Successful providers of infrastructure services, in the public or private sector, are generally run on business lines and have three basic characteristics:

- They have clear and coherent goals focused on delivering services.
- Their management is autonomous, and both managers and employees are accountable for results.
- They enjoy financial independence.

The principles underlying these characteristics come naturally to a private business, but by no means always to organizations in the public sector. Governments are forced to balance many different economic, social, and political objectives, and it is commonplace for these goals to spill over into the activities of all public sector organizations, including infrastructure enterprises. Similarly, management of public sector employees is often hampered by numerous restrictions on establishing accountability and rewarding good performance. In addition, the financial status of public agencies and enterprises often depends on budgetary decisions that are unrelated to performance and on pricing decisions that are driven by politics. These factors often work against rational management.

Many argue that endemic organizational failures and poor performance are compelling arguments for abandoning efforts to reform the public sector and for relying instead on the private sector to provide infrastructure services. Increased reliance on the private sector, discussed in Chapter 3, may be right for some countries and sectors. Nevertheless, making the public sector more effective is important for (at least) four reasons. First, given current government dominance, the public sector will continue to have primary responsibility for infrastructure services in most countries and most sectors in the foreseeable future. In the poorest countries, today’s weak private sector capabilities will improve only slowly. Second, even with dynamic private sector involvement, some sectors—such as road networks and major public works—will remain predominantly in the public domain. Third, only an effective public sector will facilitate private sector involvement—a dispirited and inefficient public works department is unlikely to mobilize the will or the ability to contract out road maintenance. Fourth, many developing country governments will decide (for strategic, regulatory, or political reasons) to retain much of the responsibility for building and operating infrastructure in the public sector, as many high-income countries have done.

Improving the effectiveness of public sector infrastructure providers (Option A in Chapter 1) is thus critical. It can be done by applying three core instruments to reinforce commercial operation in the public sector:

- Corporatization, which establishes the quasi-independence of public entities and insulates infrastructure enterprises from noncommercial pressures and constraints.
- Explicit contracts between governments and (public or private) managers or private entities involved in infrastructure services, which increase autonomy and accountability by specifying performance objectives that embody government-defined goals.
- A pricing strategy designed to ensure cost recovery, which creates a desirable form of financial independence for public utilities and even at times for public works.
Lessons of success and failure

Although the public sector has invested heavily in expanding infrastructure stocks (Chapter 1), governments have done less well in managing the flow of infrastructure services. Experience suggests that the key elements present in successful providers, and lacking in troubled ones, are those characterized above as commercial principles.

What success shows

That many public entities have performed poorly does not mean the public sector is incapable of getting it right. A recent study of the privatization of two previously well-run public power firms in Chile shows that the improvements from private management yielded a productivity increase of only 2.1 percent in one case and less than 4 percent in the other. Because these firms were already being run on commercial principles, the gains from privatization were ten to twenty times less than would otherwise have been the case. There are many other examples of successful public provision of infrastructure services—Mexico in power, Korea and Singapore in most or all sectors, and Togo in water supply to name a few. Until recently, Botswana’s water utility was also run on commercial principles, and it has had an enviable performance record (Box 2.1).

What is the secret of such success? A common feature is a high degree of autonomy for the entities concerned. Managerial and organizational autonomy does not mean complete freedom: all public

Box 2.1  The right way to run a public utility: a look at Botswana’s Water Utility Corporation

Created in 1970, Botswana’s Water Utility Corporation (BWUC) has two primary responsibilities: to provide potable water to the country’s principal urban areas and to operate a financially self-supporting service.

BWUC is under the administrative jurisdiction of the Ministry of Mineral Resources and Water Affairs. The ministry’s deputy secretary is chairman of the board, and until recently he has been successful in keeping political influence out of the conduct of BWUC’s operations. This effort has been helped to some extent by contracting out management (until 1990 mostly to expatriates, but increasingly to nationals). The only possible defect in this arrangement is that contracts are for two years, which focuses problem solving on short-term solutions because managers want to be able to show the effect of their decisions while still under contract.

BWUC maintains a twenty-four-hour supply of water to all its service areas, with high-quality treatment. Botswana is therefore one of the few countries in Africa with a safe urban water supply. Water losses are acceptable, at about 15 percent in the distribution system and 10 percent in the raw-water transmission and treatment processes. The overall loss of about 25 percent would be considered good by utilities in many industrial countries. These low losses reflect the good quality of BWUC’s engineers, who are attracted by competitive salaries.

BWUC charges commercially oriented tariffs appropriate for the urban conditions in Botswana, and tariffs are increased when necessary. Meters are read and consumers are billed monthly, with thirty days to pay. Supply is cut off immediately if payment is not made, and there are charges for reconnection. Little evidence exists that consumers who have been cut off are sharing with others in order to retain supply. BWUC does not hesitate to adjust prices as needed in order to manage demand. In 1985-86 charges were raised to counter the effects of a severe drought. This action effectively reduced demand to the point where everyone could obtain a minimum quantity of water during the drought and avoided the need to cut supplies. Accounts receivable are usually less than 2 percent of all the amounts collectible, attesting to the success of strict billing and collection procedures.

A family of six people consuming about 100 liters a day per capita pays about $8.85 a month—approximately 8 percent of its income. Reducing consumption to 80 liters lowers the water bill to about 5 percent of income. A wealthier family consuming twice that much would pay about $32.25 a month. These charges are high in comparison with those levied by similar utilities in Africa, but they have the effect of constraining consumption and ensuring that the utility does not have to rely on subsidies from the government or from other sectors in the economy.

