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Financing needed investments

Innovative and diverse financing techniques are being employed to support an accelerating transition from public to private sector risk bearing in infrastructure provision. Mechanisms for financing specific stand-alone projects are contributing to the learning process as governments shift from being infrastructure providers to becoming facilitators, and as private entrepreneurs and lenders take a more direct role. But if there is to be sustained private risk bearing and investment in infrastructure, parallel and far-reaching actions are required to reform legal and financial institutions and to develop capital markets that efficiently intermediate savings into investment.

Governments at present provide or broker the bulk of infrastructure financing: about 90 percent of financial flows for infrastructure are channeled through a government sponsor, which bears almost all project risks. Private financing is needed to ease the burden on government finances, but, more important, it will encourage better risk sharing, accountability, monitoring, and management in infrastructure provision. In some sectors, such as power or telecommunications, the scope for private financing is great. In others, such as road networks, and in some low-income countries, the opportunities are more limited, although even there increasing room for financial market discipline exists.

The challenge for the future is to route private savings directly to private risk bearers who make long-term investments in infrastructure projects. Doing so will require institutions and financing instruments adapted to the varying needs of investors in different types of projects and at different stages in a project's life. The benefits of thus financing private initiatives in infrastructure go beyond

the projects involved. Because infrastructure investments command such a large part of total financial flows, improving the efficiency of infrastructure financing will spur the general development of capital markets. And as governments focus more on being facilitators rather than financiers, international development banks—long the partners of governments in supporting traditional financing systems—will need to experiment with new ways of doing business.

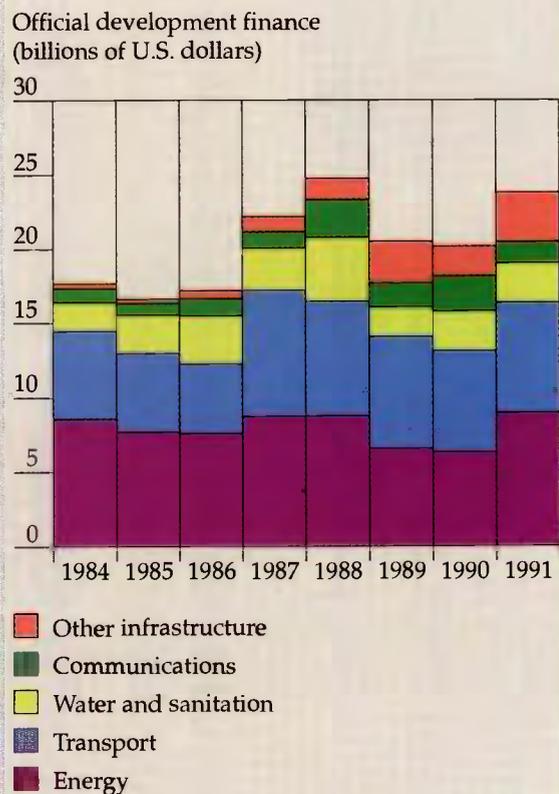
Old ways of financing infrastructure—and new

Governments have been bearing more of the burden of infrastructure expenditure than they can reasonably be expected to manage. Under today's system, tax revenues and government borrowings are the predominant source of infrastructure finance. Borrowing—whether from official or private sources—is backed by a government's full faith and credit, and thus by its tax powers. Under this system, governments bear virtually all risks associated with infrastructure financing. Private sponsorship and financing offer the twin benefits of additional funds and more efficient provision—especially valuable because substantial new investments are needed to meet pent-up demand.

Today's financing patterns

Developing countries now spend around \$200 billion a year on infrastructure investment, some 90 percent or more of it derived from government tax revenues or intermediated by governments. The burden on public finances is enormous. On average, half of government investment spending is ac-

Figure 5.1 Large shares of official development finance for infrastructure go to energy and transport.

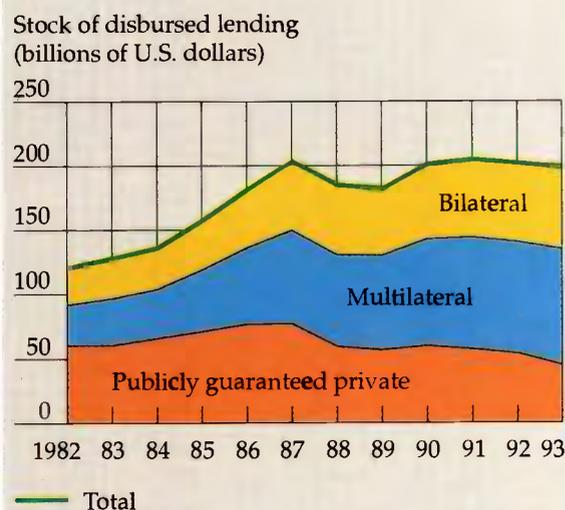


Source: Appendix table A.4.

counted for by the infrastructure sectors considered in this Report. Infrastructure's share of total government investment is rarely less than 30 percent and sometimes as much as 70 percent (Chapter 1). In addition, maintenance and operating expenditures command a high share of current expenditures.

Governments have relied to varying degrees on foreign financing for infrastructure. Official development finance (including concessional and non-concessional funds from both multilateral and bilateral sources) has increased over the past decade and currently amounts to nearly \$24 billion a year, thus providing, on average, about 12 percent of total resources for investment in these sectors. The overwhelming share of these flows has been directed to energy and transport (Figure 5.1). In contrast to the increase in official lending for infrastructure, publicly guaranteed commercial financing has declined (Figure 5.2).

Figure 5.2 Official lending for infrastructure has increased, but publicly guaranteed private loans have fallen.



Note: The loans are for electricity, gas, water, telecommunications, and transport.
Source: World Bank Debtor Reporting Service.

External finance is used primarily to import needed equipment (especially in the electric power and telecommunications sectors) because most infrastructure services cannot be exported and so do not directly generate the foreign exchange earnings necessary to repay foreign currency loans. External borrowing, however, often reflects macroeconomic constraints, and is also used to finance local expenditures for construction, equipment, and maintenance when public sector savings are limited. The Dominican Republic is one of several countries with a very heavy reliance on foreign funding, which financed 70 to 80 percent of infrastructure investments in 1991. In the late 1980s the country had a large public sector deficit (due in part to low prices of infrastructure services), and a freeze was imposed on the public sector's use of domestic credit, in order to curb inflationary expectations and permit an increase in credit to the private sector.

LIMITATIONS OF THE PRESENT SYSTEM. The main advantage of the present system is that in most countries the government is the most creditworthy entity and is able to borrow at the lowest rates, making possible infrastructure projects that might not other-

Box 5.1 Is there a free lunch?—limits to government finance

In infrastructure projects, the cheaper credit available to governments needs to be weighed against possible inefficiencies in channeling funds through government. Inefficiencies arise when financial discipline is relaxed as a result of government sponsorship.

For a power generation plant, with construction costs accounting for 70 percent of all costs and a 10 percent interest rate, construction cost overruns of 20 percent and delays in construction of two years each lead to a 15 percent increase in unit costs of power produced. The track record for publicly sponsored projects shows that such cost overruns and time delays are common, leading to a cumulative cost increase of about 35 percent. Compare this with an interest rate advantage for government, which can borrow at, for example, 10 percent rather than the 13 percent available to private investors. This 3-per-

centage-point advantage translates into a unit cost reduction of 20 percent. In other words, it would take almost a 6-percentage-point interest rate advantage to negate the inefficiencies described.

Consumers would undoubtedly benefit if it were possible to combine low interest rates and efficient provision. But the goal of a free lunch may be illusory. Even credit-worthy governments cannot borrow unlimited amounts at low cost. The evidence is that governments' costs of raising funds rise with the level of borrowing. Also, high levels of borrowing at a particular time increase debt levels and limit the amount that can be borrowed later, thereby reducing government liquidity. These are further reasons why governments may be well advised to entrust to private sponsorship those infrastructure investments that can be undertaken by private entrepreneurs.

wise be financially viable. Balanced against this advantage has been the difficulty of maintaining accountability, leading often to high costs of provision for the consumer (Box 5.1). Moreover, being credit-worthy does not imply that governments have unlimited access to resources.

Governments' ability to spend on infrastructure has been severely constrained, in part because poor performance and pricing have strained government budgets, as described in Chapter 2. Where budgets have been tightened for macroeconomic reasons, the large share that infrastructure represents in government investment has led to proportionately sharp reductions in spending in this sector. In the Philippines, for example, public investment in infrastructure fell from 5 percent of GDP between 1979 and 1983 to less than 2 percent during the remainder of the 1980s. Such sharp declines are appropriate where unnecessary or inefficient spending on infrastructure is the cause of budgetary problems, or where macroeconomic adjustment is needed. However, a continued low level of spending on infrastructure is not sustainable in the longer term; renewal of economic growth requires accompanying investments in infrastructure.

International donor policies and practices have sometimes reinforced distortions in recipient countries. Many donors have focused on financing new physical construction rather than on maintaining or improving existing infrastructure. Like ministries of public works, donor agencies find it easier to measure their achievements in new project approvals. Moreover, physical works draw on the well-practiced technical skills of donor agencies. By

contrast, policy or institutional reforms and practices that build long-term sustainability (such as maintenance and user participation) require greater donor commitment to providing steady support, through longer periods of preparation and implementation.

