

# Government Opportunism and the Provision of Water

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*What happens to the provision of water services when institutional arrangements cannot restrain government opportunism? Even when utilities are in public hands, governments are tempted to keep prices below financially sustainable levels and thereby “expropriate” the public agencies as effectively as if they were private. In the resulting low-level equilibrium, low prices are reflected in low quality, limited service expansion, operational inefficiency, and corruption, which further erode public support. A number of alternative institutional arrangements have been tried without success, but others hold promise including fragmentation, competition, and privatization.*

## Lost Water

Latin America loses about 9 trillion cubic meters of water each year, about 33 percent of the water collected and treated for public consumption. While it is impossible for water systems to deliver 100 percent of their water to the household tap, Latin America could cut those losses by more than three quarters if it could reach international standards for properly managed and operated water systems.<sup>2</sup> If the costs to society are so great in terms of tax

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<sup>2</sup> Assuming water losses of 8 percent, similar to those of Singapore (World Bank 1994), losses could be cut by 6.8 trillion cubic meters per year, and to a mere 1.3 trillion cubic meters per year if the region could achieve the loss levels reached by U.S. water companies (only 4.7 percent). See American Water Works Association (1993).

revenues, environmental impacts, and reduced coverage, why is it so difficult to properly manage and operate water systems in the region, and more generally in the developing world?

The problem is not related to project finance or lack of technical or manpower capabilities, but rather to the political economy of the sector. Indeed, the region has invested some 1 percent of GDP in water projects every year for the past decade, and operating costs are at least as large. The water sector employs tens of thousands of employees, with a ratio of employees per thousand connections more than three times the level considered efficient by privately managed firms. With these large resources devoted to the sector, why is it so difficult to expand coverage, improve quality, and properly maintain water systems? The nature of the sector, coupled with the nations' political institutions, create incentives for governments to behave opportunistically, for water companies to operate inefficiently, and for the public to withhold support from the sector. Thus, the water sector, as with other utilities in the region, has a tendency toward a *low-level equilibrium* from which it is difficult to escape. The problems of regulating the water sector are not uniquely related to the recent efforts to involve the private sector through concessions,<sup>3</sup> but rather are an essential part of why public enterprises in the region, and the developing world in general, have had difficulty providing efficient services.

A useful framework for analyzing the constraints to improving water services in Latin America begins with a discussion of the problems facing the potable water and sanitation sector—most of which are shared with other infrastructure and utility sectors. The problem of governmental opportunism is found to be the main reason for the poor performance of utilities, and of water utilities in particular, whether they are public or private. This opportunism leads to a low-level equilibrium in which low prices are associated with low quality, limited pace of service expansion, operational inefficiency, and corruption, which further erode public support. The peculiar characteristics of the water sector make this problem even more acute. The framework is complete with a discussion of the institutional arrangements that have been tried without success, and others that hold promise, such as fragmentation, the introduction of competition, and privatization.

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<sup>3</sup> See Willig et al. (1998).

When this framework is applied to case studies from throughout the region, Honduras and Peru stand out as clear examples of the stability of low-level equilibria that emerge when governments cannot develop a credible policy for the financial sustainability of the water sector. In these cases, efforts to increase coverage and service quality are regularly stymied. Consumers are unwilling to spend more on services they view as wastefully managed. Water authorities face perverse incentives as they are not allowed to raise sufficient tariff revenues, obtain adequate fiscal commitments for investment, or retain the funds they obtain from service improvements. Thus, they reasonably prefer to manage the system in ways that reduce effort, increase employment, or even allow them to privately appropriate resources. Finally, governments with relatively short time-horizons will prefer the status quo over costly political actions that might involve increased water rates in the short-run and yield diffuse benefits only in the longer term. Consumers are relatively dispersed and too disorganized to assume an active role in holding the water authority accountable. It is not surprising that in this political and social environment, private investment is not forthcoming without major regulatory and institutional changes. The government's lack of credibility to establish commercially independent and viable water systems is, then, the key to disentangling the low-level equilibrium.<sup>4</sup>

In Mexico, Chile, and Argentina, the analysis produces very different results. Mexico shows how changes within fully public institutions can lead to better performance, although the improvements from decentralizing to municipal authorities are only marginal. Chile shows decidedly strong performance among public institutions, particularly when they take advantage of private subcontracting; however, it also shows the continuing limitations of such a regulatory and ownership structure in terms of mobilizing sufficient investment. In Argentina—the country in the region that has proceeded most quickly toward extensive private participation in the sector—the interplay of two different concession arrangements with their respective institutional contexts has generated incentives for the achievement of public policy goals that are reasonable in Buenos Aires and problematic in Corrientes.

In analyzing the water sector, this book focuses primarily on issues related to the provision of potable water services. Issues related to efficient

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<sup>4</sup> This does not mean, however, that private investors would not be willing to operate the system under a contract that assures their investment recovery in a very short period of time.

water resource management, which would require consideration of alternative water uses, are not encompassed. It is appropriate to bracket such concerns because potable water uses are very small relative to the volumes consumed by agriculture or required for maintaining natural habitats. Furthermore, efficient allocation of water for direct consumption by human populations can generally be more easily attained when the price of water charged to utilities reflects its opportunity cost for agricultural or environmental uses. Therefore, any recommendations for placing water utilities on commercial standards of operation are fully compatible with efficient water resource management.

This book concentrates on the issue of increasing coverage and quality in the provision of potable water. Although it does analyze the treatment of wastewater, this subject is given relatively less emphasis. To some degree this is justified by the growing recognition, as demonstrated in almost all new concession arrangements, that the provision of potable water and the treatment of wastewater must be addressed simultaneously in the investment and operational plans of water utilities. Nevertheless, the fact that the effects of contaminated water are not generally perceived directly by the same people who consume water effectively reduces the political support for recovering costs or allocating investments toward wastewater treatment. If anything, a separate analysis of wastewater treatment would show that the processes that lead to low-level equilibria in the provision of potable water are even more extensive and problematic in the case of adequate wastewater treatment.

### **Main Features of the Potable Water Sector**

Potable water services are a critical part of the urban fabric of all societies as they influence health conditions, land prices, manufacturing costs, and daily comfort. Although Latin America has ample water supply in the aggregate, the process of capturing and distributing water has been deficient. Coverage has expanded over the past few decades but remains low in several countries. For those who receive water from public utilities, water quality and reliability of service are often poor. Almost without exception, the cost of providing the service is very high and prices are below cost. Latin America needs to invest on the order of \$12 billion annually over the next 10 years to reach adequate levels of water service coverage and sanitation, and much of

this may have to come from the private sector (World Bank 1995). Yet, despite the recent increases in investment in utilities and the rapid surge in private investment in these sectors, investment in the water sector has generally lagged. In the first half of the 1990s, the private sector committed some \$35 million to Latin America's electricity sector in 50 projects and \$22 million in 85 transportation projects, but only \$10 million in 19 potable water and sanitation projects.<sup>5</sup> This lag in private sector interest parallels the lag in water sector reforms.<sup>6</sup> These numbers are evidence that the problems in attracting investment to water utilities are more acute than they are for the other utility sectors.