A noteworthy achievement is the “one-check” system for government users. The Ministry of Finance meets all monthly charges for the government and deducts them from the cash allocations of each ministry or department. This procedure avoids the accumulation of arrears by government users of infrastructure services that is common elsewhere.

Recently, however, the utility has begun experiencing problems. After more than twenty years of successful operation, BWUC is finding it increasingly difficult to adjust its rates as required. Lags in tariff adjustments may yield short-term political gains, but they will also allow water consumption to grow and increase the risks of water shortages in this severely water-scarce country.
providers are subject to regulatory oversight by their parent ministries. Government sets clear policies and goals while leaving detailed planning and implementation of services to the providers. This delegation of responsibility and conscious absence of political intervention are one reason why these public agencies have retained high-quality managers and why they enjoy stability in mid-management and professional structures. Successful public sector organizations also enjoy financial strength. Tariffs cover (at a minimum) the requirements for operations and maintenance, while effective cost accounting controls expenses. This reliance on cost recovery from users accounts in part for the emphasis on good customer relations. Also common (although not universal) among well-run public organizations is the use of private contractors and private capital in infrastructure operation and maintenance.

What failure shows

A survey of forty-four countries with World Bank-financed projects designed to improve infrastructure performance revealed the most common problems in six infrastructure sectors (Table 2.1). Unclear goals, lack of managerial autonomy and accountability, financial difficulties, and wage and labor problems are recurrent problems for the public sector entities involved.

The goals of public sector infrastructure providers are often hazy and inconsistent. More than simply financial objectives are necessary in setting goals for infrastructure providers, especially when a large share of the population is without access to the service involved. The goals may include quantitative targets like user coverage or capacity expansion. In the absence of such goals, public providers have often failed to recognize that some consumer groups—such as the poor and rural consumers—are willing to pay for services and thus should be targeted to receive them. Whether in Africa, Latin America, or South Asia, water and power entities receive mixed signals from governments about where to expand their networks. The main victims of inconsistent official priorities have often been rural areas, where government failure to improve coverage is pushing users to search for alternative forms of service provision (Chapter 4).

A lack of autonomy and accountability underlies many other problems. Financial problems, overemployment, and unfocused goals occur because managers do not have control over day-to-day operations—or over decisions on prices, wages, employment, and budgets. Managers in such circumstances seldom have much incentive to try harder. In Ghana, for example, a 1985 reform made the chief executive of a utility responsible to its board of directors, but amendments gradually shifted accountability back to the relevant ministry, thereby restoring direct political intervention. The problem became even worse when performance-based bonuses, introduced to motivate managers and employers, became an integral part of the salary structure and thus lost their incentive value.

The third problem, financial difficulties, is common in power and water utilities when politically motivated tariff adjustments lag behind cost increases. These difficulties reflect a lack of management autonomy and the use of public infrastructure entities to achieve diverse uncompensated goals—such as keeping tariffs low in order to counter inflation. In Brazil, between March 1985 and the end of 1989, three freezes on public sector prices caused the real tariff to drop by 59 percent for port services, 32 percent for railways, and 26 percent for telecommunications. The results were higher public enterprise losses that defeated the anti-inflation strategy by fueling the overall public sector deficit.

Problems with wages and employment often have their origins in the first three problems. Many infrastructure utilities are overstaffed because governments use them to create public sector jobs and

Table 2.1 Common management problems in public sector infrastructure entities, 1980–92

(percentage of World Bank loans in which conditions were imposed to address the problem area)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of loans</th>
<th>Source of problem</th>
<th>Financial problems</th>
<th>Wages and labor problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>48</td>
<td>Unclear goals</td>
<td>27.1</td>
<td>33.3</td>
</tr>
<tr>
<td>Water</td>
<td>40</td>
<td>Lack of management autonomy and accountability</td>
<td>25.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Telecom</td>
<td>34</td>
<td>Financial problems</td>
<td>14.7</td>
<td>35.3</td>
</tr>
<tr>
<td>Rail</td>
<td>39</td>
<td>Wages and labor problems</td>
<td>15.4</td>
<td>20.5</td>
</tr>
<tr>
<td>Road</td>
<td>35</td>
<td></td>
<td>8.6</td>
<td>22.9</td>
</tr>
<tr>
<td>Ports</td>
<td>28</td>
<td></td>
<td>21.4</td>
<td>35.7</td>
</tr>
</tbody>
</table>

Box 2.2  Severance pay eases layoffs in Argentina Railways

By the end of the 1980s, Argentina Railways had about 95,000 employees and an annual deficit equivalent to 1 percent of GDP. Since the mid-1970s, the wage bill had consistently exceeded revenue. Estimates indicated that cutting personnel by half would not affect the level of service.

Major reforms have been introduced over the past few years. Private sector concessions were granted to run all freight lines and the Buenos Aires region passenger service. To curb losses and reduce employment, intercity passenger service was cut back by two-thirds. The World Bank supported the initial reform efforts by financing (through an adjustment loan) severance costs of the voluntary retirement of 30,000 rail employees. The severance pay was roughly equivalent to two years of salary for each retired employee. Auditors certified that severance payments were made only to staff whose labor contracts were terminated and that payments conformed to labor laws and were consistent with severance pay in other sectors. Measures to prevent reemployment were also put in place.

External financing of the initial adjustment added credibility to the reform process and reduced the resistance of unions. It also paved the way for subsequent employment-reduction cycles financed from government resources. Eventually, 60,000 workers were retired over a two-year period.

