Financing Private Infrastructure in Developing Countries

David Ferreira
Kamran Khatami
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Financing Private Infrastructure in Developing Countries

David Ferreira
Kamran Khatami

The World Bank
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In an effort to ease fiscal constraints and improve efficiency, the policy agendas of developing countries are increasingly concerned with promoting private development, financing, and ownership of infrastructure. This move has created significant challenges for governments who must change policy, legal, and regulatory frameworks, design and implement privatization and concession programs, and negotiate a division of risk-taking with the private sector in infrastructure projects.

Given these complexities only a handful of countries, mainly in Asia and Latin America, have made tangible progress in attracting private investment to infrastructure. Still, many lessons have been learned. In Financing Private Infrastructure in Developing Countries David Ferreira and Kamran Khatami look at the rationale for private infrastructure and the challenges faced in financing its development. In so doing, they draw lessons from experience and suggest ways of proceeding.

We hope that this paper will help policymakers in developing countries and others dealing with these challenges to understand the issues they face and learn how some governments have addressed them to date.

The authors would like to thank Robert Hill for his generous and invaluable input into several versions of this paper and Khalid Siraj for his comments on an earlier draft.

Diana McNaughton
Acting Director
Financial Sector Development Department
Finance and Private Sector Development
The World Bank
Chapter 1 of this paper argues that public sector resources in developing countries are insufficient to finance the demand for investment in increasingly integrated infrastructure services. Moreover, the public sector is less efficient than the private sector in managing newly entrepreneurial infrastructure activities. With integrated global capital markets giving domestic and international investors a greater degree of choice about where they locate, the time has come for private actors to provide what were once assumed to be purely public services. This transition will be aided by new technologies and regulatory and contracting techniques that have created opportunities for competitive provision in many areas of infrastructure that previously appeared to be natural monopolies.

Chapter 2 discusses the role of reforms in public enterprises providing infrastructure services. These reforms aim to enhance internal and external incentives in public enterprises and, ultimately, to privatize these enterprises. Where outright privatization may be politically sensitive or time-consuming, corporatization could bear productive results in the short term and prepare the institutional and regulatory environment for a greater private sector role in the financing and provision of infrastructure. Restructuring and privatization of public infrastructure services will help improve the investment climate in several ways. First, it will expedite regulatory reforms in the sector. Second, it will make the environment facing private developers more attractive and so reduce the need for government performance guarantees. Third, it will introduce commercial players into local debt and equity markets, which will help develop the capacities that are most relevant to infrastructure financing. In addition, allowing foreign investment and managerial expertise to participate in the privatization of public enterprises could fill resource gaps in the rehabilitation and expansion of services and provide valuable experience from a deregulated or differently regulated infrastructure industry.

Chapter 3 focuses on mobilization of international financing for new private investments. Given the shortage of domestic savings in most developing countries, international financing will be important to the realization of planned investment programs. Moreover, capital markets in most developing countries have insufficient depth to finance large private infrastructure projects on a limited recourse basis. These countries will, therefore, have to rely on foreign private savings for some time to come. How readily they can do so depends on the credit rating of both the host country and the project. Where sovereign credit ratings are weak, special cofinancing arrangements can be set up between governments and multilateral institutions to ensure that private investors have access to international capital. To attract foreign financing, governments should address any negative risk perception that may affect foreign willingness to invest. Given the foreign exchange convertibility concerns of foreign investors and relative unfamiliarity with local conditions, sovereign guarantees to mitigate perceived and actual
nonmarket risks are especially important. Continued progress on macroeconomic and structural reforms will gradually eliminate such concerns, but appropriate guarantees may have to be provided in the interim. Since such guarantees can accumulate into significant contingent liabilities, efficient financial accounting procedures need to be put in place in order to value and manage these liabilities.

Chapter 4 identifies the prerequisites for local capital market financing. Long-term bonds are among the most appropriate financing instruments for infrastructure projects, which are generally characterized by stable, long-term local currency revenue streams. Low inflation is a key factor in developing markets for these bonds. The development of bond markets also requires institutional investors who can take positions in long-term financial assets that match the profile of their liabilities. Pension reform in developing countries can create such a demand and channel large amounts of savings toward long-term investments in a relatively short period. Commercial banks are another important source of financing. These banks continue to hold the largest share of financial assets among financial institutions in developing countries and can contribute to infrastructure finance in a variety of ways, ranging from project appraisal, debt packaging, and construction phase financing to longer term lending and the underwriting and trading of securities used in structured financing.

Finally, Chapter 5 outlines a set of approaches and policy priorities that would underpin an efficient and expeditious transition from public to private infrastructure. These conclusions are derived from common threads that have emerged from success stories as well as from the challenges faced by countries where the transition has already begun.
Why Private Infrastructure?

Over the past decade governments across the developing world have come to recognize the importance of developing and maintaining adequate and efficient infrastructure services—as well as the severe implications of falling behind in the provision of these services. Fast-growing developing countries are finding that their infrastructure capacities are not keeping pace with the growth in other sectors. Other developing countries, further behind on the path toward market reforms, face more severe constraints because of past neglect in the creation and maintenance of infrastructure facilities. These countries are now trying to develop policy and regulatory frameworks to ready their fledgling infrastructure facilities to support economic reforms.

As a result of this increased awareness, governments are also looking increasingly to private sector resources and managerial capacity for the provision of infrastructure services. Since 1984, 86 industrial and developing countries have privatized 547 infrastructure companies worth $357 billion, and at least 574 private new investment projects, worth $308 billion, are under way in 82 countries (So and Shin 1995). Roughly 50 percent of these privatizations and 70 percent of new investments are taking place in developing countries, mostly in Asia and Latin America. What developments have led to greater private sector participation in the financing and provision of infrastructure services?

Economic importance of infrastructure

The economic literature has not reached a consensus on the link between infrastructure and economic growth. To determine the direction of causation, the link would need to be disaggregated for the various types of infrastructure, since each infrastructure component has a different impact on productivity. In any economy the productivity of labor and noninfrastructure capital depends on the availability of adequate infrastructure. If a comprehensive package of infrastructure services is viewed as essential for underpinning the productivity of labor and capital and facilitating growth, then the link and direction of causation become even more difficult to define. Moreover, the absence or inadequacy of one form of infrastructure may under- mine the availability of another. This is because most infrastructure services are delivered through interlocking networks of investments (roads and highways, gas and electricity distribution networks, sewers and water pipes). Unlike private investment in plant and equipment, the productivity of any part of the network depends on the size and configuration of the entire network.

The dependence of productive, noninfrastructure capital on infrastructure services suggests that in many cases investment in productive capital must follow the availability of infrastructure. In other words capital investments in
manufacturing, agriculture, or services are encouraged when their productivity—and thus return to capital—is greater. And greater productivity depends on the adequacy and efficiency of infrastructure services. Thus in the absence of effective financial and institutional structures that ensure timely and adequate provision of infrastructure, a vicious cycle of capital decumulation can be conceived: low levels of investment will jeopardize the financial viability and expansion prospects of existing infrastructure stocks, while the deterioration in infrastructure stocks results in lower investment, and so on. This phenomenon is particularly important in the evolving regionalization and globalization of national economies, since infrastructure services are an important element in retaining domestic and attracting foreign capital.

Expansion of infrastructure facilities may lead, be in step with, or lag behind demand. Where it lags it is clearly inefficient; whether leading is inefficient depends on the circumstances. A good mix of leading and synchronicity between development of infrastructure services and demand would be an efficient approach. Some lead time may be needed to develop certain infrastructure capacities, since infrastructure development can stimulate investment and increase demand for the same service or other infrastructure services.

Public financing of infrastructure

The World Bank’s World Development Report 1994 discusses the role of infrastructure in development and the capacities for and constraints on improving the quality and quantity of infrastructure services in developing countries. The report identifies infrastructure subsectors as follows:

**Public utilities:** Power, telecommunications, piped water supply, sanitation and sewerage, solid waste collection and disposal, and piped gas.

**Public works:** Roads and major dam and canal works for irrigation and drainage.

**Other transport:** Urban and interurban railways, urban transport, ports and waterways, and airports.

Most infrastructure expenditures in developing countries have been funded directly from fiscal budgets. But several factors, such as macroeconomic instability and growing investment requirements (particularly following the debt crisis of the 1980s), have shown that public financing is volatile and, in many countries, rarely meets crucial infrastructure expenditure requirements in a timely and adequate manner.

The debt crisis and the adjustment efforts that it required generated a volatile and generally declining investment profile in almost every developing country it affected. The public finance problems of the countries in Table 1-1 are representative of the trends across a large number of developing countries during the 1980s and, for some, into the early 1990s.

The volatility and decline in investment were less pronounced for Colombia, where prudent economic and debt management helped avoid a debt restructuring program. The pace of domestic investment in Chile also recovered after successful debt restructuring in 1985. But between 1980 and 1985 the ratio of gross domestic investment to gross domestic product (GDP) fell 7.7 percentage points in Argentina, 4.1 percentage points in Brazil, and 13.8 percentage points in the Philippines. By 1991 the ratio had fallen even further in Argentina and Brazil. For all Latin American and Caribbean countries the net investment coefficient dropped from nearly 23 percent in 1980 to about 17 percent in 1989. Lower rates of investment were accompanied by low or negative economic growth rates for Latin America as a whole. The Philippines had a similar downturn, as one of the exceptions to the

<table>
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<tr>
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Table 1-2: Average annual GDP growth, 1980–89
(percent)

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<td>1.6</td>
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<td>3.3</td>
<td>6.1</td>
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Strong economic performance in East Asia and the Pacific during the 1980s (Table 1-2).

Since infrastructure accounts for 40–60 percent of public investment in developing countries, the tightening of resources in the 1980s took a heavy toll on the ability of public budgets to finance much-needed infrastructure investments (Figures 1-1 and 1-2). The weighted average of public investment in Latin America and the Caribbean fell from 7.6 percent of regional GDP in 1980 to 6.5 percent in 1989. Except for the electricity sector in Chile, which was successfully restructured and privatized during the 1980s, these trends affected almost all infrastructure services, physical and social. In many countries noninfrastructure economic enterprises that were owned and operated by the government were also affected.

For some countries, like Argentina and Mexico, public investment as a share of GDP continued to decline during the early 1990s, but the process of attracting private sector capital through privatization of infrastructure facilities had begun. As a result underinvestment and neglect slowed in certain infrastructure sectors.

Figure 1-1: Public investment in selected Latin American countries, 1980–93
(percentage of GDP)

Source: IFC 1995b.
Evidence suggests that, possibly because of deferrable impacts and lower immediate political sensitivities, cuts in capital budgets constituted a disproportionate share of the overall spending cuts that were part of the economic austerity and adjustment programs of the 1980s. As the figures in Table 1-3 indicate, current spending remained relatively stable—or even increased—in several countries during the 1980s (Chile is an exception).

Although current expenditures from general government budgets remained unchanged or even increased in many developing countries during the 1980s, vital current expenditure categories such as repair and maintenance of infrastructure facilities were often sacrificed in the face of mounting interest payments on domestic and external liabilities. In Brazil the combined external liabilities of the central government, the central bank, and nonfinancial public enterprises accounted for 60–90 percent of total long-term debt, with annual interest payments averaging $7.6 billion between 1980 and 1989, equivalent to about 25 percent of average annual exports. In Argentina average annual interest payments on consolidated public sector debt amounted to just over 3 percent of GDP between 1980 and 1988 (Easterly, Rodriguez, and Schmidt-Hebbel 1994).

The neglect of crucial maintenance and upgrading of infrastructure facilities in Latin America and the Caribbean during the 1980s left much of the infrastructure in disrepair by the start of the 1990s. A 1992 World Bank survey of road agencies suggests that only three of sixteen countries with reliable expenditure data (Brazil, Colombia, and Venezuela) had sufficient funds to maintain their networks in good condition.

Fiscal resources are an insufficient and unstable source of financing for infrastructure projects, especially since they are part of the toolkit for macroeconomic management. If left unaddressed, the volatility of public financing and the

Table 1-3: Current government spending, selected countries, 1980–91

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<tr>
<td>Philippines</td>
<td>9.1</td>
<td>7.6</td>
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frequent neglect of infrastructure expenditures would set off a vicious cycle of income and output deterioration. Public and private investment are strongly interdependent. A decrease in the private capital stock, which may result from inadequate infrastructure or the crowding-out effect of excessive government borrowing, leads to a reduction in tax revenues and a matching cut in public investment. The subsequent decrease in the supply of social and physical infrastructure depresses private capital accumulation still more, resulting in a further loss of tax revenues, and so on. Thus private and public capital decumulation feed on each another in a destabilizing downward spiral.

For countries that experience substantial debt overhang, the adjustment process is usually long and traumatic. Once growth decelerates as a result of higher fiscal outlays for debt service and lower investment in public infrastructure, fiscal problems become systemic. In such situations governments find it compelling, year after year, to make cuts in productive expenditures. Even in countries where the public sector has made sufficient investments in infrastructure, the pace of economic growth and increasing importance of infrastructure as a competitive means of attracting foreign capital have outpaced these countries’ public sector financing and managerial capacity and ability to absorb mounting financial risks.

Rationale for private provision of infrastructure

The recent surge in private investment in infrastructure has many causes. Among the most important are the inefficiencies of public provision of services, the need for economic pricing and cost recovery, technological advances enabling greater private participation, advances in regulatory frameworks, the need for private resources, and the potential investment gap developing countries face.

Public sector inefficiency

The provision of infrastructure services through traditional institutional arrangements—public sector financing and operation—has been fraught with inefficiencies. Low productivity of labor and capital, weak incentive structures, neglect of timely maintenance, lack of sufficient economic and institutional links between demand and supply, soft budget constraints, the absence of financial risk management, and the entwining of financial management of public enterprises providing infrastructure services with macroeconomic management are only a few sources of the inefficiencies that have characterized the provision of infrastructure services by public entities. World Development Report 1994 provides information on the annual costs to developing countries of inefficiencies in the traditional structure of infrastructure services (Table 1-4) and the considerable gains that can be achieved through appropriate reform (Table 1-5).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Annual savings (billions of U.S. dollars)</th>
<th>Source of inefficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>15</td>
<td>Investment requirements created by improper maintenance.</td>
</tr>
<tr>
<td>Power</td>
<td>30</td>
<td>Transmission, distribution, and generation losses.</td>
</tr>
<tr>
<td>Water</td>
<td>4</td>
<td>Leakage.</td>
</tr>
<tr>
<td>Railways</td>
<td>6</td>
<td>Excess fuel use, overstaffing, and locomotive unavailability.</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
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<th>Sector</th>
<th>Potential annual savings from better pricing (billions of U.S. dollars)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
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<td>Power</td>
<td>90</td>
<td>Underpricing.</td>
</tr>
<tr>
<td>Water</td>
<td>13</td>
<td>Underpricing, illegal connections.</td>
</tr>
<tr>
<td>Railways</td>
<td>15</td>
<td>Underpriced passenger service.</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
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</table>

No matter what management structure a public enterprise adopts, authority often ends up in the hands of politicians who are not appointed for their entrepreneurial skills. Political considerations frequently favor allocating resources to construct additional infrastructure capacities at the cost of maintaining existing facilities, since maintenance is less attractive politically. Because the liabilities of public enterprises are ultimately backed by the resources of the state, there are few incentives for strict financial risk management. Moreover, the monopoly position occupied by such enterprises diminishes the risks associated with customer dissatisfaction. By the same token, since the state ultimately underwrites the liabilities of public enterprises, the possibility of undue judicial interference in favor of these enterprises is higher than where private firms are involved. In public enterprises the extent to which managers can reap the rewards of investment and operational efficiency are severely restricted and in many cases are insignificant. The wage structure in public enterprises is often linked to civil service wages, thus making recruitment and retention of qualified technical and managerial staff extremely difficult.

Even where public enterprises can provide infrastructure services efficiently, privatization further improves efficiency. For instance, Chile’s power sector was successfully restructured and privatized during the 1980s. As a result the private sector improved upon what was already considered an efficient sector operation. Chillectra, the privatized distribution company that accounts for half of the country’s electricity distribution, was able to reduce its energy losses from about 13.5 percent of net generation in 1990 to about 9.5 percent in 1994. The losses were caused by inefficient distribution networks and unauthorized connections.

User charges for many publicly owned and operated infrastructure services (especially in the transport sector) are often deposited in national treasuries, which consider them a dependable source of revenue. Under such a system funds for crucial operations and maintenance costs are subject to a budgetary allocation process where increased operating efficiency results in lower allocations. Such distorted incentive structures frequently govern the allocation process for new investments as well. In Jamaica the government spent about $40 million a year on roads during 1985–89, of which about $12 million went to maintenance, compared with average annual road user charge receipts of $220 million (World Bank 1992).

A combination of financial and administrative shortfalls has resulted in increasing inefficiencies in the provision of infrastructure services in many developing countries (Box 1-1). Of some 420 million people in Latin America and the Caribbean in 1989, 18 percent had no access to public water supply and 42 percent did not have sanitation facilities. Some 30 percent of the region’s population lacked electricity service. The region’s 2.2 million kilometers of roads, most of which were built during the boom years of the 1960s and early 1970s, were adequate to provide accessibility, but have badly deteriorated since the 1990s began (World Bank 1992).

There is also a lot of room for improving efficiency in Asia. For instance, the amount of energy lost in power transmission and distribution—through illegal tapping into overhead lines or poor maintenance—is at least four times the average for efficient public utilities. Even among high-growth East Asian countries measures designed to improve the incentives in public enterprises have proved that efficiency must increase. Also, countries in the region are falling

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**Box 1-1: Some aggregate inefficiencies**

- Some 40 percent of power generating capacity in developing countries is unavailable for production.
- Half the labor in Latin American railways is estimated to be redundant.
- In Africa timely expenditure of $12 billion would have saved $45 billion in road reconstruction costs.
- The average port facility in developing countries moves cargo from ship to shore at 40 percent the speed of the most efficient ports.
- The technical efficiency of power utilities in fifty-one developing countries has declined over the past twenty years.
- Water supply systems deliver an average of 70 percent of their output to users, compared with design targets of 85 percent.

behind in meeting demand for infrastructure investment. Public utilities in Thailand, for example, are generally efficient, but telecommunications services are scarce and unreliable. Telephone penetration averaged 3 lines per 100 people in 1992, with a waiting list exceeding 900,000 (World Bank 1995). Only recently has private investment of about $6 billion in the sector begun to expand capacity and provide peripheral services, particularly wireless mobile and paging services.

**Economic pricing and cost recovery**

When the public sector provides infrastructure services, it rarely recovers from users the full cost of providing the services, whether for political or economic development reasons. This inadequate cost recovery is at the heart of financial constraints for most infrastructure services, although to varying degrees in different countries.

In the Republic of Korea, for example, the costs of various modes of transportation have been kept artificially low as part of an anti-inflationary policy. Cross-subsidies are used to offset the resulting imbalances. As a result the real prices of gasoline, tolls, and urban transit modes (other than subways) consistently declined between 1980 and 1990. Low prices are causing financial shortfalls for transport agencies and carriers and are forcing private operators to curtail services or disobey regulations in order to survive (World Bank 1995h).

The World Bank has found that electricity tariffs in developing countries during the 1980s remained relatively stable (in constant U.S. dollars) between 1979 and 1983 but deteriorated markedly thereafter (World Bank 1990). Between 1983 and 1987 tariffs fell by about 35 percent. Average tariffs during the late 1980s were only about half the average incremental economic cost of power system expansion during the 1990s. Moreover, the average tariff in developing countries during the late 1980s was just over half the average level in OECD countries. Thus electricity consumers in developing countries paid tariffs that were too low to encourage efficient use of electricity, while power utilities were unable to raise sufficient funds from revenues to finance expansion. The relative movement in tariffs, expressed in constant local prices, shows that electricity consumers in developing countries faced greater fluctuations in tariffs than their OECD counterparts. Thus even though the marginal costs of supplying electricity had been studied in most countries by the late 1980s, few governments and power utilities adopted efficiency pricing for electricity supply.