Potable water services have many of the characteristics of private goods that are bought and sold in any private market—a fairly homogeneous commodity, purchased for domestic or industrial consumption, with reasonable information about its quality and characteristics. It is a commodity for which demand is normal with fairly stable and predictable elasticities in prices and income. However, potable water services share three basic characteristics with other utilities that make it difficult to provide them through perfectly competitive markets: large sunk costs, economies of density and/or scale, and massive consumption.<sup>7</sup> The combination of these characteristics leads to significant politicization of the sector's pricing and operations.

In comparison with other utility sectors, these characteristics are more acute for potable water services, making for a higher degree of politicization of its pricing and operations. First, in the water sector, sunk costs are more significant because most of the sector's fixed assets have few alternative uses. In that sense, the sector resembles the gas and electricity distribution sectors. By contrast, telecommunications assets are substantially more mobile than water sector assets thanks to computer technology. Furthermore, the ratio of operating to total costs for efficient water firms is much lower than for gas or electricity. For example, in the United States, this ratio is about 10 percent for water companies, while it is 32 percent for gas utilities and over 57 percent for electric utilities.<sup>8</sup> In the cases of gas and electricity, the energy

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<sup>5</sup> Estimated from data in *Public Works Financing* (October 1995).

<sup>6</sup> In Peru, Chile, and Argentina, water sector reforms were introduced much later than reforms in other utility sectors. See chapters 3, 5, and 6.

<sup>7</sup> See Spiller (1993) and Levy and Spiller (1994).

<sup>8</sup> These operation cost ratios were calculated from data in American Water Works Association (1993), EIA 1997, and Department of Energy annual reports.

component of total costs is higher than the expenditure for the actual water resource, and depreciation of capital may be relatively lower as well. This implies that the revenue needed to cover current cash expenditures as a proportion of total costs is smaller in water than in other utilities.

The water sector shares large economies of density with the electricity and gas distribution sectors. For a given distribution network, increasing the number of households connected or their consumption reduces the network's average costs.<sup>9</sup> This is especially true when alternative sources of water are not available. In such cases, retail competition may not be feasible even when using the same infrastructure for distribution as is increasingly common in the electricity and gas sectors. Thus, in a given locale, there will normally be a very small set of actual suppliers.<sup>10</sup>

Finally, water is the quintessential massively consumed product, and access to water is generally perceived to be more of a "social" and "basic" service than other utility services. In open political rhetoric, but alas not in public investment decisions, equitable access to potable water services is more strongly defended than access to services such as telephones or electricity. In Latin America, cultural attitudes toward paying the full cost of electricity and telephones have changed more rapidly than attitudes toward water rates. In Honduras and Peru, even the suggestion that reforms will increase rates has been sufficient to halt reform efforts. Similar consumer opposition to price increases associated with some water sector privatizations took place in Argentina.<sup>11</sup> In Chile, by contrast, substantial price increases have been readily accepted as a means for receiving improved services. A large part of this acceptance may be due to Chile's decision to establish a water bill subsidy targeted to poorer households, thereby defusing the political argument that the poor will be hurt by adequate rates.

These three characteristics—prevalence of sunk costs, economies of density and/or scale, and massive consumption—lead to the politicization of utility pricing. First, the fact that a large component of infrastructure

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<sup>9</sup> For evidence of these economies in the United States, see Bhattacharyya et al., 1994; and for Mexico, see chapter 4.

<sup>10</sup> This, however, does not mean that competition has not developed in water sectors. Free entry into the potable water sector has created direct competition in Guatemala City. A similar process is beginning to develop in Colombia. In both cases, competition is developing where multiple water sources are available.

<sup>11</sup> See *Financial Times* (February 13, 1996).

investments is sunk implies that once the investment is undertaken the operator will be willing to continue functioning as long as operating revenues exceed operating costs. Since operating costs do not include a return on sunk investments (but only on the alternative value of these assets), the operating company—whether public or private—will be willing to operate even if prices are below total average costs.<sup>12</sup> Second, economies of density imply that in most utility services, there will be few network operators in each locality. Consumers will tend to view the service provider as a monopoly, presuming it will use its market muscle to extract higher prices. This will raise public concern about its pricing and operational practices. Finally, the fact that utility services tend to be massively consumed creates an opportunity for politicians to use pricing strategically as an instrument of political mobilization, and generates a large, potentially vocal group of consumers whose interests can be used to obstruct effective reforms. Thus, massive consumption, economies of density and/or scale, and sunk investments allow governments (whether national or local) to behave opportunistically vis-à-vis the investing company.<sup>13</sup> For example, after the investment is sunk, the government may try to lower prices, disallow costs,<sup>14</sup> restrict the operating company's pricing flexibility,<sup>15</sup> require the company to undertake special investments,<sup>16</sup> control purchasing or employment patterns, or try to restrict the movement or composition of capital.<sup>17</sup> All these are attempts by politicians (and those they represent) to capture the rents associated with the

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<sup>12</sup> The source of financing does not change this computation. For example, if the company is completely leveraged, a price below average cost will bring the company to bankruptcy, eliminating the part of the debt associated with the sunk investments. Only the part of the debt that is associated with the value of the nonsunk investments would be able to be subsequently serviced.

<sup>13</sup> This incentive exists vis-à-vis both public and private companies and is discussed further below.

<sup>14</sup> This is possible under the current regulatory framework in Chile. See chapter 5 for a discussion of how the Chilean legislation limits the potential for opportunistic behavior by the regulator.

<sup>15</sup> Chapter 6 discusses how the government of Corrientes in Argentina successfully limited the pricing flexibility of the private operator, triggering a change of ownership.

<sup>16</sup> The first renegotiation of the Aguas Argentinas concession was associated with a new government's desire to change the investment plan detailed in the concession agreement (see chapter 6).

<sup>17</sup> For example, the latest water sector legislation in Chile limits the ownership of water companies by other utility operators (see chapter 5).



company's sunk costs by administrative measures. This political capture of rents is equivalent to asset expropriation, as the company—whether public or private—will be unable to reap the rewards associated with those sunk assets. Thus, expropriation may be indirect and undertaken subtly. While the government may uphold and protect traditionally conceived property rights, it may nonetheless attempt to expropriate—i.e., capture rents—through regulatory procedures.

### **The Political Profitability of Government Opportunism**

Governments may find it advantageous to expropriate sunk assets if the direct costs are small compared to the (short-term) benefits of such action and if the indirect institutional costs are not too large. The direct costs of expropriation—either directly or through administrative measures—include reduced investment by other operators in the infrastructure and utilities sectors who will, as a result, consider further commitments as increasingly risky. The institutional costs of such expropriations are to undermine the effectiveness of basic rules and norms of governance by disregarding judicial findings or evading proper, or traditional, administrative procedures. Meanwhile, the government may anticipate short-term benefits in electoral gains or winning parliamentary debates by mobilizing the public around the issues of reducing operators' prices or attacking monopoly suppliers.