A World Bank review of urban water supply and sanitation projects identified typical problems. Serious cost overruns (the group of projects as a whole cost 33 percent more than the appraisal estimates) and time overruns (46 percent of the projects required two to four extra years to complete) greatly increased costs of service provision. Maintenance was severely neglected because a lack of funds created shortages of skilled staff and spare parts. The review found that borrowers had often failed to comply with loan covenants, especially those relating to pricing and financial performance.

In the case of bilateral assistance, a further problem that especially afflicts infrastructure arises from the full or partial tying of aid—the requirement that funds be spent on goods or services purchased only from specified countries. In recent years between two-thirds and three-quarters of official development assistance to infrastructure has been fully or partially tied. By contrast, less than 20 percent of official development assistance going to areas other than infrastructure is tied. By definition, tying aid precludes international competition in procurement. The Principles for Effective Aid agreed on in 1992 by the Development Assistance Committee (DAC) of the OECD reaffirmed the superiority of untied aid and specified that, except for the least developed countries, tied aid should not be extended

to projects that would be commercially viable if financed on market terms.

THE NEED FOR NEW APPROACHES. In the coming decade, demand for infrastructure investments will simultaneously increase in two different sets of countries: those that have undertaken macroeconomic adjustment with consequent low investment levels and, at the other extreme, those whose rapid growth is now placing a heavy burden on infrastructure. Infrastructure investments in developing countries represent, on average, 4 percent of GDP, but they often need to be substantially higher. Where telecommunications or power-supply networks are expanding rapidly, annual investments in either sector can be as high as 2 percent of GDP. A special factor increasing investment demand in many countries is the rapid pace of urbanization, requiring investments in water supply as well as waste treatment and disposal.

In Asia, the share of infrastructure investment in GDP is expected to rise from 4 percent today to more than 7 percent by the turn of the century, with transport and energy likely to demand the most resources, followed by telecommunications and environmental infrastructure. Some of the planned investments are without precedent. China, for example, has set a target of installing at least 5 million telephone lines annually up to 1995 and at least 8 million lines per year thereafter, to more than triple its 1992 base of 18 million lines by the year 2000.

Private entrepreneurship: trends and opportunities

Current efforts to secure increased private sponsorship and risktaking in infrastructure projects reflect these various challenges. After decades of severe regulatory restriction, private entrepreneurship in infrastructure bounced back in two ways during the late 1980s: through the privatization of state-owned utilities and through policy reform that made possible the construction of new facilities in competition with, or as a complement to, existing enterprises.

The principal new infrastructure entrepreneurs are international firms seeking business in developing countries and operating often in association with local companies. These firms bring to bear not only their management expertise and technical skills, but also their credit standing and ability to finance investments in developing countries. Major electric, telecommunications, and water utilities in industrial countries face slowly growing demand and increased competition (following deregulation) in their home markets. As a result, they are vigor-

ously seeking high-yielding investments in developing countries. Construction conglomerates are active in toll-road construction and in power projects, where they sometimes take an equity interest. Some companies or groups of companies also specialize in stand-alone infrastructure projects, putting together financing packages and overseeing project development and operation.

Most indicators of infrastructure investment under private sponsorship reveal rapid growth. Privatized telecommunications and electricity utilities in Latin America and Asia are undertaking large and growing new investments. The number of these so-called greenfield projects—especially in the road and electric power sectors—has grown rapidly (as discussed below). Infrastructure investments by the International Finance Corporation (IFC), a World Bank affiliate that invests only in private entities, have experienced a surge, from modest amounts in the late 1980s to \$330 million in fiscal 1993. The amount invested by the IFC was leveraged more than ten times, so that, in 1993, IFC participated in private investments of \$3.5 billion.

The most important development during the past four years has been the explosion in international flows of long-term private capital to developing countries, especially in the form of foreign direct investment and portfolio flows. Aggregate flows stood at more than \$80 billion in 1992 and were projected to reach \$112 billion in 1993 (Table 5.1). Infra-

Table 5.1 Portfolio and foreign direct investment in developing countries, 1990–93
(net inflows in billions of dollars)

Type	1990	1991	1992	1993 ^a
Foreign equity securities	3.78	7.55	13.07	13.1
Closed-end funds ^b	2.78	1.20	1.34	2.7
ADRs and GDRs ^c	0.14	4.90	5.93	7.2
Direct equity	0.77	1.45	5.80	3.2
Debt instruments	5.56	12.72	23.73	42.6
Bonds	4.68	10.19	21.24	39.1
Commercial paper	0.23	1.38	0.85	1.6
Certificates of deposit	0.65	1.15	1.64	1.8
Total portfolio ^d	9.34	20.27	36.80	55.7
Foreign direct investment	26.30	36.90	47.30	56.3
Total	35.64	57.17	84.10	112.0

Note: This table records all portfolio and direct investment flows. Separate figures for infrastructure are not available.

a. 1993 figures are estimated or projected.

b. A closed-end fund has a predetermined amount of funding and sometimes a fixed life.

c. ADR = American depositary receipts; GDR = global depositary receipts. An ADR is an instrument used by an offshore company to raise equity in the United States without formal listing on a U.S. stock exchange. GDRs are similar instruments used in Europe and elsewhere.

d. Portfolio investment is the sum of equity and debt.

Source: World Bank 1993i, pp. 10, 21.

Box 5.2 Tapping international capital markets

Several channels exist for tapping international capital markets. The larger private utilities in developing countries have direct access to debt and equity markets. In October 1993 Telecom Argentina placed much of its \$500 million, seven-year bond issue with U.S. and Asian investors; Argentina's Telefonika has also used bond market placements to raise expansion funds.

Foreign direct investment opens another route into international equity markets. General Electric Corporation, an international conglomerate, has an active interest in developing infrastructure projects in developing countries. Its subsidiary, the General Electric Capital Corporation (GECC), issues securities on U.S. and European markets and invests the funds in selected projects. GECC has participated as an equity investor, for instance, in the Northern Mindanao power project—a 108-megawatt diesel-fired power project in the Philippines. Backed by the group's total operations, the placement of securities issued by GECC is easier than it would be for developing country power projects alone.

An instrument widely used to tap resources in the U.S. capital market is the American depositary receipt (ADR). ADRs are certificates of deposit that enable for-

eign companies to raise equity on U.S. markets without the need for a listing on a U.S. stock exchange and without complex settlement and transfer mechanisms. They are issued by a U.S. depository bank, and the underlying shares of the company are held in trust by a custodian bank in the home country. In 1990 Compañía de Teléfonos de Chile (CTC) raised \$92 million on the New York Stock Exchange through an issue of equity in the form of ADRs—the first major equity issue from Latin America in three decades.

In April 1990 the U.S. Securities and Exchange Commission approved rule 144a, facilitating private placement of securities, including those placed as ADRs. Before then, privately placed securities held by qualified buyers (institutions that manage assets worth at least \$100 million) could be traded only after a two- or three-year holding period. Rule 144a allows trading to occur immediately, provided that the new buyer is also qualified. Moreover, after three years the securities can be sold to all buyers. Rule 144a was used in 1992 to enable a \$207.5 million international bond issue for the Mexico City-Toluca Toll Road. Since then, other Mexican toll roads and the Subic Bay power plant in the Philippines have raised funds using rule 144a.

structure has been a significant beneficiary of such flows (Box 5.2).

Aggregate private investment in infrastructure in developing countries is currently about \$15 billion a year, or roughly 7 percent of the \$200 billion being spent annually on infrastructure in these countries. Although small, the fraction of private investment in infrastructure investment is much larger than it was some years ago, and there is a strong likelihood that private investment will continue to grow, possibly doubling its share of the total by the year 2000. One indication is the IFC's current infrastructure pipeline, which is almost as large as all the projects financed to date.

The small overall share of private finance in infrastructure obscures large regional and sectoral disparities. Private finance is proportionately greater in Latin America than in other regions, and larger in telecommunications and electric power generation than in other sectors. The diffusion of current experience across regions and sectors will raise the global share of private sponsorship and finance. For example, telecommunications privatization and independent power generation are under discussion in all regions, including Sub-Saharan Africa. And continuing technological and financial innovations will undoubtedly make private financing more at-

tractive. As an example, electronic methods of identifying vehicles and charging tolls could make roads more like a public utility service, and boost the share of private finance in the highway sector.

Even with the rising share of privately financed infrastructure, governments will continue to be an important source of financing. Often, they will need to be partners with private entrepreneurs. Public-private partnerships in some ways represent a return to the nineteenth century, when infrastructure projects were privately financed in much of the world while government support acted as a stimulant. But the nineteenth century experience also offers important warning signs (Box 5.3).

The spread of project financing: achievements and lessons

Many new infrastructure projects in the private sector are built by "special-purpose corporations" which bring together private sponsors and other equity holders. Despite their lack of credit history, several such ventures have successfully attracted equity and loan finance—and a huge pipeline of such projects bears the promise of decisively shifting the channels and instruments of infrastructure financing in the future.

Box 5.3 Warning signs from the nineteenth century

Throughout the nineteenth century, when infrastructure was largely in private hands, contemporaries complained that many worthwhile projects were neglected for lack of financing. Some of the complaints reflected the difficulties of financing pioneering transportation (especially railway) projects. Other complaints were self-serving efforts to shift all risk on to government budgets, and in many cases the financial bankruptcy of enterprises had severe consequences for government finances.

Governments all over the world provided aid to private infrastructure projects in various forms, including direct subsidies. Two instruments in use then and of current interest as well are financial guarantees and land grants.

