

Key words: Infrastructure, regulatory governance, incentives, government-owned utilities, best practice, water utilities, cost containment, benchmarking

Infrastructure Management: Applications to Latin America

by Sanford Berg and Maria Luisa Corton
Public Utility Research Center, University of Florida

Executive Summary – 1/5/00

Government-owned and privately owned water systems are key components of a nation's infrastructure. How managers and government policymakers address information asymmetries has a significant impact on sector performance. This paper explores issues facing a firm that is considering private participation in the water sector. The various risk factors and risk-mitigation techniques are identified. Risk factors include technical and operational problems, commercial and financial concerns, human capital and personnel issues, regulatory governance and incentive issues, and environmental issues.

In response to these risks, multinational firms have several strategies for limiting exposure and gaining experience in a number of countries. Contractual arrangements range from service contracts to concessions to full ownership. Organizational responses to these risks attempt to deal with internal information issues and regulatory rules. To illustrate the importance of economic and political issues facing water utilities, we present an overview of Peruvian water utilities. In this case of (currently) government-owned utilities, the regulatory agency, SUNASS, has a limited set of instruments for addressing pricing, investment, and quality of service. It is utilizing benchmarking as a tool for informing customers and multilateral lending agencies about resource use in the water sector. Better comparisons across firms will create some pressure for improved performance.

1. Introduction

One way to capture the issues that have to be addressed by policymakers is to consider the situation facing a set of private investors deciding whether to invest in or operate an existing utility system. While examples are drawn from Peru and other parts of Latin America, they apply to any emerging market. The fundamental point is that information and incentives are central to problems facing various stakeholder groups.

Information is limited because past accounting and engineering systems were not designed to promote cost minimization. Furthermore, the future is a great unknown. Executives evaluating a project lack information on utility operations and seek ways to gain assurance that the rules of the game will not be changed unilaterally. Investors

considering whether to fund the project discount the expected net cash flows at a rate commensurate with the perceived risk. They will structure the firm to take advantage of the best ways to process and act on information, reducing transactions costs. In particular, bond holders will not want managers to take on projects that threaten to reduce bond ratings, although equity investors may want managers to “go for broke” if the firm is near bankruptcy. Information and incentive issues permeate the organizational design factors affecting the firm.

A parallel set of situations arises for regulators. Once a firm gains some operating experience, a new information asymmetry arises. Whether the firm is government-owned or privately owned, the managers know more about the opportunities for cost containment and demand patterns than do sector regulators. This situation leads to regulatory procedures and policies that attempt to reduce the information disparities between corporate managers and those implementing public policy. In the case of municipal utilities, oversight by a national agency is further complicated by local political objectives.

2. Information Issues for Potential Investors

The key determinant of value is the expected cash flows in the future, including as a negative the additional outlays that may be required as part of the bundle of rights and obligations being acquired. Two factors significantly affect the estimates: the adequacy of existing operating data (and forecasts of demand and input price changes) and the projected stability of the rules under which the firm will operate in the future. The first provides a baseline. Such numbers need to reflect reality *today*. Reality *tomorrow* depends on commercial and technological developments (compared with the existing

baseline numbers). Commercial uncertainties (such as demand growth and the availability of substitutes) can be addressed by modular planning and keeping customers satisfied. Technological uncertainty requires managers to monitor engineering developments, so they can adapt to changes in a timely manner.

Regulatory rules represent an equally important determinant of projected cash flows. For example, investors need to know system expansion requirements and the likelihood of changes in environmental standards. Similarly, if customers cannot be cut off due to nonpayment or returns are capped at excessively low levels, managers can do very little to improve performance. When the returns are inadequate for capital attraction, investments will not be forthcoming to improve quality or expand customer penetration.

The decision to acquire a company that is being privatized will be conditioned on how well risks can be identified, quantified, and mitigated by private investors. The sharing of the risks between each party should follow the guiding principle that whoever can control the risk best should assume it and should receive adequate compensation for doing so.

