the government can be important. When governments do not provide or finance infrastructure, they often subsidize it—sometimes directly, sometimes indirectly through guarantees and other instruments. Because government budgets are always more limited than the plans of project proponents, governments need ways of deciding how much to spend on infrastructure, how to allocate that spending, and how to administer it.

The questions are both technically difficult and politically charged. For example, if the government can afford to construct and maintain just one more road in the next year, should it connect a poor rural area to the capital, or should it strengthen the network around a congested and more prosperous commercial center? Answering requires technical capability to undertake cost-benefit analyses, financial reporting that reasonably reflects the true costs of different policies (box 6.8), and decision-making processes that give weight to the results of those analyses while allowing a socially acceptable balancing of competing interests.

When governments provide infrastructure, they need to think about the best way to organize themselves to do it. Traditionally, governments provided services through ministries, but a desire to free service providers from some of the constraints of bureaucratic procedures, give them some managerial independence from ministers, and increase their accountability for results led many governments to establish legally independent, though still wholly government-owned, infrastructure agencies.

Some governments have taken extra steps, such as making the state-owned agency subject to company law, appointing as directors people outside the government with commercial experience, and requiring the agency to prepare audited financial reports according to high-quality accounting standards. In South Africa, for example, the state-owned electricity agency, Eskom, is now a company with mainly outside directors with business experience, which reports according to international accounting standards. Even when all these steps are taken, however, it can be difficult for governments to resist political pressures to interfere in business decisions and keep prices below costs. This is part of the reason why many governments undertaking these reforms have eventually turned to private participation.

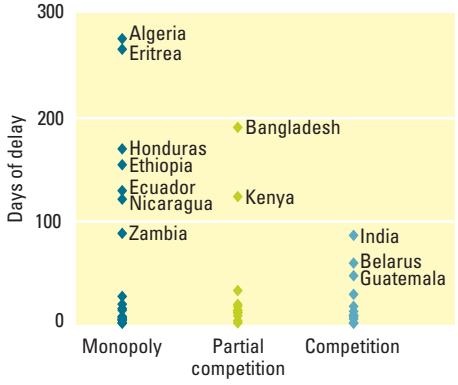
The challenges of improving infrastructure are similar in all sectors, but there are enough differences between sectors, especially in the opportunities for competition, to make it easier to discuss them one at a time.

Telecommunications—competition makes the difference

Modern telecommunications services have become more important to firms of all kinds—allowing them to communicate rapidly and cheaply with distant suppliers and customers. The services provide access to the Internet, underpin modern financial markets, and help governments communicate with firms and citizens. Modern telecommunications are vital to the investment climate. In Bangladesh, China, Ethiopia, and India the Bank's Investment Climate Surveys found that garment manufacturers are more productive, pay higher wages, and grow more quickly when telecommunications services are better.[76] Among developed countries, investments in telecommunications in the last 20 years appear not only to have followed growth, but to have fueled it.[77] In Latin America a 10 percent increase in the number of main phone lines per worker has been estimated to increase output per worker by about 1.5 percent.[78]

The extent to which telecommunications services meet firms' needs varies greatly from country to country, as well as within countries. A three-minute call to the United States costs $0.17 from Finland, but $9 from Chad, where the government effectively taxes international calls to subsidize local calls and other services.[79] Getting a new phone line takes only a couple of days in Lithuania, but most of a year in Algeria (figure 6.9). In East Asia few firms report having to pay a bribe to get a mainline

Figure 6.9 Long delays for phone connections are common, especially without competition