In Asia, for example, the financial performance of state utilities deteriorated over the past two decades. Rates of return in state utilities fell from about 9 percent in the mid-1970s to 5 percent in 1991, and average power tariffs declined from 5.2 to 3.8 cents per kilowatt hour. In the absence of transparent cost recovery mechanisms, consumers usually end up incurring a variety of other costs. Poor repair and maintenance of roads, for example, increase vehicle operating costs and require premature reconstruction. These costs were estimated at $1.7 billion a year in Latin America and the Caribbean at the start of the 1990s (World Bank 1992). Subsidized provision often results in inefficient consumption and overinvestment in new assets. And when these expenditure outlays come from the public budget, they have inflationary effects.

Such costs are ultimately channeled to consumers through an unstable and inflationary environment that erodes the real value of income and wealth. The lost efficiency and fiscal burden of mispricing are equivalent to about 3.5 percent of developing countries' 1995 GDP (using the figures in Tables 1-4 and 1-5 and developing countries' GDP as reported in World Bank 1995)). The quasi-deficit nature of deteriorating infrastructure and insufficient expansion also contributes to economic instability, lower growth, and higher inflation.

World Bank research on the losses from increased vehicle operating costs and premature reconstruction of badly deteriorated roads shows that each dollar not spent on needed road maintenance can increase vehicle operating costs by about $3 and require an additional $2-3 for premature reconstruction. Other losses are incurred through the indirect effects of low-quality services, such as the health and medical costs of inaccessibility to safe water or transportation costs stemming from poor telecommunications.

Developing countries that are trying to promote private financing of infrastructure will have to implement tariff reforms that allow economic cost recovery (Box 1-2). Prices may rise in countries where heavy subsidies were provided prior to reforms, but cost recovery does not necessarily mean higher prices. When tariff reforms are undertaken in conjunction with other policy and regulatory reforms that aim to create an
Box 1-2: Benefits of sound economic pricing

Sound electricity and water pricing policy can generate a number of benefits, among which the following:

- Price is the best inducement for conservation. Industries will invest in conservation to the point where the cost of saving an additional unit of energy (or water) is the same as the purchase price of that energy (or water).
- The benefits of subsidizing energy (or water) consumption are smaller than the benefits of allocating the equivalent subsidy to infrastructure, social, and human capital formation.
- Sound pricing enables private sector participation.
- Proper prices lead to better financial situations for utilities, which lead to maintenance expenditures to improve operating conditions and the quality of supply (that is, to reduced costs and improved availability and reliability of supply).
- Adequate prices are necessary to implement efficiently and reliably a proper maintenance policy, to lower forced outage rates, to increase efficiency and availability, to reduce losses, and to improve reliability of supply.
- Sound pricing encourages efficiency in supply by providing utilities with signals for an efficient operation and investment program.

enabling environment for private participation, consumers can end up paying less for higher-quality services.

There are many examples of lower prices through higher productivity and competition in the postreform provision of infrastructure services. Regulatory reform of Argentine ports, which included decentralization, privatization, and deregulation, caused tariffs to fall and is estimated to have saved $156 million a year between 1989 and 1994. Between 1989 and 1993 staffing in the sector (including dredging activity) dropped from more than 13,000 to around 5,500, while cargo movements increased from 40.0 million tons to about 46.5 million tons.

In most cases allowing cost recovery in a more competitive environment results in lower prices relative to inefficient public monopolies. The experience in industrial countries in this area is encouraging. According to the OECD, business tariffs in countries where telephone service is still provided by monopolies fell 3.1 percent between 1990 and 1994—but they fell 8.5 percent in countries that had introduced competition (The Economist, 9 December 1995). And prices are generally lower in Britain, Scandinavia, and the United States, where industries are competitive. Moreover, the regulated prices of all of Britain’s privatized utilities (except water, where higher prices are allowed for new investments) have fallen in real terms since privatization, even though the firms have been making large profits.

Advances in technology

Technological developments have allowed unbundling, private entry, and competition in many infrastructure services once viewed as natural monopolies. In telecommunications, wireless technologies such as satellite and microwave systems are replacing long-distance wire-based cable networks, and cellular systems offer an alternative to local distribution networks. These changes have gradually eroded the network-based monopoly in telecommunications and have made competition possible. Such technological advances have influenced many restructuring decisions, even among privately owned firms in industrial countries. American Telephone and Telegraph’s (AT&T) September 1995 announcement that it would split into three companies (services, equipment, and computing) was partly influenced by such evolving and technological regulatory factors. At the time of the announcement AT&T’s chairman cited new legislation that would allow local telephone companies to compete directly with AT&T in long-distance and local telephony, with the local ability arising from new cost-efficient technological possibilities (The Washington Post, 26 September 1995).

New technology also has made competition among electricity suppliers technically feasible. The 1992 Energy Policy Act in the United States took advantage of these possibilities and allowed
dozens of independent power producers nationwide to sell bulk electricity to distribution companies over existing transmission lines. Moreover, rapid technological development in metering systems has made full retail competition possible. New regulatory regimes can complement technological advances in changing the competitive landscape of infrastructure services.

In the transport sector containerization has facilitated competition in port services and remote electronic pricing systems have introduced cost-efficient and accurate determination and collection of user charges for major road networks and urban transport systems.

New technologies also enable infrastructure firms to diversify from single sectors into previously separate industries. Optical fiber networks, for example, are being managed as part of gas and electricity transmission systems. Cable, telecommunications, and electricity distribution services to households are expected to adopt common delivery, metering, and billing systems. In Europe electric utilities have recently entered into telecom markets, and in Chile electric utilities have become involved in the water sector.

Finally, innovations in financial technology and the globalization of financial markets have introduced a larger pool of resources and a more diversified array of instruments that better match the financing needs of infrastructure projects. These subjects are discussed in greater detail in Chapters 3 and 4.

### Table 1-6: Infrastructure services provided in competitive markets

<table>
<thead>
<tr>
<th>Sector</th>
<th>Activity</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>Supply to grid or large</td>
<td>Argentina, Chile, Norway, United Kingdom, United States</td>
</tr>
<tr>
<td></td>
<td>consumers and distributors</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>Supply to large</td>
<td>Argentina, Canada, United Kingdom, United States</td>
</tr>
<tr>
<td></td>
<td>consumers and distributors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long-distance services</td>
<td>Australia, Republic of Korea, New Zealand, United Kingdom, United States</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Australia, Hungary, New Zealand, Sri Lanka, United Kingdom, United States</td>
</tr>
<tr>
<td></td>
<td>Cellular telephony</td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>Passenger and freight services</td>
<td>Sweden, United Kingdom</td>
</tr>
<tr>
<td>Water</td>
<td>Bulk water supply</td>
<td>Chile, United Kingdom, United States</td>
</tr>
</tbody>
</table>

*Source: Smith and Klein 1994.*

### Advances in regulation

Regulation has always been closely tied to industries with natural monopoly characteristics. When such services are provided by public entities, many regulatory issues become immaterial. Effective regulatory techniques and institutions are, however, central to the creation of a competitive and incentive-based climate for the private provision of infrastructure services. Regulatory improvements provide a better operating regime for existing facilities or components and emerge in response to technological developments that provide new options and structures for the provision of infrastructure services.

New regulatory and contract arrangements have alleviated certain concerns arising from the monopoly nature of infrastructure services. Many infrastructure services traditionally provided through a public monopoly—such as ports, power generation, and long-distance telecommunications—now have the potential to be very competitive.

The regulatory techniques related to the unbundling of infrastructure services have in many cases lowered the intrinsic barrier to entry stemming from the economies of scale that characterize infrastructure investments. Some examples of competitively provided infrastructure services are shown in Table 1-6. The unbundling of services in the electricity sector, which can open competition in generation and even in distribution, is one of the best-known examples of
such regulatory reforms. In Britain any person who consumes more than 100 kilowatts per bill-
ing period may purchase power directly from a
generator or another distribution company act-
ing as a “second tier supplier” (Stewart-Smith
1995). The key to this system is metering to
enable disaggregation of flows and settlement. In
the United States some state regulators have pro-
posed that residential customers be given a
choice of power suppliers—just as they can
choose long-distance telephone providers—and
industrial customers are bargaining for lower
rates from competing power suppliers.

In sectors where duplication in the provision
of services is not feasible, such as roads and
water, various modes of bidding for concessional
arrangements have introduced competition that
promotes efficiency and raises the quality of ser-
dvice. Specifically, where natural monopolies are
unavoidable, awarding concessions through
repeated franchise bidding subjects the monopo-
lies to competition. Auctioning monopoly fran-
chises to the lowest-cost providers also results in
lower prices for consumers. To ensure efficient
service for users, however, several other factors
must also be taken into account when concess-
sions are awarded to private suppliers, including
technical merit, bidder experience, operations
expertise, and financing capacity.

Deregulation can also stimulate competition,
providing substitutable services such as various
transport modes and different energy carriers.
As mentioned earlier, regulatory reform of
Argentina’s ports stimulated considerable com-
petition and productivity. As a result the ports
were able to recapture cargo traffic that had been
lost to cheaper land transport services and more
competitive port facilities in neighboring Chile.

Regulation of a natural monopoly is intended
to eliminate, curb, or allocate economic rents.
Inappropriate regulation carries considerable
costs for the governments administering the reg-
ulation, for the firms subject to it, and for the
economy as a whole. For instance, rate-of-return
regulation in many infrastructure projects is
intended to cap the economic returns that a pri-
ivate firm can accrue from an infrastructure con-
cession. One side effect of this form of regulation,
however, is that firms have an incentive to invest
excessively, inflate costs, and engage in cross-
subsidization. In cases where the purpose of reg-
ulation is to allocate economic rents, all parties
involved will spend resources to obtain the poten-
tial rents. The costs of inappropriate regulation—
and thus the welfare benefits of deregulation—
for certain infrastructure subsectors in the
United States are shown in Table 1-7.

### Need for private resources

In addition to its capacity for enhancing effi-
ciency and viability, the increasing role of the pri-
ivate sector in providing infrastructure services
arises from financial necessity. Public budgets in
developing countries simply cannot be expected
to provide timely and adequate expansion of infra-
structure capacities or to save financially trou-
bled public entities providing infrastructure ser-
dives. Many developing countries that have emerged
from debt crises have adopted austerity and macro-
economic adjustment programs that leave very little
room for raising public spending without jeopardiz-
ing the basic goals of economic reform.

In stronger emerging market economies, espe-
ially in high-growth East Asian economies, the
demand for infrastructure is outpacing the
financing capacity of public resources (Boxes 1-3
and 1-4). East Asia has a healthy annual growth
forecast of more than 7 percent over the next ten
years—and an infrastructure bill of $1.2–1.5 tril-
lion. In the power sector alone the combined new
supply requirements of China, India, Indonesia,
Malaysia, the Philippines, and Thailand are
25,000–30,000 megawatts a year.

The annual level of infrastructure investments
required in developing countries in the 1990s is
projected to amount to more than $200 billion
(1993 dollars), with $100 billion needed for power,
$60–70 billion for water and sewerage, $25–30 bil-
lion for telecommunications, and $15–20 billion

### Table 1-7: Estimated annual gains from
deregulation of selected U.S. infrastructure
sectors

<table>
<thead>
<tr>
<th>Sector</th>
<th>Extent of deregulation</th>
<th>Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airlines</td>
<td>Complete</td>
<td>13.7–19.7</td>
</tr>
<tr>
<td>Trucking</td>
<td>Substantial</td>
<td>10.6</td>
</tr>
<tr>
<td>Railroads</td>
<td>Partial</td>
<td>10.4–12.9</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>Substantial</td>
<td>0.7–1.6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>35.4–44.8</td>
</tr>
</tbody>
</table>

**Source:** Winston 1993.
Box 1-3: Thailand: Public sector efficiency may not be enough

The Thai state enterprises in charge of infrastructure services are generally profitable, providing a sizable net financial contribution to the treasury (about $781 million in 1993). Of eighteen public utility state enterprises, fifteen are considered major. These fifteen enterprises are efficient and perform well financially except for three whose tariffs have been kept low for social reasons (the State Railway Authority, Bangkok Mass Transit Authority, and Expressway Transportation Organization). Thailand’s industrialization has been rapid, however, and a major government concern is ensuring financing for extremely high increases in infrastructure investments. Capital expenditures by the fifteen major public utilities rose by an average of 5.4 percent a year during 1989–93, reaching about $10 billion in 1993. Investment requirements are expected to grow by 8 percent a year until 2000, with average annual investment requirements reaching about $15 billion. To ensure that sufficient resources are attracted to infrastructure, the government has embarked on a privatization strategy and is promoting increased private participation in the provision of infrastructure services.


Box 1-4: Growing demand for ports in China

Between 1980 and 1993 the cargo handled in China’s main seaports more than doubled, to 679 million metric tons. In 1994 container throughput grew 28 percent. In terms of transport demand, ocean shipping is expected to maintain annual growth of more than 8 percent through 2000, while annual domestic waterway traffic is expected to increase by 7 percent. Not surprisingly, export-oriented shipping is growing faster than domestic shipping.

Over the past decade China invested more than $2.3 billion in the modernization and development of its ports. In 1994 alone China built twenty deepwater berths in coastal ports with a combined capacity of 25.8 million metric tons, renovated 200 miles of navigation channels, and increased handling capacity at inland river ports by 2.74 million metric tons.

By 2000 China aims to have ten ports with capacities over 100 million metric tons a year, including those at Dalian, Qinhuangdao, Nanjing, and Guangzhou. Shanghai alone will spend 10 billion renminbi ($1.2 billion) on port improvements during 1996–2000.

This scale of investments and development is expected to require considerable foreign capital and managerial expertise. Foreign investors can own up to 49 percent of a port, which makes ports, along with power plants, one of the most accessible areas of infrastructure for foreign investors.


for highway rehabilitation (Santos 1994). At these levels infrastructure investments will account for between a quarter and a third of all fixed investments in developing countries (estimated at $700–$750 billion a year). By comparison, international aid (grants and official loans) for infrastructure was only about $15 billion in 1993, as was aggregate annual private investment in infrastructure in developing countries.

Potential infrastructure investment gap, 1996–2000

As noted earlier, infrastructure investment in developing countries needs to increase in every region. The pent-up demand for infrastructure services is substantial, whether because of low levels or inefficient past investment or because, despite higher and more efficient levels of infrastructure investment, supply has been outpaced by growth (as in East Asia). In addition, global economic opportunities brought about by freer trade arrangements and deeper financial integration and capital mobility have increased the growth potential of developing countries. And as the number of developing countries adhering to sound macroeconomic and structural policies increases, higher growth rates will continue in the next few years.

While higher growth clearly should be accompanied by a concomitant increase in infrastructure investments, the increase required across different regions and countries is difficult to measure. This exercise is not made any easier by the erratic and inconsistent relationship between infrastructure investment and economic growth in developing countries. Inconsistencies arise from differences in how macroeconomic and structural policies are managed. Those policies
have a direct bearing on the efficiency of investments and the impact on growth.

It is, however, possible to compute aggregate figures for the incremental increase in expenditure levels using the latest available data from various sources. To start with, Table 1-8 shows the average level of infrastructure investment across developing regions in 1993.

Projected regional GDPs for 1995-2000 are shown in Table 1-9. Table 1-10 shows estimated levels of investment in infrastructure for 1-3 percentage points of GDP higher overall infrastructure investment, using the data in Table 1-8 as a base. Except for East Asia and the Pacific the changes in the last three columns of Table 1-10 are basically chosen for arithmetic convenience; that is, they produce the desired average. These figures are simply used to assess the investment gap relative to current investment levels.

To compute the potential investment gap that would exist if the overall average infrastructure level in developing countries were increased, the figures in Table 1-10 are applied to Table 1-9; the results are shown in Table 1-11. According to these results, each one percentage point increase in the level of infrastructure investment (as a percentage of GDP) would require about $300 billion of additional investment during 1996-2000, or an average of about $60 billion a year.

Table 1-8: Infrastructure investment in developing regions, 1993*

<table>
<thead>
<tr>
<th>Region</th>
<th>Public</th>
<th>Private</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>2.31</td>
<td>0.07</td>
<td>2.38</td>
</tr>
<tr>
<td>South Asia</td>
<td>2.73</td>
<td>0.21</td>
<td>2.94</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>5.01</td>
<td>0.83</td>
<td>5.84</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>1.98</td>
<td>0.62</td>
<td>2.60</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>4.14</td>
<td>0.07</td>
<td>4.21</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>3.68</td>
<td>0.19</td>
<td>3.87</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>3.64</td>
</tr>
</tbody>
</table>

*a. 1984-94 average.

Table 1-9: Projected gross domestic product, 1995-2000*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>313,346</td>
<td>322,747</td>
<td>332,429</td>
<td>342,402</td>
<td>352,674</td>
<td>363,254</td>
</tr>
<tr>
<td>South Asia</td>
<td>372,242</td>
<td>387,132</td>
<td>402,617</td>
<td>418,722</td>
<td>435,470</td>
<td>452,889</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>1,548,424</td>
<td>1,703,267</td>
<td>1,873,594</td>
<td>2,060,953</td>
<td>2,267,048</td>
<td>2,493,753</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>1,597,251</td>
<td>1,664,336</td>
<td>1,734,238</td>
<td>1,807,076</td>
<td>1,882,973</td>
<td>1,962,058</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>673,020</td>
<td>703,305</td>
<td>734,954</td>
<td>768,027</td>
<td>802,588</td>
<td>838,705</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>1,088,232</td>
<td>1,109,996</td>
<td>1,132,196</td>
<td>1,154,840</td>
<td>1,177,937</td>
<td>1,201,496</td>
</tr>
</tbody>
</table>

Table 1-10: Regional infrastructure investment rates at different average overall investment averages*

<table>
<thead>
<tr>
<th>Region</th>
<th>3.64a</th>
<th>5.00</th>
<th>6.00</th>
<th>7.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>2.38</td>
<td>3.50</td>
<td>4.50</td>
<td>6.50</td>
</tr>
<tr>
<td>South Asia</td>
<td>2.94</td>
<td>4.50</td>
<td>5.50</td>
<td>7.00</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>5.84</td>
<td>6.50</td>
<td>6.80</td>
<td>7.50</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>2.60</td>
<td>4.00</td>
<td>6.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>4.21</td>
<td>5.78</td>
<td>6.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>3.87</td>
<td>5.50</td>
<td>6.50</td>
<td>7.00</td>
</tr>
</tbody>
</table>

*a. 1993 average.

<table>
<thead>
<tr>
<th>Region</th>
<th>5 percent of GDP</th>
<th>6 percent of GDP</th>
<th>7 percent of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>19,234 3,847</td>
<td>36,369 7,274</td>
<td>70,639 14,128</td>
</tr>
<tr>
<td>South Asia</td>
<td>32,756 6,551</td>
<td>53,724 10,745</td>
<td>85,177 17,035</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>69,008 13,802</td>
<td>100,204 20,041</td>
<td>172,994 34,599</td>
</tr>
<tr>
<td>Latin America and the Caribbe</td>
<td>126,496 25,299</td>
<td>307,510 61,502</td>
<td>398,017 79,603</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>60,592 12,118</td>
<td>88,205 17,641</td>
<td>107,443 21,489</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>94,279 18,856</td>
<td>152,043 30,409</td>
<td>180,926 36,185</td>
</tr>
<tr>
<td>Total</td>
<td>402,365 80,473</td>
<td>738,054 147,611</td>
<td>1,015,194 203,039</td>
</tr>
</tbody>
</table>

Given the constraints on public budgets, increases in infrastructure investment will have to be achieved through private sector participation. According to the latest available data, the private sector accounts for less than 10 percent of overall investment in infrastructure, and is mainly concentrated in selected countries in Latin America and Asia. Governments therefore need to carry out policy, institutional, and regulatory reforms to ensure that private resources are directed to infrastructure in sufficient and sustainable amounts.

In addition to promoting private participation in the development and provision of infrastructure services, governments must continue to play a role in ensuring that incentive structures remain attractive across infrastructure sub-sectors, so that infrastructure services will develop uniformly. Under these conditions infrastructure services can effectively support economic growth and then grow in step with it.

**Notes**

1. Social aspects of infrastructure such as education and health are assumed to be embodied in the labor force.
2. See the examples of Indonesia and the Republic of Korea in Chapter 2.
3. The required infrastructure investment levels in East Asia are estimated at 6.5 and 6.8 percent of GDP, respectively, for low case and baseline growth scenarios as reported in World Bank 1995g.
2

Moving Toward Private Infrastructure

Recognizing that the inward and protectionist economic polices of the 1960s and 1970s led to the severe economic distress of the 1980s, many developing country governments have increasingly changed economic course toward market mechanisms, private incentives, and export orientation. As a result public enterprises, industrial promotion, and trade protection are out; privatization, industrial deregulation, and free trade are in.