Thus, incentives for expropriating the quasirents associated with the existence of sunk assets will be largest in countries where direct costs are small, indirect institutional costs are low, and the government's horizon is relatively short. Direct costs will be smaller when there are fewer private operators in the infrastructure sector; when the sectors do not, in general, require massive investment programs; and when technological change is not an important factor in the sector. Institutional costs will be low in countries where formal or informal governmental regulatory procedures—checks and balances—are weak or absent; where regulatory policy is centralized in the administration; and where the judiciary has little tradition, or authority, to review administrative decisions. Perhaps most important, the government's time horizon is strongly affected by the periodicity of elections, and whether or not the government faces highly contested elections and a need to satisfy key constituencies. Private operators will recognize and evaluate these fac-



tors, often choosing not to undertake investments in the first place. Thus, direct government provision of infrastructure may become the default mode of operation.

### **Credibility and Regulatory Frameworks**

Clearly, the three basic structural features of utilities have important implications for the development of regulatory structures. In particular, it is important to link regulatory reform to a country's institutional environment in a discriminating fashion.<sup>18</sup> Moreover, regulatory structures cannot be directly copied from one country to another, and regulatory reforms that attempt to improve upon current regulatory structures have to pass the acid test of implementability.

But in every case, regulatory designs have to confront the inexorable tradeoff between flexibility and credibility. On the one hand, regulations must be sufficiently fixed and rigid to provide investors and managers with the certainty they need regarding future terms and profitability. Without the credibility provided by this rigidity, investment decisions will be biased toward shorter-term gains or investment will dry up all together. On the other hand, governments need to have sufficient flexibility to adjust to changing conditions. Surprises can come in the form of windfalls for the utility companies, through technological advances or unforeseen cost-savings, and the public interest demands that these savings be shared with consumers. Most countries, then, develop institutions that create a mixture of flexibility and credibility that is strongly conditioned by the strength and effectiveness of other institutions, such as parliaments, courts, and regulatory agencies. In other words, a first best solution is seldom achievable.

The particular features of utility sectors make regulatory credibility a necessary ingredient for managing public or private investment in a socially efficient manner. The regulatory proposals that attempt to grant regulators substantial discretion to reform and correct perceived market imperfections adversely affect investment incentives and explain much of the lagging performance for infrastructure in Latin America. This paradox is at the essence of the tradeoff between credibility and flexibility developed in Levy and Spiller

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<sup>18</sup> See, for example, Guasch and Spiller (1995), Levy and Spiller (1994 and 1996), and Spiller (1993 and 1996a).

(1994). Indeed, this tradeoff reflects a more general problem inherent to commitment in governments. As Weingast's (1995) opening paragraph excellently exemplifies: "A government strong enough to protect property rights and enforce contracts is also strong enough to confiscate the wealth of its citizens."

The government opportunism that lies at the root of the low-level equilibrium can only be made transparent and confronted directly when the operator has some autonomy from the executive branch. Such an arrangement can range from arms-length relationships among governments and public water agencies—as is the fashion currently in Brazil—to concessions designed to attract private investors—as actively pursued by Argentina. In either event, a government that wants to address the problems of service coverage and quality will have to design institutional arrangements that limit its own ability to behave opportunistically toward the water company—be it public or private. Such institutional arrangements are nothing more than the design of a credible regulatory framework.

A credible regulatory framework has to stipulate the procedures and policies for price setting, conflict resolution (arbitration or judicial) between the parties, consumer rights, quality standards, and investment, among other things. In other words, regulation, if credible, solves a key contracting problem between the government and the utilities by restraining the government from opportunistically expropriating the utilities' quasirents.<sup>19</sup> This, however, does not mean that the utility has to receive assurances of a rate of return or exclusive licenses.<sup>20</sup> In some countries, however, such assurances may be the only way to limit the government's discretionary powers.

The absence of a credible regulatory framework is most apparent when looking at efforts to attract private investment in the sector. A first order effect is that, without a credible regulatory framework, investments may never take place. In countries where the government's commitment not to expropriate investments explicitly or implicitly is very weak, private investors will

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<sup>19</sup> See Goldberg (1976) for one of the first treatments of this problem. See also Williamson (1976).

<sup>20</sup> Indeed, when Colombia's initial reform of telecommunications deregulated value added networks, it specifically stipulated that the government could not set its prices nor did it allow exclusivity provisions. Thus, the regulatory framework in this context meant a total restriction on governmental discretion.

simply not take the risk. Under such conditions, even public entities with any degree of decision-making autonomy will underinvest.<sup>21</sup>

A second effect of noncredible government policies is that operators may keep maintenance expenditures to a minimum, thus degrading quality and increasing water losses. This has been an important cause of the low quality of supply in the water sector across Latin America. For example, unaccounted water reached 50 percent in Honduras, Mexico, and Peru,<sup>22</sup> while in Argentina (prior to the privatization of the water sector in Buenos Aires and Corrientes) it was as high as 60 percent. In Chile, on the other hand, unaccounted water is much lower, averaging 17 percent among private companies. Quality can also be measured in terms of pressure and frequency of interruptions. In Argentina, prior to the privatization of Aguas Argentinas, the percentage of connections in the federal capital with reasonable water pressure (more than 8 meters) was only 15 percent. In three years, Aguas Argentinas was able to increase that percentage to 97 percent (see chapter 6 on Argentina). A high frequency of interruptions is also quite prevalent in the region. In Honduras, the average water system provides only 10 hours of service per day, with 70 percent of connections showing intermittent service (see chapter 2 on Honduras).

Third, operators may insist upon high up-front rents achieved through high prices. Although these may provide incentives for some investment, they may also be politically unsustainable. To privatize Argentina's telecommunications sector, prices were raised well above international levels, which allowed companies to reduce their exposure to regulatory risk. Subsequent to privatization, however, the government reneged on many other aspects of the license.<sup>23</sup> Prior to granting the Buenos Aires concession, the Argentine government increased the prices for water services in Greater Buenos Aires close to costs. Although the concession for Corrientes appears not to have

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<sup>21</sup> As chapters 2 and 3 on Honduras and Peru make clear, this is the current situation in both countries. Chapter 6 on Argentina, on the other hand, shows this to be the case prior to the recent privatization. See Willig et al. (1998) for other examples.

<sup>22</sup> Some Peruvian companies have much higher percentages of unaccounted water (see chapter 3).

<sup>23</sup> License provisions such as indexation were initially not implemented—allegedly because of the passage of the Convertibility Act that prohibited indexation. Later, indexation and other provisions were modified by the government. The initially high prices, though, allowed the companies to remain profitable even when the government deviated from the license provisions. See Spiller (1993).

followed this rule—since the winning bid proposed a price reduction of 17 percent below then current rates—most of this price reduction was planned to take place after the fifteenth year of the concession. Generous price increases, however, may turn out to be politically infeasible, as demonstrated by the water service concession of Tucumán. In that case, the price increases triggered a customer revolt, which led to substantial nonpayment problems, and the eventual revocation of the license (see chapter 6 and Artana et al., 1997).<sup>24</sup>

A fourth effect of noncredible regulatory frameworks is to push the financing of sunk costs to users through relatively high connection charges. This has occurred in various sectors, from telecommunications to water, where high connection charges are used by investors to offset the risk to their sunk assets. For example, the World Bank estimates the long-run incremental cost of a water connection in Greater Buenos Aires to be approximately \$2,500. Connection charges under the current concession agreement with Aguas Argentinas vary from \$400 to \$600 (see chapter 6). Although these hook up charges do not reach the full connection cost, they do substantially reduce the payback period for the investor, partially protecting the utility from governmental opportunism. Other water systems expand only when users or third parties commit full funding for the investment. Bolivia has several examples of this practice. The Santa Cruz water company expands only when all potential users in a particular expansion zone have committed to pay the related expansion costs. In El Alto, expansion of the system has been contingent on community mobilization of resources with matching grants from exter-