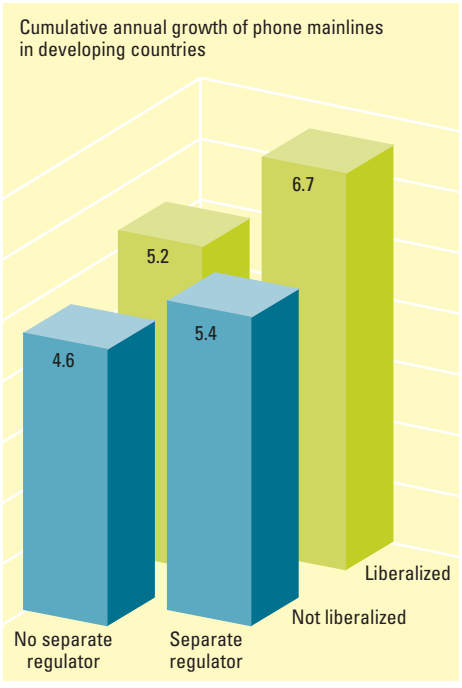


Note: Data for waiting times are for fixed-line connections, and are from 2002 and 2003. Countries with delays longer than 40 days are shown. Competition status relates to competition in local calls.
Source: International Telecommunication Union and World Bank Investment Climate Surveys.

phone connection—in Africa, 20 percent or more do.[80]

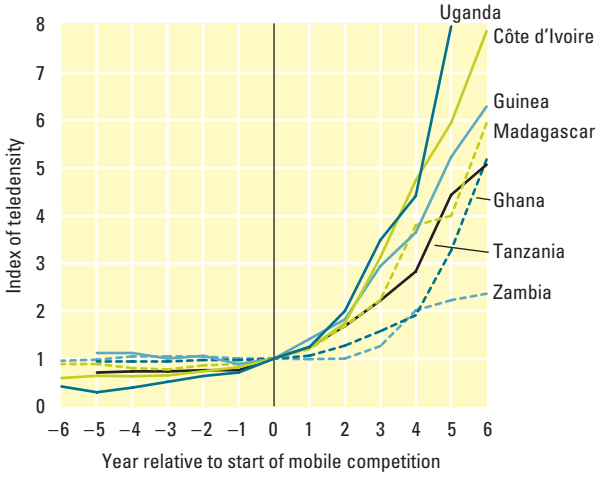
On average, however, telecommunications services have improved dramatically. Over the last 20 years prices have fallen at an average of 7 percent a year, while the number of phone subscribers per capita in low-income countries has quintupled.[81] The changes have been driven by changes in technology and by changes in policy. Most governments have at least partly privatized their country's main phone company and allowed at least some competition. The policy changes mean lower prices, shorter waiting times for connections, and faster expansion of services (figure 6.10 and figure 6.11).[82]

Figure 6.10 Liberalization and good regulation accelerate the growth of phone connections



Note: Data cover years 1996–2001.
Source: Qiang, Pitt, and Ayers (2004).

Figure 6.11 Competition spurs the spread of mobile phones in Sub-Saharan Africa



Note: Teledensity refers to total number of fixed and mobile connections per capita. The data are rebased so that the index of teledensity equals 1 in the year the second mobile operator enters the market. The countries selected are all those that liberalized before 1998, plus Uganda, which liberalized in 1998.
Source: International Telecommunication Union and World Bank staff.