In the infrastructure sector, where public sector overspending during the 1970s and underspending during the 1980s played an important role in economic instability and structural inefficiencies in many developing countries, greater emphasis has been placed on privatization and private participation. The results of the deregulation policies of the 1970s in the United States and the privatization experiences in Chile, New Zealand, and the United Kingdom during the 1980s encouraged this new thinking.

Reforming public enterprises

Depending on country and enterprise conditions, reforming the operation of the public enterprises that provide infrastructure services is an efficient strategy prior to privatization. The main objectives of such reform should be to maximize the internal incentives of managers and workers and to create external incentives through a competitive environment (Box 2-1). Countries as diverse as Chile, the Republic of Korea, New Zealand, Sweden, and the United Kingdom have tried, with some success, to reform their state-owned enterprises by imposing on them the same framework of internal and external incentives that applies to successful private corporations.

Corporatizing public enterprises should lead to the development of a financial and regulatory environment that is more responsive to the financing and regulatory concerns of private infrastructure projects. As discussed in Chapter 3, debt issues by efficient public enterprises can make an important contribution to the development of bond markets. This role is important in setting benchmark rates in debt markets since government issues may gradually decline as a result of fiscal discipline or macroeconomic improvements.

Some East Asian countries have implemented specific measures—including organizational restructuring and performance agreements—to improve the efficiency of public enterprises providing infrastructure services. When performance agreements were used in Korea the rate of return on the assets of public enterprises (in power and telecommunications) rose from less than 3 percent before 1984 to more than 10 percent by the end of the decade. In 1983 Indonesia decentralized the management of ninety ports by creating four public port corporations. Efforts were also made to control overregulation and make managers more accountable for their actions. As a result of these measures, as well as an effective cost control program, costs were 5 percent lower and revenues 20 percent higher by
Box 2-1: The public enterprise as a modern corporation

**Internal incentives**

- Clarify the principal and agent incentives
  - Property laws should be defined, used, and accounted for under the same rules that apply to modern private corporations.
  - The corporation and its owners should have separate legal identities to isolate management from political interference.
  - Share transferability should be allowed in order to diversify public enterprises ownership and enable residual risk bearers to effectively participate in management decisionmaking.

- Separate commercial from social objectives
  - Governments should set commercial objectives for public enterprises and give them incentives similar to those applied to private firms. Where social objectives are imposed, the cost should be identified and the enterprise should be fully compensated.

- Provide incentives to corporate participants
  - Effective internal governance of corporatized public enterprises can be achieved if the state provides adequate incentives—such as profit sharing and equity distribution—to boards, managers, and employees.

- Put the private sector on boards
  - A more effective way of ensuring that boards perform their strategic and monitoring role is to include private sector representatives.

- Avoid large holding company structures
  - Holding structures create additional layers of bureaucracy, fail to shield the operating companies in the group from political interference, allow cross-subsidization between companies, and distort signals and incentives for management.

**External incentives**

- Encourage competition
  - Competition is perhaps the most important external factor an enterprise faces. With proper internal incentives, public enterprises will respond to private competitors by increasing their efficiency in order to survive commercially, particularly in the absence of large state subsidies.

- Improve financial discipline: the role of debt
  - Creditors can impose discipline akin to that imposed by shareholders and improve commercial discipline in investment decisions. Governments should, however, refrain from guaranteeing public enterprises' debt.

- Improve performance through equity markets
  - The market exerts an important discipline on management, demanding information flows and, through pricing of equity, evaluating management performance.

- Avoid complex monitoring
  - Elaborate monitoring systems usually include management controls and complex formulas for various markets. These can distort incentives and are difficult to enforce. An efficient internal governance system coupled with the discipline of external incentives works better than complex, centralized monitoring schemes.

Source: Muir and Saba 1995.


**Privatizing public enterprises**

The factors motivating privatization efforts differ for each country. In some countries the initial push for privatization comes from its potential to generate government revenues while eliminating a major source of public sector deficit. In other countries privatization is seen as a necessary component of economic restructuring. Whatever the motivation, private infrastructure projects that increase efficiency and expand services highlight the long-term economic advantage of privatization even in countries where this objective played a minor role in launching the program.

**Country experience**

In Latin America infrastructure services were privatized partly as a result of the emerging recognition of private infrastructure's advantages (Chile) but mainly as a result of severe macroeconomic distress (Argentina and Mexico).
Infrastructure privatization in the region has often been used to generate revenues for governments and retire external debt while eliminating a substantial source of fiscal drain. Severe inefficiencies in state-operated infrastructure services also encouraged privatization. For instance, government subsidies to the railway sector in Argentina averaged about $1.4 billion a year during the 1980s. The railways, privatized in the early 1990s, now receive less than $100 million a year from the government, and only for urban commuter railroads and subway concessionaires. As Table 2-1 shows, Latin America is far ahead of other regions in terms of infrastructure privatization.

In Mexico the divestiture program began in 1983 as part of the macroeconomic stabilization program adopted with the support of the International Monetary Fund. In Argentina electricity companies accounted for as much as half of the total deficit of state-owned enterprises by 1989, so privatization was critical. The government encouraged private participation in the sector to provide needed capital, reform inefficient companies, and upgrade and maintain neglected equipment. The government also used a debt-equity swap mechanism in the privatization of ENTel, the state telecommunications company, bringing in cash proceeds of around $2.2 billion. These funds were then used to reduce the government's debts to foreign commercial banks.

Among Asian countries (except Malaysia), privatization has not been emphasized as a first step toward promoting private provision of infrastructure. Instead emphasis has been placed on providing the necessary frameworks for private financing and operation of new infrastructure capacities. Most governments in the region did not face the dire macroeconomic constraints that were so pressing in Latin America. Also, state utilities and agencies providing infrastructure services were more efficient and financially viable than their counterparts in Latin America. As noted earlier, the promotion of private infrastructure in Asia is primarily seen as a way of complementing public sector efforts to keep pace with economic growth.

Malaysia began privatizing infrastructure as early as 1983 in the context of its New Economic Policy. The objectives of the privatization program were similar to those in other countries: to relieve the government of the financial and administrative burden of undertaking and maintaining a vast and continually expanding network of infrastructure; to promote competition, improve efficiency, and increase productivity; to stimulate private entrepreneurship and investment to accelerate the rate of economic growth; and to reduce the public sector's size and presence.

Since 1989 the privatization effort has been guided by a Privatization Master Plan that identified a larger set of state-owned enterprises for privatization. Roads, railways, the national airline, telecommunications, and power generators have already been privatized. Privatization is estimated to have saved about $2.5 billion equivalent in salaries and pension payments for 93,000 former state employees who are now in the private sector. In addition, the government would have had to provide some $16 billion equivalent for infrastructure projects had it not been for privatization. Partly as a result of passing the huge costs of infrastructure development to the private sector, the government has achieved budget surplus and a low level of external debt since 1993 (Financial Times, 19 September 1995).

In Thailand the recently adopted strategy for privatizing infrastructure assets was partly a response to a rapid rise in investment—from $2 billion in 1989 to $10 billion in 1993, or 8 percent of GDP—by the fifteen major public utilities (World Bank 1995). To keep pace with the investment demand in infrastructure the government is privatizing public utilities in energy, transport, water, and telecommunications and creating new regulatory frameworks for private investment in these sectors. In the power sector, for example, the Electric Generating Company was set up as a subsidiary of the Electricity Generation Authority

**Table 2-1: Revenues from divestiture in developing countries, 1988–93**

(billions of U.S. dollars)

<table>
<thead>
<tr>
<th>Region</th>
<th>Infrastructure</th>
<th>All sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>0.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Asia</td>
<td>7.4</td>
<td>19.7</td>
</tr>
<tr>
<td>Latin America</td>
<td>22.5</td>
<td>55.1</td>
</tr>
<tr>
<td>Eastern Europe and Central Asia</td>
<td>2.0</td>
<td>17.9</td>
</tr>
<tr>
<td>Total</td>
<td>32.0</td>
<td>95.9</td>
</tr>
<tr>
<td>Number of divestitures</td>
<td>267</td>
<td>2,279</td>
</tr>
<tr>
<td>Total divestitures, 1980–87</td>
<td>51</td>
<td>456</td>
</tr>
</tbody>
</table>

with an initial generating capacity of 600 megawatts. In 1994, 48 percent of the company's shares were privatized through a public offering, and it now competes to build new generation capacity. The national authority will in turn identify and bid out generation projects to independent power producers using build-operate-own (BOO) or build-operate-own-transfer (BOOT) contracts. The Petroleum Authority also privatized a subsidiary, PTT Exploration, in 1994. By 2000 the Electricity Generation Authority, the Metropolitan Electricity Authority, the Telephone Organization, and the Petroleum Authority will all be corporatized and up to 50 percent of their shares will be offered to domestic and foreign investors. In 1993 Thailand's fifteen major public utilities held combined assets amounting to about $28 billion, compared with total capitalization of the Stock Exchange of Thailand of about $130 billion. Thus the privatization of public utilities will give a strong boost to development of Thailand's capital markets (World Bank 1995).

Finally, investments in new infrastructure projects often require foreign financing. Developing private domestic infrastructure companies will allow these companies to participate in infrastructure projects and investments abroad and thereby diversify the currency mix of their earnings profile. The privatized Chilean utilities, for example, have become regional players, acquiring assets in other countries. Chilean companies have played a major part in privatization of infrastructure in Argentina, and Enersis, the Chilean power company, owns power generating assets in Argentina and Peru.

**Privatization and capital market development**

In addition to relieving the public sector's managerial constraints and alleviating fiscal burdens, privatization of infrastructure projects helps develop capital markets and create a company base that will then seek additional opportunities to provide infrastructure services.

For example, Chile and Malaysia, which embarked on early and extensive infrastructure privatization programs, have been more successful than other countries in mobilizing domestic funds for new investment in infrastructure. According to the International Finance Corporation's Global Composite Index, infrastructure stocks account for the largest share of stock market capitalization in both countries (Table 2-2).

In addition to development of equity markets, private infrastructure companies or public enter-

<table>
<thead>
<tr>
<th>Region/country</th>
<th>Sector with largest share of capitalization</th>
<th>Sector's share of market capitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>Mining</td>
<td>38.2</td>
</tr>
<tr>
<td>Brazil</td>
<td>Infrastructure</td>
<td>42.5</td>
</tr>
<tr>
<td>Chile</td>
<td>Infrastructure</td>
<td>50.0</td>
</tr>
<tr>
<td>Colombia</td>
<td>Manufacturing</td>
<td>57.7</td>
</tr>
<tr>
<td>Mexico</td>
<td>Manufacturing</td>
<td>27.5</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>Manufacturing</td>
<td>81.7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Manufacturing</td>
<td>69.3</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Infrastructure</td>
<td>25.6</td>
</tr>
<tr>
<td>Philippines</td>
<td>Manufacturing</td>
<td>35.1</td>
</tr>
<tr>
<td>Thailand</td>
<td>Manufacturing</td>
<td>50.9</td>
</tr>
<tr>
<td>IFC Global Composite Index</td>
<td>Manufacturing</td>
<td>37.3</td>
</tr>
</tbody>
</table>

a. State-owned monopolies in telecom and electricity accounted for about 70 percent of market capitalization in 1992, with the giant Telebras accounting for 46 percent of the Bovespa price index.

Note: Infrastructure is defined as transportation, communications, and utilities.

Source: IFC 1995a.
prises with enhanced external incentives make a considerable contribution to the development of debt markets. These entities can rely on their stable and long-term revenue profile in issuing debt securities, especially long-term instruments. Such debt instruments help set important benchmarks for the longer end of debt markets and provide attractive investment opportunities for contractual savings institutions such as funded pension schemes. (The impact of debt issues by private and public infrastructure companies on capital markets is discussed in greater detail in Chapter 4 in connection with development of local financial resources.)

**Foreign investment in privatization**

Foreign investment in privatization transactions takes place through either portfolio equity investment or foreign direct investment. In portfolio investment the foreign buyer engages in a purely financial investment with individual shares not exceeding 10 percent. For investment to qualify as foreign direct investment the investor has to acquire 10 percent or more and is usually interested in having substantial influence over the operations of the company (Sader 1993). Box 2-2 describes two innovative portfolio equity instruments that foreigners can use to invest in developing country companies.

Foreign participation in a privatization program may encounter greater political obstacles than new investment undertakings that include corporate entities that are already involved in foreign capital. This is because foreign participation in privatization is sometimes perceived as a sell-off of domestic assets and a transaction that does not immediately create new capacities and services. Such sensitivities are even stronger when infrastructure services are being privatized, especially when privatization is accompanied by price adjustments and shedding of redundant staff. In Argentina, for example, Ferrocarriles Argentinos, the company responsible for railways and subways, was unbundled and privatized using twenty-year concessions. In 1989, before it was privatized, the company employed 92,500 people. By 1994 the private concessionaires and the authorities that assumed responsibility for its services together employed just over 19,500 people. Of these, only about 7,500 worked for the private concessionaires that had taken over most freight and urban passenger services; the rest worked for the three commuter lines then awaiting transfer to a concessionaire. Foreign companies from Belgium, Japan, Portugal, and the United States are shareholders in most of these concessions along with Argentine partners.

Foreign investment in privatization should not be viewed as threatening, however. Properly balanced with mobilization of local funds, it has several merits. Because infrastructure facilities are usually very expensive and local capital markets may be too thin to mobilize sufficient funds, foreign capital can help jump-start the privatization process. In addition, foreign entities that are interested in purchasing substantial equity in privatized infrastructure are usually corporate entities that are already involved in managing infrastructure investments and facilities, normally in more advanced countries. In fact, privatization programs can require that key

**Box 2-2: Foreign portfolio equity investment**

Foreigners can make equity investments in developing countries either directly, by buying shares in a company, or indirectly, by purchasing equity instruments traded in international securities markets. The most commonly used equity instruments are American Depository Receipts (ADRs) and Global Depository Receipts (GDRs). ADRs are negotiable equity-backed instruments that are publicly traded in the U.S. securities markets, attracting U.S. investors whose ability to directly invest in foreign stock markets is limited by law. GDRs function like ADRs but can be traded simultaneously in different securities exchanges all over the world.

In 1991 Argentina became the first country to use GDRs when it privatized Telefónica de Argentina, issuing securities with a nominal value of $364 million. In March 1992, $270.3 million in ADRs and GDRs were issued in the sale of 30 percent of Telecom Argentina. The largest single issue of ADRs was carried out by Mexico in May 1991, when the remaining 15 percent of Teléfonos de Mexico (Telmex) was privatized for $2.4 billion. A year later Telmex offered another $1.2 billion in ADRs.

*Source: Sader 1993.*
investors have to be just such “strategic” investors. Bolivia’s recent experience is an example of this approach (Box 2-3).

Regulatory changes in industrial countries are making it easier for their companies to participate in privatization programs in developing countries. The 1992 Energy Policy Act, for example, allowed certain types of U.S. utilities to invest in foreign enterprises. As a result U.S. companies have become both partners and advisers in privatization programs, especially in the oil and electricity sectors. Elsewhere, French water companies are using their experience in operating private water concessions at home to participate in newly private ventures abroad. Infrastructure companies from industrial countries can also help developing country regulators and their private local partners make the transition to a less regulated or differently regulated environment. Such assistance may be crucial given that private management of infrastructure services in a competitive and deregulated environment was unheard of in most developing countries less than a decade ago.

The participation of foreign corporate entities in privatized infrastructure companies in developing countries also enhances the possibilities for raising the additional capital that is usually needed to remedy accumulated neglect and expand service capacities. In 1990 the government of Mexico began selling its majority stake in Telmex, the state telephone monopoly, to a consortium of investors that included France Telecom, U.S.-based Southwest Bell, and a group of Mexican investors led by Grupo Carso. As part of the terms of the sale the new owners of Telmex committed themselves to investing $12–14 billion and to making specific improvements in phone density and service quality. In Argentina private companies in the natural gas sector are committed to investing $611 million during 1994–98.

Box 2-3: What is capitalization?

Capitalization is privatization in which sale proceeds stay with the company to finance future investment. If, for example, the net fixed assets of an electricity company have a market value of $100 million, a strategic investor would pay $100 million into the company. The company would now be worth $200 million: $100 million in fixed assets and $100 million in cash. This approach helps mitigate some of the popular doubts about foreign involvement in domestic privatizations, and by leaving the proceeds with the company helps ease the shortage of cash for working capital and investment that commonly afflicts popular participation schemes.

The Bolivian government decided to use this approach in 1993 when it announced that it was privatizing six large state enterprises in key sectors, including infrastructure. Under the plan the enterprises are divested by international tender. The successful bidder pays the agreed price not to the government but to the company, doubling its net worth. The cash must be used for investment in the sector, stimulating expansion and efficiency improvements together with job creation. Initially, the strategic investor and the government hold equal stakes in the new company. Under the original plan the government was going to immediately distribute its share in equal parts to all adult Bolivians—about 3.2 million people. This component was later modified in light of logistical difficulties. Instead the government used the shares to endow pension accounts that were set up for each adult citizen.

To date the Bolivian airline has been capitalized by a Brazilian airline for $47.5 million. The electricity company has been unbundled and its three generation companies have been capitalized for $139 million (compared with an initial reference price of $99 million). The telephone company was capitalized for $610 million (compared with a reference price of $135 million) by STET, an Italian telephone company. Railways were divided into East and West branches and divested in November 1995. Mining is set for divestiture by late 1996. Meanwhile, new laws and regulations in the power and telecom sectors have been passed by the Bolivian Parliament to address the postprivatization era.

Mobilizing International Financing for Private Infrastructure

As discussed in Chapter 1, there is a large demand for investment in infrastructure in every developing region over the next decade. At the same time many developing countries either do not have sufficient domestic savings or lack the macroeconomic record or institutional and legal infrastructure that are needed to transform domestic savings into appropriate financial instruments for financing private infrastructure. As a result foreign financing will continue to play an important role in new private investments in infrastructure. In the long run, economic growth, greater volumes of savings, and well-developed financial intermediation mechanisms should generate sufficient domestic resources for investments in infrastructure.

Although foreign financing of private infrastructure projects poses project as well as macroeconomic risks, these should be weighed against the risks of neglecting investments in infrastructure. Poor infrastructure is no longer only a retarding factor for fixed investments in domestic resources, but also severely disadvantages developing countries in attracting foreign capital.

This chapter focuses on how governments can facilitate the mobilization of foreign resources. Ways of managing the financial liabilities that governments often have to bear in the process are also discussed, along with ways that such liabilities can be mitigated.

Need for efficient contact between government and investors

Improving governments’ ability to negotiate infrastructure project financing with the private sector must be a priority. Government agencies that traditionally have received direct budgetary allocations and contracted out project construction need to develop the skills required to operate in the context of private investments. These agencies also need to acquaint themselves with the myriad financing sources and sophisticated financial and legal literature embodied in project finance under build-operate-transfer or comparable arrangements.

The longer negotiation time required to develop infrastructure projects relative to more traditional forms of direct investment is one of the factors limiting investment by many of the infrastructure development funds that have been set up to date. Differences in expectations about actual and perceived risks, reasonable returns, revenue sharing, risk sharing and management, future pricing policies, and so on have led to high transactions costs. Indeed, in Latin America project developers face considerable difficulty in negotiating concessions, often working as long as five years without reaching closure. An example is the Carbon II independent power producer in Mexico, where after years of discussions between the government’s energy monopoly and the project developer both parties walked away from the deal (Hamilton, Rabinovitz, and Alschuler Inc. 1995).

For industrial country firms investing in developing countries, project size combined with the complexity of dealing in foreign markets have made for long and expensive predevelopment phases prior to contract awards. As a result development costs average about 5 percent of total project costs. Moreover, failure rates
are high, with only 20 percent of private projects under development reported as likely to come on line (compared with an average of 35 percent in the United States). Thus the mere launching of project development in a complicated administrative and legal environment can be discouraging, especially for small and financially weak domestic or foreign investors. This trend favors highly capitalized firms that have the technical and financial resources to sustain longer, more costly development cycles.