Let us consider the main problems experienced by water utility companies in developing countries, which have generally led to poor performance and low productivity of these companies.¹ Risks associated with each problem will be identified, to illustrate the tasks facing outside investors.

1. Technical and Operational Problems:

- inefficient operational practices
- inadequate maintenance

¹ See, for example, Savedoff and Spiller (1999).

- high unaccounted-for water (40-50%)
- service expansion limited
- inadequate water quality procedures

How can an outside decision-maker evaluate technical and operational risks associated with these problems? Unless the government-owned firm has an outstanding reputation for keeping adequate records, there will be insufficient knowledge about the state of installations and the need for replacement, rehabilitation and expansion. Furthermore, operational performance of the system is questionable. How old are pipes and pumping devices? Have maintenance procedures been adequate in the past? What is the percentage of water not accounted for? What is the source of losses - leakage or commercial losses (theft)? What procedures are used to guarantee water quality? What is the level of operating costs? What are system expansion possibilities? Are water sources adequate? This litany of questions illustrates the range of uncertainties presented by the acquisition of a water utility.

2. *Commercial and Financial Concerns:*

- Unmetered system that creates distortions in consumer charges
- Amount of water produced *estimated* (instead of being based on actual measurements)
- No reliable consumption data (poor consumer records)
- Inefficient billing and collection practices
- Laws prohibit cutting off water services
- Revenues not sufficient to generate the funds needed to expand service and protect water environment from contamination
- Tariff policies that do not reflect the true economic cost of future water supplies
- Tariff structures with large cross-subsidies (which may not actually reduce the costs of water consumed by low-income groups)

Again, an outsider will be concerned that cost recovery cannot occur when there is such uncertainty regarding these aspects of operations. The baseline is always current

procedures and capabilities, so if these are inadequate, organizational changes will be required. New administrative procedures are likely to be disruptive, requiring internal education and buy-in by current employees. For example, what are the mechanisms for responding to customer complaints? Sometimes it is easier to start from scratch than to try to graft new systems onto old procedures. Similarly, historical records are required for making forecasts. How has demand evolved over time? Are the seasonal and hourly patterns predictable?

In the area of financial risks, currency valuation and convertibility raise issues. Mechanisms for hedging risks will be a high priority for external investors. They need to be fully aware of government rules regarding remittances by foreign companies (and likely developments in this area).

3. *Human Capital and Personnel Issues*

- Excess Staff
- Political appointments and intervention
- Inability to attract managerial talent and qualified technical staff due to lack of adequate incentives
- Frequent turnover of high-level staff, low productivity and lack of discipline in the labor force

Due diligence by a potential buyer will involve an investigation into the way contractual disputes will be resolved and other issues. Is a union contract in place? When does it expire? Have pension fund contributions been kept up? What is the managerial compensation scheme? Are current managers the result of political appointments? What is the turnover of staff at various levels of responsibility? Are job descriptions flexible?

4. *Regulatory Governance and Incentives Issues*

Financial markets view the regulatory regime as a major determinant of how risky the cash flows are likely to be. So potential investors seek a number of features in the environment to insulate decisions from day-to-day politics, while ensuring long-run sustainability of the regime itself.² *Regulatory governance* refers to the procedures used by the agency to conduct its activities, while *incentives* are the result of particular policies adopted. Both are important, but the first provides a foundation for the latter.

Recently, Australia's Utility Regulators Forum had a Discussion Paper of "Best Practice Utility Regulation" prepared as part of a program to promote the exchange of ideas regarding regulatory activities. Nine *best practice principles* were identified:

1. Communication (information to stakeholders on a timely and accessible basis)
2. Consultation (participation of stakeholders in meetings)
3. Consistency (across market participants and over time)
4. Predictability (a reputation that facilitates planning by suppliers and customers)
5. Flexibility (using appropriate instruments in response to changing conditions)
6. Independence (autonomy—free from undue political influence)
7. Effectiveness and Efficiency (cost-effectiveness emphasized in data collection and policies)
8. Accountability (clearly defined processes and rationales for decisions, with appeals)
9. Transparency (openness of the process)

These principles are then embodied in *best practice processes*, as problems are identified and addressed in a systematic manner.³ Finally, the third component emphasized in the Discussion Paper relates to *best practice organization*: the role, resources, and structure of the agency. The staff expertise for making decisions and

²King and Pitchford (1998) provide an overview of privatization issues.