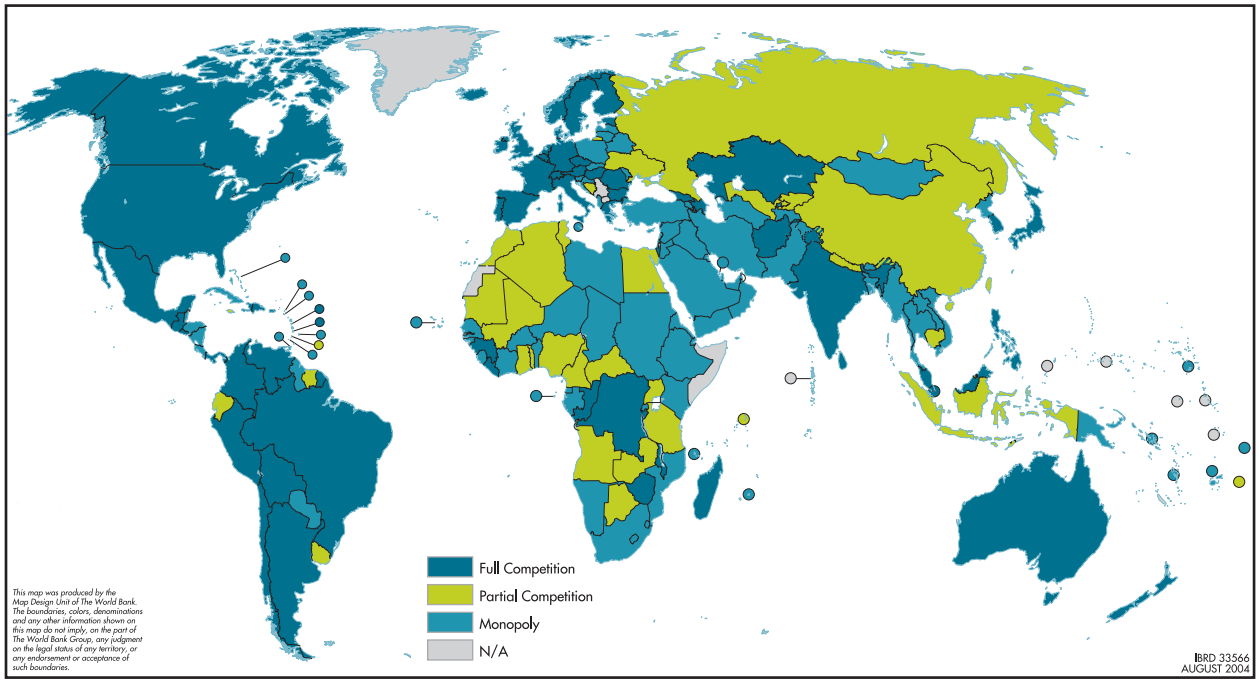
Although challenges remain, including the extension of access in rural areas (box 6.9), the combination of technological change and liberalization has transformed telecommunications. Providers need no longer be monopolies, and with the advent of cellular telephony, investments are no longer so immobile. Together these changes greatly reduce the policy-related risks of investment in the sector and go much of the way toward solving the problems that have traditionally afflicted infrastructure.

Many governments have yet to take full advantage of the opportunities of technological change. By 2002 all developed and most Latin American countries allowed full competition in international telephone calls, but most other countries did not (figure 6.12).

Electricity—competition is possible, but not as easy

Access to a reliable electricity supply at a reasonable price is vital for most firms—from small factories in rural areas to multina-

Figure 6.12 Competition in international calls is still limited or prohibited in much of the developing world



Source: World Bank staff; created by the Map Design Unit of the World Bank.

tional firms. Most urban firms are served by utilities, but firms in small towns and rural areas in developing countries may have to supply themselves.[83] Firms with access to grid electricity seldom get good service. Temporary losses of supply are frequent in many countries, especially in Africa and South Asia (figure 6.13), as are fluctuations in voltage that damage machinery. Firms estimate that such outages cause them to lose on average around 5 percent of their annual sales.[84] The problems are especially severe in Nigeria (box 6.10). Elsewhere in Africa, firms report that it takes two or three months to get a new electricity connection and often requires a bribe.[85] Limited access in rural areas and poor quality in cities cause many firms to rely on self-supply, which for most is more expensive than a regular supply from a utility.

BOX 6.9 *Expanding rural access to electricity and telecommunications*

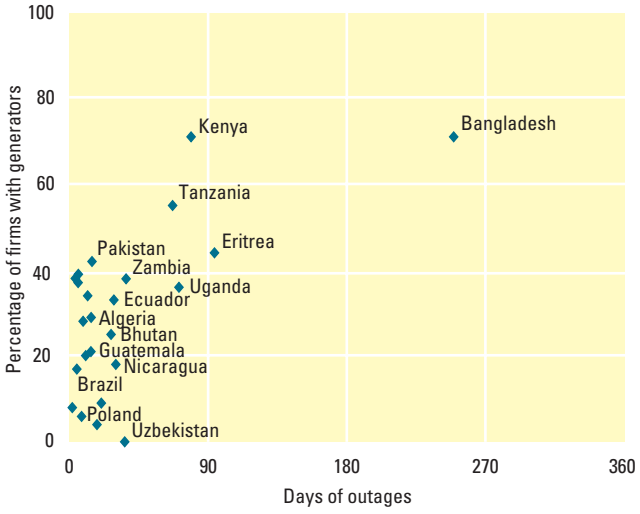
For many years governments in developing countries relied on state-owned monopolies to bring electricity and telecommunications services to rural areas. Typically they required the monopolies to charge the same price in rural and urban areas, even though the costs were higher in the rural. Because that made the rural services unprofitable, governments gave the monopolies budgetary subsidies and allowed them to benefit from cross-subsidies from low-cost, high-revenue customers. In many countries, however, the subsidies have been too small to finance rapid expansion. Even when expansion was affordable, the monopolies had a financial incentive to go slow.

