

Pricing: The Most Dangerous and Most Important Decision

By Sanford V. Berg and Lynne Holt

This article, the third in a series, addresses the tensions in setting efficient prices for growing water systems. It draws on World Bank case studies to explain how independent regulatory commissions (IRCs), in their oversight of water utility tariffs, can affect utilities' investment decisions and consumers' water usage patterns.

I. Introduction

Many factors can undermine efforts to reform water and sewer service. Some institutional factors, such as financial distress of the national government, political instability, and a lack of legal protections, are beyond the control of independent regulatory commissions (IRCs). Nevertheless, as this article illustrates, regulators can affect water and sewerage rates by ensuring that the tariff structures of water utilities rely on optimal pricing principles. In addition, regulators can ensure that subsidies are properly targeted, based on well-defined social objectives, and designed to provide appropriate price signals. Efficient price signals to all consumers of water and sewerage services promote sensible conservation. They also provide signals to utilities regarding priorities for network expansion.

As the first article in this series emphasized, the establishment of an IRC is a necessary precondition for private investment. Unless public funds are available to subsidize water service, a utility's tariffs and connection fees are its major source of cash flows to cover costs. If a utility's tariffs and fees fail to generate sufficient revenue for its operating and capital costs, governments will find it difficult to attract and retain qualified bidders for contracts that involve private sector participation. The same reasoning applies to government-owned utilities that face resource constraints.

The second article in the series identified nine functions or "best practices" of an IRC. Each of the functions has implications for cost of service and pricing. Here we focus on achieving sufficient revenue through carefully designed rate structures—recognizing the sensitivity of politicians to price increases.

II. Optimal Pricing--Principles

Properly designed water tariffs promote economic efficiency and equity, price transparency, and good quality of service.

Appropriate tariffs promote economic efficiency and are not discriminatory. As much as possible, an IRC should focus on regulatory objectives that are quantifiable rather than subjective. Water utility tariffs filed with the IRC can promote various objectives, such as efficiency and equity, which often must be balanced. An economically efficient tariff

will create incentives to ensure that consumers obtain the largest possible aggregate benefit for a given cost of water supply.

Most economists argue that this objective can be realized if all prices are set equal to their relevant marginal costs. A tariff that promotes equity requires consumers to pay amounts proportionate to the costs they impose on utilities (Boland and Whittington 2000). Consumers paying appropriate amounts tend not to waste water. In turn, this lower water consumption reduces the need for costly infrastructure investments, an advantage to consumers!

Tariffs should be transparent. Charges for water should be easy for consumers to understand. People who understand their bills and the associated cost of service may be less likely to oppose rate increases. Transparent pricing also encourages consumers to conserve when prices rise and enables utilities to better assess customer demand and so plan for network expansion.

Tariffs should not be undermined by poor quality of service. The IRC can establish indicators to measure a water system's capacity to provide services to customers, and it can penalize a utility for poor performance when standards are not met. Even if rates are affordable, consumers may seek substitutes for piped water service if service or water quality is unacceptable. When consumers elect to access alternative water suppliers because of a utility's substandard performance, the utility will not collect projected revenues and thus jeopardize reform efforts.

III. Optimal Pricing--Practices

Regulators can help utilities realize optimal pricing objectives by approving water tariffs that preserve the principles of marginal cost pricing, providing incentives for metering programs, and assessing penalties for poor quality of service.

Two-Part Tariffs. In practice, marginal cost pricing (if the marginal cost is less than the average cost of water) may ultimately result in financial deficits for utilities. To address this problem, regulators often adopt a two-part pricing structure that includes a volumetric charge and a connection fee. Frequently, the volumetric charge is set at the marginal cost of supply and the connection fee is set to recover the amount caused by the deficit. Alternative tariff structures that address social objectives are outlined below.

Metering. The IRC should provide incentives for utilities to install meters. In addition to increasing price transparency, metering (1) increases the information available to regulators and makes it easier for them to assess investment needs, (2) gives consumers control over their charges by enabling them to curb consumption and fix leaks, and (3) makes rate changes appear less arbitrary (Clarke 2001). Yet metering may not be cost-effective if pursued in isolation.

As a World Bank study on subsidies in Central America concludes, metering should be promoted on the basis of fairness and as a means of improving operating efficiency (Walker et al. 2000). However, meter installation is useless unless a utility's service quality is improved and appropriate tariff structures are in place. The study

estimated that metering in Panama reduced residential customers' water consumption by 22 percent over a four-month period (Walker et al. 2000). But residents of Central American cities with poor service quality expressed skepticism about the accuracy of meters.

