PUBLIC POLICY FOR THE
privatesector

Regulating Water Services

Sending the Right Signals to Utilities in Chile

Gabriel Bitrán and Pamela Arellano

Gabriel Bitrán (gbitran@bya.cl) is a partner, and Pamela Arellano (parellano@bya.cl) an associate, at Bitrán & Asociados in Santiago, Chile.

During the 1980s and 1990s the Chilean water and sanitation sector underwent deep reforms so that private capital could finance the huge investments needed to achieve universal service. The regulatory framework put into place cleared the way for massive private equity. But users have also paid the price of transforming the heavily subsidized sector into a self-sustaining industry able to provide universal coverage. This Note examines key features of the new regulatory scheme that have contributed to the sustainability of the reforms: a phased approach, an efficient pricing policy and methodology, and expert panels to deal with conflict resolution.

Success or failure of the reforms in Chile should be measured by benefits for users in coverage, rates, and quality of service, benefits for investors in returns and risk reductions, and benefits for the country in savings to the government thanks to private investment. On all counts except apparently rates, the reforms have been successful. The coverage and quality of service have improved sharply. Investors have earned healthy and stable profits. And the government has saved the several billion dollars needed to achieve full coverage of sewage treatment. Rates have increased dramatically, first to cover the actual cost of services and then to finance the huge investments in sewage treatment. But to the extent that the rate increase has not been due to inefficiencies, this outcome can be said to be a necessity rather than a failure.

Proceeding with reform in stages

What are some of the key factors in this success? One has been the ability of the government to build a social consensus around the need for the reforms—a consensus that has allowed a tripling of the price for a good as essential as potable water is. This consensus was aided by a well-designed sequence of policy events.

The regulatory approach for the Chilean water and sanitation sector is based on setting prices that convey appropriate signals to economic agents, so that they make decisions as if they were operating in a competitive market. Getting to this state of affairs has required a decades-long process, with important changes in the legal and regulatory framework as well as the industry structure.

This process can be divided into three periods. During the first (1977–88), a national agency,

Servicio Nacional de Obras Sanitarias (SENDOS), carried out the production, commercial, regulatory, and supervisory functions. Several measures were taken to improve the sector's performance, including adopting modern management tools, reducing costs and rationalizing investments, moving toward self-funding, and eliminating cross-subsidies among customers and service areas. In addition, in the early 1980s a new law separated water rights from landownership to make them fully tradable, and water rights markets have flourished across the main watercourses serving large urban and agricultural areas.

The second period (1989–98) started with the creation of a new institutional model for the sector as part of a general approach intended to focus public spending on areas in which the private sector would not be interested. The reform, aimed at giving a central role to the private sector and using the market as a mechanism for allocating resources, included these measures:

- Separating the regulatory and supervisory functions (to be performed by the state) from investment, production, and sale of services (to be carried out by independent companies).
- Moving from centralized provision of water and sanitation services by SENDOS to a scheme of independent regional utilities with geographic concessions.
- Changing the legal status of the new state-owned water and sanitation companies to subject them to the rules governing private, publicly traded corporations.
- Introducing a new regulatory regime for concessions to establish, build, and operate water and sanitation services.

The last period (1999–2004) saw the privatization of the main water and sanitation utilities, a process that attracted some of the most prominent international operators in this field—such as Suez, Thames Water, and Anglian Water—as well as some high-profile local groups.

This sequence of steps had the virtue of completing most of the reforms and required tariff increases under state ownership of assets. Had it been otherwise, the process would have lacked the legitimacy needed to be fully implemented. At the same time, if the companies had remained under state ownership, the huge investment needed for the sewage treatment program would have triggered a general tax increase or diverted resources earmarked for social spending.

Setting prices for efficiency in allocation of resources

The Chilean tariff law for water and sanitation services seeks to set prices efficiently—that is, at the marginal cost of delivering services at all stages: potable water production, potable water distribution, sewage collection, and sewage disposal. This approach raises two issues.