An alternative that some governments have used, especially in the last decade, is to rely on a combination of liberal regulation and well-targeted, output-based subsidies. Removing legal barriers to entry by new providers of electricity and telecommunications services helps ensure that profitable opportunities to extend service in areas unserved by the incumbent are seized quickly (as illustrated by Cambodia in box 6.7).

Liberal entry rules may not by themselves cause access to increase as fast as governments want. In such a case governments may find carefully targeted direct subsidies more effective than cross-subsidies or subsidies aimed only at keeping providers afloat. Peru, for example, has used a least-subsidy approach to bring pay phone service to targeted rural areas. Some of the subsidy is paid up front, the rest in half-yearly installments, conditional on the operator meeting its performance targets. Although the operators are struggling financially even with the subsidies, most results from the pilot project appear promising. For the scheme's beneficiaries the average distance to the nearest pay phone fell by more 90 percent. And competitive bidding led to a subsidy 41 percent lower than the government had budgeted for and 74 percent lower than the subsidy previously requested by the incumbent. Similar schemes have been used for rural electrification in Argentina, Chile, and Guatemala.

Source: Cannock (2001); Harris (2002); Tomkins (2001); Wellenius (1997a); and Jadresic (2000).

Figure 6.13 Many days of power outages a year, and a higher share of firms having their own generators



Note: The figure shows all countries for which data on both the days of outages and the share of firms having their own generators were available. Data are for various years between 1999 and 2003.
Source: World Bank Investment Climate Surveys.

Many firms also pay higher than necessary prices for electricity, as governments direct utilities to hold down prices for (often middle class) households and effectively tax firms to make up some of the difference. The largest industrial users sometimes have enough influence to avoid such levies, leaving small and medium firms to bear most of the burden. In the Indian state of Kerala industrial users pay twice as much per kilowatt-hour as households, but commercial users—offices and shops—pay nearly twice as much again.[86]

BOX 6.10 *The power to improve productivity in Nigeria*

Poor service from the government-owned National Electric Power Authority (NEPA) causes severe problems for Nigerian manufacturers.

In a 1998 survey 93 percent of respondents reported experiencing power outages more than five times a week. On average the outages caused them to lose 88 working days per year. The firms also reported that poor supply led to the destruction of raw materials, restart costs, and equipment damage. They ranked poor electricity supply as by far their most important obstacle in infrastructure.

Many firms invested in self-generation as a result. On average they generated almost as much themselves as they bought from NEPA. The average cost of self-generation was high, however—$0.30 a kilowatt-hour, or about three times more than NEPA charges. Small firms may be particularly vulnerable because they are less able to bear the fixed costs of self-generation. Accordingly 16 percent of small firms relied only on NEPA service, while no medium or large firms did. In addition, small firms lost 24 percent of their output to outages, while medium firms lost 14 percent and large firms 17 percent.

Source: Adenikinju (2003).

Poor electricity supply makes existing investments less productive and discourages new investment. In Uganda firms that experienced fewer problems of supply from the (generally poorly performing) Uganda Electricity Board invested less in self-supply and more in their own productive capacity.[87] In Bangladesh, China, Ethiopia, and Pakistan the Bank's Investment Climate Surveys found that more reliable power supply increases garment manufacturers' total factor productivity and the growth rates of their output and employment.[88] In Latin America a 10 percent increase in electricity-generating capacity per worker has been estimated to increase GDP per worker by around 1.5 percent.[89]

As in telecommunications, changes in technology, coupled with dissatisfaction with monopoly provision by public enterprises, have led many governments to liberalize and introduce private participation. Economies of scale in generation declined in the 1980s, allowing more countries to have enough generating stations to make competition in the supply of electricity workable.[90] Countries that can trade electricity with their neighbors have further opportunities.