Corporatization

The explicit separation of infrastructure service providers from government starts by changing a government department into a public enterprise in order to increase management autonomy. Many countries have achieved this changeover in water, power, and railways, although it is a more recent phenomenon in port services. Enterprises are obliged to provide services that match demand, but many do not have the legal corporate independence needed to ensure efficient operation.

Corporatization is the next step, giving the enterprise an independent status and subjecting it to the same legal requirements as private firms. Corporatization means that the entity is subject to standard commercial and tax law, accounting criteria, competition rules, and labor law and is less susceptible to government interference. In practice, this transformation is not always complete because public organizations do not face adequate competition or do not have solely commercial objectives. For example, corporatization implies the transfer of employees from civil service status to contracts governed by ordinary labor law. Yet even under corporate structures, public entities are often reluctant to reduce employment. The experience of developing countries suggests that the enforcement of ordinary labor law and the work force cuts needed for suc-
Box 2.3 It took ten years to corporatize Indonesia's main ports

In Indonesia, there are three formal stages in the adoption of commercial principles. First, the government department is transformed into a government enterprise. Then the enterprise becomes a corporation that still has a combination of commercial and noncommercial goals. Finally, the corporation is turned into a profit-oriented entity whose ownership can be shared with the private sector. Ports have just reached this third stage.

The reform of Indonesia's port management began in 1983. Before that, the management of all 300 ports was centralized in the Directorate General of Sea Communications, a government department. Most of these ports had obsolete equipment and failed to meet regional needs. In mid-1983 the government decided to decentralize management for ninety of its ports by creating four new public port corporations, headquartered at the four largest ports.

Two years elapsed before the government addressed the overregulation that remained a major impediment to the success of the new corporations. Moreover, managers did not yet have a clear understanding of their responsibilities and accountability and lacked the autonomy to implement reforms they thought were needed. These problems had been addressed by 1988, when an effective cost control program lowered expenses by 5 percent and increased revenue by 20 percent for the largest port corporation. Between 1987 and 1992, revenue grew almost twice as fast as expenses.

Ten years after the reform process started, the port corporations face the market test. Competition promises to be tough: a recent survey of foreign investors ranked Indonesia's port infrastructure at about the same level as Australia's but below others in the region, such as Hong Kong, Malaysia, and Singapore.

cessful restructuring are more politically acceptable—and hence more sustainable—when severance pay accompanies dismissals. This has been the experience with Argentina's railway reform program (Box 2.2).

The transformation of a government department or ministry into a public enterprise is more difficult for public works than for utilities—and roads present a special challenge. However, converting highway departments to public utility corporations (as in New Zealand) is attracting interest as a way to improve performance, especially in the area of maintenance. Highway expenditures are budgeted according to assessments of traffic-related costs, and user charges are then calculated to reflect the wear and tear caused by different types of vehicles. This experience is very recent, however, and, although it has inspired similar approaches (in Tanzania, for instance), it is too early to assess its sustainability.

Commercial accounting procedures are an immediate benefit of corporatization. Explicit cost accounting identifies nonremunerative activities and reveals sources of inefficiencies, making costs and benefits more transparent in public enterprises and government departments. In Ghana, for example, an attempt to reform the main utilities began with the development of a good set of accounts for costs. The government's move to suppress transfers to enterprises that could achieve financial autonomy created a need for the enterprises to use proper cost-accounting techniques. Within two years, real operating costs in the state transport corporation were down by 67 percent, allowing its revenue to increase from 92 to 111 percent of its full operating costs.

Organizational changes are always simpler on paper than in practice. It takes time and much effort to convert a government department into a public corporation. The introduction and full implementation of standard accounting practices alone can take up to five years, as many Eastern European policymakers are finding out. Getting everything else right is equally difficult. Ghana's utilities have been undergoing transformation for seven years and still have a long way to go. And it took ten years to corporatize fully Indonesia's major ports (Box 2.3).

Focused goals and accountable management

Corporatization provides an organizational structure, but by itself it merely transforms the problem of official governance into the more tractable, although still difficult, task of corporate governance. Organizational changes alone neither provide clear goals nor create incentives for managers to meet these goals. Many governments argue that their departments and enterprises are already run on commercial principles, but this has not helped managers to be more effective. Many managers argue that the autonomy they do get is too limited to be effective and that it is too easily revoked. Many workers argue that they have little incentive to be effective because good and poor performers are treated equally. And many users would argue that corporatization has not given them access to improved or expanded ser-
vices. These concerns are particularly prevalent in Africa and South Asia, where reorganizations of public utilities and government departments have been common but where performance has often remained disappointing. Latin American countries have preferred a more fundamental shift to private ownership (Chapter 3).

The introduction of market principles can help solve the problem of corporate governance. For its part, government must allow adequate competition, level the regulatory playing field, and instruct managers to maximize profits or to achieve set rates of return. Although effective in the long run for some sectors and some services, this solution raises at least two problems. First, and more obvious, providers in many cases are in the public sector precisely because of the limits on profit maximization—either because the services are public goods (as with roads) or because governments have objectives other than profit. Second, because service providers have monopoly powers, prices have to be regulated outside the supplying entity (see Chapter 3).

When the market solution cannot be used to address corporate governance problems in the public sector, three other approaches might be considered for structuring the relationship between governments and infrastructure providers.