The first issue relates to the difference between short- and long-term marginal costs. In the short term water and sanitation facilities normally have spare capacity, so the cost of providing an additional unit of service is low. But in the medium and long term, as demand grows, firms need to invest in more infrastructure. In the water and sanitation sector it is generally inefficient to increase infrastructure marginally to meet growing demand. Instead, it is better to undertake infrequent and relatively large investments in infrastructure. The appropriate pricing signal should therefore be the long-term marginal cost, which reflects the cost of the additional infrastructure and resources needed to meet expected demand in the long term.

The second issue stems from the seasonal variation in demand in most of the country. Demand during the summer can be significantly higher than at other times of the year. Since efficient pricing dictates that rates must reflect the marginal cost of providing the infrastructure needed to match demand throughout the year, tariffs cannot be flat. Indeed, when the long-term marginal cost is highest (peak periods), so is the price; when the long-term marginal cost is lower (off-peak periods), the price is also lower. (Given this pricing system, all Chilean water and sanitation customers are individually metered.) In addition to this variable charge, there is a fixed charge and another variable charge due to overconsumption, designed to convey the effect that a sharp increase in a single customer's demand can have on everybody else's bill.

Using a model company to set tariffs

Efficient allocation of resources implies that the marginal cost of production must reflect the

minimum cost of meeting additional units of demand. Nevertheless, production inefficiencies always exist, especially with monopolies.

In Chile, to avoid transferring the cost of inefficiencies to users, the rate setting process emulates competitive conditions by using a fictitious company that would theoretically meet demand over the next five years in the most efficient way. The values of the parameters used to set the rates for each company are those of this model company, taking into account characteristics of the concession area in which the actual company operates.

If a company incurs losses given the tariffs set in this way, it will have to improve its efficiency in order to be profitable. But the company may profit in excess of what the rate allows for if it achieves efficiency and scale gains through the five-year rate period beyond what was assumed; efficiencies are passed through to customers only every five years, when new rates are set.

The model company is allowed a return on assets that is set every five years using a methodology based on the capital asset pricing model, with a floor of 7 percent (adjusted for inflation). The risk premium has a cap of 3.5 percent and a floor of 3.0 percent over the risk-free return rate of the Chilean economy. Since the return is set over assets, water and sanitation companies can leverage their balance sheets to achieve a higher return on equity, something all of them effectively do. Moreover, tariffs on the services they provide are protected against changes in the corporate tax rate: if that rate is adjusted upward or downward, so are the tariffs.

A model company scheme can be effective only if the regulator has strong technical skills and the professional and financial resources needed to build the model company without fully depending on the information provided by the actual company. It requires keeping an accurate, long-term record of each company's financial and operational results and operational and capital spending. So the model company scheme relies not only on good regulation but also on a sound legal system and mature capital market, which assure "good behavior" by the companies in providing information that is essential to rate setting and cannot be guessed or predicted by the regulator.

Dealing with conflicts

A key institutional feature of the Chilean model is the expert panel, created for each concessionaire for each rate setting process to resolve conflicts that might arise with the regulator. Each panel has three members (usually engineers or economists), one named by the concessionaire, another by the regulator, and the third picked by the regulator from a list of candidates previously agreed on with the concessionaire.

As a first step the regulator and the concessionaire each carry out a study taking a position on tariff adjustments. Then they exchange their studies and begin a discussion period. If the regulator and the concessionaire do not reach an agreement on the new rates, discrepancies are submitted to the expert panel along with all supporting material. The panel must decide on a value or position for each parameter or aspect on which a discrepancy exists. On each point the panel must choose the position of one party or the other; it may not set intermediate values. But because of the many discrepancies normally submitted to the panel, the panel's decisions, taken together, have usually translated into an intermediate value between the parties' overall positions.

The panel must reach a decision, by a simple majority, in 30 days. Its decision is final and cannot be appealed in court, a feature that has proved to be crucial in keeping the process at a technical level and ensuring prompt results. Of all the arbitration mechanisms used in regulated sectors in Chile, this one has been the strongest and most effective.

Beyond tariffs, other issues also often lead to conflicts, such as compliance with quality standards and investment plans. Conflicts relating to such issues are normally dealt with by ordinary courts, making judicial independence a critical factor in the regulatory process.

Assessing results

What effects have the reforms had? One notable outcome is a tripling of the average real tariff between 1989 and 2002 (figure 1), spurring criticism from the public as well as some political quarters. Before the reforms, however, rates had been heavily subsidized, and higher-income households, as the most intensive users, had benefited the most.

