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Services

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University of California at Berkeley  
Institute of Urban and Regional Development



# **An Overview of Private Sector Financing of Urban Infrastructure Services**

**David E. Dowall**

## **INTRODUCTION**

China has the world's largest population, approximately 1.2 billion people. Of the total, only 28 percent or about 324 million live in urban areas. China's low level of urbanization reflects its planning and development policies, which sought to maximize resources available for industrial development by increasing the labor force participation rate and holding down urban infrastructure investment. Since the 1950s, planners have controlled migration and population growth through a variety of programs. However, economic reforms and institutional changes now make it more difficult to control population movements and, as a result, China's rate of urbanization is accelerating. During the 1980s urban population growth increased at an average of 4 percent per annum. In the 1990s, urban growth rates exceed 6 percent (Courtney, 1995).

New policy directions taken during the 1980s have removed many of the constraints to small-town development such as permitting individuals, families, or production units to invest capital in tertiary activities for profit. Now rural towns and villages contain numerous small businesses and provide a range of commercial services. Many small towns are starting to attract industry. Continued urban growth and economic development requires enormous investments in urban infrastructure, specifically transportation, telecommunications, energy, water supply, waste collection and treatment, housing, schools, and public health services. Unfortunately, given current governmental policies, most of the small towns and villages are unable to generate sufficient financial resources to provide infrastructure. Changes in government policies and programs are needed to enable local governments to mobilize resources to finance infrastructure and urban services. However, public financial resources such as central government transfers or locally generated taxes are unlikely to keep pace with urban development requirements. An alternative source of financing for urban infrastructure is to tap the private sector. This paper outlines a variety of promising alternative techniques for mobilizing private sector capital.

## **THE BENEFITS OF PRIVATE SECTOR FINANCING OF URBAN SERVICES**

The private provision of urban infrastructure services yields three important benefits to local and central governments: (1) it significantly enhances the efficiency and quality of service provision; (2) it conserves scarce public sector resources; and (3) it provides additional sources of capital for financing infrastructure investments. This section of the paper reviews the long-standing arguments for the public

provision of infrastructure services and discusses the new view of infrastructure provision which stresses private sector provision.

The prevailing wisdom over the years has been that urban services are best provided for by local governments (Bahl and Linn, 1992). Most economic arguments stress the fact that urban public services are largely natural monopolies and are subject to significant externalities. Some services such as water supply, wastewater collection and treatment, schools, and security are so important and confer such significant public benefits (often referred to as "merit goods") that they should only be provided for by government. Public infrastructure services are typically so expensive that they are beyond the financial capacity of private businesses. Even if such systems could be financed through tariffs, it may be difficult to exclude non-payers from using them. These arguments have profoundly shaped urban public policies around the world and led to the proliferation of urban infrastructure services during the late 1800s in Western Europe and North America and the current massive expansion of infrastructure in Asia and Latin America. Table 1 illustrates trends in infrastructure coverage for low-, middle-, and high-income economies from 1975 to 1990.

**Table 1**  
**Infrastructure Coverage in Low-, Middle-, and High-Income Countries, 1975-1990**

Sector	Low- Income Coverage		Middle- Income Coverage		High- Income Coverage
	1975	1990	1975	1990	1990
Power generation (Kilowatts(000)/million persons)	41	53	175	373	2,100
Telecommunications (Lines/1000 person)	3	6	33	81	442
Sanitation (Percentage of population covered)	23	42	44	68	95+
Paved Roads (Kilometers/million persons)	308	396	1,150	1,335	10,106
xWater (Percentage of population covered)	40	62	54	74	95+

Source: The World Bank, World Development Report, 1994.

### *Improving Infrastructure Efficiency*

In the 1980s, public finance experts and economists began to seriously reassess arguments for the public provision of infrastructure services (Savas, 1982, and Roth, 1987). Engineers and economists looking at various infrastructure systems discovered that government-provided infrastructure services were poorly planned and managed. Case studies revealed widespread inefficiency. Infrastructure service output is frequently lost. Infrastructure systems are poorly maintained, and infrastructure services are underpriced, resulting in fiscal drains for governmental units. Electrical power supply losses are typically two-

three times higher for poorly run public corporations than for the most efficient private corporations (World Bank, 1994). Water losses often exceed 50 percent of water production in old poorly run municipal corporations. In Africa, nearly one-third of the roads built in the past 20 years are now useless due to inadequate maintenance. During the 1980s electrical power tariffs in developing countries were sufficient to cover only 60 percent of the actual costs of operating new systems.