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<sup>24</sup> Another effect that may not be directly applicable to the water sector, is that investment may be undertaken with technologies that have a lower degree of sunk investments, even at the expense of reducing the quality and increasing the cost of services. In this regard, it is not surprising that private telecommunications operators have rushed to develop cellular rather than fixed link networks throughout Eastern Europe. While cellular technology has a higher long-run cost than fixed link, and on some quality dimensions is also an inferior product, the magnitude of investment in specific assets is much smaller than in fixed link networks. Furthermore, a large portion of the specific investments in cellular telephony are undertaken by the customers themselves who purchase the handsets. In the solid waste sector, too, private haulers will use general purpose trucks or handcarts rather than invest in specialized compacting equipment, even though the latter may be more profitable and environmentally sound, simply because it is more difficult to resell or convert them to other uses (see Cointreau 1994).

nal funding agencies.<sup>25</sup> In water systems that combine low prices and low hookup charges, it is difficult to attract operators who might otherwise be willing to face regulatory risk in return for the ability to exploit particularly profitable service segments.

By strongly encouraging inefficiency and poor performance, a non-credible regulatory framework eventually creates the conditions for a direct government take-over. Thus, the government eventually becomes owner and operator by default. Government ownership, then, represents neither the best way to promote the public interest nor the most efficient way to provide services, but simply the failure to develop institutions that limit the temptation for opportunistic governmental behavior.

### **The Emergence and Stability of Low-level Equilibria**

While much of the literature demonstrates the importance of government credibility and the effects of regulatory frameworks on *private* participation, credibility and regulatory frameworks are also critical to effective provision of water and other utility services *when they are in government hands*. The relationship between the executive arm of government and the agencies or semiautonomous authorities that operate and manage publicly owned water systems illustrates the same range of incentive problems as those that arise with private sector participation. The manifestations of these incentive problems are generally similar—low coverage, limited investment, and poor quality service. They differ, however, in other ways. Private operators will respond to regulatory frameworks and incentive structures in ways that maximize their return and minimize their risk. By contrast, public operators—who do not directly realize returns from asset ownership—are more likely to dissipate rents through excessive employment and other forms of inefficient resource utilization, creating indirect ways to capture those rents privately. If it were easy to limit governmental opportunism and develop workable frameworks for private operation, these would have been more

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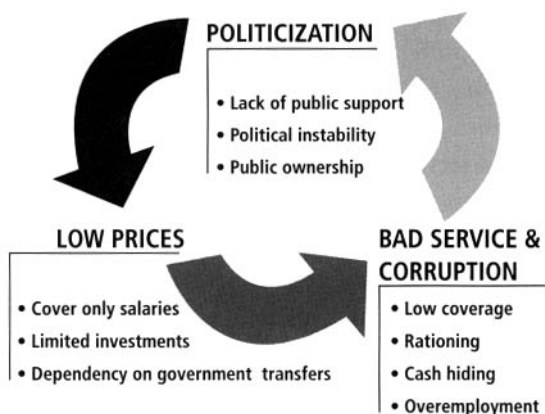
<sup>25</sup> In numerous cases, mobilizing communities to finance expansion costs, in full or in part, has been a successful tool for reaching areas that lack water service for several reasons. Community mobilization can create a lobby to voice demands for adequate water service to the relevant political authorities; provide the marginal funds necessary to initiate a project; perform formal or informal supervision of public works to assure quality; and establish support for continuing maintenance and proper operation.

common in the region. Given the difficulties in limiting governmental opportunism, public ownership becomes the predominant mode of provision by default, nowhere more so than in the water sector.

Government opportunism, in its basic form, implies low prices: prices so low that they fail to provide the operator—public or private—with the ability to finance its business expansion, whether current or past (i.e., servicing the debt). Lowering prices, however, is not simply a one-time reversible action. Rather, once the short-term political interest in lower prices is seized upon, the low prices trigger a downward spiral in which mutually reinforcing factors make low prices and low quality a stable equilibrium. This downward spiral is depicted in Figure 1.1.

Politicians, in their clamor for lower prices—or delayed billing, or performance of unprofitable activities—can claim social consciousness while blaming the operator, whether public or private, for inefficient performance.<sup>26</sup> But low prices imply that the public operator will depend on government transfers for expansion and investment. In Peru, for example, the average return on equity of the water operators is a startling 0 percent. Similarly, in Honduras the average revenue per connection reaches only 50 percent of operating costs, while the Buenos Aires water operator reached profitability only

Figure 1.1



<sup>26</sup>Low prices fit the perfect “credit claiming—blame shifting” strategy discussed in Fiorina (1982).

following its privatization. The need for government transfers, in turn, limits the operator's ability to expand, as investments are not evaluated relative to their own profitable returns but against the competing uses of funds in the national budget. In Chile, for example, one of the key restrictions on expanding water services or treatment is the fact that the water companies remain public entities whose expenditures form part of the national budget (see chapter 5). Despite the fact that these investments might easily be recovered through rates and, therefore, would represent no net claims against future tax revenues, the investment budgets are restricted by competition with other sectors, such as education, for which little or no cost recovery can be anticipated.

A cash-poor company that needs direct government transfers to finance its investment program will also be subjected to substantial scrutiny and intervention, thus limiting its autonomy in matters of personnel, allocations among inputs, and areas for expansion. Once it becomes politically convenient for the polity to set opportunistic prices, the maintenance and investment budget may disappear, leaving only the minimum required to cover salaries (which themselves are protected by a strong lobby).<sup>27, 28</sup> Under such scrutiny, a cash-poor company also loses much of its ability to protect its autonomy by strategically manipulating its information. Consequently, the company will find its asset base depreciating, its maintenance program will suffer, and its service quality will deteriorate. These factors will further tighten its investment capabilities, making its expansion programs sporadic, generating low coverage levels, and probably shortages and rationing as well (see Table 1.1).

Although public enterprises usually require the Finance Ministry to approve investment programs, some cash-rich companies may protect their autonomy by utilizing their information advantage, forestalling close government scrutiny. This is where the reinforcing dynamics start to make this

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<sup>27</sup> In SAANA's Tegucigalpa operation, the union effectively co-administers the enterprise. One effect is a pattern of excessive employment in Tegucigalpa, even in comparison to the inefficient employment levels in other parts of Honduras (see chapter 2).

<sup>28</sup> For example, in Honduras, labor costs exceed 50 percent of current revenues, while in Buenos Aires prior to the privatization, labor costs hovered between 30 percent and 64 percent of total revenues. By contrast, efficient operators in countries with higher unit labor costs have much lower shares. For example, in a sample of over 1,000 water companies in the United States between 1989 and 1992, the American Water Works Association estimates that labor costs averaged 20 percent of revenues (AWWA 1995).