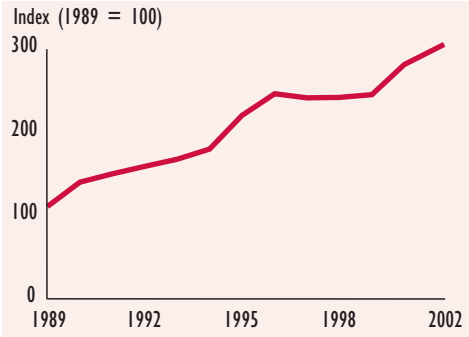
Moreover, the new prices gave the privatized water and sanitation companies the right incentives to invest in new infrastructure. Average annual capital spending increased from 37 billion Chilean pesos (US$30 million) in 1974–88 to 100 billion (US$150 million) in 1989–2002 (figure 2).

This new infrastructure has brought improvements in the coverage of water and sanitation services (figure 3). The biggest gains have been in sewage treatment, where coverage is expected to reach 100 percent by 2005—an achievement far beyond the resources of the Chilean government. So it is also fair to say that a significant part of the tariff increase has been due to the addition of sewage treatment as a new service.

For the water and sanitation companies, regulation based on the model company has provided the incentives to make efficient production and investment decisions. While companies initially experienced losses under the new regulation, a few years later the sector was outperforming other regulated utility sectors in Chile. Water and sanitation companies have achieved average returns on equity of about 14 percent, ranking among the top performers on the Chilean stock exchange.

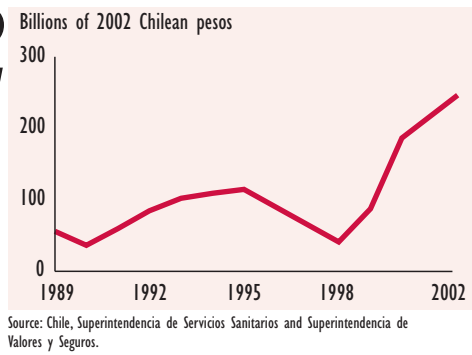
Finally, per capita water consumption has dropped almost 18 percent in the past five years, an outcome widely attributed to the rise in water and sanitation rates. The addition of new charges to the bill, such as sewage treatment rates, has further reduced consumption.

Figure 1 **Average real price of water and sanitation services in Chile, 1989–2002**



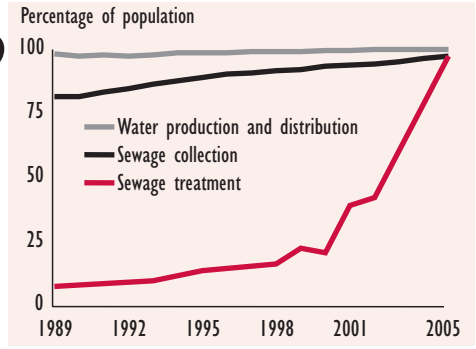
Source: Chile, Superintendencia de Servicios Sanitarios and Superintendencia de Valores y Seguros.

Figure 2 **Annual capital spending in the water and sanitation sector in Chile, 1989–2002**



Source: Chile, Superintendencia de Servicios Sanitarios and Superintendencia de Valores y Seguros.

Figure 3 **Coverage of water and sanitation services in Chile, 1989–2005**



Source: Chile, Superintendencia de Servicios Sanitarios.

Conclusion

The new regulatory scheme in the Chilean water and sanitation sector has provided the right signals for efficient allocation of resources. It has also proved to be a powerful magnet for private equity, attracting international operators as well as Chilean pension funds. The international operators have brought world-class technology, not only in their production processes but also in their management practices. As shareholders, pension funds have contributed the necessary political stability to the system, since they hold the retirement savings of more than 80 percent of Chilean workers.

The Chilean model has attained the goals set for service coverage. But that achievement has come at the cost of severe price hikes. Thus even with the best political handling, the changes in the water and sanitation sector would have been unlikely to survive public scrutiny if not accompanied by vigorous and sustained economic growth, which has helped make it possible for households to pay the price.

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Telephone: 001 202 458 7281
Fax: 001 202 522 3480
Email: ssmith7@worldbank.org

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