Guarantees. In India, if a railway company did not attain a minimum rate of return of, for example, 5 percent, the government made up the difference under the terms of a guarantee backed by its full powers of taxation. Such guarantees were also critical in the construction of the Canadian railways. But guarantees removed incentives

for investors to monitor management performance while opening the way for promoters to negotiate so-called “sweetheart” deals with construction and supply companies. Because many infrastructure projects were one of a kind, the practice could be readily disguised. It now appears that bond guarantees led to higher construction costs.

Land grants. During the nineteenth century, lands adjoining railways and canals were often ceded to promoters, allowing them to profit from the many side businesses that grew up around their investments. By providing collateral that could be used to back bonded debt, land grants—like interest guarantees—corrected for capital market imperfections. In Canada during the 1850s and 1860s, defaults on guaranteed bonds drained government revenues. In 1871, therefore, the Canadian House of Commons adopted a policy of land grants as a way to subsidize railway construction without having to raise the rate of taxation. Land grants proved most effective in such large speculative ventures as the Indian railroads and the transcontinental lines in the United States.

Project financing, which permits sponsors to raise funds secured by the revenues and assets of a particular project, is often used in new ventures that have no track records. This technique requires a clearer delineation of risk than is the case with traditional public projects. Allocating risk among participants has often been a difficult and time-consuming process, but new safeguards and conventions are evolving to deal with project risks and complexities.

Providing funds to a project is an important objective in itself, but the financing process also serves another important end. Monitoring by financial markets and institutions complements regulation and competition in service delivery. As such, it provides another mechanism for investors to impose discipline. Norms for devising incentive and penalty mechanisms to ensure performance by private-sector interests are becoming clearer. Privately sponsored and financed projects measure their success against contractually agreed targets for new capacity, construction costs, and time overruns and against indicators of service quality.

The continuing role of the government lies in insuring the private investor against policy-induced risks. Moreover, certain types of infrastructure—rural roads and, to a lesser extent, sewerage and sanitation—may be unable to finance themselves through user charges. Thus the need for govern-

ment support does not disappear. One-time grants, of either capital or land, are the preferred mechanism for ensuring efficient operation.

Concepts and trends in project financing

Established companies—such as privatized telecommunications and electric power utilities—have a credit history, a customer base, and tangible assets that can be offered as security to lenders. New companies—as in electric power generation, toll roads, or environmental infrastructure—have only the prospect of a future earnings stream to support borrowings. For them, a key issue is what recourse lenders have if investments fail to produce the expected returns.

The financing of a project is said to be *nonrecourse* when lenders are repaid only from the cash flow generated by the project or, in the event of complete failure, from the value of the project’s assets. Lenders may also have *limited recourse* to the assets of a parent company sponsoring a project. An important policy question is whether government tax revenues should be used to provide recourse, in the form of guarantees to lenders.

The use of nonrecourse or limited-recourse financing, also known as *project financing*, is a transitional response to new needs arising from activities recently brought within the orbit of the private sec-

tor. Financing in this form can be complex and time-consuming, as the interests of various parties have to be secured through contractual agreements. The equity stake of private sponsors is typically about 30 percent of project costs and usually forms the limit of their liability. Private lenders (especially commercial banks) influence project success by demanding performance guarantees from project sponsors. Where performance depends on government policy, such guarantees are sought from governments. The expectation is that projects financed on a limited-recourse basis will, over time, develop a track record that will provide comfort for future investments.

ADVANCES IN PROJECT FINANCING. A survey published in October 1993 provided details of nearly 150 private infrastructure projects that had been funded worldwide since the early 1980s on limited-recourse terms, at a total cost of more than \$60 billion (Table 5.2). Both the number of projects and the funding involved had doubled compared with an earlier sample (in September 1992). This illustrates the strong momentum in private projects, which five years ago were largely curiosities.

About half the projects surveyed (by number and value) were in developing countries, with a heavy concentration in middle-income countries. The only low-income country with more than one funded project was China (although many more projects are in the pipeline there). Argentina, Malaysia, Mexico, and the Philippines had the most projects. Along with China, they represented 80 percent of the projects for which funding had been committed. Mexico stood out, with the largest number of limited-

recourse projects. Relative to its size, Malaysia, too, has been a significant user of project finance.

Transportation projects, mainly toll roads, dominated the numbers and the value of projects in high-income and developing countries (Table 5.3). The more than two-thirds share of transport projects in middle-income countries reflected the extensive toll-road programs in Argentina, Malaysia, and Mexico. The survey estimated that twelve power projects had been funded in middle-income countries (a 16 percent share of all projects). This estimate is already outdated, however, with the number for the Philippines alone now being eight. The sectoral composition of the project pipeline is constantly changing. For middle- and (especially) low-income countries, independent power projects are likely to be an important focus for future project financing. Water and environmental infrastructure is another growth area—projects are being undertaken in middle-income countries (especially for wastewater treatment), and their diffusion to low-income countries is imminent. A public-private partnership has made possible the construction of a chemical waste treatment and disposal facility south of Jakarta in Indonesia.

The pipeline of projects under serious consideration is substantial. *Public Works Financing* estimates that 250 projects are being considered in developing countries—seventy-two of them in low-income countries. The countries of East Asia and the Pacific Rim are expected to be the biggest users of stand-alone, limited-recourse projects in the next decade. This region has 150 projects in the pipeline, with an estimated total cost of \$114 billion. China alone is es-

Table 5.2 Infrastructure project financing for projects funded and in the pipeline, October 1993
(billions of dollars)

Country group	Number of projects		Total value of projects		Average value of projects	
	Funded	Pipeline	Funded	Pipeline	Funded	Pipeline
World	148	358	63.1	235.4	0.44	0.71
High income	64	107	34.3	112.0	0.54	1.05
Middle income	77	179	25.7	77.1	0.33	0.43
Low income	7	72	3.1	46.3	0.44	0.64

Source: *Public Works Financing*, October 1993.

Table 5.3 Project financing of funded infrastructure projects, by sector, October 1993

Country group	Number of projects funded	Percentage distribution of projects					
		All projects	Power	Transport	Water and environmental infrastructure	Telecommunications	Other
World	148	100	13	60	16	2	10
High income	64	100	8	48	25	2	17
Middle income	77	100	16	69	10	3	3
Low income	7	100	29	57	0	0	14

Source: *Public Works Financing*, October 1993.

timated to have as many as fifty projects under way. In the next few years India, Indonesia, and Pakistan could each have more than five projects, and several projects are being considered in Sub-Saharan Africa as well.

Adapting project finance techniques

Differences in project, country, and sectoral characteristics influence the availability of finance, the instruments of risk allocation, and the degree and nature of government involvement. The main sectoral divide is between toll roads (and urban transit systems) and all other projects. Toll-road financing requires greater government involvement than do other infrastructure projects (see also Chapter 2 on the unique problems of this sector).

PROJECT SIZE. As project size increases, the complexity of risk allocation increases rapidly, requiring many complicated agreements between equity holders, creditors, input suppliers, and buyers of service. The dictum "start small," therefore, has its attractions. However, many contractual agreements are required irrespective of project size, and the high transaction costs entailed often mean that investors are not interested in projects below a certain size. The average size of projects in low-income countries has been \$440 million, and that of projects in the pipeline has been even higher, at \$640 million (see Table 5.2). In middle-income countries, average project sizes are more than 25 percent smaller. The inference is that transaction costs in middle-income countries are lower, making smaller projects more feasible.

Large projects can create serious problems in low-income countries. An early and innovative effort using project finance for power generation is the \$1.8 billion Hub River Project in Pakistan, the country's first private power project. When completed, the project will be one of the largest private power facilities in the world. It has suffered significant delays, however, because of complex negotiations over the division of responsibilities and risks among the many parties involved. This experience appears to support the wisdom of learning through smaller projects before moving on to larger ones.

A Sri Lankan power project is a good example of what is needed when a country begins to seek private infrastructure investment. The project is small (44 megawatts), and the foreign and local entrepreneurs involved are technically and financially strong. The government has guaranteed payments by the state-owned power purchaser, a dollar-based tariff for the first ten years, foreign exchange con-

vertibility after the first ten years, and certain *force majeure* risks.

ProElectrica, a 100-megawatt, \$70 million gas turbine plant near Cartagena, Colombia, financed entirely by the private sector, provides another good example of carefully structured project finance for a small project. A group of large industrial consumers has contracted to buy electricity for fourteen years from ProElectrica. Foreign exchange payments have been guaranteed through prepayments into an international escrow account. In addition to short negotiations and early implementation, the benefits of ProElectrica may extend to the regulatory reform it has triggered. The Colombian government has responded by creating arrangements to ensure that the local transmission utility "wheels" the power from the generator to users, a step that creates a precedent and a model for further new entry by private generators.

CREDIBLE CONTRACTS. The credibility of the regulatory regime determines the bounds of available finance (although success in financing a specific project creates a body of precedents that itself helps to improve the regulatory regime). Project financing is a key mechanism for initiating a process of change in countries or sectors with limited track records in private infrastructure provision.

The Philippines, as noted in Chapter 3, has significant experience with privately financed power projects. The achievements have been considerable, especially in attracting foreign investment, given the obstacles the country faced in mobilizing foreign investment in the late 1980s. Although the Philippines now has an extensive, and sophisticated, legal and administrative environment for independent power projects, the country's earlier experience shows that much can be achieved in less sophisticated circumstances, provided that the ability to write credible contracts exists. This lesson is also demonstrated by the experience of a power company in Guatemala (Box 5.4).