- **Performance agreements** retain all decisions in the public sector. They try to increase the accountability of employees and managers and to improve the focus of operations by clarifying performance expectations and the roles, responsibilities, and rewards of all those involved.
- **Management contracts** transfer to private providers the responsibility for managing an operation such as a port or a power or water utility. They increase the autonomy of management and reduce the risks of political interference in the day-to-day operations of the public entity.
- **Service contracts** transfer to private providers the responsibility for delivering a specific service at lower costs or obtaining specific skills or expertise lacking in the public sector—such as design engineering. (Turning all operations over to the private sector under a lease or concession is discussed in Chapter 3.)

Properly designed, these contracts can address organizational failures. And they can be just as effective in a public works department as in a public utility. Many governments are attracted to such contracts because they do not involve relinquishing public ownership.

**Performance agreements**

Performance agreements negotiated between government (the enterprise owner) and managers have been tried in most infrastructure sectors. This type of agreement originated in France, where the main purpose was to spell out reciprocal commitments of government and managers. Korea, which was among the early Asian users of performance agreements, added explicit performance-based incentives for both managers and employees. The focus on incentives is what most recent contracts are trying to duplicate.

**Revealing information to improve the focus.** In order to identify the sources of incentive failures, governments must develop information and evaluation systems for performance monitoring. The information component focuses on the development of standard financial and cost-accounting procedures, as well as detailed quantitative and qualitative indicators. In roads, for example, these indicators include measures of the condition of the network and its use and management, administration and productivity, and finance. The negotiation of a performance agreement covering most of these indicators has allowed the Highway Department of the State of Santa Catarina in southern Brazil to sharpen its objectives. The result is that priorities have changed and focus more on maintenance and rehabilitation of roads than they have in the past. Specific targets have been set for all categories of expenditure. The share of paved roads in poor condition is expected to decline from 18 percent in 1991 to 4 percent by the end of 1994. Staff needs and skills have been assessed, supporting a reduction in workers from 3,149 in 1990 to 1,885 in 1993. Already 10 percent of all maintenance work is contracted out to the private sector—and the performance agreement requires an increase to 25 percent by 1995. Similar reforms are being introduced in the states of Maranhão, Piauí, and Tocantins.

**Building in incentives.** This component has several elements. The first is a promise of increased managerial autonomy for the enterprise as well as rewards for workers and managers in exchange for fulfilling agreed performance targets. Some agreements in India, Korea, and Mexico include bonuses of up to 35 percent of total wages. The Koreans consider nonpecuniary benefits—such as award ceremonies or press coverage—to be a key factor in their success with contracts. Firing nonperforming staff is one of the sanctions available in Korea (Box
The second incentive element that can be built into these agreements relates to the duration of the agreement. Shorter agreements (one year, as in Korea or Mexico) are more effective because they allow for more frequent assessments, although they also involve time-consuming renegotiations.

The third common incentive is the weight attached to various performance indicators after careful negotiation between the managers involved and the government. In Mexico the agreement signed in 1989 by the Federal Electricity Commission and the government distributed weights according to its priorities as follows: 44 percent for improvements in productivity, 23 percent for better operational efficiency, 18 percent for reaching administrative and financial targets, and 15 percent for improvements in service quality. These weights were only partly successful in giving managers and employees a better sense of priorities and an incentive to focus on what matters rather than on what might be easier to achieve. By 1991 the ranking of performance from best to worst was as follows: efficiency, service quality, productivity, and administrative and financial performances—not quite a match with the priorities and weights.

**Box 2.4 What's special about Korean performance agreements?**

The Korean performance agreements are an outcome of the 1983 reform of public enterprises. The agreements are intended to permit comparative evaluation of the short- and long-term performance of all managers (rather than focusing on the company), to ensure that information is available for the evaluation, that rewards to managers and employees are linked to their performance, and that the evaluation is done by independent auditors. Korea has been more successful with performance evaluations than most countries. Despite financial difficulties at some enterprises in recent years, they have generally reached their noncommercial goals.

**What kind of performance indicators are used?** Performance indicators are selected to measure results against the trend and according to agreed targets. The benchmarks are generally based on international experience and are derived in consultation with independent outsiders to minimize potential conflicts of interest. The targets are set and assessed annually to increase accountability. Quantitative indicators generally account for 70 percent of the final score. The key quantitative indicators are profitability and productivity. Other quantitative indicators are sector-specific, representing such characteristics as coverage or physical outputs. Qualitative indicators focus on corporate strategy, research and development, improvement in management information, and internal control systems. Indicators are combined into a single public profitability indicator using a weighted average of performance with respect to each indicator.

**What is the information base for the assessment?** Korea now benefits from a sound financial and accounting basis that provides management with a clear statement of objectives for performance. To some extent, this spread of standard accounting techniques stems from their introduction as one of the performance indicators.

**How is performance related to reward?** To increase accountability to users of infrastructure services, the performance-based ranking of public companies is published in the press. The best managers get not only prestige but also monetary compensation. The annual bonus to staff members and the career prospects of their managers are related to the ranking of their company.

**The outcome?** Within three years, the management performance of executive directors, directors, and department chiefs improved substantially in at least 60 percent of the enterprises. More dramatically, the rate of return on the assets of the Korean Electric Corporation tripled over a period of seven years (Box 2.4). These agreements are also proving useful in the reform of highway departments, as seen from the supplier's experience. Performance agreements have not achieved such impressive results in Africa. Although they have often improved noncommercial goals, such as increases in rural coverage, they have often failed to achieve financial targets. In Senegal cost recovery efforts improved initially, but within three years costs were back to the level they had been before the introduction of performance agreements. In this case, the agreements failed to address the lack of performance incentives for managers and workers. The difficulties that many agreements have had in differentiating the rewards for performance in the civil service explains why most experts hold little hope for such agreements in Africa and suggest relying more on other alternatives discussed below.
Management contracting

Management contracting gives responsibility for a broad scope of operations and maintenance to the private sector—usually for three to five years. This approach can be more effective than relying on a performance agreement to achieve similar objectives. A management contract signed for the power company in Guinea-Bissau is demonstrating that management contracts may work where many performance agreements have failed. There, a new management team succeeded in doubling electricity sales in just three years (Box 2.5).