**Table 1.1 Measures of Efficiency for Selected Water Utilities in Latin America**

Country/Company	Revenues/ Oper. Costs	Wage Bill/ Revenues	Coverage	Hours of Operation	Employees Per 1000 Connections	Water Losses
<b>Chile (1995)</b>						
Public Enterprises (avg.)	1.27	0.15	99%	23	2.5	31%
Private Enterprises (avg.)	1.21	0.12	100%	24	4.9	17%
<b>Honduras (1994)</b>						
SANAA – Tegucigalpa	0.36	0.25	53%		13.6	50%
SANAA – Other	0.48	0.43	77%	10	5.0	
Municipal Authorities	0.41	0.29	67%	11	4.0	
DIMA	1.67	0.21	65%	22	6.0	37%
<b>Mexico (1994)</b>						
			85%			
Auton. Municipalities				14	6.3	47%
Regulated Municip.				15	5.8	46%
Auton. States				15	5.7	49%
Regulated States				16	5.5	46%
<b>Peru (1993/1994)</b>						
			72%	14		
SEDAPAL	1.17	0.19	75%	14	2.1	38%
SEDAPIURA	0.86	0.35	81%	18	7	55%
Admin. Sullana	0.97	0.32	70%		4.4	49%
SEDAQOSQO	1.16		55%		5.7	46%
<b>Argentina</b>						
OSN (1985)	0.89	0.57	72%		9.6	
Aguas Argentinas (1994)	1.22	0.39	77%		3.6	
Aguas de Corrientes (1991)	0.01	0.37	66%		7.4	61%
Aguas de Corrientes (1995)	0.99	0.35	73%		2.6	45%
<b>Brazil (1995)</b>						
SANEPAR	1.08	0.70	99%		2.8	28%
CASAN	0.99	0.72	88%		3.3	35%
CESAN	1.13	0.67	95%		3.6	28%
SABESP	0.99	0.39	94%		2.5	36%
CAESB	0.70	0.63	90%		3.2	24%
SANESUL	0.71	0.44	94%		4.3	47%
EMBASA	1.01	0.61	100%		4.2	54%
CAEMA	0.82	0.78	78%		8.0	59%
CAGECE	0.84	0.58	74%		2.9	39%
CAER	0.40	0.25	99%		7.4	43%

Sources: Chapters 2–6, and for Brazil, SNI 1997.

a low-level equilibrium. As the company is stripped of cash, the management and the union have a clear incentive to engage in “cash hiding.” That is, since extra cash cannot be used for investments without government authorization, it will be used to increase employment, whether permanent (if the company has the ability to do so) or temporary. Corruption can then become endemic. Corruption, bad service, and low quality make the company a public eyesore, reinforcing the public perception of bad management and reducing general support for continuing fiscal transfers. For example, households in the marginal neighborhoods of Honduras were willing to pay about twice as much for service improvements in privately or cooperatively managed systems than in those operated by the national water company or municipal water authorities due to the poor reputation of the latter. Clearly, in such contexts, there is successively less political incentive for elected officials or the Finance Minister to support government transfers.

Thus, a stable low-level equilibrium is achieved in which prices are kept low, government transfers are limited, service quality and coverage are low, and no one—whether the service operator, the government, consumers, or constituents—has an interest in changing their position. Although attempts at reform may occur, they commonly fail. Low-level equilibria, then, are stable because: (a) there is no public support for increasing government transfers or raising prices to adequate levels; (b) the government has little incentive to spend scarce investment funds on a mismanaged organization; and (c) attempts to improve management fail, unless there is basic institutional change.

### **Failed Strategies**

Clearly, low-level equilibria have high social costs.<sup>29</sup> Specific calculations for Honduras conservatively estimate that raising prices to cover incremental costs of expansion and increasing coverage to 93 percent of the population would increase national welfare by some 2 percent of GDP (see chapter 2). In addition to the social costs of not providing water to people who are willing to pay for it, lack of potable water has a negative impact on health conditions. Unreliable water service prompts firms to invest in generating

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<sup>29</sup> For further discussion on the importance of the infrastructure sector on a nation's wellbeing, see Spiller and Savedoff (1998).

their own supplies, increasing their costs and reducing their international competitiveness. Furthermore, it degrades the environment by diverting too much water from aquifers and streams. A well-developed potable water sector has, then, a direct impact on the wellbeing of a nation. It improves health, reduces the cost of urban development, and increases the available time for market and nonmarket activities. It also reduces the cost of water-dependent industries (e.g., food processing).

Thus, moving out of a low-level equilibrium should be an important government priority. But as the previous discussion suggests, low-level equilibria are stable—simple fixes will not do the job. Past efforts include the standard set of international agency recommendations including price increases, performance contracts, or other types of temporary performance improvements, and even hiring private firms under Build-Own-Transfer (BOT) contracts.

A standard international agency recommendation is that prices should cover operating and investment costs. When prices are raised to cover operating costs and finance investment, they are rarely raised enough because the low efficiency of the system means that actual costs are much higher than long-run marginal cost. Consumers resist the hike in prices and will not accept them until service is first improved. As a result, the cash generated by a price increase is easily dissipated by the existing management structure and eventually eroded by inflation or repealed. Even pressure from international agencies may not work. In negotiations on a particular sector development loan, a government may agree to a price increase. Once that price increase is introduced, however, the political forces that triggered opportunistic price setting will kick in again—slowly or rapidly—depending on the extent to which inflation erodes the imposed price increase. In the longer run, the price increase will be nothing more than a blip in the chart.<sup>30</sup> As a result, reforms that introduce price changes without making an institutional change in the way prices are set are not sustainable.

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<sup>30</sup>Between 1979 and 1989, electricity rates fell by an average of 1.5 percent after IDB loan approvals in the electricity sector compared to an average increase of 7.2 percent before, despite contractual clauses requiring that rate levels be maintained. This applies to 23 loans in 12 countries for which data was available in "Evaluation Report on Electric Power Sector, Tariff Policy and Lending," ORE, RE-187, Inter-American Development Bank, Washington, DC (March 1993).

A second type of improvement exercise is to introduce performance contracts. These contracts are effected between management and government, where management will receive some part of the expected increased profit. In general, such contracts have failed in their effort to improve public sector performance as demonstrated by Shirley and Xu (1996). The reason is quite simple. On the one hand, these contracts do not change the basic discretionary power of the government nor do they alter the degree of asymmetry of information between management and government. Since managers know that the government or consumers will eventually appropriate any surplus or profits, they will operate the firms to redistribute cash to themselves and their workers, rather than to increase efficiency. These performance contracts often fail because the government lacks credibility—it can neither establish hard budget constraints nor effectively monitor management's actions. Hence, the use of management contracts as a solution to a credibility problem is ultimately self-defeating. Similarly, introducing new management is also generally inadequate for sustainable changes because the new management faces exactly the same incentives as the old guard. Although not necessarily corrupt, the new management will find that it is better to keep any excess cash in the company rather than transfer it (directly or indirectly) to the government.<sup>31</sup> Since there are no effective incentives to expand or improve service, the cash is used in ways that are not perceived by consumers as better service. Thus, a basic implication of this analysis is that public companies subject to governmental opportunism will rotate management without substantive operational improvements.

A third strategy aims to decentralize the service provider, either by reorganizing administratively or transferring responsibility to subnational political entities. For example, Peru drastically decentralized its water services at the end of the Alán García administration with no significant impact on service quality because the incentives faced by the operator remained the same (see chapter 3). The debate in Honduras over whether to “regionalize” the national water company or “municipalize” water services risks ignoring the more fundamental incentive problems (see chapter 2).