Penalties for Substandard Water Quality and Service. The IRC should impose penalties on utilities that provide poor service. Affordable tariffs can be undermined by substandard water quality and service since the real cost rises when people turn to alternative water supplies. For example, as a World Bank case study noted, post-reform tariffs in 1998 were in the affordable range (about 2 percent of monthly salary) for consumers in the poorest sections of Mexico City (Haggarty et al. 2001), but service in terms of water quantity and quality and continuity of provision was the worst in the city. To compensate for these deficiencies, people in the poorest neighborhoods either substituted expensive bottled water for drinking or bought water from private water trucks. Consequently, the marginal cost per cubic meter for the poor ended up being 64 to 228 percent higher than the marginal cost for the largest residential consumers.

IV. Pricing to Realize Social Objectives--Principles

An IRC's or national government's incentives for making water utility rates more affordable may require some form of cross-subsidization among customer groups. Income redistribution may be included in a utility's tariffs, as is the case in many developing countries, or it may be part of a government's social assistance program. The challenge to regulators and their governments is to address issues of rate affordability without distorting the principles of marginal cost pricing discussed above. To that end, the IRC should promote the following principles.¹

Remove cross-subsidies from the tariff structure, if possible. Cross-subsidies occur when a water utility charges one group of customers rates below marginal cost and, to compensate, charges another group rates above marginal cost. The IRC needs to be concerned about cross-subsidies because they send the wrong signals to both utilities and consumers: cross-subsidies promote neither efficiency nor equity, and they reduce transparency, as discussed above.² They also threaten the revenue stream that private (and public) companies need to fund investments.

Cross-subsidies in water tariff structures are common, whether by category of consumer, housing type, or differential consumption levels. For example, cross-subsidies based on customer category may involve having industrial consumers subsidize residential consumers or more affluent consumers subsidize poorer consumers. The latter cross-subsidy is usually realized through rate differences based on location via census tracts with low-income housing.

Cross-subsidies based on consumption levels may contain some type of lifeline rate or rising block structure, such as increasing block tariffs (IBT), which are popular in developing countries. The intent of such tariff structures is to protect poor households with low consumption. However, IBT structures tend to benefit mostly consumers in the middle and upper classes. In many cases, the initial blocks in the tariff are set for

consumption far in excess of a household's basic needs and therefore do not reflect marginal cost pricing (Boland and Whittington 2000).

Because cross-subsidies can skew the real cost of water supply, consumers may be less likely to conserve. Cross-subsidies can also affect the utility's behavior by causing the utility to expand its network only to customers who can subsidize existing customers. Geographic areas with high-cost, low-revenue consumers will be avoided.

Target explicit subsidies to those who really need them. Ideally, subsidies will be provided to targeted consumer groups through a social welfare program and not through the tariff structure. However, many governments in developing countries lack the administrative support and information to execute such a plan. And government agencies that do not pay their water bills damage a nation's credibility with private investors.³

Whether the subsidy is provided through a welfare agency's transfers or is included in tariffs, policymakers responsible for subsidy schemes should address the following policy questions: 1) Who is the subsidy really trying to assist? 2) Does the targeted consumer group actually need that assistance? 3) Which criteria should be used to determine the appropriate beneficiaries of such assistance? If a welfare agency funds the water subsidy through government transfers, the IRC will need to coordinate with that agency. However, if the subsidy remains in the utility's tariff structure, the IRC should reassess beneficiary characteristics on a periodic basis. In doing so, the IRC could contract with the social welfare agency for technical assistance.

Tariff structures provide flexibility to users. High one-time connection fees in developing countries could discourage customers from accessing piped water and sewerage systems. Therefore, the IRC and government should advocate low-income assistance programs to finance those connections.

V. Pricing to Realize Social Objectives--Practices

Regulators can help utilities in meeting social pricing objectives by providing them with appropriate incentives to adopt alternative tariff structures and subsidy programs that are "consumer friendly". Subsidy programs should preserve marginal cost pricing principles, rely on sound data analysis, and carefully target those customer groups with the greatest needs.