However, when public agencies prevent a private contractor from controlling key functions affecting productivity and service quality—such as staffing, procurement, or publicly provided working capital—the contractor cannot be held accountable for overall performance, and generally the contract does not succeed. That is why a recent management contract signed for a power plant in the Philippines failed within nine months. When the new managers and the government disagreed on staffing levels and composition, the contract was broken despite the rapid improvements observed in maintenance following the arrival of the new management team.

When is it effective? Management contracting works better when a contractor is granted significant autonomy in decisionmaking and compensation is based, at least in part, on performance. In France, where management contracts are common in water supply and sanitation, the incentive for productivity improvement links the contractor’s payment to such indicators as reduced leakages and increased connections. The contract for the Electricity and Water Company of Guinea-Bissau specified that 75 percent of the remuneration was guaranteed but that the remaining 25 percent was based on performance. Management contracts with fees based on performance tend to be more successful than those with fixed fees—such as traditional management consulting assignments. Fixed-fee arrangements differ little from technical assistance and are seldom successful. Relating incentives to performance may not work, however, where a government can interfere with tariffs. In general, such contracts tend to be more useful as interim arrangements allowing private firms and public agencies to gain experience with partnerships before engaging in more comprehensive contracts or while the regulatory framework is being developed (both discussed in Chapter 3).

A recent innovative application of management contracts is the experience with Agences d’Exécu-

Box 2.5 Management contracting in Guinea-Bissau—a success story?

Introducing a five-person management team under a foreign management contract improved the performance of Guinea-Bissau’s national electric utility. Previously, service interruptions had been chronic, and most areas had electricity only a few hours a day. Comparative statistics for 1987 and 1990 show the turnaround. But more recent experience illustrates the difficulties of management-government relations.

Box table 2.5 Performance of Guinea-Bissau’s national electric utility

<table>
<thead>
<tr>
<th>Indicator</th>
<th>1987</th>
<th>1990</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed capacity (megawatts)</td>
<td>7.2</td>
<td>10.3</td>
<td>11.1</td>
</tr>
<tr>
<td>Operable capacity (megawatts)</td>
<td>2.2</td>
<td>7.5</td>
<td>9.9</td>
</tr>
<tr>
<td>Capacity factor (percent)</td>
<td>32</td>
<td>51</td>
<td>42</td>
</tr>
<tr>
<td>Fuel consumption (kilograms per kilowatt-hour)</td>
<td>0.300</td>
<td>0.254</td>
<td>0.275</td>
</tr>
<tr>
<td>System losses (percent)</td>
<td>30</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>Electricity sales (millions of kilowatt-hours)</td>
<td>14</td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>Average revenue (dollars per kilowatt-hour)</td>
<td>0.12</td>
<td>0.25</td>
<td>0.22</td>
</tr>
</tbody>
</table>

The foreign management contract was implemented under a joint initiative of the French Ministry of Cooperation, the United Nations Development Programme, the African Development Bank, and the World Bank. It reduced wastage of foreign aid. (In the previous ten years, foreign aid for power was more than three times the estimated value of the utility at the end of the period.)

At the beginning of 1994, however, serious problems became evident. Despite economic tariffs the utility was unable to generate revenue to finance expansion—or even, at times, current operations—leading again to shortages and reductions in service quality. This precarious financial condition was due to a large rise in receivables stemming from the utility’s difficulty in collecting payments. The government demanded continued service for “critical” functions even when its unpaid bills were causing financial distress. And in the private sector fraudulent connections were rampant despite the utility’s efforts to prevent them.
Box 2.6 AGETIPs: involving the private sector in Africa’s urban infrastructure

If governments do poorly in executing infrastructure projects, why not leave it to the private sector? That is precisely what is happening in ten West African countries. The Agences d’Exécution des Travaux d’Intérêt Public (AGETIPs)—nonprofit, nongovernmental agencies for executing public works—enter into contractual arrangements with governments to carry out infrastructure projects. The AGETIP in Senegal, which has twenty professional staff members, has handled 330 projects in seventy-eight municipalities. It hires consultants to prepare designs and bidding documents and to supervise works, issues calls for bids, evaluates bids and signs contracts, assesses progress, pays contractors, and represents the owner at the final handover of the works.

AGETIPs use an integrated approach to design works that promotes competition while facilitating access for small contractors. Project designs take into account local constraints, labor markets, the limited output potential of small contractors, the weak project-identification capability of local governments, the availability of consultant architects and engineers, and the economic and social rationale of subprojects under consideration. Project eligibility and selection criteria are spelled out, with particular emphasis on labor-intensive methods. Open competitive bidding weeds out inefficient operators.

Contracting out services

Contracting out services is becoming popular with public infrastructure providers. It provides a flexible and cost-effective tool for increasing responsiveness to users and taps expertise too expensive to maintain permanently on public payrolls. It also permits competition among multiple providers, each with short and specific contracts.

