

The Buenos Aires Water Concession

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Transparent, rule-based decisionmaking is important to maintaining public trust in regulated infrastructure. The Buenos Aires water and sanitation concession led to remarkable improvements in delivery and coverage of services and to lower prices for consumers. But a poor information base, lack of transparency in regulatory decisions, and the ad hoc nature of executive branch interventions make it difficult to reassure consumers that their welfare is being protected and that the concession is sustainable.



Summary findings

The signing of a concession contract for the Buenos Aires water and sanitation system in December 1992 attracted worldwide attention and caused considerable controversy in Argentina.

It was one of the world's largest concessions, but the case was also interesting for other reasons. The concession was implemented rapidly, in contrast with slow implementation of privatization in Santiago, for example. And reform generated major improvements in the sector, including wider coverage, better service, more efficient company operations, and reduced waste. Moreover, the winning bid brought an immediate 26.9 percent reduction in water system tariffs.

Consumers benefited from the system's expansion and from the immediate drop in real prices, which was only partly reversed by subsequent changes in tariffs and access

charges. And these improvements would probably not have occurred under public administration of the system.

Still, as Alcázar, Abdala, and Shirley show, information asymmetries, perverse incentives, and weak regulatory institutions could threaten the concession's sustainability. Opportunities for the company to act opportunistically — and the regulator, arbitrarily — exist because of politicized regulation, a poor information base, serious flaws in the concession contract, a lumpy and ad hoc tariff system, and a general lack of transparency in the regulatory process.

Because of these circumstances, public confidence in the process has eroded. The Buenos Aires concession shows how important transparent, rule-based decisionmaking is to maintaining public trust in regulated infrastructure.

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THE BUENOS AIRES WATER CONCESSION

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I. INTRODUCTION

The signing of a concession contract for the Buenos Aires water and sanitation system in December 1992 has attracted world wide attention and been the subject of considerable controversy in Argentina (see for example, Idelovitch 1994, *The Economist* various, Artana et. al 1997). In addition to being one of the world's largest concessions, the case is interesting for a number of other reasons. First, the rapid implementation of the Buenos Aires concession is in contrast to the slow moves towards private participation in other water systems, such as Santiago or Lima. We explore in Section II the circumstances in the water sector and the political and institutional factors that led Argentina to implement the concession. Second, the reform has been widely acclaimed for generating major improvements in the sector, including wider coverage, better service, more efficient operation of the company, and a reduction in waste. What makes these improvements especially striking is that the winning bid brought an immediate 26.9 percent reduction in water system tariffs.¹ We explore the features of the contract that explain performance improvements, and consider how institutions affected outcomes in Section III. Finally, the Buenos Aires case is of interest because the contract was renegotiated in 1997, provoking criticisms of the original bid and the regulation. We describe these revisions in Section IV and measure the extent to which Buenos Aires was better off because of the concession, with and without the renegotiation, in Section V. Section VI concludes with lessons for reform design.

As we will show, water and sewerage services improved dramatically thanks to the concession. Consumers benefited from the large drop in real prices, which was only

¹ This decrease was subsequently eroded, as we explain later.

partly reversed by subsequent changes in tariffs and access charges, and from a large expansion of the system. Quality and reliability of service also improved, and wastage of water was reduced. We will argue that these improvements would not have occurred under any reasonable assumptions about continued public operation of the water system.

These gains notwithstanding, we will demonstrate how information asymmetries, perverse incentives and weak regulatory institutions could threaten the long-run sustainability of the concession. In particular, politicization of the regulator, a poor information base, serious flaws in the concession contract, an obscure tariff system and a general lack of transparency in the regulatory process, have created opportunities for the company to act opportunistically, and the regulator, arbitrarily. These circumstances have led the federal executive to by-pass the regulator, and public confidence in the process has eroded. The Buenos Aires concession shows the importance of transparent, rule-based decision making in maintaining public trust in regulated infrastructure.