Almost all countries in the developed world and most in Latin America now allow at least some firms to choose their electricity supplier. Elsewhere the picture is mixed. Many countries have allowed a sort of competition in generation under which a state-owned utility contracts out the financing, construction, and operation of new power stations to privately owned independent power producers. The state-owned utility, however, usually retains a monopoly on selling electricity to customers, limiting the benefits of such competition. In addition, such projects can create disguised government debt (see box 6.8).

Getting competition to work in electricity is harder than in telecommunications, as high-profile problems in California show.[91] Many small countries have too few generators to allow real competition, while in larger countries, individual electricity companies may still have market power if they own many generation plants. Even when electricity generators do not have

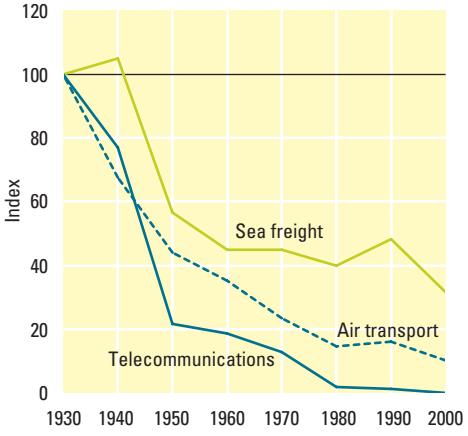
market power at most times of the day, they may have it when demand peaks, and like sellers in many markets, they may collude to increase prices. Competition is fostered by separating generation from transmission, and distribution from retail supply, so that the owners of the transmission and distribution lines cannot use their monopoly in these industry segments to stifle competition in generation. But such unbundling makes it harder to coordinate investments among these segments of the industry.

Overall the evidence suggests that competition (usually combined with commercial provision and new forms of regulation) has led to better service. Countries that early on introduced competition, private provision, and new forms of regulation—such as Argentina, Chile, and the United Kingdom—have benefited from lower prices and higher quality.[92] In Chile wholesale prices fell by 37 percent and retail prices by 17 percent between 1986 and 1996. Private companies were sufficiently confident in the market to invest in hydroelectric generation, transmission, and distribution.[93] More generally, competition in electricity has been found to increase labor productivity and generating capacity per capita.[94] Competition also tends to lower prices for small and medium firms because they need no longer buy from a utility that overcharges them.

Transport—overcoming the tyranny of distance

Transport infrastructure creates opportunities for firms to buy and sell not only in neighboring markets but in the entire world. As governments eliminate import quotas and reduce import tariffs, transport becomes more important as a source of further gains in trade.[95] Although global transport costs have been falling over the long term (figure 6.14), further progress is important. For Chile and Ecuador transport costs to the United States are now 20 times larger than U.S. tariffs.[96] If they could reduce their transport costs by 10 percent, they could expect to increase their trade by 20 percent.[97] Other evidence suggests that they would also grow faster.[98]

Figure 6.14 The declining costs of transport and telecommunications



Note: Index for all services set at 100 in 1930.
Source: Busse (2003).

Transport costs depend on distance, so countries far from rich markets in Europe, North America, and East Asia face a disadvantage they can do nothing about. Yet poor infrastructure has been found to account for 40 percent of the cost of transport in the average country and 60 percent in landlocked countries. So while distance accounts for much of transport costs, shipping goods from efficient ports, such as those in Hamburg and Rotterdam—or inland cities benefiting from good infrastructure, such as Ankara and Vienna—is cheap for the distance.[99] According to one study a country could lower its transport costs by an amount equivalent to moving several thousand kilometers closer to other countries—considerably reducing the "tyranny of distance"—if it could improve its transport (and telecommunications) infrastructure from the median to the 75th percentile.[100]

Reducing transport costs requires paying attention to particular transport modes, such as ports and roads. Yet governments should not lose sight of the links among different modes: ports and airports, for example, become more valuable when served by good roads and railways. Transport costs are also affected by factors other than transport infrastructure, such as whether telecommunications systems allow companies to track their goods in transit and how quickly goods are cleared through customs (see chapter 5).