An important additional element of contractual effectiveness is the mechanism for resolving disputes. International arbitration procedures are common—for example, arbitration may be in a neutral jurisdiction using an internationally recognized set of rules, such as those laid down by the International Chamber of Commerce. Sponsors and lenders may also seek to have key elements of the contract determined according to the legal framework of a mutually acceptable third country. For example, contracts for the Hopewell Shajiao C power station in China were drawn up using Hong Kong law.

Box 5.4 A successful first step in Guatemala

In January 1992 Empresa Eléctrica de Guatemala S.A. (EEGSA)—the major power distributor in Guatemala—signed a fifteen-year power purchase agreement with a local power-generating company. Almost immediately the company sold its interest in the project to Enron Power Development Corporation, a subsidiary of a large U.S. natural gas company with interests in several independent power projects. The project consists of twenty 5.5-megawatt generators mounted on a barge at Puerto Quetzal, which operate as a base-load plant. The project increases Guatemala's generating capacity by 12 percent and its effective capacity by about 15 percent.

The prices in the power purchase agreement are denominated in U.S. dollars. The agreement requires EEGSA to provide the project company, Puerto Quetzal Power Corporation (PQP), with weekly fixed capacity payments, provided that PQP meets minimum availability standards; weekly energy payments, with a minimum guaranteed purchase of 50 percent of output; and additional collateral and documentary support to secure EEGSA's obligations to PQP. EEGSA has the option to pay PQP in U.S. dollars or quetzales at the prevailing

market rate. When power availability falls below 50 percent, PQP will pay EEGSA penalties. The agreement requires the project to provide power at a competitive price. Under current assumptions of capacity utilization, which allow for deterioration of performance over time, EEGSA will pay an average of \$0.07 per kilowatt-hour over the life of the project—which is about the long-run marginal cost of bulk power in Guatemala.

PQP has cut some of its risks by entering into contracts for turnkey installation, operations and maintenance, and fuel supply. The plant started operating in late February 1993, on schedule and within budget. A review of early operations indicates that PQP has achieved high levels of available capacity, that revenues and net income agree with forecasts, and that converting quetzales into U.S. dollars has not been a problem. After watching EEGSA's experience with PQP, the Instituto Nacional de Electrificación—a government-owned enterprise responsible for power generation, transmission, and retail distribution outside Guatemala City—has begun negotiating other power purchase agreements with independent producers.

TOLL ROADS. Today's resurgence in toll-road construction reflects practical reality: roads are needed for economic development, but the financial and managerial capacity of the public sector is limited. In the past five years, Mexico has added an impressive 4,000 kilometers of new toll roads at a cost of \$10 billion. Malaysia has the most expensive public-private project in the developing world, the \$2.3 billion North-South Toll Motorway. China is planning many ambitious toll roads—the 123-kilometer, \$1 billion Guangzhou-Shenzen superhighway will cut through the heart of fast-developing Guangdong Province. Many other smaller toll roads, bridges, and tunnels are also being constructed.

In most cases, tolls charged directly to users do not cover the full cost of roads. Governments grant land rights to encourage development made viable by the road (for example, shopping centers on freeway exits of the Guangzhou-Shenzen highway; see Box 5.5). Governments also allow private toll-road operators to share in the revenues of existing publicly owned toll roads (as is the case for Sydney Harbor Tunnel and the Bangkok Second Stage Expressway). They can provide capital grants to make projects financially attractive to private entrepreneurs and can offer "shadow tolls" to private operators (tolls paid from government revenues on the

basis of traffic flows), as proposed in Australia and the United Kingdom.

Governments and the private sector have had limited experience in dealing with each other as equal partners on complex toll-road projects. Obligations have had to be renegotiated midstream when a project's ambitious original goals were not backed up by adequate preparation. Sometimes, specific road segments were not viewed as depending on the quality of other roads, and competing ministries failed to cooperate.

The Mexican toll-road program illustrates the dangers of launching a major initiative with multiple objectives and insufficient preparation. The contract terms failed to pin the responsibility for construction time and costs on the private project sponsors, an omission of conditions that have since become the norm. De facto flexibility in the concession period allowed sponsors to shift cost increases onto the consumer or the government. Creditors (mainly state-owned banks) failed to perform their normal appraisal and monitoring functions. The resulting high tolls have held down road use, although measures are now being introduced to increase usage (Box 5.6).

However careful the preparation, conflicts can arise. In the Second Stage Expressway in Bangkok, the Japan-led private consortium and the Transport

Box 5.5 Land grants and eminent domain

Land grants have proved to be a valuable form of collateral for innovative projects that might otherwise not have been financed because lenders had little experience with similar projects. But in implementing a policy of land grants, there is a risk that the grants might be wasted if they are given to projects that would be built in any case.

Overall, however, land grants have greater merit than interest guarantees because they represent a one-time infusion of resources and do not reduce the incentives for efficient operation of the project. They may be especially suited for more speculative projects—such as high-speed rail in industrial countries or high-risk transport investment in developing countries.

Awarding land grants raises complex questions about acquisition procedures and compensation of landholders. Land acquisition can take several years and

delay infrastructure projects substantially—some of the difficulties of the Second Stage Expressway in Bangkok are related to these delays. Not only is an appropriate law of eminent domain required to define the terms under which the government can acquire the land, but, as was demonstrated in the case of Narita Airport outside Tokyo, lack of sensitivity in implementation can lead to contentious and expensive delays.

In anticipation of land being acquired, landowners have an incentive to overdevelop their property or undertake other measures to overvalue their land. A practical solution is to use prevailing market prices and community standards of land development as a norm. The more difficult issue is one of compensating those whose property values fall as the flow of business activity changes because of new infrastructure development. In general, governments have not compensated such losses.

Authority have disagreed, first over the level of tolls they had agreed on and then (more seriously) over who has the right to operate the road. Delays arising from these conflicts and from slow land acquisition have affected the viability of the Don Muang Tollway, intended to link the Second Stage Expressway to the airport.

The lesson for toll roads, as for electric power, may be that contractual uncertainties are best ironed out in smaller or simpler projects. Argentina has developed an extensive system of private concessions in which tolls are charged to finance maintenance. There was an initial outcry against tolls on existing roads, and charges had to be lowered—but the greatly improved quality of the roads has made tolls more acceptable. In the state of Madhya Pradesh in India, an 11.5-kilometer toll road linking an industrial park to a national highway was built at a cost of \$2 million and commissioned in November 1993. The enabling legislation put in place and the financial mechanisms used are being adopted and refined elsewhere in the country.

Risksharing: the lessons learned

At the heart of project financing is a contract that allocates risks associated with a project and defines the claims on rewards. While often the cause of delay and heavy legal costs, efficient risk allocation has been central to making projects financeable and has been critical to maintaining incentives to perform. Risks are divided not only between public and private entities but also among various pri-

vate parties. Four kinds of risks can be distinguished—currency, commercial, policy-induced, and country—although the distinctions among them are not always clear-cut.

CURRENCY RISK. Much recent, privately financed infrastructure has drawn on foreign capital and therefore faces the risk of local currency devaluation. International lenders rarely assume such risk, preferring instead to denominate their repayments in foreign currency terms. In the past, public enterprises or governments have borne the currency risk, but in the growing move to private finance, the risk of currency depreciation falls on the project sponsor, and ultimately on the consumers of the service. In many recent private projects, service prices have been linked to an international currency.

Independent power generation presents a special case. Although most power projects do set their charges in U.S. dollars, these charges are paid by the transmission utility, and the final consumer is often charged local currency prices untied to movements in exchange rates. Transmission utilities cannot be expected to continue to bear currency risk in the long run.

Countries may wish to promote schemes for insuring against currency movements (forward cover) so as to allow for short-term risk management. In Pakistan, for example, the central bank offers forward cover at an average premium of 8 percent. In time, private financial institutions may offer similar schemes. However, even with these arrangements, the consumer pays at least in part for ex-

change risk through the passing on of forward-cover premiums.

COMMERCIAL RISK. Two types of commercial risk may be distinguished, those relating to costs of production and those arising from uncertainties in demand for services. Substantial progress has been made in shifting cost-related risks onto private sponsors and other private parties. Typically, contracts include bonuses for early commissioning of the project and penalties for late completion. In a project to construct a power plant in India, the private sponsor will pay a penalty of \$30,000 every day beyond the agreed commissioning date for the first six months and a higher penalty thereafter. A fixed payment for overall capacity also shifts the risks of cost overruns to the private sponsor. A contract may also specify operational obligations, such as maintenance or the availability of capacity. In the case of utilities, a power or water supplier is sometimes penalized for capacity availability below prespecified levels (see Box 5.4 on the Guatemala power plant). Or the contract may require that a plant be available in effective working order for a specified period of time.

Project sponsors are able to transfer some of these risks to other private parties. It is common, for

example, to transfer construction risk to specialized construction companies through turnkey contracts. Also, sponsors may enter into long-term contracts with input suppliers.

Where sector policy concerns are unimportant, investors also accept market risk, but progress in this regard has been slower. Tariffs in line with costs, sector unbundling to permit new entry (as described in Chapter 3), and access to transmission networks are required in order to enable private sponsors to assume all market risks. In telecommunications projects, the market risk is typically borne by the sponsor. In the electric power and water sectors, on the other hand, limitations on assumption of market risk arise because payments to cover costs are not assured. Also, governments need to decisively eliminate the prospect that investors will be bailed out if circumstances are unfavorable. In transportation projects, such as Mexican toll roads and certain Argentine rail concessions, governments permitted revisions in contract terms when traffic levels were lower than expected.