II. CIRCUMSTANCES LEADING TO REFORM

A. Circumstances in the Water Sector

Reform is more likely to occur when the water sector is in crisis, but only if the causes of the crisis are tractable (Alcazar and Brook Cowen 1996). Problems that result from a failure to expand supply as fast as demand or from mismanagement are easier to address than those that stem from scarce and costly raw water. Buenos Aires did not have a public health crisis, but it did have serious problems. We argue in this section that it was ripe for reform because its sector problems were highly tractable, given the right political circumstances.

(i) *Cost and Scarcity of Raw Water.* Buenos Aires sits on the west bank of the Rio de la Plata, which has an abundant flow of 29,000 M³ per second (World Bank 1994) and supplies 92 percent of the system's water needs.² As a result the supply of raw water is ample throughout the year and transport costs are low. Nasser 1997 estimated that the marginal cost of water in Buenos Aires could be as low as US\$0.15 per cubic meter, even taking into account the investments being implemented under the concession. This is cheap compared to cities with scarce water supplies, such as Lima, where the marginal cost of water and sewerage was estimated at US\$0.45 per M³ in 1994 (World Bank 1994).

(ii) *Supply and Demand.* Notwithstanding the ample availability of cheap raw water, before the concession only 70 percent of the population in the metropolitan area were connected to the water system, and only 58 percent to the sewerage system. The shortfall was in the poorer, suburban areas, which had been growing by 5 to 6 percent a year prior to the concession and totaled 5.6 million people at the time it was signed in December 1992.³ Only 55 percent of persons in these areas had access to water and only 36 percent to sewerage. Almost all of the 3 million inhabitants in the older center of the city, the Capital District, were connected to the municipal system (Table 1).

² The rest is from about 300 wells that are becoming increasingly contaminated by untreated sewerage.

³ Approximately, 2 million people are in the province of Buenos Aires but are not in the concession area. They are served by municipalities.

Table 1. Water and Sanitation Coverage before Privatization

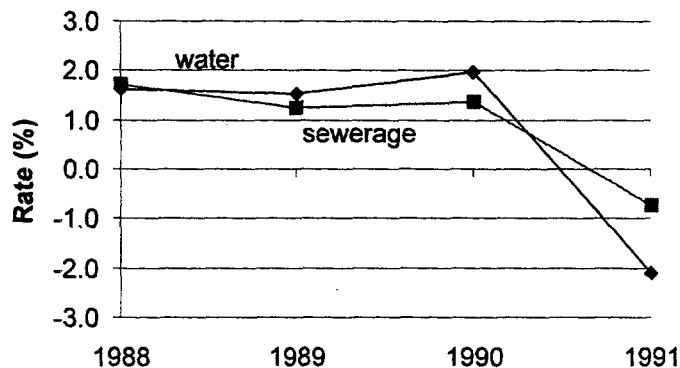
	<i>Water</i>	<i>Sewerage</i>
Capital District	99%	99%
Suburban areas	55%	36%
Total metropolitan area	70%	58%
Number of connections (millions)	1.2	0.7

Source: Concession Contract.

The state owned water utility, OSN (Obras Sanitarias de la Nación), had not been investing enough to keep up with the pace of growth in these outlying areas of the city, and the bulk of new connections had been financed by neighborhood associations. The growth of connections was very slow, and below Buenos Aires' low population growth rate in 1991 (Figure 1). Indeed, OSN's level of investment was not even enough to maintain existing assets. For example, average annual investment from 1987 to 1991 was only US\$11 million, which did not cover depreciation. Much of the water and sanitation system was more than 60 years old and badly in need of repair and replacement at the time of the concession in 1993 (FIEL 1997). The deterioration of the system caused water shortages in parts of the city during the summer, as well as frequent breaks and interruptions, low pressure, poor water quality, and sewer flooding during rainstorms.⁴ Unaccounted for water (UFW), the difference between water production and the volume billed to customers, calculated as a percent of water produced, reached 45 percent before the concession, compared to 10 to 20 percent in OECD countries.⁵

⁴ Only 17 percent of the population in the suburbs received adequate pressure before the concession, defined as greater than 8 wcm (Abdala 1997).