A final strategy is to use BOTs to expand systems. BOTs are attractive because they promise to add capacity without disturbing the existing bal-

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<sup>31</sup> An indirect transfer back to the government means that excess cash crowds out government transfers, probably on a one-to-one basis.

ance of political interests. They require no fundamental change in the way the company operates or is managed, nor do they require any direct transfer from the government. BOT's, however, require substantial governmental guarantees, very high initial prices, and relatively inflexible contract terms. Since the overall credibility problem is not resolved, BOTs are appropriately perceived as "very expensive," further reinforcing the public impression of corruption and favoritism that encircles the company.

### **Complementary Mechanisms for Success**

The basic question remains: what will succeed? In other words, what set of changes could move a water sector away from its low-level equilibrium? The key to escaping the low-level equilibrium is to develop a process that limits government discretion in price setting. Once such limits are in place, attempting to improve management and to set prices at reasonable levels may actually succeed because they will take place within a context of incentives compatible with improving coverage and service quality.

For a process to be effective in limiting government discretion, the operator must have substantial financial and managerial autonomy and three complementary mechanisms must be in place.<sup>32</sup> First, substantive restraints on regulatory discretion must be embedded in the regulatory framework; second, formal or informal constraints must limit the ability of the polity to change the regulatory framework itself; and finally, institutions must be in place that enforce those substantive or procedural constraints. These three mechanisms are easier to implement in countries where decision making is naturally decentralized. In countries where decision making is heavily centralized, regulatory credibility requires more rigid institutions and restraints.

Regulatory commitment has generally been introduced in three different forms: through specific legislation, "hard wiring," or license terms (i.e., contracts). In the first case, governments can enact specific legislation and delegate its implementation to a regulatory agency whose decisions, on both substance and process, are subject to review by the judiciary. Such legislation seeks to establish the conditions for investment and operation of companies in the particular sector and endows the regulator with substan-

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<sup>32</sup> See Levy and Spiller (1994).

tial discretion in pursuing the objectives as set out by law. In the second case, regulatory credibility can be achieved by designing the decision-making process ("hard wiring") so that the interests of the regulated companies are safeguarded against administrative expropriation.<sup>33</sup> In these cases, the regulatory agency is tied to specific, predetermined procedures for supervising the industry. In the case of pricing, this can involve specifying the exact method to calculate and determine acceptable adjustments. Here again, the courts may review agencies' decisions, both on substantive and procedural considerations. Finally, regulatory credibility can be achieved by granting the operator a license or contract that specifies the regulatory process through which its prices will be determined. Deviations from the license could then be challenged through the courts.

These three regulatory instruments have different implications for both regulatory credibility and flexibility and perform differently depending upon the context.<sup>34</sup> To show the difficulties in building commitment, consider the United States, which enjoys a relatively propitious political environment with fragmented political structures, decentralized decision making, and multiple checks and balances. The United States has a government structure that fragments power among a directly elected president, a legislature composed of two chambers elected under different rules and at different times, and electoral rules designed to tie legislators to their local constituencies which limits—but does not eliminate—the power of political parties. The United State's judiciary is reasonably well respected by the population and its decisions are widely accepted and implemented. In such a case, specific legislation may be difficult to introduce, as the political fragmentation inherent to the political system increases legislative costs. Thus, a policy problem must be a priority before legislators will spend time drafting—and negotiating—very specific legislation.<sup>35</sup> Hard-wired decisions, that is, very specific decision-making procedures are, on the other hand, easier to draft and adopt, but are, as everything, potentially imperfect. In particular, they run the risk of being diverted by future judicial interpretation. Finally, although contractual arrangements such as licenses are feasible in the United

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<sup>33</sup> See McCubbins, Noll, and Weingast (1987). On hard-wiring, see Hamilton and Schroeder (1992) and Macey (1992).

<sup>34</sup> For an in-depth discussion, see Spiller (1996a).

<sup>35</sup> See Schwartz, Spiller, and Urbiztondo (1996).

States, they may be too rigid given the nature of the U.S. political system. Thus, the commitment potential of U.S. regulatory structures is quite strong and allows most of these mechanisms to function much better than in less propitious environments. It is, then, not surprising that hard-wiring solutions are the regulatory norm for the United States.<sup>36</sup> Hard-wiring solutions provide politicians with the necessary political flexibility while at the same time the credibility of the judiciary and their traditional protection of property and contract rights provide investors with some assurances against opportunistic behavior.<sup>37</sup>

On the other hand, in nations with centralized decision-making processes, the first two approaches do not provide much regulatory credibility. Nations with centralized political decision making can change laws relatively easily; hence, very specific laws (in substance or in process) will not effectively constrain governmental decision making. Indeed, it is quite interesting to observe that while in the United States the evolution of the electricity sector was undertaken almost without federal legislation, in the United Kingdom, a highly centralized system, most major regulatory changes occurred via legislative action.<sup>38</sup> Similarly, in centralized political environments, courts are less likely to challenge administrative decisions.<sup>39</sup>

Various countries have attempted different approaches to limit governmental discretion when privatizing infrastructure sectors. Chile, a country with substantial checks and balances, introduced very specific legislation to regulate price setting in electricity, telecommunications, and water. Similarly, Chile's antitrust legislation limits political interference through a very complex decision-making process.<sup>40</sup> On the other hand, Argentina, a country with substantial credibility problems, privatized its water and electricity distribution utilities with a very specific regulatory framework embedded

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<sup>36</sup> See McCubbins, Noll, and Weingast (1987).

<sup>37</sup> This does not mean, though, that U.S. utilities have not had their share of regulatory difficulties. In the 1970s, higher inflation, the increase in the real price of oil, and the emergence of environmental concerns required substantial changes in the regulatory process (Joskow 1974), costing electric utilities substantial market value. One of the lasting effects of this period is an increase in the perception of regulatory risk because capacity additions (mostly nuclear) that were undertaken during the oil shock period were challenged in courts by environmental groups and eventually were withdrawn from the rate base.

<sup>38</sup> See Spiller and Vogelsang (1996).

<sup>39</sup> See Spiller (1996a) for a theory of the evolution of independent courts.

<sup>40</sup> See Corbo, Luders, and Spiller (1997).



in their operating licenses. These licenses, themselves, substantially limit the ability of the regulatory agency to deviate from the prescribed price setting process. Bolivia, almost alone, has maintained private ownership of electricity through the use of very specific concessions since the turn of the century.<sup>41</sup> Mexico, which until recently had a highly unified political system, chose to reform the utility sector through decentralization. This decentralization has had limited effects on performance, largely because responsibilities have been devolved to states that recreate the low-level equilibrium problem at the subnational level. Peru and Honduras, both countries with very few checks and balances, have systems that grant substantial discretion to the regulatory authorities,<sup>42</sup> which limit their ability to escape from low-level equilibria.