Data Analysis for Setting Subsidies. The IRC should collect and analyze data to evaluate appropriate recipient groups for subsidies. For example, a study of subsidies in the tariffs of an urban public water and sewerage company in Panama was conducted in preparation for a bid for a concessionaire (Foster et al. 2000). One finding was that only 16 percent of the company's customer base lived in poverty or extreme poverty, but at least two-thirds of the company's customers -- mostly middle-class -- received subsidies.

Identifying existing cross-subsidies will not necessarily help the IRC assess policies to reconfigure those subsidies (assuming they are needed). Willingness-to-pay surveys may be a good starting point for tariff analyses.⁴ Part of Panama's subsidy study included two surveys to assess affordability by poor households of existing and higher

tariffs for water and sewerage services (Foster et al. 2000). The results showed that households below the poverty level were willing to pay for water and sewerage at existing or higher levels. However, if a connection fee for sewerage were imposed, a much smaller proportion of poor households indicated a willingness to pay. This resistance to the fee was partly attributable to much lower coverage by sewerage service than water service and partly to the high up-front cost of sewerage connection. These findings indicate that a future subsidy in the tariff structure of Panama's water utility would be directed more effectively to sewerage connections than to water consumption.

Alternative Tariff Structures That Preserve Marginal Pricing Principles. The IRC should provide incentives to utilities to use tariff structures that do not distort principles of marginal cost pricing. The IBT structure, as we noted, includes cross-subsidies. This tariff structure for water service in El Alto, Bolivia, was analyzed in a World Bank case study of a concession in La Paz/El Alto (Komives 1999). The IBT structure in effect included a lifeline unit tariff for residential connections that fell well below the estimated marginal cost for the first 30 cubic meters of water per month. However, most households in El Alto used much less water per month. The concession therefore gave a greater financial incentive to serve high-volume (industrial and commercial) customers than low-volume, residential customers.

A tariff structure of uniform price with rebate appears to reduce the problems associated with IBTs. A household's water bill would include two components: a volumetric charge set equal to marginal cost and a fixed monthly rebate. The subsidy also could be targeted to low-income households, and the fraction of total water use billed at the marginal cost could be increased (Boland and Whittington 2000).

Consumption Subsidies Through Direct Transfers. In countries with the necessary administrative capacity, subsidies based on water consumption are most efficiently provided through targeted welfare programs and not through utility rates. A good example is Chile's program that funds subsidies as part of the central government's annual budget. Households must apply for benefits. On the basis of a socio-economic ranking, eligible households may receive a subsidy for up to three years. Eligibility pertains to the poorest 20 percent of the population nationwide. The subsidy covers a maximum of 85 percent of the household's water bill for the first 20 cubic meters of consumption. The water company receives funding from the government to cover the household subsidies and bills households for the remaining amounts.

Connection Subsidies That Provide Flexibility for Consumers. The IRC can provide water utilities with incentives to create programs that offset some of the costs incurred by consumers in connecting to the water and sewer network. Two examples are cited in the World Bank study on the concession for water and sewer services in La Paz and El Alto (Komives 1999). In El Alto, households had the option of paying a reduced connection fee in exchange for supplying labor during the connection process. In addition, low-income households in El Alto were offered a three- to five-year financing plan to pay the connection fees.

Conclusion

The current price of water is an anchor for expectations for existing customers who generally perceive price increases as “bad.” People without service—the potential beneficiaries of service expansion funded by a rise in price—generally have no voice in the process. Price increases for water can be dangerous for both regulatory commissions and governments since consumers often view water service as a “right”. The importance of water for life and health gives the water bill additional political visibility. Nevertheless, all stakeholders have an interest in efficient price signals and programs that benefit the truly needy in a cost-effective manner.

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¹Many of the concepts on subsidies in this article are discussed in Estache et al. (2000).

²With respect to water pricing, high-income residential consumers and commercial and industrial consumers tend to be more price-sensitive than residential low-income consumers. When the price of water goes up, high-income consumers will reduce consumption. Therefore, there is a real possibility that the subsidy obtained from one group is reduced. See Yepes (1999).

³World Bank case studies of Guinea and Cote d'Ivoire note that government agencies in both countries have failed to pay for water consumption for long periods of time. In such cases, the private operator is unlikely to expect that subsidies will be transferred in a reliable manner. See Clarke (2001).

⁴ However, willingness-to-pay surveys may have methodological deficiencies, as noted by Estache et al. (2000). See Foster et al. (2000) for a discussion of the limitations of the surveys in Panama's case study.