BOX 6.11 *Port reform in Colombia and India*

Colombia and India show two ways of confronting the challenges posed by port reform.

In Colombia port efficiency had become a major issue by the early 1990s. Early proposals involved the reorganization of Colpuertos, the state-owned company, but not private participation. President Gaviria, however, favored a bolder approach and raised the issue in his inaugural address in 1990. His government drove the reform, with little involvement from labor groups.

Legislation to allow private participation in ports, including severance packages for workers, passed within 60 days. The overall program—liquidating Colpuertos, establishing new policymaking and regulatory bodies, concessioning the five major ports to private firms, introducing competition in stevedoring in each port, and retrenching nearly 6,750 workers—was completed in three years. The combination of competition and private participation led to impressive improvements in performance.

India approached the task differently. Each of the 12 major ports in India is administered by a Port Trust representing various interest groups. Port reform began with the issuance of a new policy framework in 1994 and guidelines for private participation in 1996. Private participation was to start with the concessioning of the container terminal at Jawaharlal Nehru Port, established in 1989 as a satellite port to Mumbai.

The implementation of reforms was left to the ports, and the Jawaharlal Nehru Port Trust (the majority of whose trustees represented the government or labor) chose to engage the main stakeholders in the reform process and to protect the interests of labor by keeping the existing port under public ownership. But they did allow a new private terminal to compete with it. The competition improved performance, with preberthing and turnaround time falling from around 11 days in 1996 to less than 3 days in 2002.

Source: Navarrete (2004) and Ray (2004).

BOX 6.12 *The benefits of rural roads in Morocco and elsewhere*

When built in the right locations (and not "roads to nowhere"), good roads can create substantial new opportunities for entrepreneurs in rural areas and small towns, as illustrated by a Moroccan government program to pave gravel roads and dirt tracks.

Upgrading the roads meant they were usable all year round, causing less damage to the vehicles using them. The new roads allowed farms and other firms to move their goods more often and more cheaply. In some cases the time it took to get to rural markets fell by half. The cost of shipping a truckload of merchandise also fell by half. In the areas benefiting from the road upgrading, the land is more productive, and the volume and value of agricultural produce is higher. As it became easier to ship produce quickly without damaging it, farmers shifted from low-value cereals to high-value fruit. As the price of bringing goods to the farms fell, farmers used more fertilizer. Improvements in the agricultural economy spurred the growth of other business. Off-farm employment grew twice as fast as in areas not benefiting from road improvement. The estimated economic rate of return to the projects ranged from 16 to 30 percent.

As is often the case, the improvement in infrastructure did not benefit only firms. It made it easier for children to go to school and, by making the delivery of butane more affordable, reduced the need for women and girls to collect firewood. After the road improvements, primary school enrollment rose from 28 percent to 68 percent.

The Moroccan experience is not an isolated case. Recent work by the International Food Policy Research Institute suggests that Uganda's investment in rural feeder roads connecting farmers to otherwise remote markets has high returns in agricultural growth and rural poverty reduction. In China investment in rural roads is very socially profitable. In India such investment is the most socially productive form of public investment in reducing poverty.

Source: World Bank (1996a); Fan, Hazell, and Thorat (1999); Fan, Zhang, and Rao (2004); Fan, Zhang, and Zhang (2002).

Ports—many types of competition. More than 80 percent by weight of the trade of developing countries goes through ports.[101] The efficiency of those ports affects exporters and importers directly and almost all firms indirectly. Improving one measure of port efficiency from the 25th to the 75th percentile—achievable in part by reducing the influence of organized crime—has been found to reduce shipping costs by more than 12 percent.[102] As with improvements in other transport infrastructure, the reduction in costs is equivalent to moving thousands of kilometers closer to trading partners.[103]

Unlike the customers of electricity and telecommunications utilities, port customers are mainly firms, not households, which makes tariff setting less politicized. Ports, however, require immobile investments and often have market power, so they face many of the challenges common to infrastructure services. Under public ownership and restrictions on competition within and sometimes between ports, they have tended to be overstaffed, have restrictive labor practices, act as a magnet for corruption—and as a result offer slow and expensive service to firms.[104]