³Stern and Holder (1999) use a similar framework for appraising regulatory systems. They emphasize three principles that relate to institutional design (the formal elements of regulation): (1) Clarity of Roles and Objectives; (2) Autonomy; and (3) Accountability. They identify three areas related to regulatory processes (informal accountability): (4) Participation; (5) Transparency; and (6) Predictability. The six criteria are used to rate agencies in six Asian nations.

clarity of responsibilities (within and among government entities) were important aspects of this third component.

Of course, policies also affect the risk to be faced by investors. Price cap regimes result in slightly high costs of capital than rate of return (cost of service) regulation. Caps place more of the commercial risk on firms: although cost containment programs can result in higher returns, downside risks are also present. In practice, price caps have tended to reflect the net present value of future outlays and revenues, so the two regimes tend to be very similar in practice.

5. *Environmental Issues Requiring Attention*

Related to the sector regulatory institutions are the environmental regulations and associated rules for reducing ecological impacts.

- If sewerage coverage is much lower than water coverage, has this produced contamination of shallow groundwater aquifers?
- Is there currently discharge of large quantities of untreated sewage into rivers or lakes in the proximity of population centers?
- What regulations are likely to be applied in the future?
- Are existing facilities grandfathered into a system accepting lower standards, or are investments in upgrades going to be required?

Clearly, these issues are important from the standpoint of estimating future cash flows.

They illustrate how political risk comes into play. By changing the rules of the game, the government can effectively expropriate the assets. Potential investors are concerned about the predictability of policy decisions made by the executive and legislative branches. Political stability and commitment to keeping promises are essential if capital is to be attracted to an emerging market.

In response to the risk elements, firms have a number of alternative strategies for limiting exposure. The World Bank has described the strengths and limitations of these alternative arrangements.⁴ These range from the simple (and lower risk), to the most complex (and higher risk):

1. service contracts (to provide assistance for performing specific tasks),
2. management contract (to operate and maintain a government-owned business),
3. lease arrangement (to operate/maintain and receive the income stream from operations),
4. concession (like a lease, except it includes investment responsibilities),
5. build-operate-transfer (similar to concessions, but used for greenfield projects such as a water or wastewater treatment plant),
6. joint ownership (partial divestiture)

With full divestiture, the government solely takes on the task of regulating the provision of monopoly services. At the other end of the spectrum, returns may be limited, but risk exposure is also limited. These simpler forms do give firms experience in working within a country. They can be viewed as mechanisms through which government, suppliers, and consumers become familiar with the realities of the political and commercial environment. Phasing in private participation represents one strategy for acquiring managerial skills and attracting investment capital.

3. Organizational Responses to Opportunities and Regulatory Rules

Figure 1 depicts a relatively comprehensive set of relationships affecting international risk perceptions. Not all the important links and feedbacks are shown, but the arrows indicate that institutions influence external attitudes toward the investment climate of a nation conditions (especially as they affect regulatory governance). Historical experience in the particular nation (and others) provides signals regarding likely future treatment of

⁴ *Toolkits for Private Participation in Water and Sanitation*, The World Bank, Washington D.C. 1997.

capital. Political stability is certainly a relevant factor here, since if a commitment is only good until the next election (or revolt), future cash flows will not be given much weight.