Over the past 15 years, studies of infrastructure provision and management in developing as well as developed countries have pinpointed widespread inefficiencies and poor-quality service. The consensus view of infrastructure economists is that the widespread inefficiencies of infrastructure provision in developing countries is the result of weak or inappropriate economic incentives built into existing institutional and organizational structures. Extensive international experience directed toward improving the efficiency of infrastructure service delivery suggests that reforms should emphasize modifying the incentives which infrastructure managers face, so as to enhance their performance. Most recommendations center on introducing commercial principles to infrastructure provision and increasing competition between service providers (Kessides, 1993).

Private provision of infrastructure services is an important aspect of the overall reform of the sector. Private provision of infrastructure introduces commercial discipline into the operation and management of infrastructure services. Increased efficiency is due to a number of factors, including: (1) clarity of objectives of the private operator; (2) management autonomy of operator; (3) accountability of operator to his investors; (4) provision of managerial incentives to operator; and (5) competition from other firms or potential operators.

### *Conserving Scarce Public Sector Resources*

During the 1970s and 1980s, many OECD governments became concerned about their large and growing budget deficits (Butler, 1985). Consequently, throughout the 1980s, a main emphasis of economic policy was to control public spending and borrowing (OECD, 1991). With borrowing restricted, many sub-national units of government have not been able to keep pace with growing demands for infrastructure. Real, inflation-adjusted expenditures on infrastructure investment and maintenance have fallen dramatically. Given the lack of public sector capital to finance and operate infrastructure, many local and central governments started transferring responsibilities for infrastructure services from the public to the private sector. For example, in the U.S. many cities have shifted solid waste collection and management to private sector firms. In such cases, local governments no longer need to allocate public funds to support the operation of solid waste management services (Savas, 1982). Responsibilities for highway construction or transportation has been shifted to private companies, through concessions and BOT (build-operate-transfer) systems (Gómez-Ibáñez and Meyer, 1993). In other cases, governments are shifting operating responsibilities for water supply and wastewater collection and treatment systems to private firms by granting such firms concessions or long-term service/management contracts (Kessides,

1993). Shifting infrastructure service provision responsibilities to private sector firms helps local and national governments to conserve scarce resources and to better target their limited resources on activities or services which only they can provide.

### *Attracting Private Capital to Infrastructure Investment*

In response to restrictions on local and central government indebtedness, central and local governments have looked towards the private sector for infrastructure investment capital. Over the past ten years, a multitude of new financing tools have been developed to attract and channel private funds into infrastructure projects. Private financing of infrastructure service provision can be accomplished in a number of ways, including: (1) negotiated private contributions (development exactions) where a private developer pays for the infrastructure systems needed to support new development; (2) formation of joint ventures between public and private sectors to provide infrastructure services; (3) contracting out of services (the contractor would then finance the purchase or leasing of equipment to provide the service); (4) provision of long-term leases or concessions; (5) privatization of infrastructure services; and (6) private commercial or bond-based loans to governments or public utilities.

Motivated by concerns about inefficient infrastructure provision; the lack of financial resources in the public sector; limitations on public sector borrowing; and by changes in technology, financing methods, and institutional practices, the private provision of infrastructure services is rapidly expanding around the world. Over the past ten years, private sector provision of infrastructure is gaining acceptance and the share of urban services now provided by the private sector is increasing. As of 1993, private investment in developing-country infrastructure was averaging \$15 billion per year and growth. Private sector financing of all kinds currently accounts for about 7 percent of total infrastructure financing in developing countries. Over \$60 billion dollars on BOT projects have been financed between 1982 and 1995 (Public Works Financing, 1993). During the next five years, the share of private sector financing is expected to increase to 14 percent of developing-countries' infrastructure financing (World Bank, 1994). The dramatic growth in private sector financing reflects the increasing attractiveness of such investments and the significant changes in institutional environments which permit such forms of financing. The public sector benefits created by private sector financing of urban infrastructure services is clear. The next section looks at the private sector benefits.