To improve the efficiency of ports, governments have tried to expose them to more competition, often while introducing private participation (box 6.11). Colombia and Argentina split their national state-owned companies into several separate companies that compete with each other for some services.[105] Governments can also create competition within a single port in services not inherently monopolistic: different terminals in a port can sometimes compete with each other, and different stevedoring companies can sometimes compete at the same terminal.[106]

The combination of private participation and increased competition has led to better services.[107] In Colombia average vessel waiting time fell from 10 days before privatization and competition to a matter of hours afterward, throughput per hour increased, and the ports moved to all-year, all-day operation.[108] In Argentina the average stay fell from 72 hours to 33, throughput per worker rose from 900 tons to 4,850, and capacity increased fivefold.[109]

Roads. Almost all goods are transported by road at some stage, making a country's road network a critical part of its infrastructure and the investment climate (box 6.12). Not surprisingly, the extent of the network has been found in many studies to be associated with better economic performance. In Latin America a 10 percent increase in the length of roads per worker has been estimated to increase GDP per worker by nearly 2 percent.[110] Not all roads are equally valuable, of course; in the United States the interstate road building of the 1950s and 1960s seems to have significantly boosted productivity, while recent spending on roads has had only modest benefits.[111] Even so, the evidence suggests that governments should pay close attention to the extent and quality of their road networks. The challenges relate to planning appropriate network expansion, executing the required investment and maintenance, and working out how best to pay for it.

All the typical challenges are more difficult because the transaction costs of imposing user fees (tolls) to fund roads are high, at least on city streets and rural roads. Even on intercity highways, where the transaction costs are lower, user fees remain uncommon.[112] So prices rarely ration demand on congested roads, cover the costs of maintenance, or signal that new capacity is needed. One avenue for tackling these problems is thus to increase the use of tolls. The advent of electronic tolls and related information technology is making direct pricing feasible on more roads and, in the long term, it may make the road industry much more like other utilities. In the near future, however, only a small proportion of roads will have tolls. Therefore, many governments focus on using other sources of revenue linked to road use to pay for roads, such as use-related license fees and especially fuel taxes.

Many governments are assigning funds from fuel taxes and other sources to a road fund that operates with some autonomy from ministers. The funds are allocated to investment and maintenance projects according to a set of principles established by political authorities. Road users may be represented on the agency, and the agency may consult with road users and others on the allocation of funds. As in other areas, designing a system that gives the managers of the road fund the information, incentives, and capability to make decisions aligned with the public interest is crucial.

Developing countries often spend too little on maintenance compared with investment, perhaps because of donors' traditional preference for subsidizing capital rather than outputs, and perhaps because large investment projects offer opportunities for politicians to cut more ribbons or for decisionmakers to collect bigger bribes. Countries afflicted with higher levels of corruption seem to spend more on public investment in roads and other infrastructure, but less on maintenance, and seem accordingly to have poorer quality roads.[113] There is no simple answer, but an emphasis on making decisionmaking more transparent can help reduce corruption and improve decisions. Governments can consult on, publish, and explain the principles for allocating funds and the decisions implementing those principles, and they can use open and transparent processes for awarding contracts to do the work.

Road agencies that decide on the allocation of funds need not build or maintain roads themselves. More road agencies now contract out such work to private firms, under output-based contracts. In Argentina the highway authority maintains many roads by letting long-term maintenance contracts that require private firms to maintain roads to a defined standard. One review concludes that the program reduced the proportion of roads in poor condition from 25 percent to less than 5 percent, reducing road users' costs by more than 10 percent.[114]

Improving the provision of finance and infrastructure services in an economy can have a big impact on the investment climate—and ultimately depends on improving the investment climate for providers of those services. Similar links exist in the labor market, where the quality of the investment climate has important implications for the incentives of workers to invest in their own skills. The effectiveness of the labor market in connecting people with productive jobs is critical to growth and poverty reduction. These issues are the subject of chapter 7.