In India state governments have been negotiating with private power developers for several years, and eight power generation projects have been identified as candidates for private investment. The biggest of these is a 2,450 megawatt gas-fired power plant in Dabhol estimated to cost $2.5 billion. The project development was steered through thirty government agencies, 170 formal approvals, nine court cases, and thirty-nine months of grueling negotiations. Despite all this, project construction was halted by the newly elected Maharashtra state government in August 1995 due to criticisms of the contract negotiated by the previous government; only recently was construction restarted.

In Latin America government agencies with monopoly power in a particular sector have resisted negotiations that would force them to relinquish their authority to operate and fund new capital expenditures (Hamilton, Rabinovitz, and Alschuler Inc. 1995). In some countries different line agencies become quite disorderly in trying to promote private sector participation in their respective sectors. Such behavior is confusing and frustrating to investors, and tends to lead to duplication of similar resources and functions across different public agencies.

To alleviate some of these concerns, developing countries can set up single-window or unified institutions to negotiate project finance deals with private investors. Unified institutions benefit from economies of scale in terms of employing expensive technical resources. Through continuous interaction with investors, these institutions also can obtain a better perspective on the approval process of domestic institutions and propose streamlining measures that lead to more efficient and expeditious processes. They can arrange or directly provide training for relevant line agencies and help them negotiate contracts. They also can act as centralized information units where crucial information is pooled and analyzed. This function is particularly important in terms of managing government support to private projects. Lessons in this area can suggest policy actions and reforms that not only help mobilize greater domestic resources, but also keep a close eye on the contingent liabilities of governments. Finally, these institutions can coordinate the development of a project pipeline and allocate funds for prefeasibility or feasibility studies of priority projects.

Although single-window institutions as described above are generally lacking, this concept has been partly executed in a number of developing countries. The Build-Operate-Transfer (BOT) Center in the Philippines, which operates under the provisions of the 1990 BOT Law, deals with private sector participation in all infrastructure sectors. This law was recently revised to include more diverse forms of private sector participation (Table 3-1). The revision of the law to make it more flexible in terms of private investment structures partly reflects the BOT Center's accumulated experience in dealing with investors and domestic institutions and in identifying issues of mutual concern.

Given the emphasis that it has received from the highest authorities (including the office of the President), the BOT Center should be able to play an important role in streamlining the process for approval, financing, construction, and operation of private infrastructure projects. The success of such an institution hinges on the way its relations and responsibilities are defined and executed relative to the line agencies responsible for sectoral planning and regulation.

Another example of a unified negotiating agency comes from Pakistan, which recently negotiated and finalized several private power project deals. Until 1994 foreign investment in Pakistan's power sector was hobbled by the need for protracted negotiations of power purchase agreements and other project contracts. Moreover, pricing was not competitive and there was no central source of reliable information about concessions and facilities. In response to these weaknesses a special commission was created in November 1993 to develop an energy policy that would attract foreign investment. The subsequent policy reforms have drawn many foreign developers and resulted in a number of financial closures. One element of Pakistan's policy reform was the establishment of the Private Power Board within the Ministry of Energy. As the single point of contact between developers and government agencies, the board speeds the approval process and eliminates seemingly endless treks.
Table 3-1: Schemes included in the Philippine Build-Operate-Transfer Law

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build-lease-transfer</td>
<td>Private sector finances and constructs facility</td>
</tr>
<tr>
<td></td>
<td>Government leases facility for fixed period</td>
</tr>
<tr>
<td></td>
<td>Government owns facility upon expiration of lease</td>
</tr>
<tr>
<td>Build-transfer-operate</td>
<td>Government finances project facility</td>
</tr>
<tr>
<td></td>
<td>Contractor builds facility</td>
</tr>
<tr>
<td></td>
<td>Contractor operates facility on behalf of government agency</td>
</tr>
<tr>
<td>Contract-add-operate</td>
<td>Private sector leases existing government facility</td>
</tr>
<tr>
<td></td>
<td>Private sector undertakes expansion or improvement of facility</td>
</tr>
<tr>
<td></td>
<td>Private sector operates the facility</td>
</tr>
<tr>
<td>Develop-operate-transfer</td>
<td>Private sector undertakes facility</td>
</tr>
<tr>
<td></td>
<td>Facility raises property values of adjoining property</td>
</tr>
<tr>
<td></td>
<td>Private sector obtains right to develop facility</td>
</tr>
<tr>
<td>Rehabilitate-operate-transfer</td>
<td>Private sector rehabilitates, operates, and maintains existing government facility</td>
</tr>
<tr>
<td></td>
<td>Government retains ownership upon expiration of contract</td>
</tr>
<tr>
<td>Rehabilitate-own-operate</td>
<td>Private sector rehabilites existing government facility</td>
</tr>
<tr>
<td></td>
<td>Private sector operates facility for indefinite period on the condition that it does not violate the terms of its franchise</td>
</tr>
</tbody>
</table>


Through layers of government bureaucracy that were once typical in Pakistan (Infrastructure Finance, February/March 1996).

International capital and project finance flows

With greater global integration, a significant amount of capital is now internationally mobile. Despite short-term and incidental setbacks, international flows increasingly seek investment opportunities in developing and emerging markets due to lower yields in industrial countries and the advantages that come with risk diversification. Long-term government bond yields in the G-3 markets (Germany, Japan, and the United States) have fallen by half since 1990. As a result fund managers are willing to accept greater risks in order to meet the income demands of increasingly sophisticated investors. But although international financial markets have the capacity and drive to meet the project financing needs of developing countries, economic and project level risks must be sufficiently manageable. Although the global flow of capital is growing, the share of flows to developing countries has remained at around 9 percent of total capital market flows in recent years (Table 3-2).

In 1995 project flows to finance infrastructure projects in developing countries accounted for about 1 percent of international flows and about 10 percent of flows to developing countries (Table 3-3). Overall project finance flows to developing countries were 21 percent higher in 1995 than in 1994. East Asia and the Pacific attracts the largest share of these flows, with

Table 3-2: International capital market flows, 1993–95
(billions of U.S. dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonds</td>
<td>481.0</td>
<td>426.9</td>
<td>460.6</td>
</tr>
<tr>
<td>Equity</td>
<td>40.7</td>
<td>44.9</td>
<td>41.0</td>
</tr>
<tr>
<td>Syndicated loans</td>
<td>136.7</td>
<td>202.7</td>
<td>368.5</td>
</tr>
<tr>
<td>Other</td>
<td>160.2</td>
<td>278.9</td>
<td>388.3</td>
</tr>
<tr>
<td>Total</td>
<td>818.6</td>
<td>953.4</td>
<td>1,258.4</td>
</tr>
<tr>
<td>Flows to developing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>countries</td>
<td>75.3</td>
<td>89.6</td>
<td>113.3</td>
</tr>
<tr>
<td>Share of total (percent)</td>
<td>9.2</td>
<td>9.4</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Table 3-3: Project finance, 1995  
(millions of U.S. dollars)

<table>
<thead>
<tr>
<th>Destination</th>
<th>1995</th>
<th>1994Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>15,105</td>
<td>4,690</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>4,781</td>
<td>2,745</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>2,750</td>
<td>897</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>2,083</td>
<td>1,093</td>
</tr>
<tr>
<td>South Asia</td>
<td>1,616</td>
<td>161</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>1,068</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>27,403</td>
<td>9,639</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sector</th>
<th>1995</th>
<th>1994Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>8,923</td>
<td>1,701</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>1,117</td>
<td>592</td>
</tr>
<tr>
<td>Transportation</td>
<td>2,189</td>
<td>804</td>
</tr>
<tr>
<td>Other infrastructure</td>
<td>1,251</td>
<td>1,083</td>
</tr>
<tr>
<td>Noninfrastructure</td>
<td>13,923</td>
<td>5,461</td>
</tr>
</tbody>
</table>

Source: Euromoney Loanware and World Bank data.

China and Indonesia accounting for more than 85 percent of the funds committed in the region.
Growing private sector participation in infrastructure has been a stimulating factor in global capital flows. More than 40 percent of the financing commitments made in the fourth quarter of 1995 and about half those made for the entire year were for infrastructure projects, with a focus on power, transportation, telecommunications, water, and construction.

Raising long-term debt

The growing experience with international project finance flows suggest that equity is a more readily available component in the financing of infrastructure projects. Infrastructure projects usually have high leverage (debt to equity) ratios, and securing large amounts of long-term debt remains the main financing challenge. The number of international emerging market equity funds in Asia grew from 50 in 1989 to 242 in 1994; in Latin America the number of funds grew from 2 in 1989 to 108 in 1994 (Figure 3-1). These funds include specialized infrastructure funds in both regions. Moreover, there are numerous project sponsors in most infrastructure industries that are willing and able to take equity risks for equity returns. Matching funds to projects is not always an easy task, however.

For investors to achieve returns on equity it is often essential that a project be able to mobilize long-term debt for anywhere up to 80 percent of its cost. Leverage ratios and capital recovery are

Figure 3-1: Net assets of international emerging market equity funds, 1989–94  
(millions of U.S. dollars)

Source: IFC 1996.
also subject to specific commercial characteristics in various subsectors. In telecommunications, for example, where shorter technological horizons and less regulated markets result in greater competition and price volatility, investors seek and usually can achieve higher returns over shorter periods. Higher returns result in more equity in the financing composition and therefore a lower leverage ratio. Debt-equity ratios of about 50:50 are common in telecommunications investments. Road and hydroelectric dam projects, on the other hand, require large investments with slow capital recovery. The markets for these services allow a greater degree of predictability in revenues, albeit with less flexibility in tariff adjustment, thus lowering cash-flow risks. These characteristics result in higher leverage ratios, with debt tenors that can stretch as long as twenty-five years or more to ensure expected returns on equity.

Private infrastructure projects usually access debt financing on a nonrecourse or limited recourse project finance basis. In nonrecourse project finance creditors rely solely on the income and assets of the project itself for repayment, rather than on the credit of the project sponsors. Under limited recourse finance the project sponsors have some limited liability with respect to the project company’s obligations, such as timely completion of the project, but do not provide a full guarantee of the project company’s debts, especially after commercial operation begins. The inherent risks associated with financing of infrastructure projects are compounded by the fact that most investments are very large and capital recovery is achieved over a long period. As a result most projects require debt tenors of ten to twenty-five years. Moreover, a slow rate of capital recovery coupled with a high expected rate of return on equity (20–30 percent) leads to high leverage ratios. In China, where economic performance is strong and the country enjoys an international investment grade rating, private investment in power has been stalled by debate between the government and investors about appropriate rates of return. The government has insisted on capping after-tax profits at 15 percent of equity-financed net fixed assets, while foreign investors are seeking at least an 18 percent return to compensate for the risks involved in investing in the country.

Debt financing for private infrastructure projects is provided either before or after a project’s construction is complete. Construction phase financing usually comes from local and international commercial banks. Except in Malaysia, the role of local commercial banks in developing countries in financing greenfield private infrastructure projects has been very limited due to weaknesses in credit appraisal and financing techniques. In addition to institutional weaknesses, commercial banks in developing countries are usually unable to make long-term loans because the profile of their liabilities is mostly short-term. This short-term profile of bank liabilities (deposits) is largely the result of macroeconomic instability in many countries, especially during the 1980s (see Chapter 4).

Accordingly, international commercial bank lending through syndicated or individual loans is an important source of project financing, especially during the construction phase. Commercial banks are able to appraise project risks and can provide financial flexibility in response to construction delays or cost overruns. Commercial bank lending is usually guaranteed by export credit agencies, which provide pre-completion cover for varying degrees of commercial and political risk. Coverage of pre-completion risks helps secure financing for projects.

Still, lending secured by export credit agencies is not without risk. Most such agencies limit tenors to ten years (twelve years for power plants), mandate semiannual repayment of principal, and allow only a six-month grace period following project completion. These conditions force the brunt of debt repayment during the early phase of a project’s life, when cash flows are most uncertain. As a result projects may not generate sufficient income to retire commercial bank debts if loan maturities are shorter than required. For instance, financing a thirty-year asset, such as a power plant, over ten years results in power rates that are not economic and limits creativity in structuring tariffs. In addition, the export credit agency guarantees often required by commercial banks must be backed by the host government’s counter-guarantees. An important drawback of such arrangements is that government counter-guarantees end up covering both commercial and political risks. To improve projects’ ability to attract long-term commercial bank project financing with fewer guarantees, policymakers must reduce the elements of risk associated with the construction phase and improve the regulatory and market environment in which projects will operate. Project contractors are responsible for guaranteeing the timely
completion of projects, but governments have to ensure that the operating environment allows them to assume such risks.

As mentioned above, some projects require longer-term financing than commercial banks usually provide to match their revenue profile and repayment ability. In such cases commercial lenders usually try to ensure that projects are capable of obtaining takeout financing once the construction or seasoning period ends. In Indonesia’s Paiton private power project, for example, commercial lenders extended $360 million with a guarantee that once the project was operational the U.S. Export-Import Bank would take over for the banks and make a direct loan to the project. Multilateral development banks can also design instruments to mitigate refinancing risks (Box 3-1).

To reduce the need for concessionary multilateral or bilateral support, projects must be able to demonstrate their ability to raise long-term funds in capital markets once commercial operations begin. Thus governments in developing countries will not only have to ensure that local capital markets are strong enough to meet part of the refinancing requirements, they also have to maintain a macroeconomic framework that is not perceived as jeopardizing the ability of projects to float debt on international capital markets.

**Box 3-1: The World Bank guarantee**

A partial risk guarantee covers risks arising from nonperformance of sovereign contractual obligations to a private sector project or from force majeure events affecting a project. By covering risks that the market would not bear or would price very high, the guarantee lowers the cost of financing. A partial credit guarantee covers events of nonpayment for a designated part of the financing. These guarantees extend maturities beyond what private creditors would otherwise provide—for example, by guaranteeing late payments or by providing incentives for lenders to roll over medium-term loans.

Partial risk guarantees reduce a government’s contingent liability to the minimum required to make the project feasible, with the private sector taking on all or much of the commercial risk. This contrasts with the traditional pattern in which governments take full responsibility for financing and thus bear the entire risk in projects.

The World Bank charges two fees for the guarantee cover: a standby fee and a guarantee fee. These fees are charged either to the borrower or the lender. The standby fee, applied for the period when the guarantee is in force but not callable, is currently 25 basis points a year on the outstanding amount guaranteed. The guarantee fee, applied for the period when the guarantee is callable, is set at 40-100 basis points on the amount covered by the guarantee. This rate includes a fee of 25 basis points plus a premium varying from 15-75 basis points, depending on the level of risk coverage. The World Bank receives a counter-guarantee from the relevant member country, and above 25 basis points the guarantee fee is passed on to the government.

**Improving country creditworthiness**

Long-term capital for limited recourse infrastructure projects is also abundant in the international bond markets. But the universe of accessible capital is very narrow for projects that are unable to obtain international investment grade credit ratings.6

The global market for investment grade debt was $14 trillion in 1994. By contrast, the worldwide private market for unrated or below investment grade project debt in emerging markets was only about $12 billion (Hamilton, Rabinovitz, and Alschuler Inc. 1995). In the long run, then, the degree to which infrastructure investments in developing countries achieve investment grade ratings will determine their ability to access international capital markets. Such ratings certify a project’s ability to meet its repayment obligations under a specific debt issue. An investment grade credit rating also lowers the cost of debt. Price differentials of 175-350 basis points occur in the international capital markets between investment grade paper (BBB- and above) and anything less. These differentials have critical implications for the tariff structure of infrastructure projects.

Two conditions must be met for infrastructure projects to achieve an investment grade rating in international capital markets. First, projects
have to be investment grade in local currency. Second, the credit rating of the country in which a particular project is being financed must be investment grade.

To illustrate the effects of an investment grade rating on private debt issues, Table 3-4 shows Standard and Poor's sovereign credit rating for a number of Asian and Latin American countries, as well as the average maturity and average interest spreads of bond issues by private sector issuers in these countries. The overall pattern is clear—the higher the ratings, the longer the maturity and the lower the interest spread.

Thus achieving an investment grade rating is essential to raising long-term debt on international markets in volumes that are sufficient to meet investment demands. A government's sovereign credit rating is decisive to the outcome of private efforts in this regard. Policymakers must secure a favorable rating by sustaining policies that ensure macroeconomic stability and efficient external asset and liability management. Policies also should promote stable and transparent regulatory frameworks and create market environments that allow economic cost recovery and provide reasonable parameters for determining project cash flows (in local currency) over the life of projects.

**Rule 144A: A window for long-term U.S. dollar debt**

Nearly all bond issues by private infrastructure projects in developing countries have taken place in the U.S. capital market under Rule 144A.

**Table 3-4: Interest rate spread and maturity for unenhanced private sector bond issues, 1994**

<table>
<thead>
<tr>
<th>Country</th>
<th>Standard and Poor's rating</th>
<th>Average maturity (years)</th>
<th>Yield spread at launch (basis points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>A+</td>
<td>10.0</td>
<td>89</td>
</tr>
<tr>
<td>Thailand</td>
<td>A-</td>
<td>5.9</td>
<td>134</td>
</tr>
<tr>
<td>Chile</td>
<td>BBB+</td>
<td>5.0</td>
<td>125</td>
</tr>
<tr>
<td>Colombia</td>
<td>BBB-</td>
<td>10.0</td>
<td>641</td>
</tr>
<tr>
<td>Philippines</td>
<td>BB</td>
<td>8.7</td>
<td>300</td>
</tr>
<tr>
<td>Argentina</td>
<td>BB-</td>
<td>4.5</td>
<td>410</td>
</tr>
<tr>
<td>Brazil</td>
<td>B</td>
<td>2.9</td>
<td>387</td>
</tr>
</tbody>
</table>

*Note: Enhancement refers to such features as bond-equity conversion options, collateralization, guarantees, and put options.*

*Source: IMF 1995a.*

...
countries may need to design special financing channels to improve their access to capital for private infrastructure projects during the transition to reduced sovereign risks and secure local markets. This is where international financial institutions, bilateral or multilateral, can step in. These institutions help countries secure access to limited recourse project financing by providing either direct loans or guarantees of syndicated bank loans or bond issues. As policy and institutional reforms take hold, the need for support from these institutions diminishes (Figure 3-2). Loans and guarantees may both be necessary early on, but the share of guarantees will gradually increase and loans can be provided through contingent commitments (for example, for take-out financing).

To address the financing needs of limited recourse projects in developing countries, especially those with non-investment grade sovereign ratings, the World Bank has designed guarantee instruments (see Box 3-1). World Bank guarantees have been used for a number of private infrastructure projects, where they have made financing more affordable and helped extend the maturity of loans and bond issues.

In several cases the World Bank has also helped member countries develop special infrastructure financing vehicles. By providing financial support to develop private infrastructure during the transition to strong domestic markets, these vehicles act as intermediaries for extending government and international financial institution support to infrastructure projects financed on a limited recourse basis. These vehicles also help to attract sizable cofinancing from other sources. The structure of support provided by these vehicles varies. In countries that are at earlier stages of reforms with higher credit risks these vehicles act as intermediaries of funds from the international financial institutions and, in the process, help leverage additional flows from other sources (Box 3-2). Most of the funds channeled through these mechanisms are raised on concessionary terms. In countries that have made more progress with reforms (the Philippines, Colombia; see below) support is either in the form of guarantees or contingent lines of credit, and normal commercial markets are proposed as the main sources for raising funds. The financial products offered also become more complex since they are designed to mitigate risks that may be slowing market flows.

THE PHILIPPINES' PRIVATE SECTOR INFRASTRUCTURE DEVELOPMENT FUND. Prudent economic policies have fostered stability in the Philippines. During 1990–95 the average annual inflation rate was about 9 percent, allowing a gradual fall in real interest rates. The Philippine economy grew by an average of 5 percent a year during 1994–95 while posting strong export growth. Although the country does not yet have an investment grade rating, the government is actively promoting private infrastructure and plans to privatize public enterprises under new laws that allow private investment (see Table 3-1).9

The initial impetus for private participation in infrastructure development came from a need to overcome crisis conditions. A severe electricity shortage peaked in 1992–93, when brownouts averaged seven hours a day in many regions and power shortages caused about $3 billion a year in losses to the economy. A fast-track program introduced in 1993 allowed independent power producers to expand generation capacity. By the

Figure 3-2: The transition to an investment grade credit rating

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9 For more information on the Philippines’ private sector infrastructure development fund, see the Box 3-2 titled "Philippines' Private Sector Infrastructure Development Fund."
Box 3-2: Preliminary financing tools for private infrastructure in Pakistan, Sri Lanka, and Jamaica

**Pakistan.** Pakistan’s Private Sector Energy Development Fund was created in 1988 to support institution building and to provide subordinated debt financing for limited recourse private power projects. The fund was initially capitalized with a World Bank loan of $150 million cofinanced with $150 million from the Export-Import Bank of Japan (Jexim), as well as $99 million in loans provided by France, Italy, and the United States for equipment to be sourced from these countries. The fund, administered by the National Development Financing Corporation, was replenished in January 1995 with a $250 million loan from the World Bank and a $110 million Jexim loan (raised to $250 million in May 1996). France also provided an additional $10 million loan toward purchases of French equipment.