Contracting out is most common for maintenance services. Major overhauls of power stations, for example, are routinely contracted out to plant suppliers or specialists in most developing countries. Service on contract is also a standard arrangement for the design and construction of major capital works because of the obvious benefits from specialized engineering knowledge and construction skills. The infrastructure supplier sets the performance criteria for the contracted services, evaluates bids from competitive tendering, supervises performance, and pays agreed fees for the services involved. Contracting out is a versatile means for carrying out many other tasks, and the base of developing country experience is growing. Standard professional services—such as auditing, data processing, and recruitment—are also often contracted out. Railways in Pakistan have contracted out such activities as ticketing, cleaning, and catering. Private contractors in Kenya do limited locomotive repair and maintenance for the state railroad. Meter reading and fee collections in the water supply and sewerage sectors have been handled through service contracts in Chile since the 1970s. Santiago’s public water company even encouraged employees to leave and compete for service contracts.
Figure 2.1 The adoption of commercial principles in 1984 allowed Togo's water utility to increase coverage and production... but a performance agreement in 1989 was needed to improve financial outcomes.

Selecting the right type of contract

Which of the three types of contracts—performance agreements, management contracts, and contracting out—is the right one depends on the infrastructure activity and the specific cause of poor performance in providing the service. Because the performance of a public entity depends on the actions of government, managers, and workers, the best contract is the one that most effectively alters incentives to whichever of these three performs least well.

If the problem is with the government, the performance agreement may be the preferred instrument because performance agreements are reciprocal. For example, a 1989 performance agreement by Togo’s water utility illustrates how managers can use such agreements to get the government to endorse needed tariff increases. The performance agreement was a complement to commercialization in 1984. The utility’s managers wanted an explicit performance agreement to commit the government to tariff increases. Although commercialization improved performance with respect to noncommercial goals—a 73.5 percent increase in the number of connections in just five years—it did not help financial performance because the government did not authorize needed tariff increases. By 1989 the cost recovery ratio was 7 percent lower than in 1984 (Figure 2.1). The performance agreement was needed so that the government and the utility could agree on the steps to achieve financial autonomy. Within a year, the cost recovery ratio was 16 percent higher than its 1984 value. However, if the problem is one of weak commitment by the government, no remedial instrument short of privatization is likely to be very effective.

If the problem is with management, the choice of contract depends on whether abilities or incentives are in question. Performance agreements with incumbent public managers assume that their capabilities are adequate. Thus, in the case of an organiza-
tion with weak management skills, management contracts based on performance are more effective in the short run, as in Guinea-Bissau. For the longer run, training objectives can be incorporated in both performance agreements and management contracts.

If the problem with management is one of incentives, performance agreements need to make a clear link between performance and pecuniary and non-pecuniary rewards to managers. This approach has been effective in Korea, where the president of a public corporation that moved from last place (twenty-fourth) in the ranking of public enterprise performance to first place in just one year was promoted to deputy minister. Management and service contracts have the added advantage of signaling to civil servants and public managers that, if they fail to deliver, alternatives are available in the private sector. The threat to switch to a private provider has to be credible to be effective. In Botswana, after long use of expatriate managers, the water utility switched to a domestic manager, but the government has shown itself willing to rehire expatriates if performance deteriorates.

If the problem is one of poorly performing civil servants, incentives must go beyond managers. Governments and managers can agree to build into a performance agreement a clear link from employee performance to salaries and nonpecuniary rewards. Yet at the same time, if employees are protected by civil service labor practices, neither performance agreements nor management contracts may suffice. A more effective method is to rely systematically on service contracts, the way Chile has done to improve its road maintenance. This approach guarantees that the job gets done and is an alternative to the use of force account.

**Pricing for financial independence**

The third element in the successful provision of infrastructure services on a commercial basis is the establishment of reliable revenue sources that give providers more financial autonomy. Reliance on revenues directly related to services delivered will increase the productivity of infrastructure suppliers and also often benefit users. With fewer budgetary transfers, the government has less occasion to interfere, a fact key to managerial autonomy. For public utilities, smaller subsidies give managers a greater incentive to focus on cost reductions and to satisfy users because payments from users have to cover the cost of the service. In the case of public works, financing must rely mainly on budgetary transfers. It is in the interest of both managers and users to ensure the predictability and stability of these resources. More transparency in the process will increase the financial autonomy of managers.

**Pricing for public utilities**

Among public utilities in developing countries, gross revenues typically cover costs only in telecommunications (Figure 2.2). Even so, local services are typically underpriced, with the losses made up from significantly above-cost charges for long distance and international service. This difference between tariffs and costs is a type of tax on users. In all other sectors the gap between revenues and costs implies a government subsidy to users. These subsidies vary from 20 percent for gas to 70 percent for water. The low ratios of revenues to costs illustrate how little of their costs public utilities recover; the financial losses thus generated are made good by transfers from government. For public water utilities in Latin America, annual financial losses represent 15 percent or more of the investments needed to supply the entire population with adequate services by the turn of the century.

![Figure 2.2 Costs are seldom fully recovered in infrastructure.](chart)

<table>
<thead>
<tr>
<th>Ratio of revenues to costs</th>
<th>Financial autonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>0.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The best way of reducing the gap between costs and revenues is to cut costs and achieve productive efficiency—perhaps the most important lesson of the Bank’s experience in infrastructure. Costs due to poor debt management are excessive in about one-third of World Bank–supported infrastructure projects. Maintenance problems that cause water or power losses are even more common and costly. In Costa Rica the national water company estimates an annual loss of income from such losses equivalent to 24 percent of investment planned for the next five years. In Mexico City at the end of the 1980s, neglect of maintenance and the lags between tariff increases and cost increases in the water sector required a federal subsidy amounting to about 0.6 percent of GDP a year.