Assumption by private parties of even cost-related risks creates incentives for good performance. Not only do sponsors have equity holdings in the project, but lenders are also central to the monitoring process. As part of the contract, several

Box 5.6 Mexico's toll roads: a big push that faltered

Infrastructure projects are often associated with large construction outlays that result in limited productive use. This can occur as much under private as under public enterprise if the right incentives are not in place.

In preparation for an ambitious 6,000-kilometer road program, a Mexican government agency did hasty traffic and cost projections and prepared the road designs. The quality of these estimates and designs fell far short of requirements for such an undertaking. At the same time, state-owned banks lending to toll-road projects did not perform the normal project screening and appraisals.

Although the concessions for road construction and operation were awarded based on several criteria, investors who promised to transfer the roads back to the government in the shortest time were especially favored. Short concessions were partly motivated by a concern that only short-term financing would be available. The attempt to achieve success within a new administration's term also created a sense of urgency. In turn, investors negotiated toll rates that would earn a return within the concession period. Tolls typically were therefore five to ten times higher than those in the United States for comparable distances.

With tolls that high, traffic failed to materialize—the old, free roads were preferred even when travel time was typically twice as long. Moreover, cost overruns averaged more than 50 percent of projected costs. (The Highway of the Sun, from Cuernavaca to Acapulco, for example, cost \$2.1 billion, more than twice the original estimate.)

To remedy the situation, the Mexican government has taken several steps. In many cases, concession periods have been extended from ten or fifteen years to thirty years. Where joint ventures offer greater prospects of financial viability, stretches of toll road are being combined under single management. Heavier vehicles may be banned from the old road network as weight limits are imposed and enforced.

There are signs that the most difficult period is past. In the long run, consolidations of toll roads, longer concession periods, and more realistic traffic and cost projections, along with economic growth and greater financial responsibility on the part of the project's private sponsor, should bring significant returns on this infrastructure investment.

financial covenants are made. In such situations, commercial banks have a much greater incentive for supervising projects than do lenders backed by sovereign guarantees.

The evidence, although limited, shows that the assumption of cost-related risks by private sponsors and the monitoring of performance by banks are effective. Evidence, for example, on private construction is very favorable and reflects the tight contractual conditions and severe penalties for cost and time overruns. A preliminary review of the IFC's infrastructure projects shows that time overruns in construction have been only seven months on average, and cost performance has been about on target. Such performance, however, is possible only when commercial risks are truly transferred to private sponsors. The Mexican toll-road example shows that when risks can, in practice, be transferred back to the government, incentives for performance are greatly weakened.

Private investors may wish to insure themselves against commercial risks. The provision of such insurance is best left to the private sector, although governments have a role in stimulating domestic guaranty facilities, possibly by taking an initial stake in guaranty funds (Box 5.7). The private market for risk insurance for international transactions is small. While short-term insurance for trade credit is available, private insurance for infrastructure projects is uncommon, although the London insur-

ance market is to provide insurance for traffic risk for a Mexican toll road.

SECTOR POLICY-INDUCED RISK. Especially important issues arise in the power sector because project sponsors focus on the credibility and solvency of their buyer, typically a government utility that transmits and distributes power. The instrument that protects the power supplier is the "take-or-pay" contract, or power purchase agreement. Under such a contract, the buyer agrees to pay a specified amount regardless of whether the service is used. The government thus provides a contract compliance guarantee—a useful transitional measure while the long-term goal of sector reform is being addressed (Box 5.8).

Similar concerns arise with water and other environmental infrastructure projects (such as water supply, wastewater treatment, and solid waste disposal operations that are typically carried out at the municipal level by a local monopoly). Here government agencies (or municipal authorities) are not the direct purchasers of the service. But they can and do influence the ability of the service provider to meter, bill, and collect. Where the municipal authorities cannot deliver, collection guarantees from the central government are required.

Thus, in such projects, the "market" risk, or the risk arising from fluctuations in demand, is effectively transferred to the government through the

Box 5.7 Leveraging through guarantees in Thailand

To encourage private lending, the Thai government is developing the Thai Guaranty Facility to guarantee loans made by private financial institutions to municipalities and private operators of urban environmental infrastructure. The facility is planned as a public-private corporation with private sector management. The target date for initial operation of the facility is June 1994.

Because of limited experience in lending to municipalities, financial institutions consider them risky borrowers. Perceiving high project risks, lenders are reluctant to make loans for periods of longer than eight years—too short to recoup investment from environmental infrastructure.

By providing guarantees to private operators and municipalities that help them to secure loans from commercial lenders, the government's guaranty facility will create longer-term financing. With increased lending to local government, it will soon be possible to establish credit ratings for cities and to allow them to issue bonds. Ten provincial cities, the five cities of the Bangkok Met-

ropolitan Region, and Bangkok itself are expected to be the primary beneficiaries of loan guarantees for investments in wastewater treatment, solid waste collection and disposal, and potable water supply.

During its first two years of operation, the guaranty facility is expected to receive \$75 million. Lending will be five to eight times the level of these guaranty funds. Over a five-year period, it is projected that the facility will be funded at a level of \$150 million and will leverage up to \$1.2 billion in loans for urban environmental infrastructure projects. It will obtain resources principally from the Thai government, from money borrowed in part from the USAID Housing Guaranty Program and in part from Thai financial institutions.

A set of policy initiatives is also being established to ensure the effectiveness of this facility, including a move toward the "polluter-pays" principle, changes in administrative procedures, and greater decentralization of decisionmaking.

Box 5.8 Look before you leap: limiting government exposure to contingent liabilities

When a guarantee is limited to contractual compliance by government agencies, the government has significant control over events. Such guarantees can be made callable, for instance, when government agencies inhibit the supply of inputs to a project, fail to honor purchase commitments, change pricing rules, or disallow remittance of foreign exchange to service a project's private loans. Unlike blanket loan guarantees, this kind of agreement does not commit the government to protect lenders and investors against such commercial risks as cost and time overruns, adverse movements in exchange rates, and inefficient operations. Contractual compliance guarantees have the added advantage of creating incentives for government agencies to stick by their commitments and of limiting government liability to times when government agencies are out of compliance.

Governments may also issue guarantees to ensure a certain rate of return—a type of guarantee that produces the worst incentives—or to lengthen maturities of loans. In both cases, the government takes on a commercial risk. A century of experience shows that, although guar-

antees are sometimes desirable, they also create perverse incentives that can lead to project mismanagement. Guarantees make sense when international investors' perceptions of country risk are poorer than economic conditions warrant, so that the guarantees are a strictly transitional measure for attracting broad, and ultimately self-sustaining, investor interest.

Government guarantees are not always necessary, as demonstrated by the financing of ProElectrica, the Colombian power plant. A significant part of the foreign direct investment and portfolio flows to developing countries has not been guaranteed—the underlying economic environment is what drives the flows.

Thus, when offering guarantees to private lenders, governments need to determine whether such guarantees are truly required, what form the guaranty should take, and how they should be accounted for in government accounts. At the same time, governments need to set policies to enable the development of private insurance markets.

take-or-pay formula. This becomes necessary because market risk is intermingled with the danger that financially troubled power purchasers (transmission utilities) or water users may not honor their commitments. Overall sector reform is required to eliminate policy-induced risks and thus reveal the market risk.

COUNTRY RISK. Where governments do provide guarantees against sector policy or even commercial risks, these may not always be acceptable to private international lenders, who may look instead for guarantees from creditor countries or from multilateral banks to insure against "country" risks. The role of the borrower government does not disappear in such situations, since counterguarantees are typically required.

Export credit agencies in OECD countries offer guarantees against risk of nonrepayment to their national exporters or banks that extend credit to overseas importers of goods and services. Typically, these agencies underwrite sovereign risk by providing insurance on commercial credits and by extending finance directly. During the period 1983–91, export credit agencies did \$53.1 billion worth of business with a maturity of five years or more. Of this, 60 percent applied to infrastructure finance linked principally to the import of capital goods. In their most limited form, export credit agency guarantees or insurance may be extended only against

sovereign risk, with exporters or bankers responsible for commercial risks. In most cases, these guarantees are extended to both types of risk, in part because it is difficult to distinguish sovereign from commercial risks. As the primary motives for setting up such insurance schemes are supporting export industries (and thus domestic employment), export credit agency premiums have been highly subsidized, although they have been increased following losses incurred in the 1980s.

The Hopewell-Pagbilao independent power project in the Philippines marked the first time that a loan from an export-import bank was not backed by a government counterguarantee, placing the bank on the same footing as private lenders. Nonguaranteed lending by export-import banks exposes them to the same risks as other lenders, which gives them reason to improve their project appraisal, assessment of borrower creditworthiness, and monitoring.

To attract international private capital to developing countries, several multilateral development banks, including the World Bank and the Asian Development Bank, have developed guarantee schemes. The World Bank's capital-market guarantees are used to facilitate the access of developing countries to the international capital markets by lengthening the maturity of related borrowing. The proceeds from such loans can be used for infrastructure investments. The World Bank also issues guarantees for project financing—under the Extended

Cofinancing Facility (ECO)—to cover sovereign risks associated with infrastructure projects. This facility, designed to improve developing country access to international capital markets, has been used for the Hub River Project in Pakistan and a thermal power project in China. The Multilateral Investment Guarantee Agency (MIGA)—another World Bank affiliate—has also provided guarantees for several infrastructure projects.