General macroeconomic conditions and factor markets also matter. If the input markets do not provide the capital, labor, entrepreneurship, and natural resources, local production will be problematic. In the case of water utilities, local natural monopolies are likely, so the market structure is relatively simple (compared with, say, telecommunications). Similarly, the behavior of the utility can be monitored, and with appropriate regulatory incentives, should yield good performance.⁵

One way firms adapt to the information and control issues that arise in the context of international operations is to select an organizational form that facilitates the achievement of available economies of scale and scope. Each organization type has unique strengths and limitations, with its choice also depending on the company objectives (long term or short term). Following are the types of organizations within a continuum of options:

- Holding Companies: In this case each subsidiary is an independent company. If the company wants to maintain each region's culture for its subsidiaries (local or national) and its business driver is to obtain cash flows from its financial portfolio, this is the best option. However, the level of control of each subsidiary is low. Usually, there is not much involvement in local operations since the central leadership will be unfamiliar with local conditions. Directives from headquarters will emphasize priorities and project analysis. Reports from subsidiaries will address these issues and provide information on past and expected performance.
- Shared Services: Here, overhead functions common to subsidiaries are centrally consolidated. In some situations, the business driver involves attaining economies of scale, becoming more operationally efficient in common functions, and preparing for future mergers or acquisitions. However, to obtain a high level of shared services takes careful planning, good coordination, hard work, and detailed follow-up.

⁵ For a more complete discussion of these determinants of performance, see Berg (1997).

- Fully Integrate: This case represents a full integration of all operations, not just the overhead ones. When owning a number of similar businesses (such as electricity generating units), this option facilitates sharing of expertise, processes and systems across like operations. However, if the share of common operations is not high, the gains will be low. Partial ownership would also eliminate this organizational option. International activities will not be fully integrated into the parent company.

Public policy affects the choice of what organization to select. Regulatory limitations in foreign countries can force the firm to adopt one of the described types. Antitrust laws can also limit the firm's selection of organization type.

The importance of cost containment in a profit-maximizing firm is clear: management motivation is a key factor for overcoming the barriers to implementing a cost containment system. The pressure for efficient production and appropriate investment must come from institutions that replicate the kinds of pressures placed on firms by competition. At the initial phase of a regulatory regime's life cycle, the agency has to recruit staff, establish internal procedures, obtain information from the firm, and develop rules that facilitate the transition to a new governance system. While cost containment is important, investment in new capacity, outlays on maintenance, improved quality of service, and rate re-balancing represent competing areas for regulatory attention.

In the case of public ownership, *price floors* might be a useful tool for ensuring the financial sustainability of the water utility. Mayors might have only a short time horizon when making decisions. Since capacity additions and system expansions for new connections and quality improvements require investments over longer time periods, prices may be set excessively low (or disconnection for nonpayment not utilized).

It is important to distinguish how alternative approaches to capacity valuation can affect “revenue requirements”. Historical (book) data do not necessarily reflect economic reality (in terms of reproduction costs). Proxy-cost models are subject to manipulation of inputs and model parameters (to obtain the results desired by particular stakeholders). Similarly, forecasted values also involve errors. Depending on the regulatory regime and ownership-type, this situation involves incentives to over- or underestimate future capacity needs. Privately owned systems might seek to increase cash flows by overestimating investment plans. In contrast, public systems have an incentive to underestimate needs if that means prices can remain relatively low (a politically popular stance if voters do not recognize the link between price and service quality and expanded connections).

4. Application to Peruvian Water Utilities

The economic and political issues facing water utilities are complex (and embedded in local institutional settings). To make some concrete points about the mutual dependence between regulators and managers, we draw upon the situation in Peru. Like other nations in Latin America, Peru is in the process of decentralization, deregulation and privatization of the infrastructure industry. In general, Latin American countries are facing serious difficulties in the area of water infrastructure. Poor performance, inadequate system maintenance, high levels of unaccounted-for water, excess staff, low rate of metering, and low water quality are the main problems to be solved by companies and governments.

The water and sanitation sector in Peru has undergone several changes in parallel with its political system. From being highly centralized, the water sector has moved since

1990 to a decentralized system under the responsibility of municipalities. In 1992, the government created the regulatory agency Superintendencia Nacional de Servicios de Saneamiento (SUNASS) to regulate water and sanitation services either under the municipalities or under a private regime. SUNASS has the responsibility for establishing fair rates to ensure that the entities that provide services are economically efficient.