### **WHY THE PRIVATE SECTOR MAY BE WILLING TO FINANCE URBAN INFRASTRUCTURE SERVICES**

There are essentially two conditions under which the private sector may be willing to provide or finance urban infrastructure services: (1) if it can earn a profit on the provision or financing; and (2) if the provision or financing of the service is a condition for approval of real estate development. If urban service provision follows market principles, businesses may be willing to finance urban infrastructure on



purely commercial terms. Tariffs for infrastructure services must be high enough to provide adequate cashflows to cover operating and maintenance costs, amortize capital investments, and provide net revenues as a return on invested capital. Private investors are particularly concerned with their rights to set and modify tariffs, the length of their contracts, and the level of competition they are likely to face. If these issues can be satisfactorily addressed, governments can successfully attract private firms to provide and operate urban infrastructure services. There are now many examples of companies around the world who are interested in providing urban services to cities and local governments — solid waste collection, electricity, water supply, wastewater collection and treatment, telephone services, roads, airports, etc. (Kessides, 1993).

Beyond contracting out, offering operating concessions, structuring joint ventures, or privatizing services, local governments frequently require the private sector to provide urban infrastructure as a condition for gaining development approval (Altschuler and Gómez-Ibáñez, 1993). Even if urban services are not provided for on a profit-making basis, real estate development companies are willing to provide such services if they are a condition of project approval. In many countries, local governments require that developers pay or directly provide urban infrastructure services as a condition of project approval. For example, developers have been required to provide road improvements, construct subway stations, or pay urban service fees or exactions as part of the project approval process. In some instances when a private sector firm is purchasing land from the government, infrastructure provision is included as part of the compensation for the land. In all cases where private developers agree to provide or pay for infrastructure, they do so because the economic benefits they gain from real estate development exceed the costs of the new development. If the costs of development exactions are excessive or not commensurate with the benefits of the project, developers will refuse to provide the services and not go forward.

## **SPECIFIC METHODS AND APPROACHES FOR PRIVATE SECTOR FINANCING OF URBAN INFRASTRUCTURE SERVICES**

This section provides an overview of the principal methods used by central and local governments to foster the private provision and financing of urban infrastructure services. The techniques include: land privatization, development exactions, special assessment and benefit assessment districts, certificates of participation, private contracting of services, leases and concessions, BOT, public private partnerships, the privatization of services, commercial bank financing, infrastructure funds, and private bond financing. Each section describes the technique, provides examples of where it is used, and discusses key implementation issues.

### *Land Privatization*

Many local governments, whether they are in transition or market economies, rely on the sale or long-term lease of government land to finance infrastructure provision. Most of China's larger cities have

considerable experience in selling the development and use rights to urban land parcels (Dowall, 1993). In most cases, local governments identify their land resources and package sites for competitive tender. Developers bid for sites based on their development potential, location, marketability, and requirements for infrastructure provision. Payments for land use rights are frequently paid "up-front," so that the local government can use the proceeds to finance needed infrastructure investments. In some cases, bidders for sites make bids which include both cash payments and commitments by the bidders to build specific infrastructure facilities (World Bank, 1994). A major advantage of using land privatization to finance infrastructure is that it allows government to retain control of the operation and management of local infrastructure systems. Land privatization is likely to be highly marketable in high-growth areas.

The municipal sale of land and/or land use rights is commonplace all over the world. Transactions have been registered in Shanghai, Tianjin, Beijing, Guangzhou, and Fuzhou in China. Land privatization is common in Hong Kong, Singapore, and Seoul, as well as in North America and Western Europe. Former socialist countries in Central and Eastern Europe are experimenting with land privatization, and numerous demonstration projects have been successfully carried out in Russia, Ukraine, Hungary, Poland, and Bulgaria. The financial potential of using land sales to finance infrastructure is enormous. In Guangzhou during the 1980s, over \$120,000,000 worth of infrastructure was financed by real estate development corporations (Dowall, 1993).