Table 1.2 provides a summary of the relation between the extent of flexibility of the regulatory systems chosen by various nations and the extent of checks and balances in their political decision-making process. It shows that among the countries with extensive checks and balances, the United States chose a flexible regulatory system, while Chile chose a more rigid one. Both, though, have succeeded in reaching a higher level equilibrium. The Aguas Argentinas concession and the U.K. concessions are examples of rigid regulatory structures in environments with fewer checks and balances. The cases where low-level equilibria remain stable are those in which the regulatory regime provides ample flexibility with few checks and balances. These are the cases of Honduras, Peru, and Argentina prior to the recent wave of privatizations. Mexico, on the other hand, is still in transition. There, the price setting process remains too discretionary. In an environment with few checks and balances, this creates serious concerns about the country's ability to sustain a higher level equilibrium.

Given the scarce administrative law tradition in the developing world, it is not surprising that few countries have experimented with administrative procedures as ways to provide regulatory credibility. But regulatory structures by themselves may not be enough. Ancillary structures may have to be developed.

<sup>41</sup> The other long-lasting, private electric company in Latin America is the Caracas Electricity Company, which has had no regulatory structure in place but has had widely diffused local ownership. The impact of diffused local ownership is discussed further below.

<sup>42</sup> In the case of Honduras, the regulator is the largest operator, further eroding any regulatory credibility (see chapter 2).

**Table 1.2 Checks and Balances of Regulatory Systems**

Checks and Balances	Regulatory Scheme	
	Flexible	Rigid
Extensive	United States	Chile
Limited	Argentina prior to privatization	Argentina after privatization
	Mexico	
	Peru	U.K.
	Honduras	

### **Maintaining a High-Level Equilibrium (or Remaining on Higher Ground)**

An implication of this analysis is that high-level equilibria are inherently unstable unless there are institutional restraints to governmental opportunism. In their absence, a political shock may call for a price freeze, for a change in the company's investment pattern, or any other operational change that has the effect of expropriating the sunk investments of the public company. Indeed, the movement down from a high-level equilibrium could be stochastic—precipitated by random political and economic shocks, like high inflation, political and social unrest, and so on.<sup>43</sup>

Once a high-quality equilibrium is achieved, the design emphasis should shift toward how to sustain it. Sustaining it means providing political support to maintain a process that limits governmental opportunism. Such support must come from interested parties. Thus, a polity interested in preserving a high-level equilibrium will need to design an industry structure that increases the number of interest groups supporting such a high-level equilibrium.

A basic strategy to increase political support is to fragment the industry. Fragmentation can take many forms, but in every case it generates multiple actors with competing interests. The most common form of fragmentation in infrastructure is by geographic area; for example, national water or telecommunication enterprises can be broken up into many smaller independent firms that retain responsibility for service provision in a particular

<sup>43</sup> It is in this sense that some of the reforms in Mexico may not be sustainable because the transfer of operational and regulatory responsibilities to some municipalities may create incentives for utilizing the water companies' resources for short-term political gain.

area. In some cases, fragmentation takes place by subdividing the sector, as when electric generation is separated from transmission and distribution. Occasionally fragmentation creates firms that directly compete with one another, as is increasingly the case in telecommunications. Fragmentation of ownership can even be achieved by selling shares to the public or directly distributing shares in public enterprises to citizens.

Fragmenting the industry has the advantage of creating multiple sources of political support for proper governmental behavior. Similarly, fragmenting the industry and creating—at least potential—competition limits the informational advantage enjoyed by each company. This, in turn, makes it possible for the regulatory agency to learn much more about developments in the industry with regard to cost structures and strategic behavior by comparing and contrasting the performance of different firms. It also makes it more difficult for a single firm to “capture” the regulatory agency, i.e., bias agency findings in its favor, because competing firms have an interest in exposing the kind of cozy relationships that would put them at a relative disadvantage. At the same time, fragmenting the industry reduces the appearance of monopoly and makes it less attractive as a target of politicians seeking to garner political support against the operator.

The Argentine reformers have extensively utilized fragmentation. A clear example is the privatization of the electricity sector in Argentina, where today the Argentine wholesale electricity market has more than 600 players.<sup>44</sup> Although not as extensively as the Argentine case, Chile has also fragmented many of its utility sectors, including the water sector. Chile has sought to depoliticize pricing through the use of a formula whose parameters are negotiated every five years on the basis of technical cost studies. The existence of multiple operators provides substantial information to both the regulator and to the experts who may be called to arbitrate conflicts between an operator and the regulator.

Fragmentation and operational or regulatory decentralization may go hand in hand. Indeed, the federal nature of Argentina has generated a fragmented structure for utilities and regulators.<sup>45</sup> While fragmentation is a key

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<sup>44</sup> See Spiller and Torres (1996) for a discussion of the Argentine electricity reforms.

<sup>45</sup> Argentina also has regulatory fragmentation, as each province has its own set of regulatory agencies, to the point that, as in the United States, there is now a National Association of Regulatory Agencies in Argentina.

feature of Colombia's utility sector, along with operational decentralization among more than 1,000 water service companies, regulatory policy is centralized in a single regulatory agency. Several other countries have decentralized the provision of water services, such as Brazil, Peru, and Mexico.<sup>46</sup> Other countries, like El Salvador and Uruguay, retain centralized operational and policy schemes. Countries with fragmented water sectors have an advantage in undertaking successful reforms because they can create a regulatory environment that separates the regulated from the regulator and generate multiple sources of support for proper regulation, at the same time that fragmentation limits the informational advantage of each supplier.

A second basic strategy is the elimination of exclusive franchises. Granting exclusive supply rights limits potential competition and increases the informational advantage of the concessionaire. Consequently, it increases the leverage of the operator vis-à-vis the government, and may create a more acrimonious negotiating environment. This, in turn, increases the potential for negotiation breakdowns.<sup>47</sup>

Exclusive concessions also generate regulatory frameworks that are specific to the concessionaire. These specific regulatory frameworks—usually in the form of a concession rather than a public law—are then more easily renegotiated. Indeed, most water concessions granted since 1990 have been renegotiated in their first two years.<sup>48</sup> While there could be good reasons for renegotiations to take place (e.g., the concession may have been granted under substantial uncertainty about asset valuation), renegotiations are unavoidable in the granting of exclusive concessions. Once an exclusive concession has been granted, the regulator and the concessionaire will always find an amendment that will make both of them better off. The reason for this is twofold: first, as time passes political interests change, providing the regulator with an incentive to modify the concession; second, even if political interests remain constant, once the management of the concession is transferred to the regulator, the regulator's own interests are likely to differ in some way from the agreement reached among the groups that origi-

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<sup>46</sup> Honduras has a partly decentralized sector and has resisted recent efforts to introduce generalized decentralization.

<sup>47</sup> The case of Tucumán's water concession is particularly illuminating, where a negotiation breakdown motivated the operator to leave the concession.

<sup>48</sup> See Willig et al. (1998).

nally granted the concession. Both factors were at work in Argentina and are best exemplified by the concession for Buenos Aires. While this concession was designed by the federal government, its regulation was granted to a regulatory authority that had local representation as well. In this case, the concession was renegotiated two years after the granting of the concession. The renegotiation allowed the governor to get credit for expanding the service towards previously unserved areas, at the cost of a general rate increase. Following that rate increase, the operator's average rate was above the rate offered by the second lowest bid. Knowledge that renegotiation is unavoidable tilts the granting of the concession away from the most efficient operator towards the operator who is the best negotiator, thus reducing the welfare improvement associated with potential privatization of the water utility.