Institutions and instruments for resource mobilization

If the trend toward private investment in infrastructure is to continue, financial markets will have to respond by providing the necessary long-term resources. Paralleling the innovations described above in the structuring of contractual agreements—which are critical to making a project financeable—lessons have been learned about delivering long-term finance through alternative institutions and instruments.

Both foreign and domestic sources of capital will need to be tapped. Reliance on foreign savings remains a necessity for many countries with inadequate domestic savings. But there are limits to the capacity of any economy to access funds from abroad, particularly for debt finance. External borrowing must be serviced largely by domestic revenues. Overall balance of payments constraints and the sheer size of infrastructure investments imply, for most countries, that a sustained infrastructure program will have to be accompanied by a strategy for mobilizing domestic funds. In turn, an increasing share of domestic savings will need to come from private sources as governments reduce their involvement in infrastructure.

As the dominant owner and supplier of infrastructure, however, governments will continue to be a major user of funds, as well as a conduit for resources from multilateral development banks. Municipal governments (responsible for large and growing urban infrastructure) represent a major source of demand for financial resources. To meet their needs, new initiatives are being tried, including the revitalizing of existing infrastructure lending institutions. Governments are also creating specialized infrastructure funds (discussed later) as a transitional measure to make long-term financing available where private financing is not likely to be sufficient. Specialized infrastructure banks and funds are imperfect mechanisms that need increasingly to acquire marketlike discipline, and their value needs to be assessed periodically.

Synergistic links can develop between private infrastructure projects and domestic financial inter-

mediation through capital markets. Infrastructure developers and private (especially contractual) savers share a long-term horizon. Bringing compatible savers and investors together is the task of capital markets. At the same time, the financing of infrastructure projects improves appraisal capabilities and expands risk-diversification possibilities for local commercial banks, equity and bond markets, and institutional investors such as insurance companies and pension funds. Exploitation of these links can be promoted through prudent regulation, improved disclosure and reporting standards, and the development of credit-rating capabilities and credit risk insurance.

Infrastructure development banks

In many countries, specialized development banks are a conduit for funds used in infrastructure projects, especially for municipal infrastructure such as water, solid waste collection and disposal, and local roads. For municipalities, borrowing from such institutions supplements local taxes and central government transfers and is intended to cover fluctuations in expenditure or to prevent large shifts in revenue requirements.

In developing countries, such specialized infrastructure development banks have suffered from all the negative features associated with government ownership, such as inefficient targeting and subsidization of lending, interference in operations, and corruption. Inadequate diversification of risk has also led to periods of heavy demand followed by substantial slack. Moreover, the banks' traditional function as conduits of government funds is inconsistent with the trend toward less reliance on government budgets and increased use of private savings to finance infrastructure.

In industrial countries, with stronger traditions of autonomy and solid appraisal capabilities, infrastructure banks have performed better. In Japan, postal savings have constituted the primary source of long-term funds used by such institutions as the Japan Development Bank (JDB) to finance infrastructure. The JDB has been crucial to past infrastructure development, and even today, with the move toward public-private partnerships, it continues to play a major role in financing, often at highly subsidized rates. In Europe, municipal banks—obtaining their resources from contractual savings institutions and other long-term sources—have generally performed well where local governments have had operational independence.

Few municipal banks in developing countries, however, have shown a capacity for sustained investment, largely because of undercapitalization,

poor financial discipline, and substantial arrears. Although such banks have helped add to the stock of urban infrastructure, they have done little to promote the capacity or commitment of municipalities to expand and operate it efficiently. Exceptions include a facility in Colombia that rediscounts lending by commercial banks to municipal infrastructure projects (Box 5.9).

Certain pragmatic principles emerge from the experience thus far. A specialized institution is justified only if the value of business warrants it and if the concomitant technical and managerial capabilities are available. A more practical alternative is to develop and improve existing commercial and development banking channels. An effort in Argentina to create a new lending institution (COFAPyS) dedicated to the water sector failed. Besides defects in design that led to limited funding capability, the bank was seen to offer no benefits beyond those of existing channels for routing official development assistance.

The long-term goal for existing infrastructure banks—in keeping with the shift toward greater commercial orientation and accountability—must be to diversify their portfolios and operate under private ownership and control, possibly as wholesale banks. In the interim, the discipline under which they operate can be improved. For example, efforts are under way in Morocco to reform the Fond d'Equippement Communal (FEC), an agency established in 1959 to fund municipal investment. The FEC is being transformed into an autonomous agency subject to supervision by the finance ministry and by the central bank, with a board comprising mainly central government officials. The reforms provide the FEC with a new set of operational guidelines, eligibility criteria, and financial targets. This is not an ideal solution, but until capital markets are better developed or alternative financing mechanisms are available, revitalizing institutions by making them more accountable is a pragmatic way to proceed.

Looking ahead, specialized infrastructure intermediaries could play a catalytic role in capital-market development. In India, the new and innovative Infrastructure Leasing and Financial Services and the more traditional Housing and Urban Development Corporation (which is seeking to redefine its role) aim to sell their loans to other private financial institutions once project credit histories have been established. They also plan to package securities from different projects and to offer shares in these packages to investors. Another specialized infrastructure bank, BANOBRAS in Mexico, is also looking for new responsibilities consistent with

Box 5.9 Successful municipal credit in Colombia

Colombia's experience with its municipal credit institution is a success story, with a history going back more than twenty years. The municipal credit institution has evolved through successive incarnations into the Financiera de Desarrollo Territorial (FINDETER), an autonomous agency that operates under the finance ministry.

FINDETER does not lend directly to municipal governments but operates as a discount agency to private sector and state-owned commercial banks that make the loans, appraise the projects, and monitor performance. The system's success has depended on the quality of FINDETER's staff and that of the intermediaries through which it lends. Under the control of the finance ministry, it has been relatively insulated from political pressures.

Between 1975 and 1990, more than 1,300 projects with a value of more than \$1 billion were financed, assisting 600 municipalities. The system's funding does not rely on government budgetary appropriations but rather on bonds, recycling of its loans, and foreign credits from bilateral and multi-lateral sources.

greater privatization of municipal infrastructure. BANOBRAS is playing an important role in facilitating private water and sewerage projects by guaranteeing that municipalities will pay for services provided (or will allow water billing and collection). At the same time, BANOBRAS is working to strengthen municipal finances by demanding better operational and financial performance as a condition for its support.

Domestic construction capability is crucial to the development and maintenance of basic infrastructure, but construction contractors are difficult to finance because they have uncertain cash flows and limited bankable collateral. Typically, banks discount no more than 60 percent of the value of payment certificates issued by government departments. Frequent delays in payments by public authorities compound the inherently difficult financial position of contractors, who are often forced to resort to high-interest informal financing. The financing requirements of the construction industry can be partially met through local development finance companies that on-lend funds to contractors for highways and similar civil works.

Finance is also provided through specialized infrastructure banks. BANOBRAS, for example, provides short-term loans for public works against contractors' receivables from the government agency

sponsoring a project, a practice that is thought to have contributed much to the development of the construction industry in Mexico. As part of its trust activities, BANOBRAS also operates a special fund that can provide up to 25 percent of the full cost of a project to finance the start-up costs of construction. Such finance is no substitute for regular payment by government agencies to contractors, however.

New infrastructure funds

Two types of infrastructure funds have emerged in recent years. Government-sponsored infrastructure development funds are designed as transitional mechanisms to provide long-term finance until capital markets are better developed. Private funds, of which there are a growing number, serve the commercially useful function of diversifying investor risk. As transitional mechanisms, these funds serve two purposes. They allow the leveraging of government resources or official development assistance by attracting cofinancing from private sources. They can also create credit histories for borrowers perceived as risky. In time, these borrowers can secure direct access to capital markets.

The Private Sector Energy Development Fund in Pakistan and the Private Sector Energy Fund in Jamaica are designed to catalyze private financing for power projects. In response to perceived country risk and a lack of long-term financing compatible with the requirements of the power sector, the Jamaican government makes long-term financing available through the Energy Fund (up to a maximum of 70 percent of project costs) as a means of attracting private investments. Investors in the fund include the World Bank and the Inter-American Development Bank. Another example of fund leveraging in a developing country is the proposed Thai Guaranty Facility for financing environmental infrastructure (see Box 5.7). This facility will not lend directly to infrastructure projects but will guarantee private loans to municipalities and private operators. The Regional Development Account (RDA) in Indonesia is a transitional credit system designed to shift financing of infrastructure projects from government grants to debt instruments, thereby creating a credit history for borrowers, principally local authorities. The RDA lends at near-market rates. The goal is to give local authorities three to five years to establish measures for cost recovery and to demonstrate adequate financial management—thus enabling them to borrow directly from financial institutions and capital markets.

Good design for such domestic funds requires that they price their loans on market benchmarks. It is also important to incorporate incentives for pri-

vate sponsors to seek commercial financing or to commit a larger amount of equity funds and to ensure that the fund manager or the operating intermediary has a stake in the success of projects financed. Although appropriately designed funds could be useful instruments while capital markets are still developing, reform of the financial sector and improved creditworthiness of borrowers should be the long-term goals.

A number of private funds have recently been established to channel international capital for developing country infrastructure. They pool risks across projects and hence increase the availability as well as lower the costs of finance. These funds mobilize resources through private placements from institutional investors, including pension funds. For example, a pension fund with little interest in investing directly in a toll road in Mexico might be interested in participating in a fund that invests in a portfolio of such toll roads. As has been the practice of government-backed funds, private funds have concentrated heavily so far on power projects. Continued flow of resources into such funds will depend on investments being made in sound projects with credible sponsors as well as on the pace at which regulatory restrictions on institutional investors are relaxed.