Land sales are complex transaction which require considerable technical skill to successfully completed. Most cities start by preparing a land privatization strategy which is based on an urban development program, inventory, and selection of sites, a step-by-step process of soliciting, evaluating, and negotiation of bids. Land privatization programs typically require about one to three years to complete and require expertise in urban land use planning, site evaluation, real estate market, and financial analysis and law (Dowall, 1991). While these skills are frequently available in large metropolitan areas, they may be lacking in small towns. Staff training will be critical to insure successful land privatization outcomes.

### *Development Exactions*

Many local governments in North America use development exactions to finance infrastructure development. The surge in the use of exactions can be largely explained by rising concerns on the part of citizens that growth pay its own way, growing environmentalism and demands for costly mitigation of adverse environmental impacts, citizen resistance to new taxes, cutbacks in federal aid to local governments, growing concerns about lagging infrastructure, and the increased usage of fiscal impact assessment to measure the probable fiscal consequences of new urban development (Altschuler and Gómez-Ibáñez, 1993).

The most common form of development exaction is the levying of impact fees or charges on new development. The typical practice is for the mandated exactions to be paid by the developer as a condition for receiving a permit for development. Exactions may be financial or in-kind. In the U.S., local governments set these fees or charges in relation to the actual infrastructure impact that a new project

will impose on infrastructure systems. Great care is taken to insure that the new development will pay its own way, and that existing residents not be forced to subsidize infrastructure investments needed for new development.

A wide range of development impact fees are used in the U.S. A survey by Purdum and Frank (1987) found that exactions are levied for the following urban services: police and fire stations, parks, roads, schools, water lines, water treatment facilities, sewerage collection and treatment facilities, solid waste collection and disposal, and affordable housing. The actual payment made by the developer is either based on a formula (using an impact fee calculation) or through negotiation. A 1991 survey of impact fees and exactions in 100 U.S. cities (mostly California) indicates that fees for new housing averaged \$12,000 per unit and \$54 to \$76 per square meter for commercial buildings (Nicholas and Pappas, 1991). Exactions ranged between 5 to 10 percent of total development costs.

A critical consideration in designing and implementing development impact fees is whether they are reasonable and whether the developer can afford to pay them. In a market economy, the answers to these questions are complex and depend on the incidence of the impact fees — that is, who ultimately pays them: the developer; the buyer or renter of the new facilities; or the land owner. If the developer knows that he must pay the fee, he will typically try to pay less for the land, and the incidence may fall on the land seller. If the developer cannot get a reduction in the price of the land, then he will try to push the cost on to the purchaser of the new units. If this cannot be done, then the developer will earn a lower profit. In centrally planned economies with land ownership vested with the state, the incidence of development impact fees and charges may be more directly linked to the land and therefore the use of land privatization and development exaction methods of infrastructure financing should be closely coordinated. The main concern about using development fees and charges is not to try to overload the developer with too many fees and charges. If the fees are too high, it may be impossible for developers to profitably build and sell projects. Research on residential redevelopment projects in large Chinese cities clearly illustrates the problems associated with trying to levy very high exactions (Dowall, 1994).

A significant advantage of using development exactions is that they do not require the surrender of government control of infrastructure service provision to the private sector. The government merely has to adopt a program of development exactions. The fees can be collected up-front or they can be combined with developer-initiated special/benefit assessment districts.

The economic and financial analysis required to design development impact fees and exactions is relatively complex. Small towns and villages will require significant technical assistance and training. Model ordinances and methods for potential application should be developed.

#### *Developer-Initiated Special/Benefit Assessment Districts*

A number of local governments around the world have developed programs of special or benefit assessment districts to finance the provision of infrastructure (Porter et al., 1992). Usually initiated by real

estate developers, a district is formed (usually an area which is coterminous with a new real estate development project) and the land and property within the district is taxed to finance durable infrastructure investments. While special assessment districts are quasi-governmental entities, in economic terms they are very close to being private interest entities — property owners or lessors make payments to retire debt borrowed to finance infrastructure improvements. Such districts are very common in the United States. In California, Mello-Roos Districts, created in 1982, are used by private developers to establish small taxing districts which require future owners or lessors of land to pay for infrastructure improvements (Beatty et al., 1995)

Management control and operation of infrastructure systems remains with the local government. Cities usually require developers to establish districts as a condition for development approval. Creating such districts will require enabling legislation and careful financial analysis to determine assessment amounts and schedule of payment. In small towns financial and legal expertise may not be available, requiring technical assistance and training.