The fund provides subordinated debt financing (with up to twenty-three years’ maturity with eight years of grace) for up to 30 percent of the financing of private energy projects. Project sponsors are expected to mobilize 20-30 percent of project funds in equity and to raise the remaining funding as senior debt. Although private power projects were the fund’s initial focus, it is now financing other private infrastructure, and was recently designated as Pakistan’s Long-Term Infrastructure Credit Facility. In 1997 a newly created financial institution with a majority shareholding by the private sector will be assigned to administer this facility. By 1998 the private sector will control about a third of power generation capacity and supply nearly half of Pakistan’s power.

**Sri Lanka.** The World Bank is helping the Sri Lankan government promote limited recourse project financing through a Private Sector Infrastructure Development Company. This company, modeled after Pakistan’s Private Sector Energy Development Fund, has an all-debt capital structure that includes $70 million from the International Development Association (IDA) and $14 million from Germany’s KfW. Operations began after the IDA credit was approved in June 1996. A pipeline of projects recommended for funding includes the 150 megawatt Kelanitissa power plant, a container terminal, a wharf, and a 30-kilometer expressway. Loans made in U.S. dollars to private sponsors will be at variable and fixed rates and will have maturities of up to twenty-two years, including up to eight years’ grace.

The company should give momentum to private financing of infrastructure in Sri Lanka. The country’s strong export potential in textiles is held back by infrastructure bottlenecks, and 75 percent of industries and hotels produce their own power. Independent power producers could easily satisfy this demand at lower cost.

**Jamaica.** Jamaica’s Private Sector Energy Fund was also designed to promote limited recourse private investments in infrastructure. The World Bank and the Inter-American Development Bank each provided $40.5 million loans to help set up the fund. This money was used to provide a commitment to refinance the commercial construction debt of the Rockfort private power project. The project is slated to begin operations in August 1996.

In 1998 the project can call a takeout loan from the fund that will have a twelve-year maturity with no grace period and a fixed rate equal to a thirty-year U.S. Treasury bond plus 300 basis points. This arrangement does not prevent the project from testing the market for more favorable takeout financing, however. The development of the Rockfort power project and the accompanying changes in the policy and regulatory environment for the private provision of power have had an important demonstration effect, thereby improving the prospects for future private power projects in Jamaica.

End of 1995 thirty-one projects (worth $4.5 billion) were providing 4,500 megawatts of new generating capacity. Seven projects ($3.3 billion) currently under construction will add 2,750 megawatts of new generating capacity in 1996 and 1997. By 1998 nearly 80 percent of power generation will be in private hands. This is a marked transformation from 100 percent public generation in 1991.

The idea of creating a privately managed infrastructure financing facility emerged in the Philippines in early 1995 as part of an ongoing Private Sector Infrastructure Initiative that aims to improve the policy and regulatory environment for private infrastructure, improve the government’s facilitation and promotion of private projects, and enable equitable assignment of project risk between the government and the private sector. The World Bank and the Philippine government worked together throughout 1995 developing the facility, called the Private Sector Infrastructure Development Fund (Figure 3-3).
As originally designed, the fund was to be an investment grade financing vehicle. It would have generated a portfolio of projects with an investment grade rating in local currency that a World Bank convertibility guarantee would have helped achieve an investment grade rating in international capital markets. The fund’s basic objectives were to mobilize affordable long-term foreign debt for relatively small infrastructure projects (costing $150 million or less), address private investment. Colombia is in a transition phase in terms of attracting long-term limited recourse financing for infrastructure projects. Local banking and capital market capacities are gradually developing as a result of considerable reforms in the 1990s, but these markets lack sufficient depth. Moreover, interest rates in local markets are high and the ability to manage risks in long-term financial assets is limited.

Helped by Colombia’s investment grade credit rating, private developers have accessed international banking and capital markets for several projects, but the current and projected demand for new investments exceed current flows. Since 1993 the volume of private flows has been about one-fifth the levels targeted in the government’s infrastructure development program. As a result, the Colombian government, in cooperation with the World Bank, is developing a Private Sector Infrastructure Financing Facility to catalyze private flows into infrastructure. To meet its objective, the facility is being developed to offer a range of products that address the concerns and needs of private investors in Colombia’s investment environment (Figure 3-4).
The facility’s capitalization and management. World Bank financing for the facility has been set at $300 million. A contribution by the Colombian government, if made, could ease the facility’s currency risk exposure to the extent that it provides financing in local currency. A consortium of Salomon Brothers and McKinsey & Co. is working alongside a government–World Bank team to advise the government on the structuring and implementation of the facility. The government has assigned management of the facility to Bancoldex, which is a second-tier, largely government-owned entity specializing in export finance. Among government entities, Bancoldex has the strongest financial position and the most adaptable charter for accomplishing the objectives of the facility. Its mandate was recently expanded to promote infrastructure development as part of efforts to improve export performance. The project will include training to strengthen Bancoldex’s ability to administer the facility, notably in the area of project finance. Given the progress to date, the facility could begin operations in early 1997. The government is also working with the World Bank to develop a more efficient mechanism of extending and managing sovereign risk guarantees to private projects.

Products. As noted earlier, private investment in infrastructure is taking place, but the pace is insufficient to achieve targeted investment levels. Moreover, despite financial sector and pension system reforms that hold out the promise of increased local financing, foreign financing is still dominant. The facility’s product mix will be designed not only to address concerns relevant to foreign financiers but also to capitalize on local financial sector and capital market reforms and leverage existing capacities. It will do so by providing products that are currently unavailable to interested foreign financiers and fledgling local long-term debt markets. The facility will provide products that address political risks (such as exchange risk) or systemic risks (such as pervasive illiquidity in the debt market) but will refrain from taking purely commercial project-specific risks. Two specific products that have been identified are refinancing commitments and foreign exchange liquidity support.

As in many other developing countries, lenders in Colombia are sometimes reluctant to
extend credit to infrastructure projects because of uncertainties about refinancing possibilities. This uncertainty prevents credit markets from extending long-term debt. Most locally available credit must be repaid within three years, and loans from international banks are generally limited to seven years. Capital recovery takes longer for infrastructure projects and, to ensure competitive returns on equity, debt financing usually constitutes up to 80 percent of the financing package. As a result repayment of debt, under feasible tariff levels, may take much longer than the maturities currently available in the market. Once projects pass the construction phase and are operating successfully, their chances of accessing longer-term funds increase.

The facility will mitigate the concerns of lenders to greenfield projects by providing refinancing commitments. Projects or their lenders can purchase these commitments and thus obtain assurance that refinancing will be available. Refinancing terms and conditions will be specified in the commitments. While providing refinancing security, the preagreed rates would be determined such that the market is the first resort for refinancing. Also, to be able to exercise their rights under refinancing commitments, projects will have to maintain appropriate operational and financial standards (for example, debt-equity and debt service coverage ratios). This will ensure that refinancing commitments mitigate the risks associated with major systemic disruptions in normal market funding channels.

The risk of disruptive shocks in foreign exchange markets can limit the willingness of foreign investors to lend to domestic projects, especially when these projects only earn revenues in local currency. The December 1994 Mexican peso crisis, for example, ended efforts to issue debt in a Rule 144A placement for the $752 million Tormobarranquilla power generation project, and the financing was secured elsewhere. Colombia's foreign exchange reserves are adequate relative to its import levels. The depreciation rate of the Colombian peso has been relatively stable. Except for 1994, it ranged between 15 and 30 percent every year between 1990 and 1995. Thus the risk of abrupt and disruptive depreciation and inconvertibility does not appear to be significant in the short to medium term. Infrastructure investments span over an extended time horizon, however, and foreign investors perceive this as a real risk over the longer term.

In the event of a sudden and sharp depreciation, projects may not be able to adjust tariffs rapidly enough to keep pace with higher exchange rate costs. Thus they may face a period of illiquidity. Foreign exchange shortages and inconvertibility at the national level also may prevent projects from meeting their obligations to foreign financiers. To address these concerns, the facility will rely on foreign exchange lines of credit from the World Bank and other multilateral or bilateral sources to provide commitments of foreign exchange liquidity at times of severe depreciation shocks. The lines of credit would be drawn down as the commitments are called and the proceeds made available to projects to service financial obligations in foreign currency. Projects that call their commitments will continue to be responsible for repaying their financial obligations to the facility in foreign currency.

Managing sovereign risk guarantees

Private investors will continue to seek sovereign guarantees for a variety of market (commercial) and nonmarket (noncommercial) risks that they feel incapable of mitigating or managing. The long-term nature of infrastructure investments increases the exposure of investors to such risks.

Market risks are difficult to manage in under-developed markets, especially when they stem from public enterprises that are unable to meet their supply and offtake commitments to projects. An uncreditworthy public enterprise that dominates demand for an output such as power cannot be regarded as a viable demand market. Similarly, private investors often deal exclusively with public entities on the supply side without much confidence in the uninterrupted performance and quality of service provided by these institutions. In both cases private investors would likely seek a sovereign guarantee before committing funds. It may also be necessary for governments to provide sovereign guarantees to stimulate investment in areas where market demand is uncertain. Investors in greenfield toll road projects, for example, may seek government guarantees on minimum traffic levels.

In many countries the laws and regulations that are being introduced to promote private participation in infrastructure have no historical precedent and the long-term political commitment to maintaining relevant reforms remains untested. As a result the role of governments and regulatory bodies in influencing the timing of the
construction phase or maintaining a stable and reasonable regulatory framework during the operation phase are usually perceived as non-market risks for which investors will seek mitigation through sovereign guarantees.

Reforms aimed at strengthening the market discipline for infrastructure services will gradually improve the credit assessment of infrastructure projects in local currency and obviate the need for sovereign guarantees. These reforms include transparency and efficiency in the laws and regulations governing the ownership and operation of private infrastructure facilities. Tariff reforms intended to allow economic pricing are also key to the commercial viability of projects. Public enterprises need to play by market rules and obtain impartial credit assessment. Governments need to develop active plans for restructuring and privatizing public enterprises in order to reduce the need to guarantee their commitments.

At the national level an improved sovereign credit rating can be achieved through a stable political and macroeconomic framework. Strong economic fundamentals should be established through macroeconomic policies that ensure monetary stability, macroeconomic transparency, and export-oriented growth. Efficient structural policies will benefit from macroeconomic stability and support it through efficient allocation of resources.

Private investors that make long-term commitments to infrastructure projects face considerable local currency depreciation and convertibility risks. It would be optimistic to assume that a risk such as sharp and sudden depreciation can simply be offset by compensating tariff adjustments without wreaking sociopolitical havoc and jeopardizing the pattern of demand. Political circumstances that may result in civil unrest or nationalization of projects also cannot be disregarded. The various risks that foreign investors in infrastructure projects are concerned about are listed in Box 3-3. Except for currency risks, these categories of risk also affect the incentives of local investors. The risks other than commercial risks are frequently referred to as political risks, which is meant to capture the idea that they are controlled more by governments than by the private sector.

A positive investment climate is essential for countries that hope to attract long-term foreign capital. Since perceptions of a country’s investment climate are based on both current circumstances and future prospects, it is essential not only that legal and policy conditions are conducive to the attraction and utilization of foreign capital, but also that foreign investors are confident that there is little or no possibility that an unfavorable legal environment will develop. Investors gain such assurance when a favorable legal situation has existed for a sufficiently long time or when a country’s economic and political structure is sufficiently stable that there is little probability of radical change in the foreseeable future.

<table>
<thead>
<tr>
<th>Risk type</th>
<th>Refers to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>Cost overruns in construction and operation, uncertainties in demand for services.</td>
</tr>
<tr>
<td>Noncommercial</td>
<td></td>
</tr>
<tr>
<td>Currency</td>
<td></td>
</tr>
<tr>
<td>Conversion</td>
<td>The ability and willingness of the sovereign government to convert its domestic currency into foreign exchange.</td>
</tr>
<tr>
<td>Exchange rate</td>
<td>Changes in the value of one currency relative to the other over time.</td>
</tr>
<tr>
<td>Policy</td>
<td>Adverse conditions that are imposed on a project due to arbitrary or ad hoc changes in the regulatory, legal, and economic policy framework.</td>
</tr>
<tr>
<td>Political force majeure</td>
<td>Wars, political unrest and turmoil.</td>
</tr>
</tbody>
</table>
Many government efforts to influence the commercial viability of public enterprises will have identical effects on private investment. Government performance in making and keeping important promises influences private investors’ perceptions of the environment in which they will be working. In many developing countries governments have implemented programs designed to remove nonmarket barriers affecting the operational efficiency of public entities. But a World Bank study of governments’ adherence to the promises that were made as part of these programs suggests that in many cases governments fail to keep their word (Box 3-4). When government promises are not credible, it undermines the creditworthiness of the public or private providers of infrastructure services.

When providing sovereign guarantees, governments can reach agreements under which they effectively end their guarantee obligations by linking them to reforms. In this way progress in implementing reforms could eliminate the underlying need for guarantees. Such agreements could stipulate that guarantees will be lifted as public agencies whose commercial undertakings affect the financial viability of private projects are privatized or obtain a good independent credit rating. These guarantees must be issued in a way that does not hard-code institutional or sectoral arrangements that may later be subject to reform. Other guarantees, such as convertibility guarantees, could be removed when countries achieve investment grade credit ratings.

In issuing guarantees, governments must consider the expected value of their contingent liabilities. Large liabilities raise perceptions of country risk and imperil the sovereign credit rating. This outcome can be avoided if contingent liabilities are issued in a fiscally responsible framework, with appropriate distribution of risks among parties that are best positioned to mitigate them.

By valuing and budgeting for their contingent liabilities, governments can maintain the initial value of past and future guarantees and reduce effective demand for guarantees. Guarantees that are not properly accounted for have several negative implications that are rarely considered. The main role of guarantees is to mitigate risks that would otherwise increase the cost and tenor of capital beyond feasible levels.

Investors that receive sovereign guarantees place a value on them and expect this value to be preserved over time. Every subsequent guarantee that a government issues will dilute the value of

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**Box 3-4: Government attempts to reform public entities**

<table>
<thead>
<tr>
<th>Entity</th>
<th>Promises on which government reneged in whole or in part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghana Electricity</td>
<td>Support collection of revenues and arrears; timely approval of tariffs.</td>
</tr>
<tr>
<td>Ghana Telecoms</td>
<td>Timely approval of tariffs.</td>
</tr>
<tr>
<td>Ghana Water</td>
<td>Prompt payment of bills by government and public enterprises.</td>
</tr>
<tr>
<td>India Electricity (promises by state governments)</td>
<td>Support collection of arrears; increase autonomy to invest; streamline red tape; prompt approvals; increase tariffs.</td>
</tr>
<tr>
<td>India Oil</td>
<td>Increase autonomy to invest; streamline red tape; prompt approvals.</td>
</tr>
<tr>
<td>Mexico Electricity</td>
<td>Provision of support.</td>
</tr>
<tr>
<td>Senegal Electricity</td>
<td>Prompt payment of bills by government and public enterprises; contribute to investment program; increase tariffs.</td>
</tr>
<tr>
<td>Senegal Telecoms</td>
<td>Prompt payment of bills by government and public enterprises; increase tariffs; abolish subsidy to postal service by 1989; limit investments in rural areas.</td>
</tr>
</tbody>
</table>

previously issued guarantees. This dilution effect not only undermines the value of assets held by earlier investors, it also poses a bias against future investors who have access to less valuable guarantees.

It is also important to note the impact of reforms on the value of contingent liabilities. When reforms are implemented in areas where guarantees were issued to compensate for perception gaps and uncertainties, they effectively increase the value of each guarantee. As reforms are implemented, the possibilities that previous guarantees will be invoked is reduced. Box 3-5 describes an ongoing effort in Colombia that aims to develop an efficient mechanism for issuing and managing sovereign guarantees.

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**Box 3-5: Sovereign guarantee reform in Colombia**

As part of its efforts to develop a facility for infrastructure financing, the Colombian government is working with a World Bank team and private consultants (Oliver Wyman & Co.) to design an efficient system for issuing sovereign guarantees and managing the accompanying obligations. The objective of this exercise is to value the exposure to the government of financial guarantees, create a budgeting process that makes agencies offering the guarantees economically accountable, and ensure that adequate funds are available to pay the guarantees.

One product of these efforts will be a model that enables the government to assign values to its guarantees of distinct risks, market and non-market, in each project. These values will be used to identify and prioritize reforms, the absence of which requires government guarantees and accompanying budgetary allocations. Moreover, with better-defined liabilities the government can work proactively to prevent events that trigger the need for guarantees. This exercise will also introduce advanced risk management concepts into the government's budgetary process.
Notes

1. The aggregate foreign exchange conversion demand of a large number of projects could become substantial. This demand should be balanced through policies that promote export-oriented growth as discussed in an earlier section.

2. Development costs include travel, accommodation, communications, and international office facilities as well as other material expenses that are incurred in the process of maintaining contact with local and international institutions and financiers, plus staff and consultancy costs incurred in management, legal, and financial work.

3. Line agencies are the government institutions, such as ministries, that have traditionally been in charge of direct investment in infrastructure projects and delivery of services through parastatals. These agencies will most likely remain central as far as planning, prioritization, contracting, and sometimes regulation of private infrastructure projects are concerned.

4. A new build-operate-transfer law expected to pass in 1996 will likely help resolve the differences between the government and investors.

5. The U.S. Export-Import Bank is an exception and insists that commercial risks during construction are best handled by the private sector—that is, by commercial banks and project sponsors.

6. The credit ratings of the two best-known rating agencies, Moody’s and Standard and Poor’s, are described below:

<table>
<thead>
<tr>
<th>Investments grade</th>
<th>Moody’s</th>
<th>Standard and Poor’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment grade</td>
<td>Aaa, Aa, A, Baa</td>
<td>AAA, AA+, AA, AA-, A+, A, A-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BBB+, BBB, BBB-</td>
</tr>
<tr>
<td>Noninvestment grade</td>
<td>Ba, B</td>
<td>BB+, BB-, B+, B, B-</td>
</tr>
<tr>
<td>Default grade</td>
<td>Caa, Ca, C, D</td>
<td>CCC+, CCC, CCC-, CC, C</td>
</tr>
</tbody>
</table>

To further clarify ratings, Moody’s assigns numbers from 1 (highest) to 3 to differentiate borrowers within a given grade. Standard and Poor’s ratings of foreign currency debt are subject to a sovereign credit rating ceiling, which reflects the risk that, in a crisis, a country may impose currency controls or impose restrictions on the ability of the project to pay foreign debt holders.

7. The interest spread is the difference between the interest rate on the bond at the time of issuance and the rate on U.S. Treasury securities of comparable maturity.

8. Perceptions about greater risks in Latin America, the specific debt issues (which may have been concentrated in riskier undertakings), and country conditions in 1994 partly explain why Colombia’s overall standing was less favorable than that of the Philippines despite its higher credit rating.

9. Moody’s upgraded its rating from Ba3 to Ba2 in May 1994; Standard and Poor’s upgraded its rating from BB- to BB in June 1995.

10. Given the fixed costs associated with issuing debt on international capital markets, the transactions costs for debt issues of less than $100 million are usually prohibitive.

11. Colombia was upgraded to B1 by Moody’s in 1994 and to BBB- by S&P in 1995.

12. That is, the guarantees have to be valued and capital to back them has to be allocated through the budgetary process.