⁵ UFW represents losses due to leaks, theft, and failure to register users.

Figure 1. Rate of Growth in Population Served by OSN

One reason for OSN's low investment rates was its lack of funds because of its inefficient operation, combined with declining real low water tariffs. Water tariffs had declined in real terms during much of the preceding thirty years, falling by almost 70 percent from 1960 to 1976. The Ministry of Economy and Public Works was nominally responsible for setting prices and investment policy, but in practice pricing decisions were often influenced by political considerations.

Consumers had little incentive to conserve. Not only were water prices low, but also nearly 99 percent of consumption was unmetered, billing was based on factors with little relation to consumption, and only 80 percent of billed values were collected.⁶ Besides poor billing and collection because of OSN's failures, the law did not permit the company to cut service to households who didn't pay. Water consumption in 1993 was estimated at 352 liters per capita per day, compared to, for example, 173 in Santiago, another city with ample raw water.⁷

⁶ Although 20 percent of customers had meters half of these were inoperative.

⁷ Based on water distributed divided by connected consumers.

(iii) Management. Besides defects in collection and investment, OSN was generally mismanaged. The company's auditor cited OSN's poor internal organization and administration and unreliable accounting information in its annual reports. The company was overstaffed with 8 workers per 1000 connections compared to 2 in Santiago.⁸ Salaries were low, turnover of skilled personnel, high, and the entire workforce suffered from low productivity and lack of discipline (Idelovitch 1994 and FIEL 1996).

Top management was politically chosen and priorities were set according to non-commercial criteria. As a result OSN's scarce funds were focused on more visible new construction projects rather than maintenance, even though many of these new works were never completed. In addition, OSN was widely regarded as unresponsive to customer complaints; at one point the backlog of water breaks awaiting repair was close to 7,000.

OSN lost money in three of the five years leading up to the implementation of the concession in 1993. It made money in the other years only thanks to inflation accounting and non-operating income. Indeed, OSN was not designed to be financially autonomous; its act of incorporation provided for the company to make use of Treasury subsidies whenever its own revenues did not cover its costs (OSN Ley Organica 1949). Nevertheless, many observers believed that an efficiently operated OSN could have made money and expanded coverage, given the low cost of water in Buenos Aires (field interviews). The government had increased prices in the years before the concession, and

⁸ One reason for this was that OSN had once been responsible for water throughout Argentina and when the sector was decentralized in 1980, OSN failed to reduce its staffing *pari pasu*.

even though the increases were less than inflation, it became more likely that an efficiently operated company could earn a reasonable return on capital.⁹

(iv) Externalities and Health Problems. The opportunity cost of water usage in Buenos Aires was and is low. Usage costs are low because the city's extraction rate, while relatively high, is far below the river's replenishment rate and drinking water is not in competition with other uses. Externalities due to pollution of the river have also been low. Even though only 5 percent of sewage is treated before being dumped in the river, this contamination has had low external costs thanks to the self purification capacity of the river and the fact that downstream users are not affected.¹⁰

The principal externality from the system resulted from contamination of groundwater and rivers by septic tanks, cesspools and direct discharge of untreated sewerage and industrial effluent. At the time of the concession eighty eight percent of those not connected to the sewerage system used cesspools and septic tanks and the remainder used direct disposal such as discharges into creeks. Since 95 percent of the thirty percent of the population without connection to piped water relied on shallow wells, waterborne diseases from bacterial contamination were believed to be important among this population.

Thus, in many ways Buenos Aires' sector circumstances seemed exceptionally well suited for successful reform. Despite an abundant and forgiving source, water had been made artificially scarce by mismanagement and poor policy, resulting in preventable

⁹ Water tariffs were increased by 25 percent in February 1991 and by 29 percent in April of 1991. Although the CPI increased by 84 percent in 1991, by the time of the concession the rate was sufficient to cover OSN's operating and maintenance costs.