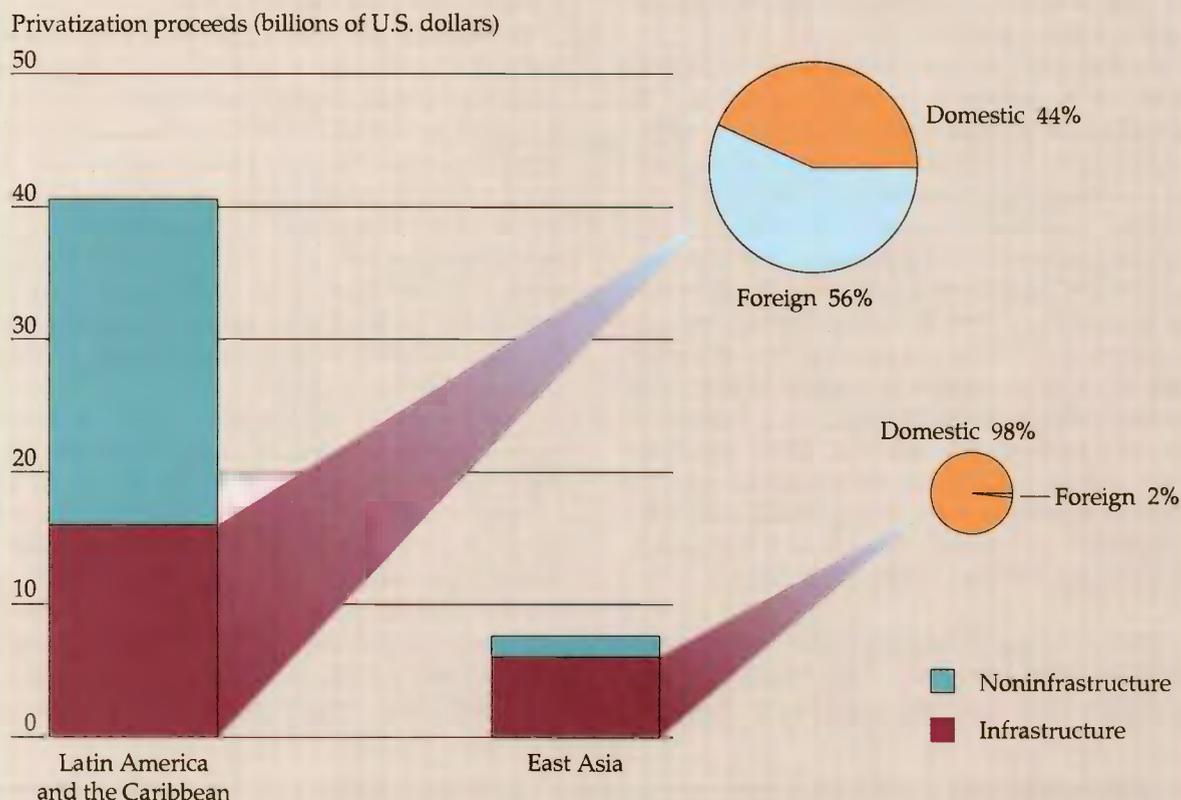
Development of domestic capital markets

The long-term goal must be to broaden and deepen domestic capital markets so that they can serve as efficient and reliable conduits for infrastructure finance. Getting there will require broad investor participation, a variety of market-making players (brokers, dealers, underwriters), and a wide range of financial instruments. In addition, markets require adequate disclosure of information to ensure efficiency, and effective laws to safeguard investors.

In most developing economies, the informational and contractual preconditions are not in place for efficient private and commercial financing of infrastructure projects. Private institutions such as credit-rating agencies and public ones such as regulatory agencies are needed to ensure an adequate flow of information to investors, to facilitate monitoring, and to discipline management. Financial liberalization and policies to encourage the growth of the formal financial sector will in time help overcome such shortcomings.

Experience shows, however, that equity listings and bond issues by infrastructure companies or projects can spur capital-market development by increasing the range of investment options. The discussion here highlights how infrastructure development, private provision strategies, and capital-

Figure 5.3 Infrastructure is a large share of privatization proceeds; foreign financing of infrastructure privatization is important in Latin America.



Source: Sader 1993.

market development are best considered within an integrated framework.

PRIVATIZATION. The privatization of infrastructure concerns has given a boost to local stock markets. Of the \$61.6 billion of revenue obtained by developing countries from the privatization of public enterprises between 1988 and 1992, about one-third (\$21 billion) came from the privatization of infrastructure entities. Aggregate proceeds from infrastructure privatization have been highest in Latin America, with the most activity being in telecommunications (Figure 5.3). Some Asian countries, such as Malaysia and Korea, have opted for partial privatization. Outside Latin America and Asia, however, privatization has so far had a limited impact.

Techniques for financing privatization have implications for the broadening of share ownership on stock markets and for the general development of capital markets. Three privatizations in telecommunications—Empresa Nacional de Telecomunica-

ciones (ENTel) in Argentina, Compañía de Teléfonos de Chile (CTC) in Chile, and Teléfonos de México (Telmex) in Mexico—and one in electric power generation, Chilgener in Chile, illustrate the implications of privatization for financial markets.

- All except Chilgener sought a strategic (or core) investor in order to introduce management expertise and to create a commitment to further growth.
- A significant proportion of shares was sold to the general public, and in all cases shares were allocated to employees.
- Substantial proceeds from the initial stock offerings and subsequent rises in share prices have given these companies a dominant position in their domestic capital markets.

The two Argentine telephone companies constitute almost 40 percent of the market capitalization in Buenos Aires, and Telmex dominates in Mexico with a 20 percent share. These large capitalizations have attracted financing from pension funds, creat-

ing the basis for long-term capital flows into the capital markets. Substantial returns (especially from telecommunications and electric utilities), rising market shares for infrastructure companies, and growing investor confidence are mutually reinforcing (Figures 5.4 and 5.5).

Explicit and implicit commitments to growth have led to ambitious investment programs, financed in part through new equity offerings, further sustaining the growth of the domestic capital market. As the aggregate numbers indicate, such privatizations have been a source of substantial foreign exchange inflows in Latin America. The Argentine government used a debt-equity swap mechanism in the privatization of ENTel, bringing in cash proceeds of around \$2.2 billion and reducing its commercial bank debt (at face value) by roughly 14 percent of the total debt to commercial banks and 7.7 percent of the total external debt involved. These privatized companies have also attracted significant portfolio investment, directly in the form of equity held in the companies and indirectly through such instruments as American depositary receipts (see Box 5.2).

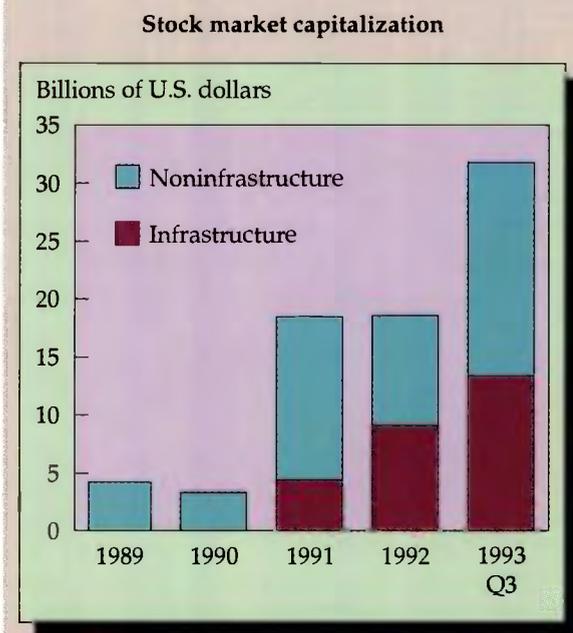
BOND MARKETS. Bonds can attract to infrastructure financing a whole new class of investors, such as pension funds and insurance companies seeking

long-term, stable returns. Generally, it has been the role of the government to foster the development of bond markets. Government bond issues establish the benchmarks—in terms of pricing and maturity structure—for bond markets overall.

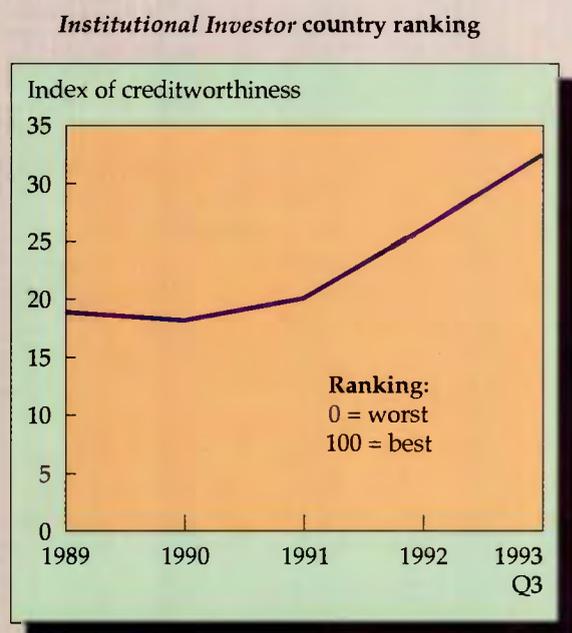
In developing countries, the use of bond financing is in its early stages. Revenue bonds (used for greenfield projects and paid back from the project's revenues) are new in infrastructure finance in developing countries. They have been used to help finance toll roads in Mexico and the Subic Bay Power Station in the Philippines. Corporate or municipal bonds, based on the credit of a company or government authority, have been used by infrastructure entities, but the bonds have often been placed on international markets because domestic bond markets are underdeveloped.