13. Creditors, such as holders of fixed-income securities issued by the project, prior their funds according to their expectations of risk. Covenants are never signed with governments restricting them to maximum exposure to liabilities resulting from future guarantees. When governments overexpose themselves, the risks in assets held by creditors increase. This will affect the value of these assets in secondary markets, whether bonds or loans.
Developing Local Financial Resources

During 1966-94 funds from foreign sources accounted for at least 70 percent of the financing for greenfield infrastructure projects in developing countries (IFC 1994). Because the revenues generated by infrastructure projects are usually in local currency, the foreign investors that finance these projects often face sizable and volatile risks such as exchange rate and convertibility risks. These risks affect a project’s ability to meet its financial obligations.

In the long run local resources should provide most or all of the financing needs of private infrastructure projects. Developing countries should recognize the risks associated with over-reliance on foreign financing and work to develop a long-term domestic debt market. The emphasis on debt markets in this chapter does not in any way suggest that equity markets in all developing countries are sufficiently developed, though some countries are quite advanced in this regard. However, mobilization of long-term local currency debt remains a major challenge for financing private infrastructure, even in countries where local equity is more readily available.

Implications of inadequate local financing

The use of foreign resources and the risks that it entails have implications at both the project and national levels. At the project level the main issue is the potential mismatch between assets and liabilities. Even with a realizable stream of local currency assets, foreign-financed projects face considerable exchange rate risks in meeting their obligations to creditors. Any negative movements in the exchange rate bear directly on the financial viability of the project. If tariffs are linked to the exchange rate, movements may force tariff adjustments to generate adequate revenues for debt service. Sharp exchange rate movements result from a variety of shocks, including political. These shocks can force tariff adjustments that could otherwise be partly avoided if economic fundamentals were attended to. In Mexico, for example, the tariffs for most toll roads constructed during 1988-94 were indexed to inflation but not to the exchange rate. After the peso crisis most projects were unable to service their obligations to foreign creditors due to the sharp devaluation of the peso. Higher tariffs substantially reduced traffic volume on many roads, and the government eventually stepped in to bail out nearly all the consortiums involved in road concessions.

In some cases tariff levels are quoted and payable in foreign exchange by a purchasing state enterprise, such as in the power purchase agreement between the National Power Corporation of the Philippines and the Subic Bay Power Corporation. The Philippine government has guaranteed the payment of the capacity charge under the agreement and therefore shoulders a substantial exchange rate risk over the life of the project.

At the national level large-scale reliance on foreign savings could become a source of economic volatility. Increasingly integrated international financial markets have given a substantial
degree of mobility to capital. This means that capital flows can reverse in the event of a perceived crisis, forcing countries into financial and economic turmoil. This concern is particularly relevant to foreign portfolio investments, where a drying up of foreign flows can jeopardize the realization of targeted investments.

When foreign savings are mobilized to finance infrastructure projects, the foreign exchange conversion required over the life of the projects may become a source of rigidity in a country’s external accounts. Foreign funds that are used to finance equity and debt components of large infrastructure projects require that substantial proportions of project revenues be converted and expatriated over the periods of debt maturity and concession rights (some as long as thirty years). The required outflow is effectively equal to the foreign equity plus the net return on that equity and the foreign exchange debt service payments over the life of the project.

The foreign exchange demand that is generated by foreign currency financing of infrastructure assets is not necessarily compensated by matching net inflows from exports. Many countries that lack developed local capital markets (and thus depend on foreign financing of infrastructure) are also implementing economic adjustment and reform programs. These programs are intended to improve transparency in resource allocation and emphasize economic comparative advantages, improving signals for export-oriented investment and growth. The response of the export sector may not, however, be as swift as expected or required.

In fact, large inflows of foreign financing for infrastructure privatizations or new investments may actually hurt the very export sector that these projects depend on for foreign exchange. Mexico, for example, had sizable inflows in the early 1990s, including funds directed to infrastructure privatization and new infrastructure investment. But the peso appreciation caused by these inflows resulted in imports growing faster than exports during the first half of the 1990s. For Latin America as a whole exports grew by 9 percent in 1994 while imports increased by 12 percent (Naim 1995).

By contrast, Malaysia, which has complemented sound economic policies with timely financial sector reforms (including in the capital markets), has been able to mobilize substantial domestic resources to finance large private infrastructure projects. As a result locally financed infrastructure investments have achieved an important degree of insulation from exchange rate risks and will not place a long-term convertibility demand on foreign exchange markets.

Not all developing countries seeking to promote private infrastructure can copy Malaysia’s experience. But they should recognize the importance of promoting domestic financial markets within a stable macroeconomic framework. Steps to develop and deepen local financial markets may not immediately increase savings rates in countries where current savings rates do not meet the demand for investment in infrastructure. But these reforms will help transform existing savings into financial assets with longer maturities. This transformation will promote medium- to long-term investments that will in turn generate larger pools of savings through higher and steadier income growth. To move along this path, developing countries must promote the role of commercial banks, develop long-term bond markets, and reform the contractual savings sector. A stable, low-inflation environment is essential to developing these capacities.

The inflation challenge

Economic instability is high on the list of factors that discourage the private sector from committing its resources to commercial activities. Clearly, the longer is the duration of an investment undertaking, the greater is the need for economic stability and reasonable predictability. Infrastructure investments require a much longer stability horizon than other commercial activities, such as agriculture, manufacturing, and noninfrastructure services. To be financially viable at affordable tariffs or user charges, most infrastructure projects require financing of between ten and twenty-five years. The private sector’s willingness to commit its resources and undertake long-term financial obligations depends directly on the stability of the policy and institutional framework of the country where the investment is to take place.

High and volatile inflation rates, which shorten the investment horizon and severely disrupt economic activity, are a major sign of instability. High inflation not only makes long-term economic and financial planning less certain, it also creates major problems for long-term finance. Although long-term investment in a high-inflation environment can be funded by
long-term loans provided a high nominal interest rate is charged, inflation-adjusted interest rates are not a viable solution for long-term financing. Such rates do not provide investors with a realistic repayment schedule—one that can be supported by the cash flow from investments financed with the loan. Although high nominal interest rates in high-inflation economies provide adequate real compensation to lenders and reasonable real total costs to borrowers, they create problematic cash flows, especially for infrastructure projects. Front compression of the loan repayment profile in a high-inflation environment is generally incompatible with the stable cash-flow profile of infrastructure projects. In fact, high rates of inflation transform all long-term nominal interest loans into short-term loans, making them unsuitable for financing long-term investments (Box 4-1). A record of low and stable inflation is required to extend a country’s financial horizon. It is also a decisive factor in developing long-term fixed-income securities (see below).

**Bond markets and infrastructure finance**

Of the various instruments that can be used to finance infrastructure projects, long-term fixed-rate bonds are among the most suitable. Infrastructure projects tend to have stable earnings profiles over extended periods of time, providing a degree of predictability for future earnings. The earnings profile may not, however, be able to follow sharp swings, as may be required by sudden shifts in interest rates, since in many cases tariff levels are regulated or tariff adjustments require official approval. These features are compatible with the financing profile of fixed-rate bonds.

North American and European capital markets were formed when large public companies, most of which are now considered public utilities, first issued securities. Developing countries have generally avoided this possibility by financing these public works with government funds. The recent shift toward privatization and market-based financing of such services in developing countries shows how the financing demands of companies investing in or providing infrastructure services can benefit from well-developed bond markets while also contributing to the development of these markets by providing long-term investment outlets.

Fixed-rate bond prices are primarily determined by interest rate movements in the currency of the bond’s denomination. Thus a stable

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**Box 4-1: Long-term finance in an inflationary setting**

The following formula gives the nominal interest rate \( i \) in the presence of an inflation rate \( f \), and an expected real interest rate \( R_i \):

\[
(1 + i) = (1 + f)(1 + R_i)
\]

Thus an expected real interest rate of 10 percent in the presence of no inflation requires a nominal rate of 10 percent, while an expected real interest rate of 10 percent in the presence of 100 percent annual inflation rate requires a nominal rate of 120 percent.

A high nominal rate causes two loans of equal amounts and with similar maturity profiles ($5,000 loans, repaid in five end-year $1,000 payments) to have different repayment profiles, as shown in the table.

The front compression of repayment cash flow in the presence of 100 percent inflation is due to the fact that each $1 of loan would have to earn $1.2 of nominal interest for the lender to achieve a 10 percent real increase in the buying power of the loaned amount. That is, $1 to retain the buying power of the principal amount and $0.2 to provide the buying power of the $0.1 interest at the end of the first year.

**Distribution of loan repayments under two inflation profiles**

<table>
<thead>
<tr>
<th>End of year</th>
<th>No inflation</th>
<th>100 percent annual inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23.0</td>
<td>60.3</td>
</tr>
<tr>
<td>2</td>
<td>21.5</td>
<td>25.0</td>
</tr>
<tr>
<td>3</td>
<td>20.0</td>
<td>9.9</td>
</tr>
<tr>
<td>4</td>
<td>18.5</td>
<td>3.6</td>
</tr>
<tr>
<td>5</td>
<td>17.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Mozes 1995.*
macroeconomic environment in that currency’s home country is important to the proper functioning of a long-term bond market. Inflation is perhaps the biggest worry for investors who purchase fixed-income securities such as bonds. Not only does inflation erode the purchasing power of the principal portion of the investment, it also affects interest rates, which can cause substantial capital losses. As a result investments in long-term fixed-rate bonds such as those used to finance infrastructure projects are subject to both the performance of the specific project and to a host of macroeconomic trends over an extended period. One way investors protect themselves from excessive risk is by limiting the terms of the bonds they buy—for example, three to five years rather than ten to fifteen years. Floating rate instruments also protect investors against interest rate and inflationary movements. But these instruments need to be complemented with derivatives such as interest rate swaps in order to offer a predictable cost profile for borrowers, especially for highly leveraged infrastructure projects. Long-term swap markets are, however, naturally as rare as long-term bond markets in developing countries.

Prospects in Latin America

Given these criteria, it should come as no surprise that domestic bond markets are either absent or at an infant stage (Argentina, Chile, Colombia, Mexico) in Latin America. In 1992 the corporate share of bond issues was 0.82 of GDP in Argentina and 0.11 percent of GDP in Brazil. Still, the Mexican peso crisis notwithstanding, economic management in Latin America has undergone a considerable transformation. Fiscal and economic reforms such as budget cuts, privatization, improved tax collection, and trade liberalization have improved the chances of sustained economic stability. The policy response to external shocks also has undergone a marked shift (Box 4-2). As a result seventeen of twenty-two Latin American countries had single-digit inflation rates in 1995, and average inflation in the region (excluding Brazil, which began an adjustment plan in 1994) dropped from 130 percent in 1989 to 14 percent in 1994. Given the economic stability that has been achieved, future efforts to develop long-term bond markets should focus on the regulatory framework and institutional infrastructure, including eliminating tax disincentives for holding and trading bonds, establishing and strengthening professional and widely owned credit rating agencies, creating efficient secondary market trading institutions to enhance liquidity, and lowering transactions costs.

Until 1988 Argentina’s unstable macroeconomic environment and hyperinflation precluded the development of long-term bond markets. But recent improvements in economic management—through macroeconomic and structural reforms, as well as regulatory and tax reforms specific to bond market development—have created the potential for growth of these markets. Even before Mexico’s peso crisis bond maturities in Argentina were short of the ranges suitable for financing infrastructure projects; most of the 105 bond issues registered with the National Securities Commission by September 1993 had two- to four-year maturities. Moreover, corporate debt issues in the bond markets were limited to $50 million, with maturities of no longer than five years (World Bank 1994a). The recently reformed pension and social security system should, however, become a major source of demand for long-term debt instruments. Between mid-1994 and early 1996 private pension funds accumulated about $2.5 billion of assets, mostly in government securities and bank time deposits (Vittas 1995a).

Bond markets are also growing in Colombia, although the total size of the corporate bond market is still far short of even the $2 billion in

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**Box 4-2: Better policy responses in Latin America**

When Mexico defaulted on its international debts in 1982, the flow of external funds to the region came to an almost complete halt. Latin American governments responded by closing their economies even more, tightening their grip on the private sector, imposing pervasive economic controls, and in some cases by nationalizing banking systems. In 1995, however, the initial reaction of the Argentine, Brazilian, and Mexican governments to the backlash produced by Mexico’s crash was to deepen market reforms, accelerate privatization plans, boost fiscal accounts, fine-tune foreign exchange regimes, step up efforts to promote exports, and strengthen private banks.

private annual investments targeted in the 1994–98 infrastructure development program. The interest rate on the latest issues of five-year government bonds has fallen to 25 percent (from 27 percent in 1995), benefiting from declining inflation. Still, this represents a real interest rate of around 5 percent. But prudent fiscal policies, a stable and declining inflation rate, growing demand for long-term bonds by infrastructure projects, and recent reforms in the pension system hold promise for the development of long-term bond markets in the next few years.

In Mexico the prospects for developing long-term bond markets depend on the restoration of macroeconomic stability in the wake of the December 1994 peso crisis. From 7 percent in 1994, inflation jumped to around 35 percent in 1995. Moreover, the exchange rate depreciated by about 90 percent in 1995. The resulting fluctuations in the treasury bill rate are shown in Figure 4-1.

**Emerging bond markets in East Asia**

In emerging East Asian economies the prospects for further developing and deepening bond markets benefit from much stronger economic fundamentals. In some East Asian countries historically low inflation and prudent fiscal policies have already created a viable capacity in bond markets (Table 4-1).

Government bonds still dominate most East Asian bond markets, but fiscal balance or surplus in many countries has allowed rapid expansion of corporate bond volume. The move toward privatization of infrastructure services and new investment by the private sector not only reduces the demand for budgetary outlays that might generate deficits, it also facilitates and accelerates the pace of corporate issues and the development of bond markets. Both Malaysia and Thailand have used their bond markets to raise substantial local financing for their privatization programs as well as for new private investments in infrastructure.

**MORE-ADVANCED MARKETS.** In Malaysia the issuance of debt securities increased by 160 percent to $3.2 billion in 1994, mainly as a result of the increase in huge projects (such as power generating facilities and roads) undertaken by the private sector. The $3.4 billion North-South Expressway, which was financed entirely by local funds, was able to raise the ringgit equivalent of $400 million by issuing convertible bonds. This issue gave investors a low-risk utility-type asset with healthy capital gains prospects once the concessionaire company became listed. The purchase by the Employees Provident Fund of the ringgit equivalent of $550 million of fixed-rate bonds as part of the financing for the $1.5 billion Lumut combined-cycle power project is another example of a bond market satisfying the financing needs of large infrastructure projects while providing an investment outlet for institutional investors looking for alternatives to now-infrequent issues of government securities. The rest of the financing for the Lumut project included the ringgit equivalent of $400 million in

![Figure 4-1: Mexican treasury bill rates (percent)](percent)

*Source: IMF data.*
Table 4-1: The emerging East Asian bond market, end-1994
(billions of U.S. dollars)

<table>
<thead>
<tr>
<th>Country</th>
<th>National government</th>
<th>State government</th>
<th>State enterprises</th>
<th>Central bank</th>
<th>Corporate</th>
<th>Total</th>
<th>Share of GDP (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>24.4</td>
<td>0.0</td>
<td>9.0</td>
<td>0.0</td>
<td>0.0</td>
<td>33.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>6.8</td>
<td>4.7</td>
<td>11.5</td>
<td>8.7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.0</td>
<td>0.0</td>
<td>1.5</td>
<td>6.8</td>
<td>0.7</td>
<td>9.1</td>
<td>5.8</td>
</tr>
<tr>
<td>Korea, Rep. of</td>
<td>27.9</td>
<td>2.7</td>
<td>37.4</td>
<td>32.1</td>
<td>60.8</td>
<td>161.0</td>
<td>42.8</td>
</tr>
<tr>
<td>Malaysia</td>
<td>29.0</td>
<td>0.0</td>
<td>3.7</td>
<td>2.0</td>
<td>4.9</td>
<td>39.5</td>
<td>56.0</td>
</tr>
<tr>
<td>Philippines</td>
<td>24.8</td>
<td>0.0</td>
<td>0.1</td>
<td>0.2</td>
<td>0.0</td>
<td>25.1</td>
<td>39.3</td>
</tr>
<tr>
<td>Singapore</td>
<td>42.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
<td>44.9</td>
<td>72.4</td>
</tr>
<tr>
<td>Thailand</td>
<td>2.6</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
<td>3.5</td>
<td>13.7</td>
<td>9.8</td>
</tr>
<tr>
<td>Total</td>
<td>151.0</td>
<td>2.7</td>
<td>59.3</td>
<td>47.9</td>
<td>77.1</td>
<td>338.0</td>
<td></td>
</tr>
</tbody>
</table>


equity from Malaysian sponsors and $550 million from a syndicate of Malaysian commercial banks.

As recently as 1990 almost 91 percent of the bonds outstanding in Thailand were government issues; the rest were state enterprise issues. Corporate bond issues were severely restricted by the Public Company Law, which allowed only public enterprises listed on the Stock Exchange of Thailand to issue debt instruments. Private companies and unlisted public enterprises were prohibited from selling bonds to the public. Such restrictions, as well as the decline in outstanding government issues as the government's fiscal position shifted to surplus in 1988, caused the Thai bond market to shrink in the late 1980s. In 1992 a new Public Companies Act and Securities and Exchange Law allowed all public and private companies to issue bonds. As a result the size and composition of the Thai bond market changed, with the share of corporate bonds growing from 3 percent of the market in 1992 to 26 percent in 1994 (Table 4-2).

Table 4-2: Thailand’s domestic bond market, 1988–94
(billions of U.S. dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Government</th>
<th>State enterprises</th>
<th>Corporate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>8.42</td>
<td>0.42</td>
<td>0.00</td>
<td>9.83</td>
</tr>
<tr>
<td></td>
<td>(95)</td>
<td>(5)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>7.82</td>
<td>0.47</td>
<td>0.00</td>
<td>9.29</td>
</tr>
<tr>
<td></td>
<td>(94)</td>
<td>(6)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>7.62</td>
<td>0.71</td>
<td>0.00</td>
<td>9.33</td>
</tr>
<tr>
<td></td>
<td>(91)</td>
<td>(9)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>5.91</td>
<td>1.97</td>
<td>0.00</td>
<td>8.88</td>
</tr>
<tr>
<td></td>
<td>(75)</td>
<td>(25)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>5.27</td>
<td>3.00</td>
<td>0.20</td>
<td>9.47</td>
</tr>
<tr>
<td></td>
<td>(62)</td>
<td>(35)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>3.98</td>
<td>5.33</td>
<td>1.04</td>
<td>11.35</td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(52)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>2.63</td>
<td>7.56</td>
<td>3.49</td>
<td>14.67</td>
</tr>
<tr>
<td></td>
<td>(18)</td>
<td>(56)</td>
<td>(100)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are percentages.
The rapid growth of the corporate segment of the Thai bond market has enabled greater local financing of infrastructure privatization and investments. In 1994 the Thai government set up the Electricity Generating Company with an initial generating capacity of 600 megawatts. That same year, half of the company's shares were privatized through a public offering that raised the baht equivalent of $180 million. The company is now bidding for new generation capacity, with the Rayong Power Plant as the first of such ventures. To acquire the Rayong plant the Electricity Generating Company borrowed about $470 million (including bond issues and syndicated loans) from local and international sources. Of this, the baht equivalent of $240 million was raised in local markets, half of it through a ten-year fixed-rate bond issue.

Public enterprises, especially in infrastructure and utilities, have been central to the development of Asian bond markets. As noted earlier, except in the Philippines, state enterprises in East Asia are more efficient than their counterparts in most other developing countries. They also have benefited from a sound economic framework that has kept inefficient pricing to a minimum. As a result these entities can participate in capital markets without requiring preferential treatment while also helping to set benchmarks for long-term securities.

The Korea Electric Power Corporation, for example, periodically issues bonds to raise revenue to expand power generating facilities. These bonds have three- to five-year maturities, and their interest rates are similar to corporate bonds. The nominal value of Electric Power Corporation bonds issued between 1983 and 1994 was about $7.1 billion. Similarly, highway construction bonds are issued with three-year maturities and trade like corporate bonds. Other such bonds, referred to as special bonds, include Korea Telecommunications Corporation bonds, Korea Gas Corporation bonds, and Public Waterworks bonds.