When exclusive licenses are granted, there are institutional designs that can offset, although not eliminate, the problem of renegotiation. In particular, the regulatory framework can preserve a degree of flexibility yet guard against abuse by involving more actors in decisions regarding modification of the contract. A particularly interesting case can be found in the United Kingdom, where the regulator and the company may modify the license by mutual agreement, thereby creating some flexibility in the regulatory framework.<sup>49</sup> This flexibility, however, is checked by the ability of the Secretary of State of Trade and Industry to refer such a license modification to the Monopolies and Mergers Commission (MMC). The MMC must, in such cases, assess whether or not such a license modification is in the public interest, and the modification will not occur without the MMC's ratification. Thus, having multiple decision makers involved in modifying concessions may limit the potentially perverse incentives for "insiders" to benefit from renegotiations at the public's expense.<sup>50</sup>

Introducing multiple and independent decision makers in ratifying a concession amendment does not mean that the same decision makers should be involved in the granting of the concession. Indeed, in the United Kingdom, the MMC is not involved at all in the granting of licenses, but is involved in the license modification process. Limiting the set of decision mak-

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<sup>49</sup> See Spiller and Vogelsang (1997).

<sup>50</sup> In Argentina, renegotiation of the Aguas Argentinas' concession required the approval of the Ministry of Economics, as it had to approve the company's estimate of extra costs associated with the change in the investment plan.

ers that participate in granting licenses reduces potential rent seeking by various parties, thereby providing some assurances that the initial regulatory framework can enhance efficiency.

A third basic strategy for maintaining the high-level equilibrium is to privatize the sector. Privatization creates a group with a clear interest in limiting the government's opportunistic behavior and the will to spend substantial resources to this end. At the same time, privatization provides an opportunity to grant large segments of the population direct interest in the profitability of the operator. Various forms of popular capitalism have been successful in this regard. For example, investments by private pension plans in Chile and Bolivia have given large segments of the population direct interest in protecting these plans from being raided to fund other public activities—a common problem under the prior publicly owned and managed arrangement. Similarly, the sale of large shares of utility companies to widespread groups of individual citizens can help shield these companies from direct or indirect expropriation, as has been the case with the Caracas Electricity Company, and the public enterprises privatized in the United Kingdom and the Czech Republic. Since widespread ownership deters governmental opportunism by affecting the domestic political process, popular capitalism that is directed toward citizens will be, in that sense, superior to selling the company to a foreign investor. The lack of direct political support for foreign investors may well increase the risk of governmental opportunism.<sup>51</sup> The experience of the concession in Corrientes—discussed in chapter 6—illustrates how a conflict between the governor and the foreign operator was readily resolved once the company was sold to a local group.<sup>52</sup> In the Tucumán case, though, the conflict was not resolved, and the concession was cancelled.

It is important to reiterate that each of these strategies will have a limited effect if the mechanisms for establishing prices are not insulated from governmental opportunism. The more fragmented and competitive is the market, the less justification for government involvement in price determination at all. But when fragmentation is limited and operators are private, the need to protect consumers against rent seeking provides fertile ground

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<sup>51</sup> Nevertheless, foreign investors from large and politically strong nations may also have recourse to their countries' influence to restrain some acts of governmental opportunism.

<sup>52</sup> See chapter 6 and Artana et al., 1997.

for governmental opportunism in price setting. Under precisely such conditions, price setting mechanisms are critical because they must fulfill their legitimate functions of protecting consumers while establishing the credibility and certainty required by investors. All too often, the screen of consumer protection is used to shield opportunistic behavior by the government. Hence, when fragmentation is limited, the mechanisms of independent price-setting boards with explicit procedures and formulaic price-setting—or very specific contractual licenses that are difficult to change—need to be considered as a way to institutionalize credible government policy toward pricing in the sector.

Although various pricing models may work well, others do not. Chile's negotiation method that relies on firm, specific, long-run average cost calculations works like a price cap and has proven effective, as is also the case with the Aguas Argentinas pricing scheme. By contrast, the pricing arrangements in Honduras, Peru, and to a lesser extent in Mexico, have proven ineffective. However, the key point is that the actual pricing scheme comes to play only in the presence of a credible regulatory framework. Without credibility, even putatively efficient pricing schemes (e.g., that of Corrientes) will generate few investment incentives.

## Conclusions

The efficient expansion and provision of high quality water services is important to the economic development of Latin America. Nevertheless, the potential for government opportunism inhibits the expansion of coverage and the provision of adequate services because it hinders the government's ability to build a credible regulatory framework.

While the potable water sector may be constructed of concrete, it is nonetheless quite fragile. The water sector suffers acutely from the implications of three essential features: large sunk costs, economies of scale and density, and massive consumption. Because of these features, the sector is prone to government opportunism, triggering a downward spiral of low prices, low investment, low quality, low coverage, and high levels of corruption. To avoid such a downward spiral, escape a low-level equilibrium, and maintain high quality levels, several basic design features should be introduced. First and foremost, countries must establish enterprises that are financially and managerially autonomous. Second, industries should be frag-



Table 1.3

Institutional Design	Institutional Framework	
	Supportive	Difficult
Promising	Chile	
	Argentina – Bs. As.	Argentina – Corrientes
Problematic	Mexico	Peru
		Honduras

mented to the greatest extent possible and exclusive rights of supply should be eliminated whenever possible so as to promote competition. Third, a regulatory framework should be created with procedures for determining prices that drastically limit governmental discretion. Finally, utilities should be privatized, with an emphasis on achieving widespread domestic participation in ownership of assets.

The case studies analyzed in this book deepen the understanding of the characteristics of the potable water sector, the political institutions that lead to a low-level equilibrium and create obstacles to reform, and the three basic design features necessary for improvement (see Table 1.3). The cases of Peru and Honduras demonstrate clearly the emergence and stability of low-level equilibria. In those two countries existing institutions are characterized by weak checks and balances that preserve extensive governmental discretion. Coupled with a problematic institutional design for operating and regulating the sector, this weak institutional framework tends to obstruct investment and service improvements while resisting change. Mexico, an intermediate case, is characterized by a somewhat supportive institutional framework, but also suffers from a problematic institutional design. Because regulatory and operational functions are not always separated, the Mexican reforms may recreate the same tendency toward low-level equilibrium that characterized the national and centralized system. The increasing fragmentation of politics in Mexico could either strengthen the institutional framework by developing stronger checks and balances or lead to autarchic, and problematic, institutional frameworks at subnational levels. On the other hand, Chile's relatively strong institutions and positive regulatory design have helped it maintain a high-level equilibrium. The remaining problems in that country are related to restrictions on the composition of capital, implemen-

tation of the arbitration process, and obstacles to investment in sanitation as a consequence of continuing public ownership. In Argentina, two concession arrangements whose designs were both promising provide a basis for comparison. One experience developed fairly positively due to the compatibility of the design with the institutional framework. In the other case, the basic incompatibility between design and context led to a breakdown in the original arrangement. In each case, it is evident that the three basic design features described above are promising avenues that may allow countries to break out of the low-level equilibrium—and make a serious start toward reducing the loss of water.

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