¹⁰ The construction of a 2.5 km offshore pipe at one of the effluent plants (Berazategui) eliminated problems for downstream users (Obras Sanitarias de Buenos Aires near the city of La Plata).

externalities. Of course the fact that problems have a solution doesn't mean they will be solved; that occurs when political and institutional circumstances are favorable, as we consider next.

B. Political Circumstances

Our premise is that reform becomes politically desirable when the political benefits outweigh the political costs, and feasible when reformers have the power to overcome opposition and implement change (World Bank 1995). It is credible when the reformers' promises are believable and sustainable when those promises are hard to overturn. This section explains how water system reform became politically desirable, politically feasible and credible in Buenos Aires.

(i) Economic Crises Made Reform Feasible. Water reform became politically feasible in Argentina because economic crisis changed the rules of political competition, encouraging cooperation after years of bitter conflict. To understand the unique circumstances that made reform feasible we must understand Argentina's history. Three political forces vying for power have dominated Argentina's political history since the early 1940's – the military, members of the Radical Party (mainly the middle class) and the primarily working class members of the Peronist Party. These groups failed to develop stable, cross-cutting coalitions that could bring together different interests to support policies that would encourage economic growth (McCubbins 1993). Rather, when one group was in control it used its power to redistribute wealth and income to the benefit of its supporters, and to reverse the actions of its predecessors (Ibid., Hill and Abdala, 1993). As a result successive regimes tended to expand the role and employment

of the state, control prices and salaries, and restrict trade, contributing to deficit public spending, rising inflationary pressures and falling production.

The frequent intervention of the military and the rise of Peronism contributed to the instability of Argentine politics. From 1930 to 1983 there were five military coups that resulted in a total of 23 years of military rule. The rise of Juan Domingo Perón in the 1940's with his base in urban, unionized labor, led to further instability by polarizing politics between the Peronist Party and the opposition Radicals. During the period when Peron and, following his death in 1974, his wife, were in power (1946-55 and 1973-1976), the role of the state in the economy was increased through nationalization of public services, or direct interventions, such as fixing prices and wages. Both of these Peronist regimes were characterized by increasing political polarization and both were ended by military coup.

The instability and economic deterioration continued under the military governments that followed. The military regime from 1976 to 1983 focused mainly on defeating the urban guerrilla movement through increasingly repressive tactics; (during their rule thousands of citizens disappeared). Although they followed more liberal economic policies with some initial successes, the conflict with the British over the Malvinas Islands in 1982 greatly increased the external debt and deficit spending, contributing to rising inflation that reached 15 percent a month by the end of 1983 (Snow 1996). The economy did not improve with the restoration of democracy and the election of the candidate of the Radical Party, Raúl Alfonsín. Continued political polarization made meaningful structural reforms impossible. The executive and one house of

congress were held by the Radical Party while the other house was controlled by the Peronists.

By the time of the election of the Peronist candidate, Carlos Menem, in 1989, Argentina was in the midst of a severe economic crisis. In the previous five and a half years real salaries had decreased by 50 percent, unemployment and underemployment had doubled, annual inflation had increased to more than 3,000 percent and the economy was in recession (GDP fell by 1.3 percent in real terms). Menem won 47 percent of the votes and control of the Senate. Although Menem himself was a moderate, he ran on a traditional Peronist platform that stressed popularism and won the support of most of the poor. His Radical opponent's platform, in contrast, called for stabilization and liberal market reforms, policies that Menem adopted after taking power.

The severity of the economic crisis prompted the moderate wings of the two major political parties, who represented middle to upper income voters, to build an informal coalition in order to bring the Menem government quickly and give it the power it needed to address the accelerating hyperinflation and economic deterioration.¹¹ The moderates supported compromise because of concerns that further deterioration of the economy might tempt the military to intervene, as had so often happened before. The low public support for the traditional parties in opinion polls (Table 2) created further pressure for consensus. Accordingly, the moderate wings of the opposing political parties agreed that Menem could take power five months ahead of schedule to avoid a

¹¹ Menem's party officially called the Justicialist Party, included not only the urban working class and the middle class of poorer provinces, but also newer industrialists. Some of his appointees were members of other parties.

long hiatus between the election and his inauguration.¹² The opposition Radical Party also agreed to support a series of laws giving the President sweeping powers that, in effect, allowed him to legitimize frequent use of emergency decrees during the crisis and early reform period (McCubbins 1993).¹³ Menem made wide use of this power: while his predecessor, President Alfonsín, had issued 10 decrees, Menem issued 308 from 1989 to 1993 (de Michele and Mazetti 1996).