One of the important problems currently faced by SUNASS is that some of the enterprises are having serious financial difficulties. One issue is how SUNASS might determine the causes of these financial difficulties. Are the companies efficient? Are the (typically) low rates responsible for these difficulties? What factor or factors make a difference regarding the sustainability of the company?

A recent study by Tova Maria Solo (1998) from the World Bank asserts that where groundwater is available and extending pipelines is costly, bulk water supply systems generally bring water from private wells to secondary vendors. Such vendors account for more than 30% of supply in Honduras, Guatemala City and Lima, Peru. It is hard then, for general citizens in Peru to evaluate quality under these circumstances. In addition, the high percentage of water not accounted for (above 35%) has multiple explanations. First, it is possible that the poor maintenance results in leakage, so water is lost. Second, it is also possible that water is taken in low-income neighborhoods without payment.

Under government provision of water services, price becomes a salient political issue. Public companies suffer from a variety of managerial problems. One of them, the principal-agent problem, can make managers deviate from cost-minimization to benefit their own situation, rather than provide good performance for customers. Political factors

can intervene with cost control programs and network expansion programs. It could be that the objective of government managers is not to minimize costs (for a given mix of quantity and quality) but to maximize mayoral votes in the next election. A low price seems to be a stable equilibrium aligned to this objective.

Another possibility is that the prices facing consumers are not that low. As Solo found out in her study, small-scale entrepreneurs (vendors who provide bulk water to citizens) are able to offer competitive prices when compared to the connections costs and service provided by water utilities (with service available only a few hours per day). In fact, as Solo mentions, in the Argentinean case, Aguas Argentinas had to review and renegotiate its concession under the pressure of low-income families who refused to hook up because of the high rates.

All in all, the lack of appropriate comparative data about quality, prices, quantity and service coverage has made it hard for customers to exert pressure on the water companies. This pressure could act as an incentive to managers to be responsive toward the company performance. In late 1999, SUNASS published comparative statistics that represent the first step toward educating citizens and informing political leaders about the relative performance of forty-five municipal utilities.

What kinds of lessons might be drawn from these comparisons? If a firm is operating on the production frontier, for a given level of resources, managers could achieve either a large number of connections (to a system that only provided service say, six hours per day) or provide very high-quality service to a small number of customers. Increased connections require resources that imply reduced quality (holding total resources constant). The key point is that utility managers must make choices reflecting

overriding objectives of water users (and policy makers). If a firm is operating far *inside* the frontier, it is wasting resources. Citizens are not receiving the services they could be obtaining, given the resources local citizens (and external funding agencies) are providing to municipal water suppliers.

Furthermore, the production frontier could be expanded by the acquisition of additional resources from customers, taxpayers, or financial markets. Thus, additional capacity investments or expansion of operating resources can enhance performance. If managers lack incentives for cost containment or are not using best-practice production technologies, their water systems will not be operating on the frontier. Benchmarking data provide some yardstick comparisons for determining how near to the frontier various firms are, taking density and other relevant cost-drivers into account.

The basic principles of opportunity costs and customer valuations shed light on a number of operating issues. For example, there are also trade-offs between different types of quality (absence of organic material vs. number of hours per day that water pressure is adequate to provide service). Again, for a given amount of resources, say \$100,000, a cost-minimizing firm could be anywhere on the "quality frontier". On the basis of the SUNASS benchmarking, it is clear that many municipally owned water systems are operating inside the quality frontier (and thus, the overall production frontier).

It is likely that the objective of managers is not to minimize costs but to meet other objectives, such as to maximize mayoral votes in the next election. A low price (and poor quality) seems to be a stable equilibrium, mainly because general citizens find it hard to evaluate quality. Those benefiting from the system (via political patronage)

know very well how they gain from the present arrangements. The question is how to inform all the affected parties of the relative inefficiency of current arrangements. A recent study by Tamayo et al. (1999) documents the lack of incentives for good performance.