Thai state enterprises are also major players in the bond market. Faced with massive capital expenditure bills and the government's strategy of financial self-sufficiency, these enterprises have turned to local capital markets for funds. Between 1990 and 1991 the value of state enterprise bonds quintupled. The growing number of state enterprise bonds being issued serve as important benchmarks for the rest of the market. In April 1995 the Government Housing Bank raised 1 billion baht ($25 million) using a coupon of 9.62 percent and was followed by the Metropolitan Waterworks, which raised 1.6 billion baht ($64 million) at 10 percent, and the Rapid Transit Authority, which raised 2 billion baht ($80 million) at 9.99 percent. The maturity of bonds issued by state enterprises ranges between three and ten years. Some of these bond issues are in the form of floating rate notes.

Thailand demonstrates how positive shifts in the government's fiscal position plus regulatory reforms can improve the climate for long-term financial instruments and free up resources to finance more productive sectors. The recent success of public enterprises and private investors in accessing a greater volume of resources in Thai markets is the result of continued surpluses in the government's fiscal position, which have fostered macroeconomic stability and low inflation. Thailand's inflation rate has almost halved since the fiscal deficit turned into fiscal surplus in 1988, with average inflation of 4.94 percent during 1989-94. The Thai bond market is also preferred to commercial banks, whose funds are more expensive. Whereas domestic banks charged an average interest rate of 13-14 percent a year in 1994 to prime corporate borrowers, the annual cost to similar corporations of issuing a five-year bond was about 12 percent. Bonds also offer higher returns to investors—an A-rated bond with a five-year maturity yields about 12 percent a year, compared with a 6 percent return on savings deposits and 10 percent interest on one-year deposits.

LESS-ADVANCED MARKETS. A lack of appropriate benchmark rates is a major drawback of the underdeveloped bond markets in China, Indonesia, and the Philippines. In the absence of reliable benchmarks it is difficult to price long-term corporate debt and impossible to price floating rate debt. The prevalence of U.S. Treasury rates and the London Inter-Bank Offered Rate (LIBOR) in pricing U.S. dollar debt issues in the U.S. and Eurodollar markets illustrates this. Market-based benchmarks enable market participants to price bonds in both primary and secondary markets. Such benchmarks may include securities issued by a national mortgage corporation, state enterprise bonds, or repackaging of existing debt issues of major state-owned entities.

In the Philippines private sponsors have invested in many greenfield infrastructure projects, mostly in power generation. At least
80 percent of private infrastructure finance has come from foreign sources. The share of externally financed debt is even higher—more than 90 percent—because the local financial sector and capital markets are unable to offer long-term funds at appropriate cost and maturities (Price Waterhouse 1995). Government short-term paper dominates domestic securities issues, though some longer issues have recently taken place (Figure 4-2). In the past the high interest rates paid on risk-free assets, such as short-term government treasury bills, prevented the development of a long-term debt market because private issuers could not compete.

Prudent macroeconomic management has facilitated the gradual development of the Philippines' bond market. Expenditure controls and increased resource mobilization have significantly reduced the public sector deficit, with the fiscal position running a surplus since 1994. In addition, restructuring enabled the Central Bank to conduct more effective monetary management. As a result of such measures annual inflation fell from 18.7 percent in 1991 to 8.5 percent during 1993–95.

Since 1993 the government has issued floating rate notes with two- to three-year maturities. These notes, priced at par with an interest coupon based on ninety-one-day bill rates plus a fixed spread, have been very successful and the market is now well established. In June 1995 debt markets took another important step forward with the first issue of five-year fixed-rate treasury notes by the government. The 3 billion peso ($117 million) issue was oversubscribed, resulting in a slightly lower interest rate (15 7/8–16 3/8 percent) than was projected. Rates moved down again for the July issue (12 3/8–13 percent). Longer-term government issues have helped extend the maturity of the benchmark yield curve in the Philippine debt market.

The tax regime has been a major impediment to the development of the bond market in the Philippines. Specifically, a 0.5 percent documentary stamp tax made borrowing through bonds more expensive than loans from commercial banks. Furthermore, the tax inhibited the development of a secondary market for debt because every sale of a debt instrument was subject to the tax. The government recently replaced the stamp tax with the newly expanded value-added tax. Since borrowers can deduct the value-added tax as an input tax credit, the distortions caused by the documentary stamp tax regime have been removed.

Nondiscriminatory treatment that levels the playing field between bonds and other financial investments (for example, in the taxation of dividends, interest, and capital gains and the levy of withholding taxes) is essential to promoting the development of bond markets as an efficient financing source for corporations. Some institutional issues relating to bond market development are discussed in Box 4-3.

Role of credit rating agencies

Infrastructure projects often issue bonds that stretch out to fifteen years or beyond. Purchasers of such long-term instruments must have
Box 4-3: Institutional aspects of bond market development

Bond markets cannot grow without the institutional infrastructure needed to trade accurately, quickly, and securely. Institutional arrangements should usually be provided by private market participants but might, in the initial stages, need some official encouragement and support. There are several key elements of such infrastructure. First, payment, transfer, and custody systems should be reliable and incur minimum transaction costs for investors and issuers of bonds. Second, market regulations for issuing and trading bonds should require full disclosure of financial information by issuers. Pricing information on bid and offer prices is also desirable. Third, training and education are important. Public and private entities in developing markets will need to educate the public and train market professionals about such concepts as yield to maturity, duration, and convexity. The task is more demanding if the intention is to establish a market in derivatives or repurchases.


Box 4-4: The first rating agency

The rating system was introduced in the U.S. bond market in 1909, when John Moody published the first debt ratings as part of his Manual of Railroad Securities. The ratings were based on reports on the financial quality of some 250 major U.S. railroad companies. To allow users of the manual to quickly compare the quality of each of the several thousand bonds that the companies had outstanding, Moody assigned each bond a rating. His A-through-C system has since become the world standard. The importance of ratings increased greatly in U.S. capital markets after the Great Depression of the 1930s, when the perception of risk of investing in fixed-income securities was underscored by high levels of defaults.


For regulators, ratings can serve as an independent yardstick for determining the eligibility of some issuers to offer new debt securities. Many regulators also use independent credit ratings to help them monitor the financial soundness of the organizations they are responsible for, ranging from banks to insurance companies and public utilities. Finally, rating agencies enhance the transparency of the market by providing a common language for credit risk evaluation and by contributing to the market's common body of analytical information on the quality of debt issuers.

In many countries central banks or government agencies check the credit quality of companies to determine their eligibility to enter the nation's fixed-income markets or to monitor the credit quality of market participants over time. Transferring these functions to an independent credit rating system helps lower regulatory costs while removing an obstacle to market development.

The major rating agencies in eight Asian countries are listed in Table 4-3. The quality and performance of these agencies depend on their ownership structure and the general structure of the securities market, particularly the mode of government regulation and intervention.

Rating Agency Malaysia is the most successful local rating agency in the region. By March 31, 1995, it had issued ratings for about $10 billion equivalent of private debt securities. Institutional investors in Malaysia, such as the
Table 4-3: Major local credit rating agencies in Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Chenxing Securities Rating Company</td>
</tr>
<tr>
<td></td>
<td>Dagong International Securities</td>
</tr>
<tr>
<td></td>
<td>Rating Company</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Moody's (local office)</td>
</tr>
<tr>
<td></td>
<td>Standard and Poor's (local office)</td>
</tr>
<tr>
<td>India</td>
<td>Credit Rating Information Services of India Limited</td>
</tr>
<tr>
<td>Korea, Rep. of</td>
<td>Korean Investors Service</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Rating Agency Malaysia Berhad</td>
</tr>
<tr>
<td>Philippines</td>
<td>Credit Information Bureau Inc.</td>
</tr>
<tr>
<td>Singapore</td>
<td>Moody's (local office)</td>
</tr>
<tr>
<td>Thailand</td>
<td>Thai Rating and Information Services</td>
</tr>
</tbody>
</table>

Employees Provident Fund, recently have benefited from more flexible investment guidelines allowing them to invest in rated private securities, including investments in the North-South Highway and the Lumut power project. For future development of the Malaysian bond market, which has reached a relatively mature level and size, it is important that more competition be introduced in the rating business. A competitive rating industry would help ensure continued objective ratings and prevent rent-seeking.

Two Chinese rating agencies have received approval from the People's Bank of China to operate at the national level. The bank also has approved eighty-two local credit rating agencies; some of the local agencies are essentially accounting or consulting firms. Rating agencies are used to help select the enterprises that are granted permission to issue bonds. Since the parameters of bond markets in China are still set by the government through a credit plan, the rating agencies are of limited value to the government and investors. Furthermore, investors do not place much weight on the rating agencies' assessments because of an excess supply of investible funds and because state-owned enterprises rarely fail. As long as socialized ownership allows enterprises to operate under soft budget constraints, the risk assessment role of rating agencies will remain marginal.

In the Philippines the Credit Information Bureau has been in operation since 1982. The bureau is controlled by a group of companies who are in effect also the issuers. Allowing representation from a more diverse set of institutions—especially leading financial intermediaries who will distribute the debt issues in the primary and secondary markets—would significantly improve the bureau's operations. The bureau also needs to strengthen its monitoring of rated issues, since by mid-1995 only 5 percent of the initial ratings had been upgraded or downgraded. Until recently Korean rating agencies were constrained by the requirement that all bonds be guaranteed by financial institutions. Such requirements create an investment culture that emphasizes a reliance on guarantees rather than on measuring and managing credit risks, and so marginalizes the rating agencies.

Finally, government support is essential to the establishment and development of rating agencies. Rating agencies are service-oriented enterprises. Their commercial success depends on the demand for their services and the price users are willing to pay. In industrial countries demand for rating agency services is firmly established, and almost all rating agencies have been profitable. In Asian emerging markets only two rating agencies—Credit Rating Information Services of India Limited and Rating Agency Malaysia—were profitable by mid-1994, while the Philippine rating agency posted its first profit in 1994 after being in existence for more than a decade. Governments can help promote rating agencies using indirect means, such as by instituting regulations that use ratings as a measurement of risk. As noted earlier, government regulatory authorities will in turn benefit from the rating agencies' credit assessment and monitoring activities. Rating agencies are particularly useful in helping regulatory authorities to construct prudential guidelines for investment by the contractual savings sector, especially pension funds.

Developing pension funds for infrastructure finance

Pension funds are among a class of relatively new nonbank financial intermediaries in most developing countries. They sell employees and self-employed people secondary securities in the form of contractual agreements that provide for benefit payments upon the participant's retirement. Because their benefits are to be paid in the future, the secondary securities (that is, the liabilities of the pension funds) are effectively long term and the primary securities (their assets) can and should also be long term. Pension funds are
part of the contractual savings sector. Contractual savings are any transaction in which economic agents enter into a binding arrangement with institutions, public or private, to trade current consumption for future income. Contractual savings institutions (life insurance companies, occupational pension schemes, national provident funds, and funded social security systems) have long-term and fairly predictable liabilities. The institutions comprising the contractual savings sector are often referred to as institutional investors because of their role as investors in capital markets. They are potentially good sources of finance for investment in corporate bonds and equities. Contractual savings institutions acquire funds from the public at periodic intervals on a contractual basis, transform these contributions or premiums into assets, and use the earnings to pay out the benefits and claims on the policies. The savings mobilized, particularly in life insurance and funded pension funds schemes, are long-term, illiquid, stable, regular, noninflationary, and to some extent accurately determinable, depending on the precision of the actuarial base. As such, contractual savings institutions can play a key role in capital market development.

In higher-income countries these institutions are major investors in the securities market, especially in long-term debt instruments. They provide savers with opportunities to diversify risk and with the benefits of investing in a portfolio selected by professional investment managers. A 1993 report, commissioned by the U.S. Congress, on financing future infrastructure in the United States cited further mobilization of the resources of institutional investors as a priority (CPIAI 1993). The report recognized institutional investors not only as potential sources of capital but also as players in infrastructure finance that can bring the discipline of investment risk and return evaluations to infrastructure decision-making. Also, when institutions such as pension funds grow in size and relative importance, new instruments are developed to meet their needs and to fill perceived gaps in the market. For instance, the development of securitization and financial derivatives in the United States has been attributed, at least in part, to the investment and risk management needs of pension funds and other institutional investors. The emergence of block trading and the reform of stock exchanges around the world, including the abolition of fixed commissions, can also be partly attributed to the growth of pension funds and other institutional investors. Figures on the total pension assets of selected industrial countries are shown in Table 4-4.

The emerging market economies in Asia have already begun to implement the policies that made contractual savings institutions so prominent in saving and investment in industrial countries. In 1994 domestic institutional investors in Asian countries, including mutual funds, held about $109 billion (World Bank 1995c). Malaysia and Singapore accounted for 70 percent of this amount, which suggests the enormous potential for saving and investment through these institutions in other countries of the region.

Trends in the asset accumulation of contractual savings institutions in selected developing and industrial countries are shown in Table 4-5.

Once legal and regulatory reforms have led to the establishment of public or private institutions such as funded pension schemes, it is important that these institutions be subject to investment policies and regulations that allow them to maximize their returns for the benefit of their members. In many developing countries, however, the preemptive use of these funds by governments (through requirements to invest in government securities and low-return social sectors) has been a major impediment to the development of contractual savings as a source of long-term corporate finance. Government borrowing from contractual savings institutions deprives markets of long-term funds, limiting equity investment, stock market growth, and credit to the private sector.

| Table 4-4: Pension assets in selected industrial countries, 1989 and 1994 (billions of U.S. dollars) |
|---------------------------------|----------|----------|
| Country                       | 1989     | 1994     |
| United States                 | 2,426    | 3,760    |
| Japan                         | 513      | 1,118    |
| United Kingdom                | 453      | 775      |
| Netherlands                   | 202      | 264      |
| Canada                        | 181      | 238      |
| Switzerland                   | 133      | 191      |
| Germany                       | 84       | 124      |
| Australia                     | 42       | 82       |
| Sweden                        | 60       | 78       |
| Denmark                       | 33       | 53       |

Source: Intersec Research Corporation, Stanford, CT.
Table 4-5: Trends in asset accumulation in contractual savings, 1970-94

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>1</td>
<td>26</td>
<td>43</td>
</tr>
<tr>
<td>Malaysia</td>
<td>18</td>
<td>41</td>
<td>47</td>
</tr>
<tr>
<td>Netherlands</td>
<td>45</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>28</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>20</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>51</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>43</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>43</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

a. Figures are percentages of GDP.
b. 1981.
c. 1976.
Source: Vittas 1995b.

Under prudential investment regulations pension funds have a great potential to collect and accumulate savings (Box 4-5). If the growth in assets of these institutions in developing countries that have implemented economic and institutional reforms is any indication, the volume of accumulated resources can more than meet these countries' infrastructure investment gap within five to ten years. As an example, funding all the pensions in Latin America to the level necessary to pay retirees (64 and older) in 2025 the 1996 per capita income would require 9 percent of regional GDP. This amount, nearly $110 billion a year, is well in excess of projected infrastructure financing needs (Chrisney 1995).

These benefits are, of course, realized within the confines of the prudential regulations that define the investment parameters of these institutions. Prudential thresholds will have to be applied to the level of investment in higher-risk securities relative to government securities or bank time deposits. The status of capital markets in each country will help guide the development of regulations that allow diversification of investments across a broader array of assets. Legislation on the investment portfolio of pension funds should reflect efforts to maximize yield, or at least to invest in secure and profitable assets. Relaxation of investment rules involves lowering the ceiling on government bonds and granting permission to invest in equities, and ultimately to invest in overseas assets.

As mentioned earlier, contractual savings institutions could contribute substantially to the development of national capital markets and more generally to the financial and monetary development of developing countries. When they are free to choose among assets—within practical and efficient prudential regulation—contractual savings institutions try to maximize their risk-adjusted returns, for which long-term fixed-income instruments are the most logical choice. They also attempt to diversify their investments in these instruments, including into infrastructure.

Countries that have already reformed their pension institutions are reaping considerable benefits in terms of mobilizing local savings to finance infrastructure investments. For instance, Chilean pension funds, which were privatized and reformed in the early 1980s, had total assets exceeding $22 billion (43 percent of GDP) by 1994. Holdings included 55 percent of government bonds (including securities issued by the central bank), 62 percent of mortgage bonds, and 59 percent of corporate bonds. The funds also accounted for 11 percent of corporate equities and 9 percent of bank deposits. The pension funds played an instrumental role in the development of national capital markets and more generally to the financial and monetary development of developing countries.
privatization of several utilities in the mid-1980s, and now hold 10-35 percent of the equity of privatized utilities. These equities, worth nearly $6 billion, account for 83 percent of the fund’s equity holdings. The funds were also an important source of financing for the Santiago subway system and the national telephone company. By 1995 pension funds and insurance companies owned 14.5 percent of the telephone company’s shares (out of total equity of $1.5 billion equivalent). Chilean pension funds recently received permission to invest abroad because they have more or less run out of domestic opportunities (Box 4-6).

Malaysia also has done well in promoting the role of contractual savings institutions in mobilizing domestic savings and directing it toward long-term investments in infrastructure (Table 4-6). The Employees Provident Fund dominates this sector, holding more than 70 percent of total contractual savings in the country.

As a major holder of Malaysian government securities with maturities up to fifteen years and beyond, the Employees Provident Fund’s investment profile is quite compatible with the financing requirements of infrastructure projects. Accordingly, with the removal of certain regulatory constraints on investment rules, the fund has become an active player in financing infrastructure projects (Box 4-7).

The North-South Expressway and the Lumut Power Station are two prominent examples of the fund’s participation in the financing of private infrastructure projects. Along with a syndicate of forty-six other financial institutions, the fund helped finance the ringgit equivalent of $1.8 billion of debt for the North-South Expressway, its first involvement in project financing. As part of $1.1 billion of debt financing for the Lumut project, the fund purchased the ringgit equivalent of $550 million of fifteen-year fixed-rate bonds.

### Box 4-6: Investment rules for Chilean pension funds

Chilean pension funds’ investments are subject to limits by class of instruments and issuer, expressed as a percentage of total assets of the fund or as a percentage of the liabilities (or equity) of the issuer. These limits have been revised frequently. Initially no investments in corporate equities were allowed, but later such investments were permitted subject to increasing limits (currently 30 percent of the fund’s assets). Pension funds are not allowed to place more than 5 percent of their assets in the equity of a single company or to acquire more than 7 percent of the equity of a single company. These limits are substantially lower for companies with concentrated ownership and illiquid securities.

Investment in overseas assets was originally prohibited but recently has been allowed up to a rather low 10 percent limit. Actual holdings of overseas securities amount to less than 1 percent of total assets.


### Table 4-6: Assets of Malaysia’s provident, pension, and insurance funds, 1989–94

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees Provident Fund</td>
<td>40.00</td>
<td>40.34</td>
<td>41.00</td>
<td>42.09</td>
<td>44.54</td>
<td>45.68</td>
</tr>
<tr>
<td>Other provident funds</td>
<td>4.27</td>
<td>4.31</td>
<td>4.08</td>
<td>4.19</td>
<td>6.07</td>
<td>6.65</td>
</tr>
<tr>
<td>Life insurance funds</td>
<td>5.92</td>
<td>6.03</td>
<td>6.46</td>
<td>6.08</td>
<td>7.06</td>
<td>8.05</td>
</tr>
<tr>
<td>General insurance funds</td>
<td>1.84</td>
<td>1.98</td>
<td>2.31</td>
<td>2.64</td>
<td>3.01</td>
<td>3.30</td>
</tr>
<tr>
<td>Total</td>
<td>52.04</td>
<td>52.67</td>
<td>53.85</td>
<td>55.00</td>
<td>60.67</td>
<td>63.68</td>
</tr>
</tbody>
</table>

| Total (billions of U.S. dollars) | 21.44  | 24.44  | 28.0   | 32.56  | 39.56  | 47.12  |

*Source:* Bank Negara Malaysia and World Bank data.
Box 4-7: Malaysia's Employees Provident Fund: From noninflationary financing for the government to financing the private sector

The Employees Provident Fund (EPF) is Malaysia's largest provident and pension fund and largest institutional investor. By the end of 1994 it represented the second largest group of financial institutions, lagging behind only the commercial banks. In its early years the fund was required to invest its resources as deposits with the commercial banks. It was later permitted to invest in Malaysian government securities, deposits with banks, and loans to approved companies in the form of private debt securities and trustee shares. At least 70 percent of its annual investible and cumulative funds had to be invested in government securities.