### *Certificates of Participation*

Some forms of infrastructure such as buses, trains, small power plants, and other forms of infrastructure which are suitable for collateral can be financed by leasing arrangements. Private investors purchase certificates of participation or equipment trust certificates — financial instruments backed by physical assets. Ownership of the infrastructure is held by a trustee as collateral, and the user makes lease payments which in turn are used to pay debt service. At the end of the lease period, the infrastructure is transferred to the infrastructure operator.

Certificates of participation methods are well suited for financing small infrastructure elements where local governments are allowed to negotiate long-term leases. This may not be the case in China. Legal and financial research is necessary. Legal and financial expertise is required to negotiate acceptable lease agreements should they be permitted.

### *Private Contracting for Services*

The previously described mechanisms for privately financing urban infrastructure services are ones which allow the government to continue to actively operate and manage service provision. Private contracting of services shifts the day-to-day responsibilities for service provision on to private contractors. Many local governments around the world have begun to contract infrastructure services out to private companies. It is found to be a flexible and cost-effective tool for increasing the quality and user-responsiveness of services. In such cases the government offers, by way of competitive bidding, the right to provide the city with some defined service. The private contractor is given a right to exclusively provide the service for a fixed period and is allowed to levy charges for such services.

According to the World Bank, there are three types of contracts — performance agreements, management contracts, and contracting out. The type which should be used depends on the infrastructure activity and the specific objective or goal of contracting. If contracting is being used as a vehicle to finance new or expanded services, operating contracts which specify services to be provided, tariffs to be collected, and periods of performance may be appropriate. To insure that performance levels are maintained and that users get value for money, contracts should be periodically reviewed. By stipulating that agreements will be periodically reviewed, contractors will face competitive pressure from potential bidders to maintain low prices and high quality of service (Baumol, Panzer, and Willig, 1988).

A major factor which will determine the relative success of contracting out is whether tariffs for services are adequate to provide a return of costs and leave the contractor with an appropriate profit. If government set rates are too low, few contractors will be willing to bid to provide services. If tariffs are not increased to adequate levels, governments may have to subsidize the costs of service provision in order to attract contractors. Experience with the contracting-out of bus services in developing and developed countries suggests that the efficiency gains from contracting out are greatest when services are not subsidized by government (Meyer and Gómez-Ibáñez, 1993).

Designing and implementing a contracting-out program is highly complex. Small cities and towns lack adequate economic, technical, financial, and legal expertise. Technical assistance, training, and the preparation of demonstration projects would be appropriate.

### *Leases and Concessions*

Surveys by the World Bank indicate that leases and concessions for infrastructure are increasingly common in developing countries (World Bank, 1994). Thirty-seven countries have been identified as using leasing and concessions as a means of infrastructure provision. Leases and concessions differ from simple service contracts in that they are for longer periods and typically require a large financial commitment on the part of the operator. Under a lease, the government typically provides capital facilities and the contractor operates the equipment. The operator pays the local government or public utility a fee for using the equipment, and it has the exclusive right over the contract period to collect the revenue stream (from user tariffs). In France, leases have been used for decades for providing water supply to urban areas. Other developing countries have also starting using leases for private provision of water supply.

Concessions are similar to leases and incorporate all of the same elements but place more financial responsibilities on the contractor to provide additional infrastructure investments. Whereas in the case of lease, the contractor would operate and maintain an existing water supply system, under a concession, the contractor would be required to provide specified extensions and expansions or replacements of a water supply system (Triche, Mejia, and Idelovitch, 1993). Concessions arrangements are used to provide urban transportation, water supply, wastewater collection and treatment, and telecommunications.

As in the case of contracting-out, leases and concessions are very complex transactions to effectively structure. Small towns and villages are unlikely to have the professional expertise necessary to design and negotiate such transactions. Again, extensive technical assistance and training will be needed to implement leases and concessions.