(ii) *The Menem Administration Strengthened the Chances for Reform.* Reform was also politically feasible because the Menem administration was able to neutralize two formerly powerful factions that might ordinarily have opposed his free market reforms, the military and unionized labor. The military had been weakened after its defeat in the Falklands war with the U.K. and its use of repressive tactics to control guerilla violence when it was in power from 1976 to 1983. This weakness reduced the likelihood of military intervention, but did not eliminate it. By granting amnesty to low level participants in insurrections against Alfonsín and pardons to military personnel involved in some past violations of human rights, President Menem removed a potential source of tension.

Unionized labor, who were important to the extreme wing of Menem's own political party was also much weakened. Unions' credibility with the public was very low, as evidenced by polls after Menem's election. The approval rating of unions in

¹² Menem won the election on May 14, 1989 but would normally not take power until December 10; instead he was inaugurated in July. The CPI rose by 78% in May, 114% in June, 197% in July, and 38% in August. The exchange rate devalued by about 3,700% in the five months between the election and when Menem took office.

¹³ Law 23696 gave the executive power to reorganize, privatize or close any public agency or corporation by decree, and Law 23697 granted the executive power to modify, eliminate, or create regulation affect almost any aspect of business or labor relations. The executive also had strong powers when Congress is not in session or during exceptional periods according to the Constitution then in force (Michele and Manzetti 1996).

Greater Buenos Aires (the Capital District and surrounding suburbs) dropped from 21 percent in February 1989 to 15 percent in June 1990, to 8 percent in November 1990. Although other groups also received low approval ratings, none were as low as the unions, see Table 2. Electoral defeats in later congressional elections brought the number of union representatives down from 35 deputies in 1983 to 8 in 1993. Furthermore, since labor had backed Menem's election, they had few attractive alternatives to which they could switch support when he enacted policies they opposed.

Table 2. Popular Approval of Certain Groups

<i>Rate of approval of:*</i>	<i>Feb. 1989</i>	<i>June 1990</i>	<i>Nov. 1990</i>
Military	26%	24%	22%
Entrepreneurs	38%	32%	31%
Political parties	31%	23%	14%
Unions	21%	15%	8%

*Average for greater Buenos Aires.

Source: Fundación CEDEPAL, various.

The Menem administration was thus well situated for enacting radical change. Although Menem's platform had not stressed free market reforms, hyperinflation and a rapidly deteriorating economy demanded a new approach. Furthermore, most people favored or were at least neutral towards privatization in the first years of his government. Polls suggest that opposition to privatization in Buenos Aires was only 16 percent in 1989, and subsequently averaged about 35 percent between 1990 and the signing of the water concession in 1993 (Table 3).

Table 3. Public Opinion of Privatization*

(percentages)

<i>Opinion</i>	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Positive (1)	25.5	59.4	38.3	39.0	26.4	36.4	29.9	24.3	16.7	18.1
Neutral	20.6	15.9	24.4	26.5	25.0	25.6	29.2	31.6	27.7	26.9
Negative (2)	38.6	16.4	34.4	29.3	43.6	33.3	36.2	42.7	52.2	51.9
No opinion	15.4	8.4	3.0	5.3	5.0	4.7	4.7	1.4	3.4	3.1
(1)/(2)	0.7	3.6	1.1	1.3	0.6	1.1	0.8	0.6	0.3	0.3

* Great Buenos Aires Area

SOURCE: Centro de Estudios Unión para la Nueva Mayoría.