Once costs are controlled, well-established pricing principles can help achieve financial autonomy and reduce distortions in the allocation of resources—reflected in the success of countries as different as Botswana, Chile, Korea, and Singapore (Box 2.7). The infrastructure pricing strategy in these countries aims at cost recovery sufficient to guarantee the financial independence of public utilities. This pricing strategy focuses on recovering the three main cost components of most infrastructure utilities: connection, usage, and peak-capacity costs.

The cost of connecting a customer and maintaining that connection to distribution or collection networks is typically levied as a periodic flat fee, often linked to charges based on usage in a two-part tariff. The usage cost is easiest to recover when metering is available to measure use and charges are based on actual consumption. Such charges reduce waste and encourage more efficient use. In Bogor, Indonesia, raising tariffs to meet costs reduced water consumption by 30 percent in less than a year without any obvious impact on health or economic production. Where metering has not been introduced, estimates of usage are the rule. In Colombia and Thailand, fees rise with the diameter of the pipe. In India, the fee increases with the value of the connected property. These solutions are not perfect and require frequent monitoring, but they often are the best option available. The move to metering depends on the priority given to recovering costs. One outcome of the end of subsidies to Ghana’s water utility in 1988 was an increase in meter coverage from less than 30

---

**Box 2.7 Designing tariffs to achieve financial autonomy while addressing multiple goals**

The general principle for pricing public services to recover costs without distorting the allocation of resources is to set the price equal to all short-run costs incurred in efficiently producing an additional unit of output (for example, an extra gallon of water or a cubic meter of gas) while keeping productive capacity constant—that is, price equals the short-run marginal cost. However, telecommunications, power, and water systems periodically require large investments. In such cases, average costs fall as production is increased, and the efficient price is below the average cost. Charging that price would result in a deficit and hence a loss of financial autonomy. But even when there are no such economies of scale, financial autonomy is at risk when public providers have an obligation to address social concerns (Chapter 4).

Adjustments in the general pricing formula can be used to avoid an operational deficit and minimize the tradeoffs imposed by the need to jointly address equity, efficiency, and financial goals. In general, if financial autonomy is a requirement, the public price has to be revised to cover the cost of providing the service plus a markup, often resulting in multipart tariffs and possible cross-subsidies. Two common options to minimize the distortions (to efficiency and equity) of achieving financial autonomy are increasing-block tariffs and time-of-use rate structures.

Under an increasing-block tariff, consumption of services (usually water or power) is priced at a low initial rate up to a specified volume of use (block) and at a higher rate per block thereafter. The number of blocks varies from three to as many as ten. The most effective structure is the simplest, in particular when monitoring and administrative capacity are constraining.

Under the time-of-use rate structure, users pay a premium during periods of high demand. This structure encourages users to shift demand to the off-peak period and has the added advantage of increasing the overall utilization of capacity—and it often increases profits. Time-of-use rates have been applied to railways, urban buses, and subways, but they are more common in utilities such as power, water, and telecommunications. Time-of-use rates are practical for infrastructure supply networks in which the product cannot be stored cheaply and its use can be partitioned by time slices into multiple products. Time-of-use rates often vary by time of day for power and telecommunications, and by season for natural gas (to reflect seasonal demand for heating) and water (to reflect seasonal supply, especially in dry seasons).

Tariffs can also be differentiated in other ways. For instance, when service costs differ by region, prices should reflect these differences. In Nairobi, Kenya, the 1975 cost of providing water at higher elevations was 32 percent higher than the cost in lower parts of the city. Prices should vary with such differences.
percent to 53 percent in 1993, and in revenue collection from less than 50 percent to 91 percent of billings.

One aspect of cost recovery that separates good performers from poorer ones is that good performers recover the costs of maintaining sufficient capacity to meet peak demand by levying a charge based on potential demand or actual consumption at peak. This method helps avoid power outages and water shortages. In other words, good performers are much more careful than others in assessing demand. In Colombia, India, and Korea, this capacity cost is charged only to the largest commercial and industrial users because they tend to be the main source of peak demand.

Just as important as the incentive to meet objectives negotiated with the government is the financial independence that allows public managers to rely on the price system to assess users' willingness to pay. Reliance on the price mechanism is in the interest of users because it directs provision toward preferences determined by users rather than bureaucrats. Users are willing or able to pay more often than they are given credit for (Chapter 4).

What keeps so many public utilities from recovering costs is political constraints. Low prices are popular among those who receive a service even if they are willing to pay more. In Bangladesh, Indonesia, Pakistan, and the Philippines, receipts from irrigation user fees are 20 to 90 percent less than the cost of operation and maintenance. This shortfall reflects the strength of the farmers' lobbies and their ability to get political endorsement for high subsidies. Moreover, with subsidies guaranteed, public managers have little incentive to perform well or to improve their responsiveness to users. Without political support, the needed organizational changes—such as linking managers' rewards to the financial performance of the department or utility—will not suffice.

Cost recovery and the poor. Many governments fear that fully recovering costs will hurt the poor, yet increasing prices to enable cost recovery in the delivery of services may actually help the poor. They often pay much higher prices per unit for privately provided water and lighting because they are not connected to public service networks that have lower unit costs, and because they do not benefit from subsidies to users of the public system—usually the better-off. Expansion of access benefits the poor by allowing them to rely on less costly sources of water and power. (Cases in which subsidies are needed are discussed in Chapter 4.)