### *Build Operate and Transfer (BOT)*

The BOT approach is starting to be widely used to privately finance the provision of urban infrastructure. According to *Public Works Financing*, approximately 150 infrastructure projects worldwide had been funded up to 1993, and another 360 projects were in the pipeline worldwide. The funded projects have a combined value of \$63 billion. The pipeline projects have an estimated value of \$235 billion (Public Works Financing, 1993).

BOT is a form of concession, where a private entity enters into a contract with the government or the utility to construct an infrastructure facility and operate it for a fixed period of time. During this period, the contractor collects user charges and fees from users of the facility (15 to 25 years is common). The design of the facility, the term of the operating period, and the user tariffs and escalations, and what constitutes an acceptable return on invested capital (usually 15-20 percent) are part of the negotiated BOT agreement. BOT projects are developed by large private corporations with experience in the provision of specific infrastructure facilities (electric power, roads, transit systems, and water and wastewater facilities). BOT projects are typically financed with a combination of equity (the company investing in the project puts in its own capital) and long-term private debt (Augenblick and Custer, 1990).

Structuring BOT agreements is extremely complex. Experience with projects reveals that it is better to start with smaller, less complex, and less risky projects. However, the transaction costs for putting BOT projects together is very high and relatively insensitive to project scale. Therefore, very small projects may not be financially feasible for BOT financing. For large projects, the risks are many and various. Delays and cost overruns are common and will impact tariff structures and operating terms. Recent controversies in India and Thailand spotlight the complexity and high stakes that big high-profile projects take on. It is of paramount importance that the underlying BOT contract be enforceable and clear. Provisions are needed for dealing with disputes. Some contracts rely on international arbitration, using third-party bodies to referee claims. Some contracts use the laws of a third-party country. For example, a BOT project between an Indian and German firm might use English law to determine contract provisions.

Attempting to introduce BOT financing into China's small town and villages may be difficult given the extreme complexity of the transaction. Also given the high transaction costs associated with BOT financing, it may be difficult to structure projects in small towns. Given these limitations, it may be more fruitful to look at regional approaches to BOT projects which could be carried out at the provincial or sub-provincial level.

### *Public-Private Partnerships for Infrastructure Provisions*

Another approach to attracting private capital to finance infrastructure development is to form new corporations or utilities to provide infrastructure services. Instead of using leases, concessions, or BOT methods, a local government would form a corporation with private investors. The local government would typically contribute land, existing infrastructure system, and/or cash to the partnership. The private partner would bring expertise and capital to the enterprise. The partnership agreements specifically define the roles of the public and private sector partners. The agreement provides a framework for financing operations, capital investments, and sharing in the cashflow of the project.

Local governments in North America have established numerous partnerships to build and operate infrastructure systems (National League of Cities, 1987). Parking structures are commonly built and operated by partnerships, as are railway companies and hotels and visitor centers. Partnerships provide the public sector with more active control of the infrastructure activity than would often be the case with long-term leases, concessions, or BOT projects. They require a high level of sophistication and professional expertise to effectively perform the duties of a partner. Small towns may lack the professional skills and therefore technical assistance, and training will be required to help localities structure public-private infrastructure partnerships.

### *Privatization of Infrastructure Services*

An obvious option for financing urban infrastructure systems is to privatize existing services through divestiture. Under this approach, infrastructure systems are transferred to private entities. The process usually entails packaging systems for sale through competitive tender. Prior to tendering, the precise rights and obligations of the private entity is defined, including the scope of services, the right to set tariffs (usually regulated by a utilities commission), and obligations to provide services to customers in the service area (Kessides, 1993). Care must be taken to insure that private entities do not exclude unprofitable routes or subsystems from service, that they provide an adequate level of service, and that rates reflect actual costs of service and provide the operator with an adequate return on invested capital. Divestiture activities have increased dramatically over the last 10 years. Evaluations of many of these privatizations suggest that substantial efficiency gains result from divestiture. Obviously, divestiture frees up considerable public sector financial resources once infrastructure services are shifted off the public budget. Between 1988 and 1992, infrastructure privatization proceeds generated \$21 billion in developing countries (Sader, 1993).

Privatizing public infrastructure systems requires careful and extensive financial and technical analysis. In most cases, governments have retained independent expertise to package infrastructure systems for privatization. Once the divestiture has taken place, professional burdens are significantly reduced and are generally limited to public utility oversight and regulation.