Benchmarking enables comparisons to be made, so citizens can be made aware of the poor management of their systems. Whether there really are significant opportunities (and incentives) for private investment in water in Peru is still an open question. Certainly the "need" for additional capacity and improved operating procedures is real, but the "willingness to pay" is not great (because of low incomes, unavailability of best-practice comparisons, and lack of awareness regarding the true costs of "dirty" water).

Another activity of regulators involves reviewing developments in other countries. The experiences of Chile, Argentina, Venezuela, Colombia, and Brazil illustrate how Peru's problems are not unique. Chile's use of proxy cost models represents one approach to price setting, although when firms deviate from investment plans, the agency lacks the power to sanction firms. Argentina has huge privatization concessions, but each contract sets the norms, which leaves the regulator with only limited responsibilities. In the case of Venezuela, the oil crisis has precipitated change. National funding has been dramatically reduced, but no regulatory framework exists. Colombia, like Peru has a decentralized production system, with municipal mayors having significant power and discretion. However, 30% of the service is now privatized, so there should be evidence soon regarding the relative performance of firms.

Managers and investors look at regulatory procedures and policies when considering new investments or cost-containment activity. What managers achieve

savings that exceeded what had been expected? “Above-normal” returns could be partially returned to customers. However, such schemes dampen incentives for further cost containment. Incentives can also be incorporated into price trajectories. For example, a firm that is relatively efficient, based on a benchmarking study or a proxy cost model, might be required to reduce prices only a little over the next year since it is already utilizing best practice in its production process. A relatively inefficient firm might be forced to lower price substantially since there are significant opportunities for cost containment that are untapped at present.

What is the best way to evaluate government agencies responsible for water supply? One can argue that the best indicator is the actual performance of the water utilities. Excellent staff, technically sophisticated studies, and planning documents mean nothing if these are not translated into improvements in sector performance. If the law is ambiguous or does not give appropriate tools to agencies responsible for the oversight of the water sector, then it should be revised by targeting the sources of current inefficiencies. In particular, SUNASS seems to lack regulatory instruments that could provide incentives for good performance, although benchmarking offers some promise. One issue that warrants attention is how to promote the consolidation of (inefficient) small water systems. Another issue is how to promote cooperation among the various government agencies currently influencing municipal water utilities (and how to reduce duplication and identify gaps in sector responsibility).

To summarize, note that cost containment creates value by freeing up resources that can be applied to other valued activities (movements toward the production frontier from “inside” the frontier). Innovations and additional investments can further expand the

frontier, providing more services to citizens. Thus, benefit-cost analysis is a key tool for policymakers in this sector. If firms are not minimizing cost, communities (taxpayers) and multilateral lending agencies can just watch their resources being wasted.

Documented inefficiencies are bound to affect willingness to support future investments in the water sector.

Rules only constrain decision-makers when enforcement mechanisms exist. Any kind of regulation or government intervention creates incentives. However, if the agency cannot reward excellent performance, it can be argued that it regulates nothing: it has little power to influence the behavior of utilities. At present, SUNASS can collect “Master Plans” and announce quality standards, but this has little impact if municipal managers face no consequences for poor performance. However, if the political authorities do not give the agency the tools necessary to effectively regulate, then politicians and associated government bureaucracies are basically choosing *not* to regulate.

5. Conclusions

Saleth and Dinar (1999, ix) have provided the first comprehensive evaluation of the performance implications of different institutional features of the water sector. “The results show that sector performance is linked more to the performance of water law and water policy than to water administration.” Their empirical analysis of sector performance (measured in terms of physical, financial, economic, and equity dimensions) draws upon 43 water sector experts from eleven nations. They find that the following institutional features are most important: “integrated legal treatment of water sources, the existence of an independent body for water pricing, the balance in functional

specialization, the legal scope for private participation, and the seriousness of the budget constraint.” These results reinforce the points identified here regarding the importance of the regulatory framework and supporting legal structures.