The experience of industrial countries offers some guidance. In industrial countries, bond financing is widely used to raise funds for municipal infrastructure. It has also stimulated the development of the local bond market. Municipal authorities issue bonds directly. They sometimes pool their needs with those of other local governments, particularly when their borrowing requirements are small or their creditworthiness is poor. For the investor, municipal bonds have been a source of high re-

Figure 5.4 Infrastructure equities are contributing to the growth of Argentina's capital market.

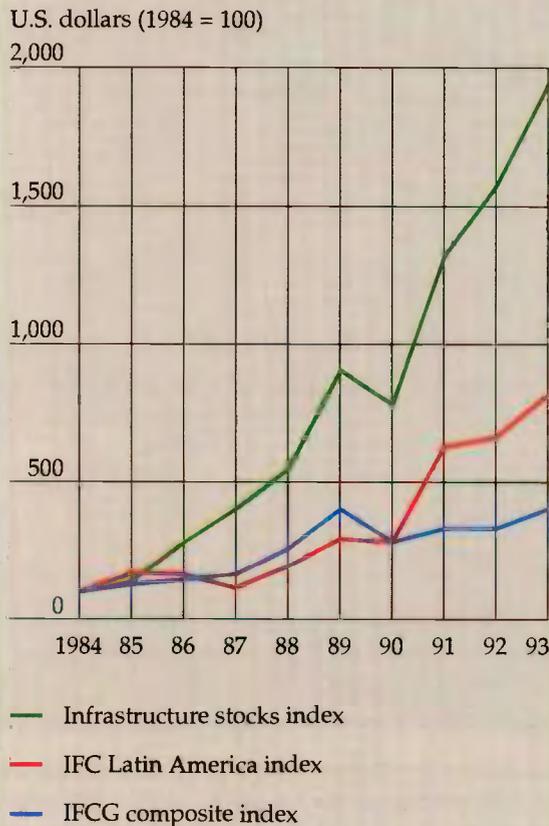


Source: IFC 1993.



Source: Institutional Investor.

Figure 5.5 Infrastructure equities have outperformed other stocks by a huge margin.



Source: IFC 1993.

turns—in part because they are often tax-exempt. But risks have also been high, and market liquidity has often been low. Municipal bond financing can also be a device to escape budgetary discipline and hence carries the risk that municipalities may borrow excessively and then default, leaving the central government to pick up the tab. Closer surveillance and legal restrictions on municipal borrowing are therefore needed complements to the discipline that markets impose.

CONTRACTUAL SAVINGS. Infrastructure companies and projects add to the supply of long-term securities on the capital market. But for the market to function well, there must be a matching demand for such securities. Contractual savings institutions, such as pension funds and life insurance companies, are particularly suited to making long-term investments. These institutions levy fixed premiums, have steady and predictable cash inflows, and incur

long-term liabilities, making them ideal suppliers of term finance for infrastructure projects.

Chile has used its pension fund system to promote the privatization of public utilities, including the Santiago subway system, Soquimich (a chemical and mining concern), and CTC. Holdings by pension funds account for 10 to 35 percent of the equity capital of these companies, although the pension funds hold less than 10 percent of their portfolios in the form of stocks of private companies.

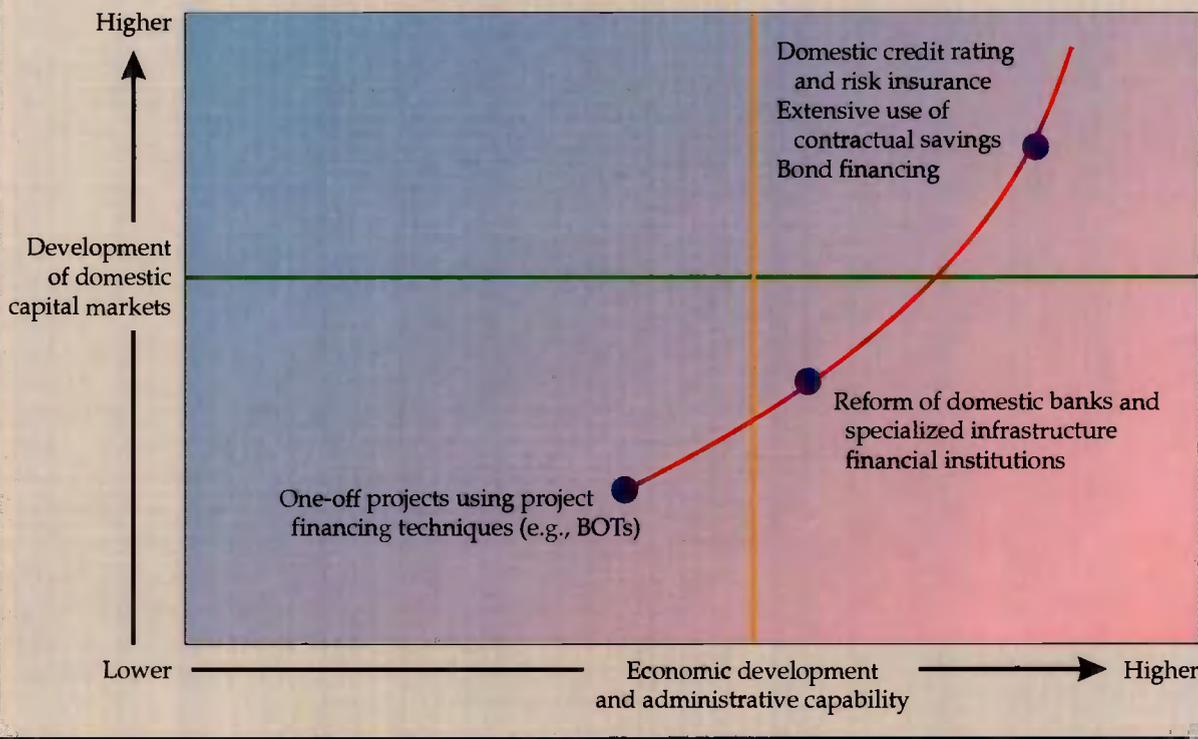
The Philippine social security system recently created a 4-billion-peso loan fund targeted to Philippine power projects and administered by local banks. This fund is able to provide fifteen-year loans of up to 200 million pesos to a bank, which then on-lends to the power project company. The social security system thus assumes only the bank risk. The banks handle appraisal and monitoring, and they can also leverage the funds by adding other resources. International insurance companies operating in the Philippines, where there is a dearth of local long-term investment opportunities, have also begun to view private infrastructure projects as a viable option for their lending portfolios. They now make loans with maturities of up to fifteen years (with approval required from the Philippine Insurance Commissioner).

In the past, government-sponsored pension funds have often suffered from mismanagement and misuse. For such funds to play a significant role in domestic capital markets, they need greater autonomy and more professional management. Experience from Latin America shows that, even when they are technically autonomous, pension funds within the public sector often come under pressure to finance government consumption spending and low-yielding investments.

The restrictions on pension fund investments are unlikely to disappear. To protect individual contributors, governments guarantee the security of pension funds. In turn, they require that the funds be invested prudently. Chilean regulations stipulate maximum investment limits—by instrument and by issue—although with increasing experience, these limits are being relaxed. The Chilean model of privately managed but publicly mandated and regulated pension funds is being adopted more widely in Latin America.

Also important are the risk-taking attitudes and abilities of pension funds in developed countries that have as yet made only limited investments in developing country infrastructure. Availability of finance would greatly increase if regulators and supervisory agencies in industrial countries were to relax the severe restrictions on the share and type of

Figure 5.6 Options for financing increase with administrative capacity and maturity of domestic capital markets.



assets that pension funds and other institutional investors can hold in the capital markets in developing countries.

Prospects

Moving from today's still heavy dependence on public financing to tomorrow's system of more private sponsorship is likely to be a long and sometimes painful process. In important respects, the traditional style of infrastructure financing has been too easy. Money has flowed through channels where scrutiny has often been limited because public sponsorship has provided high levels of comfort to lenders. The move to a more open and transparent system implies greater scrutiny and the need for more resources to coordinate many diverse interests. In return, it offers the promise of greater accountability.

From the menu of new approaches, the options available to a country depend on its administrative capability and the state of its capital market (Figure 5.6). Project finance represents the first rung of the ladder and should, in principle, be reachable in all countries. Where capabilities lack adequate depth,

the structuring of stand-alone projects using project finance techniques may require considerable effort and technical assistance from international agencies. Where domestic capital markets are not well developed and financial intermediaries are weak, the only other option may be to strengthen specialized infrastructure finance institutions. Once financial intermediaries are well developed, they can take on the task of catalyzing the development of domestic capital markets through appraisal and underwriting functions. And once credit rating and public regulation of financial markets are in place, other options open up, and the use of long-term savings of contractual institutions and the development of a variety of financial instruments should become possible.

The good news is that private enterprise has been moving into a wide range of countries and projects. Legal and regulatory reform is already under way. Infrastructure providers are being privatized. Flows of foreign direct investment by new infrastructure entrepreneurs are on the rise, as are international flows of portfolio capital. And the growth of domestic capital markets is a source of optimism. Finance follows enterprise.