### *Tapping Commercial Banks*

Large private infrastructure service providers typically have direct connections with private commercial banks. If local governments can attract these large enterprises to purchase, lease, or operate infrastructure systems, then access to private commercial credit should not be difficult. On the other hand, commercial banks are less interested in lending directly to municipalities (or if they are willing it is usually for short time periods). To help local governments in developing countries attract private capital, multilateral and bilateral agencies have developed loan guarantee programs. If commercial lenders are provided with guarantees of repayment, they may be willing to make long-term loans to local governments and parastatals. The Government of Thailand has recently established a loan guarantee program for ten cities. The guarantee facility will initially start with \$75 million, and it will lend between 5 and 8 times this amount to municipalities. Eventually the program is expected to leverage up to \$1.2 billion in loans for water supply, wastewater collection, and treatment and other environment-related infrastructure projects (World Bank, 1994).

To fully exploit funding opportunities, local governments will need to tap domestic as well as foreign sources of capital. Given the enormous demands for infrastructure in China and other developing countries, it is clear that domestic sources of funding must be developed. A transitional step is to develop national-level infrastructure banks to mobilize domestic savings and channel funds toward infrastructure projects. In Japan, for example, the Japan Development Bank has tapped postal savings accounts to provide long-term financing for infrastructure development. Municipal banks in Europe have also successfully mobilized savings and used these funds to finance infrastructure projects. There is less experience in developing countries, but India's new Infrastructure Leasing and Financial Services Corporation and its more traditional Housing and Urban Development Corporation are working to sell their municipal loans to private financial institutions once municipal borrowers establish adequate credit histories (World Bank, 1994).

### *Infrastructure Funds*

Several developing countries have established government-sponsored infrastructure funds to generate equity capital to finance infrastructure projects. Typically, governments advance funds in order to attract private capital. Pakistan and Jamaica have both established funds to support energy-related infrastructure. Indonesia has set up a Regional Development Agency to handle the transition from grant to debt-funded local infrastructure projects (World Bank, 1994). Private funds have recently started to operate internationally. These funds tap pension funds and other large institutional investors. They spread risks by investing in a range of projects across a number of countries. A major barrier to the expansion of private capital into infrastructure financing is the lack of information and institutional frameworks to support high-value long-term investments.



## *Private Bonds*

If countries have functioning bond markets, institutional investors such as insurance companies and pension funds can be tapped to finance infrastructure projects. Revenue bonds, which are used to finance new projects, use the cashflow from infrastructure operations to pay interest and return advanced capital to bond-holders. They have been used to finance toll roads in Mexico and a power plant in the Philippines. As domestic stock and bond markets evolve, it will be easier to tap domestic savings. Bond markets are well-established in OECD countries, and they play a significant role in financing municipal infrastructure projects. In some cases, bonds are issued for specific projects. In others, a pool of bonds are issued to cover several projects, which may be located in more than one jurisdiction.

## **PROGNOSIS FOR INCREASING PRIVATE SECTOR FINANCING OF INFRASTRUCTURE**

Over the past five years, private sector financing of infrastructure projects has dramatically increased. Several structural changes suggest that these trends will continue and likely accelerate. First and foremost, the demand for financing capital is enormous and will continue to grow in developing countries, particularly Asia, requiring that private sources of capital be tapped. Second, the capacity and willingness of governments to fund infrastructure through central government grants or loans is declining, and local governments and utilities need to develop alternative sources of private capital. Third, infrastructure operators are under increasing pressure to operate systems according to commercial principles, and such changes will make infrastructure projects attractive opportunities for financing and lending.

The rate of increase in private sector infrastructure financing will greatly depend on how quickly institutional environments develop and adapt to the requirements of private lenders. Such changes are required in the administrative capacity of infrastructure and economic development institutions and in domestic capital markets. Initial financing by the private sector have been one-off projects, using project-finance techniques like BOT. In the next stage, countries typically establish specialized infrastructure-financing institutions and reform commercial banks which then start to fund infrastructure projects. In the last stage, institutional and individual investors purchase bonds or stocks which are traded on domestic stock and bond markets.

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