Comparative analysis and publication of performance indicators represent one mechanism for influencing firm efficiency. However, the instrument is not a robust one because the impacts on managers are relatively indirect. What is the lesson for policy-makers interested in promoting efficiency and access to safe, reliable water? For government-owned municipal utilities, the cost of capital is either the opportunity cost of internally generated funds or the cost to external funding agencies. Presumably the former is very high, given the limited taxing authority and low incomes of affected parties. The latter is not low because water investments compete with education and other programs with high social payoffs.

Under capital rationing, the “announced cost of capital” could be low, involving subsidies or accounting fictions, but the true cost of capital should reflect the value of funds in other productive activities. Multilateral and national funding agencies should recognize the need to integrate their priorities into well-designed incentive schemes for the entire water sector. In the past, government capital has been made available without appropriate incentives for cost containment or quality improvement. Managers have wasted valuable funds (based on benchmarking data) and not faced negative consequences. In addition, multilateral and national agencies wishing to support investments in water could leverage their activities by linking funds to performance indices prepared by appropriate agencies, such as SUNASS. This strategy could also promote the combination (or coordination) of current entities, enhancing the accounting,

engineering, and business capabilities of existing utilities. Private participation in the provision of water services is one way to introduce new pressures for cost containment and efficient resource utilization.

In many nations, the *status quo* appears to be unacceptable—in terms of the lack of significant improvements in water sector performance. However, some groups must be benefiting from existing arrangements or they would have been altered already. The net gains from movements toward the efficiency frontier should enable the special concerns of narrow interests to be addressed. Creating value means that win-win options can be identified, so no stakeholder is disproportionately harmed. However, change benefiting the vast majority of the citizenry should not be held hostage to narrow interests. The situation calls for continuing education and sharing of experiences among agencies facing similar problems.

In conclusion, the greatest enemy of a “good policy” is the pursuit of a “perfect policy”. Regulators should focus on the basics before attempting refinements! For example, delays by an agency can create expectations that deadlines need not be met by entities that are supposed to be complying with rules. The resulting pattern involves delay, noncompliance, and lack of sanctions. Such a situation damages the oversight agency’s credibility. Ultimately, potential investors in and managers of infrastructure will adapt to such delays in ways that raise costs and waste resources. This infrastructure sector is far too important to let that happen. Benchmarking represents one way to provide valid comparisons across utilities, creating pressure for cost containment. However, the regulatory agency must also be a model of administrative fairness and

effectiveness if it is to provide credibility to those who might supply capital and managerial techniques to water utilities.

References

- Berg, Sanford (1997), "Priorities in Market Reform: Regulatory Structures and Performance," *Pacific and Asian Journal of Energy* 7 (Dec.): 89-101.
- King, Stephen, and Roban Pitchford (1998), "Privatisation in Australia: Understanding the Incentives in Public and Private Firms," *Australian Economic Review* 31: 313-28.
- Saleth, R. Maria, and Ariel Dinar (1999), *Evaluating Water Institutions and Water Sector Performance*, World Bank Technical Paper No. 447.
- Savedoff, William, and Pablo Spiller, eds. (1999), *Spilled Water: Institutional Commitment in the Provision of Water Services*, Washington, D.C.: Inter-American Development Bank.
- Solo, Tova Maria (1998), "Competition in Water and Sanitation – The Role of Small-Scale Entrepreneurs," *World Bank Viewpoint* (Dec.: note 165).
- Stern, Jon, and Stuart Holder (1999), "Regulatory Governance: Criteria for Assessing the Performance of Regulatory Systems – An Application to Infrastructure Industries in the Developing Countries of Asia," *Utilities Policy* 8: 33-50.
- Tamayo, Gonzalo, Roxana Barrantes, Elena Conterno, and Alberto Bustamante (1999), "Reform Efforts and Low-Level Equilibrium in the Peruvian Water Sector." In *Spilled Water: Institutional Commitment in the Provision of Water Services*, edited by William Savedoff and Pablo Spiller. Washington, D.C.: Inter-American Development Bank.

Figure 1. Regulatory Governance, Incentives and Performance