The government's borrowing needs have fallen in recent years, however, due to its improved financial position and downsized operations. Gross issues of government paper fell from $12 billion in 1986-90 to about $4.5 billion in 1991-94. As a result government issues can no longer fulfill the EPF's 70 percent statutory requirement. Recognizing the investment constraints faced by the fund, the scope of the fund's permissible investments was widened in 1991 to cover new areas, including real property, privatized projects, joint ventures, and bills of exchange. In addition, the new act requires the fund to invest only half of its annual investible funds in government securities, provided that the outstanding amount of government securities does not fall below 70 percent of its cumulative investible funds.


Although the role of the contractual savings sector in generating savings has improved, these institutions have considerable potential for generating additional savings. Some of the World Bank's recommendations for contractual savings sector reforms in the Philippines include:

- Fully or partially privatizing asset management, with a provision for investing abroad if prudent.
- Exempting the social security funds from withholding tax.
- Abolishing the 5 percent tax premium on the life insurance industry and allowing tax deductions for contributions to private pensions (subject to an overall ceiling).

A recent report on capital markets in the Philippines estimated that 8-10 billion pesos ($360-600 million) from the contractual savings sector could be mobilized for investment in long-term bonds (World Bank 1995e). At this stage new and more flexible asset allocation guidelines are required to enable the contractual savings sector

Table 4-7: Contractual savings in the Philippines, 1980–93
(billions of pesos)

<table>
<thead>
<tr>
<th>Type of fund</th>
<th>1980</th>
<th>1985</th>
<th>1990</th>
<th>1993</th>
<th>Average annual growth (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social security</td>
<td>18.4</td>
<td>43.1</td>
<td>98.6</td>
<td>154.1</td>
<td>17.8</td>
</tr>
<tr>
<td>Social Security System</td>
<td>9.2</td>
<td>26.3</td>
<td>62.5</td>
<td>103.8</td>
<td>20.5</td>
</tr>
<tr>
<td>Government Social Insurance System</td>
<td>9.2</td>
<td>16.8</td>
<td>36.1</td>
<td>50.3</td>
<td>14.8</td>
</tr>
<tr>
<td>Occupational pensions</td>
<td>n.a.</td>
<td>n.a.</td>
<td>20.0</td>
<td>40.0</td>
<td>n.a.</td>
</tr>
<tr>
<td>Insurance</td>
<td>11.1</td>
<td>18.1</td>
<td>45.5</td>
<td>62.0</td>
<td>14.1</td>
</tr>
<tr>
<td>Total</td>
<td>29.5</td>
<td>61.2</td>
<td>194.0</td>
<td>256.1</td>
<td>18.1</td>
</tr>
<tr>
<td>Share of GDP (percent)</td>
<td>12.1</td>
<td>10.7</td>
<td>15.3</td>
<td>17.6</td>
<td></td>
</tr>
</tbody>
</table>

to become a more active player in capital markets and project financing.

In Thailand pension and provident funds play a limited role in capital markets and infrastructure finance. The government pension fund is not funded, and pension payments are made from the government's annual budget. The government is planning a Central Provident Fund with an initial government contribution of $100 million equivalent. Total capitalization of existing provident funds is still small ($1.2 billion), since they cover only 1 percent of the nonagricultural workforce.

Argentina and Colombia both enacted pension reform laws in 1993. Asset accumulation by new pension systems is still small but is expected to grow quickly. In Argentina the new funded system became operational in July 1994 and in its first eleven months mobilized $1.88 billion equivalent in long-term financial resources. For a one-year period this would correspond to slightly more than 2 billion pesos, or 0.7 percent of GDP.

Bolivia is advanced in its plans to enact a similarly broad and fundamental pension reform, while Mexico introduced a compulsory supplementary retirement savings scheme in 1992 but has yet to reform the social pension system. As explained in Box 2-3, Bolivia's pension reform is closely tied to infrastructure privatization since the new pension accounts will be endowed by the shares of several public infrastructure agencies. The pension account shares were placed with Citibank as trustee in July 1995 and will remain there until July 1997, allowing time for the enactment of the pension reform law.

**Strengthening commercial banks to provide infrastructure debt**

With the exceptions of Malaysia and recently Thailand, commercial banks in developing countries have played a very small role in project finance lending to infrastructure projects. In the Philippines, for example, domestic banks provided less than 5 percent of the financing for $1.4 billion of debt for a group of eight power projects (Price Waterhouse 1995). The situation is even worse in Latin America, where high inflation, exchange rate risks, and political uncertainty have made long-term financing extremely scarce.

In many developing countries the inability of commercial banks to provide medium- to long-term finance stems directly from the maturity structure of their liabilities. Most of the liabilities in these institutions are composed of demand and short-term savings deposits. Making long-term loans would create a serious maturity mismatch between the assets and liabilities of these institutions. This mismatch is even more dangerous in the absence of efficient and liquid money markets that would otherwise provide banks with some tools to manage their liquidity and interest rate risks.

In addition to requiring a low-inflation macroeconomic environment—which would help banks mobilize longer-term liabilities such as extended time deposits or negotiable certificates of deposit—most banks in developing countries need to strengthen their technical capacities in project finance. These institutions' limited experience with analyzing the various risks involved in limited recourse financing and lack of know-how on mitigation methods are the main reasons domestic banks have played an insignificant role in project financing activity.

This weak base of knowledge is the result of collateral-based lending, which guides the extension of credit in most developing countries. In the United States the requirement that a borrower post collateral or secure a guarantee from a third party generally means that their creditworthiness is otherwise insufficient. Thus the very need for this form of support implies a high level of risk. Where credit management is strong, however, collateral is not considered a substitute for creditworthiness—it merely provides an additional margin of protection for a loan that is already acceptable.

The weaknesses of commercial banks in developing countries are rooted in interventionist and repressive government policies that resulted in financial disintermediation. Such policies were often pursued in inflationary environments, which not only made financial assets unattractive to private savers but also forced banks to allocate a good part of their credit to priority sectors—often at subsidized, low-interest rates. Many developing country governments have required that 60–70 percent of bank credit be allocated, compared with about 20 percent in industrial countries. India is a good example. Until financial reforms were initiated in 1991, 90 percent of the country's commercial banking sector was owned by the state. Commercial banks were required to invest 15 percent of their funds in cash to fulfill the cash reserve requirement and 38 percent in government and government-
approved securities. In addition, 40 percent of the remaining funds (that is, nearly 19 percent of total funds) were required to be provided as loans to priority sectors at somewhat concessional rates (Vittas and Cho 1995).

Despite severe setbacks during the 1980s, commercial banks still played a prominent role in the financial sector in developing countries in the early 1990s, holding 40–75 percent of deposits and accounting for 25–60 percent of lending (Germidis, Kessler, and Meghir 1991). Commercial banks hold 50–90 percent of the assets of all financial intermediaries in most developing countries and will continue to be at the heart of their financial markets for the foreseeable future.

Financial sector reforms that revive or establish the role of commercial banks in long-term finance are essential for increasing the share of domestic resources in infrastructure finance. Commercial banks can play an important role in screening and monitoring the behavior of projects. By developing and maintaining long-term relationships with their customers, commercial banks can have superior information to that of outsiders, support expansion plans, and reduce the costs of temporary distress by providing lines of credit to their customers.

An efficient and deep commercial banking sector is important not only in terms of appraising and financing infrastructure investments but is also a necessary prerequisite for the development of the securities and eventually derivatives markets that are essential to structured financial markets. Bonds, for example, are not easily absorbed by individual investors. Thus most bonds are absorbed by financial institutions such as banks. Banks can also play a major role in enhancing the liquidity of bond markets by executing repo transactions where regulatory frameworks permit the offering and trading of such instruments. The trading departments of commercial banks use repurchase agreements to finance their securities inventories.

In Korea bonds held by banks grew from about $3 billion in 1985 to $37 billion in 1993, accounting for 43 percent of bond holdings by all financial institutions in 1993. Corporate bonds accounted for most of this growth; their total growth during this period was 1,938 percent, compared with 936 percent for government bonds (Table 4-8).

The share of bonds held by banks in the total market capitalization of bonds in Korea has been declining after rising considerably between 1985 and 1990. This decline is mainly the result of the rapid growth of the Korean bond market in recent years. In addition to holding and trading government and corporate bonds, Korean banks issue debentures to raise long-term funds. For instance, the first private bank to issue bonds was the Korea Long-Term Credit Bank. Established under the Long-Term Credit Bank Law, it began issuing bonds in 1980.

In Malaysia commercial banks account for a sizable portion of the financial institutions involved in bond markets. These operations are conducted under prudential regulations that establish and monitor risk-weighted capital adequacy ratios and statutory reserve requirements. Thus if a financial institution invests in a corporate bond issue it must adjust its capital funds and statutory reserves in order to maintain the capital adequacy ratio and reserve requirements. The central bank also limits the amount of loans a commercial or merchant bank can lend to a single customer. Finally, since the purchase of corporate bonds is considered to be an extension of credit to the issuer, such operations are subject to the single customer limit, with the first ninety-day holding period exempted.

In Malaysia's corporate bond market commercial banks mainly act as lead managers and

**Table 4-8: Bond holding by banks in the Republic of Korea, 1985–93**

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<tbody>
<tr>
<td>Total market capitalization of bonds</td>
<td>22.57</td>
<td>59.40</td>
<td>86.64</td>
<td>117.41</td>
<td>166.81</td>
</tr>
<tr>
<td>Amounts held by banks, of which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government and public bonds</td>
<td>2.21</td>
<td>15.03</td>
<td>15.17</td>
<td>17.42</td>
<td>22.38</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>0.68</td>
<td>9.68</td>
<td>13.09</td>
<td>13.71</td>
<td>14.36</td>
</tr>
</tbody>
</table>

underwriters of new corporate bond issues, investors for their own accounts, and intermediaries in the market, matching the funding requirements of issuers with the needs of investors. The composition of securities held by commercial banks in Malaysia is shown in Table 4-9.

The ultimate objectives of banking sector liberalization are to stimulate competition and allow greater freedom for banks to respond to market signals, choose their own customers, set interest rates, and determine the location of branches. Allowing foreign institutions to open branches, start joint ventures with local institutions, or provide specialized services from abroad can be another source of competition, enabling access to a larger pool of resources and introducing advanced technologies in financial intermediation. Deregulation, however, exposes financial institutions to greater risk exposure that requires careful supervision. The need for prudential regulation increases as financial systems become deeper and more complex. The main goal of financial regulation is to achieve stability without undermining efficiency.

Deregulation should be implemented with due consideration of a country’s underlying macroeconomic conditions as well as the technical capacities of its financial institutions (Box 4-8). In Venezuela, for example, the banking system was relatively easy to deregulate. Upgrading the regulatory framework was a much slower process, however—and that lag proved fatal. More than half the country’s banks failed because of massive corruption that went undetected by shoddy supervision and because of economic instability resulting from misguided policies. The bank failures led to a bailout that was proportionally more than five times the size of the U.S. savings and loan crisis (Naim 1995).

Mistakes are made under any system of finance. Market-based financial systems, like public ones, are subject to fraud and instability.

**Box 4-8: Necessary conditions for financial deregulation**

Interest rate deregulation should proceed in stages, with complete deregulation awaiting later stages of reform. Experience in many countries suggests that the following criteria should be satisfied before complete deregulation:

- Macroeconomic conditions are reasonably stable.
- The financial condition of banks and their borrowers is sound.
- A minimal base of financial skills has been attained.
- Checks are in place to limit collusion among banks in the determination of interest rates.

When these conditions are not satisfied real interest rates may rise to exorbitant heights, threatening the net worth of borrowers and ultimately the soundness of the financial system, as happened in Chile and Turkey in the 1980s. Malaysia and Korea adhered most closely to these criteria, both waiting until 1991 to achieve complete interest rate deregulation. The cost of observing these recommendations generally outweighs the considerable risks associated with liberalized interest rates when necessary conditions are not in place.

*Source: Caprio, Atiyas, and Hanson 1993.*
The goal is not to create a perfect system, but one that mobilizes resources efficiently, minimizes allocation mistakes, curbs fraud, and stops instability from turning into crisis. The resulting role for governments is to minimize their influence over pricing and allocation of credit and to focus on regulating and supervising financial institutions and markets in a stable macroeconomic environment.

Still, there is no single answer to how liberalized or tightly controlled a banking sector should be. The results of government interventions in setting interest rates and directing credit have not been uniform. Some countries that have achieved economic growth and rapid development, such as Korea and Malaysia, did not liberalize their financial sectors until recently. Similarly, in postwar Japan a major objective of government interventions was to achieve term transformation toward longer-term lending. Subsidized interest rates and directed credit programs can be justified when the investment risk of a particular activity is high because of such features as large scale and long gestation period.

In Malaysia no banking license has been granted to a foreign bank since 1973, yet 30 percent of domestic lending is done by foreign banks. International banks are allowed to enter joint ventures with domestic lenders, but they may own no more than one-fifth of the capital of such an institution. All banks must comply with the rule that nonresident companies must source at least 60 percent of their banking needs from local lenders. Restrictions on foreign entry have resulted in unusually large profit margins for domestic institutions such as banks and brokerage firms. Such profits may not be conducive to efficiency and lower intermediation costs in the long run.

Although East Asian commercial banks frequently issue bonds in order to raise longer-term funds, this instrument is rare among banks in Latin America. Banks in Chile and Colombia are raising funds through bond issues, although the effort is very recent in Colombia.

In Argentina banks raise funds in the market by issuing bonds with maturities of one to three years. Their ability to provide long-term loans is, however, hampered by uncertainty about the possibility of rolling over their maturing bonds. A recent World Bank loan for capital market development attempts to address this issue. Under the project a backstop fund will allow Argentine banks that meet certain operating criteria to purchase commitments for refinancing their maturing bonds at a preagreed rate should systemic disruptions prevent them from rolling over their bonds in the market at maturity. Qualifying disruptions are confined to events affecting all banks rather than those affecting a single issuer. Thus the backstop facility supports rather than supplants evolving private markets. Once banks purchase commitments, they can only exercise their rights if they maintain a credit rating above a certain minimum standard, as determined by at least two approved local credit rating agencies. After the exercise of any commitments, the backstop fund actively manages its inventory of bank debentures. When the markets stabilize, the fund sells its bond holdings in domestic or international markets, creating additional liquidity in secondary markets (Habeck 1994).
Notes

1. Another cause of the problem was that the selection of the conces-
   sionaires was based on the shortest concession period bid, with the
   maximum acceptable period having been 20 years. This resulted in
   very short concessions (under 10 years in some cases), which put
   upward pressure on tolls from the outset.

2. In private power projects the capacity charge is designed to recover
   the capital or fixed costs of the plant. The power purchaser is usually
   only obliged to pay for capacity that is dependable (that is, available
   to be called on in accordance with the power purchase agreement).
   Capacity payments generate sufficient revenue to cover the project’s
   capital and fixed costs and investor returns, which include costs that
   the project would incur even if the purchaser did not “dispatch” the
   plant and purchase electrical energy.

3. For instance, the annual conversion requirements for servicing the
   foreign financing component of an independent power producer
   financed with $300 million of debt at 10 percent annual interest and
   with a fifteen-year maturity and $100 million in equity with a net
   annual rate of return of 20 percent would be equivalent to about $60
   million a year. Therefore a $2 billion annual investment inflow over a
   five-year period on terms similar to those described above could
   potentially lock in an average annual outflow of close to $2 billion
   over a ten- to twenty-year period.

4. The government’s share, held by the Electricity Generating Author-
   ity of Thailand, was reduced from 100 percent to 48 percent. The
   remaining 2 percent is held by the Thai Crown Property Bureau.

5. In addition to the Korean Investors Service there are two other rat-
   ing agencies in Korea: National Information and Credit Evaluation,
   Inc., set up by the commercial banking industry, and the Korea Man-
   agement and Credit Rating Corporation, established by the Korea
   Development Bank.

6. Including banks, the Korea Credit Guarantee Fund, merchant
   banks, securities firms, and the Guarantee Insurance Corporation.

7. Including money market funds and mutual funds.

8. Savings are placed with these institutions for extended periods and
   are not frequently withdrawn.

9. Financial operations by contractual savings institutions are different
   from the financial operations of commercial banks in the sense that
   the money multiplier effect of their operations is small and thus does
   not fuel inflation.

10. The impact of life insurance, funded pension schemes, and provid-
    ent funds on the quantity of savings is the subject of considerable
    debate, but the impact on the quality of savings, especially through
    the increase in long-term financial savings, is evident.

11. In 1994 about 56 percent of Malaysian government securities, with
    a face value of $14.5 billion, had maturities above fifteen years; 21 per-
    cent ($5.6 billion) had maturities of eleven to fifteen years; 19 percent
    ($4.9 billion) had maturities of six to ten years; and 3 percent ($840
    million) had maturities of four to five years. The government stopped
    issuing securities with maturities of two to three years in 1990.

12. The old pension system was a “pay-as-you-go” system that was
    facing immense financial pressures.

13. Financial institutions include securities companies ($350 million),
    major pension funds ($4.1 billion), life insurance companies ($8.5 bil-
    lion), other insurance companies ($1.6 billion), and the three largest
    trust companies ($35.7 billion).
Conclusion

The need for transition to private financing of infrastructure has been generally acknowledged, but sustained progress across all sectors requires that developing countries pursue nationwide, economywide strategies. This process will require that careful attention be paid to the following guidelines and caveats:

- The transition strategy should be publicly elaborated by senior political figures, in legislation if necessary.
- The transition strategy may have to be implemented by special-purpose institutions with broad representation from the executive and legislative branches of the government. Private representation can also be beneficial. Such an approach helps governments concentrate their capacity-building efforts in the public administration to promote private infrastructure and facilitate the sharing of lessons and information about activities in different sectors. A common institutional approach not only helps minimize inefficient competition among different line agencies, it also generates comprehensive policy feedback for identifying and prioritizing reforms. Technical assistance from bilateral and multilateral sources could be better targeted for designing strategies and building skills for special-purpose institutions.
- To the extent possible, incremental capital expenditures that come from fiscal resources should be used to leverage private investment; this paper suggests various methods for doing so. Depending on country conditions, infrastructure financing vehicles of the type proposed in the Philippines and Colombia may be promising options.
  - Restructuring, corporatization, and privatization of public agencies providing infrastructure services is an essential element of the transition process.
  - External management expertise and financial resources are critical to an expeditious transition, but political and economic trade-offs have to be carefully weighed.
  - Provision of sovereign guarantees is essential for many developing countries embarking on the transition, but guarantees must be provided under accurate and active financial management.
  - Apart from political uncertainties, elements of the regulatory environment or the presence of nonviable public agencies in the market can give rise to market imperfections that can only be mitigated through sovereign guarantees. These imperfections should be identified and eliminated using carefully designed reforms.
  - Local capital markets development should be given top priority within the national strategy, with clear targets for achieving a tangible shift from foreign to local financing.
Main areas of focus should include stimulating demand for long-term assets through pension reforms and developing institutional and regulatory infrastructure for bond markets.

As far as the World Bank and other multilateral and bilateral development agencies are concerned, the following are among the useful contributions they can make to the process:

- They should work with governments in devising a strategy for transition to private financing of infrastructure and provide financial assistance in the context of a mutually agreed strategy. Various direct and contingent funding instruments can be linked to performance criteria that reflect progress on components of the transition strategy.

- They should design special seminars and courses targeting very high and lower level officials from a wide set of agencies in developing countries. These courses should provide the rationale for private infrastructure and the potential consequences of slow or no progress within the particular country environment. They also should present the salient features of experiences to date in terms of financing and contracting mechanisms. It is important that officials from all relevant agencies, no matter how specialized, be provided with a broad perspective on the issues that are involved in the transition. This will help ensure cooperation among various agencies in the implementation process.

- They should design and deploy flexible and adaptable financing instruments that reflect their ability to leverage maximum market funding. In this connection they should develop local currency financing and be prepared to manage foreign exchange risks to help expedite the development of local financial capacities. Another market support instrument would be to underwrite sovereign risk insurance in order to encourage long-term debt financing. These institutions' ongoing dialogue with member countries gives them a responsibility for and informational advantage in managing such risks. Moreover, they could draw on the benefits of diversification of relevant risks across large numbers of borrowing member countries.
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