This effect has been demonstrated most convincingly for water, where the concerns for the poor are properly strong. In the Brazilian city of Grande Vitoria, Espirito Santo state, the willingness to pay for new water connections in 1993 was four times the cost of providing the service, while the willingness to pay for sewage collection and treatment was 2.3 times its cost. Without treatment before disposal, the willingness to pay falls to only 1.4 times the cost because untreated sewage creates health problems and reduces the recreational value (mostly the fishing yield) of the waters into which it is discharged.

The willingness to pay for water is high for good reason. For the poor, easier access to water can free up time that can be used to pursue income-earning activities. In rural Pakistan, women with access to improved water supply spend nearly 1.5 fewer hours a day fetching water than do women without this access. Such savings are reflected in the value users attach to the services. In Haiti a household's willingness to pay for a new private connection increases by as much as 40 percent if the current water source is at least a kilometer away.

The poor are not simply willing to pay in theory; they are paying in practice. During the mid-1970s to the early 1980s, people in seventeen cities surveyed were paying private water vendors an average of twenty-five times the prices charged by the utility. In Nouakchott, Mauritania, and Port-au-Prince, Haiti, vendors were charging up to a hundred times the public utility price. Expanding the public utility network to give the poor access would mean that they would pay less than they are now willing and able to pay private providers.

Public works and financial autonomy

Making public works agencies financially independent does not mean that the public organization collects revenue directly from users to cover its operational costs. For public works, it is difficult or impossible to measure—and hence to price—individual use. Nevertheless, a predictable and transparent flow of revenue is necessary, based on user fees and standard budgetary allocations from government. To some extent, the goal is one of financial accountability rather than financial autonomy because the main objective is to achieve predictable and adequate financing. The key to the success of Korea's highway corporation has been making the performance of the organization more transparent (a process described in Box 2.4) and linking budgetary transfers to performance. But in many developing countries the budgetary process does not allow for
such a clear link between resources and performance, and many public works departments have been trying to increase their own sources of revenue. Doing so is easier for local public works agencies than for highway authorities because the beneficiaries of local services are more easily identified.

**Financial independence of highway departments.** In principle, departments can increase their share of own-revenue sources by making beneficiaries pay, directly or indirectly, for road use. Users pay many road-related fees on vehicle ownership, such as license charges and taxes on vehicle acquisition, registration, and inspection. They also pay charges for use, such as fuel taxes, tolls, or parking taxes. Such road-user charges usually fall far short of costs, however. In Zambia in 1991, road-user charges (mainly license fees and road tolls) financed only 10 percent of the total spending on roads, with general budgetary revenue making up the shortfall.

The gap between user payments and expenditures arises because road-user charges often do not cover the costs that different types of vehicles impose on roads. In Ghana heavy trucks use four to five times more fuel than cars, but their axle loadings, often ten times higher than those of cars, cause road damage many times higher than cars. The way to handle this difference is through such supplementary taxes as annual licensing fees that vary by vehicle weight. In the case of articulated trucks, appropriate licensing fees based on weight have been calculated at $2,550 in Tanzania and $3,000 in Tunisia. But road users resist paying such high road taxes where roads are in poor condition.

Some countries have taken to financing road funds through the allocation of specific user fees (such as tolls or fuel tax revenue) for specific activities such as maintenance. This narrow earmarking of specific taxes and fees that are closely related to use of facilities helps overcome resistance to taxes. The practice is common in Latin America, the United States (for roads), and some Asian countries (special accounts in Japan, Korea, and the Philippines). The desirability of such earmarking hinges on practical rather than theoretical issues in most developing countries. In general, if the budgetary
process works well, earmarking should be avoided (Box 2.8 gives guidelines).

Cost recovery for local infrastructure expenditures. Local governments have been more successful in recovering costs indirectly—as in Colombia, for example, where “valorization” taxes pay for street improvements, water supply, and other local public services. With valorization, the cost of public works is allocated to affected properties in proportion to the benefit the work is expected to bring. Important for success are the participation of prospective beneficiaries in planning and managing projects, care in planning and implementation, an effective collection system, and—in many cases—significant advance financing from general government revenues so that works may be started on time. In Korea and North America, local infrastructure development has recently been financed using exactions, lot levies, development charges, and similar mechanisms to levy charges on would-be property developers to cover the added demands their development will impose on the urban infrastructure. The success of local taxes in contributing to the financing of infrastructure also depends on the quality of a city’s institutional infrastructure—such as its records, valuations, and collections. Each local tax requires technical expertise and political will in its implementation.

The need for a political commitment to reform

This chapter has focused on one essential element in the effective public provision of infrastructure services: the adoption of commercial principles. Abiding by these principles will be unsustainable, however, if they do not reflect a political commitment to improve public sector delivery. Political commitment underlies good public sector performance in Singapore and the sustainability of reforms in Korea’s public enterprises. It also explains why Botswana has been willing to search internationally, not just locally, for the best managers of its public entities.

Explicit or implicit contracts between policymakers and managers or operators have been used effectively to generate political commitment. The outstanding common element in contracts used by the most successful countries is that they are governed by clear rules. Among contracts that maintain ownership in the public sector, service contracts seem the most promising in this respect. Moreover, they test the capacity of the private sector to contribute to the provision of infrastructure. Thus, service contracts may be the most useful complement to corporatization and may provide a ready means of altering the partnership between the public and the private sectors. Performance agreements have been the least successful because they often endorse discretionary decisions driven by the many conflicting or evolving government interests.

Simply establishing commercial principles and maintaining them through political commitment are not sufficient for the success of commercial enterprises, however. The missing element for success is the introduction of competition with appropriate regulation. That is the focus of the next chapter.