Nevertheless, the administration had doubts about whether the political coalition that made privatization possible was robust or durable. On the one hand, most politicians and ordinary citizens, fearing that a failure to go along with change might bring back the status quo of hyperinflation and decline, were ready to give Menem a long honeymoon period. On the other hand, the government was enacting a very ambitious program that had not been part of its electoral platform. The new administration began in 1990 to liberalize trade, lay off government employees, curb state spending and privatize state owned enterprises; then in 1991 it instituted a currency board pegging the peso to the dollar.¹⁴ Consequently, the government launched privatization with a strong sense of urgency (field interviews). Speedy privatization was also seen as key to the success of the government's economic program since stabilization and fiscal and monetary reforms depended on privatization bringing new private capital, reducing fiscal hemorrhaging, shrinking the debt overhang through debt: equity swaps, and endowing the economic program with greater credibility with investors and debt holders. This focus on speed was to have important implications for the water concession, as we discuss in Section IV.

¹⁴ Government employment was reduced by 60 percent during the first five years of the administration; 15 percent through layoffs and 85 percent through transfers to jobs in health and education in the provinces.

(iii) *The Political Desirability of Water System Reform.* From the beginning private participation in the water system was part of the Menem administration's privatization program. Argentina's quick action on the Buenos Aires water system concession is in contrast to two of its neighbors, Chile and Peru. Chile had planned to sell the assets of Santiago's water system and Peru had planned a concession in Lima, also as part of large privatization programs. But both governments treated water privatization as low priority, delayed the transaction, and, after initially contacting bidders, ultimately failed to privatize. These delays are not surprising. Water does not usually have high saliency in privatization programs, especially a concession, since it brings no new capital to reward supporters or compensate losers, and since it affects a single city rather than the nation. This low saliency helps explain why Chile and Peru delayed and ultimately dropped their privatization plans, the puzzle is why Argentina went forward. We might expect that the different decisions were prompted by a need to improve the poor performance of the Buenos Aires water company. But bad as OSN was, things in Lima were much worse (see Alcázar and Xu 1998).

The Buenos Aires concession went forward as part of the block of transactions because the net political benefits to Menem appeared to be larger than the net benefits from similar action in Peru to Fujimori or in Chile to Pinochet. In the 1989 election Menem received solid support from those most adversely affected by the hyperinflation (lower and middle class, salaried workers, self employed and unemployed). Thanks to this support, he carried the poorer suburban areas of Buenos Aires, but did poorly in the upper middle and upper income districts. Coincidentally, the latter were the same districts that had the highest rates of connection to the water system (Table 4).

Table 4: Votes for Menem in the 1989 Presidential Elections Compared to Water and Sewerage Connections and Income Group

	Election returns %Menem	Percentage Coverage		Income Group*
		Water	Sewerage	
Capital District	36.6%	99%	99%	
North Zone		69%	44%	
Vicente Lopez	29.8%	98%	95%	1 & 3
San Isidro	34.1%	81%	35%	1 & 3
Tigre	53.7%	24%	8%	4& 6
San Fernando	50.3%	64%	24%	4& 6
West Zone		54%	45%	
Moron	48.1%	30%	25%	4& 6
La Matanza	60.2%	54%	55%	4& 6
Tres de Febrero	50.8%	69%	57%	1 & 3
San Martin	50.1%	77%	40%	1 & 3
South Zone		49%	21%	
Avellaneda	46.7%	83%	37%	1 & 3
Lanus	52.8%	76%	17%	1 & 3
Lomas de Zamora	52.8%	53%	30%	1 & 3
Almirante Brown	60.0%	13%	9%	4& 6
Est. Echeverria	58.6%	10%	8%	4& 6

*1-3 = upper and upper middle income; 4-6= lower middle and low income.

Sources: Election results: Diario El Clarin, May 16 1989. Income groups: INDEC, "El Consumo y el Ingreso de Los Hogares Frente a una Caída de la Inflación". 1985/1986 Water and Sewerage Coverage: Concession Contract.

The design of the concession rewarded both supporters and opponents. Middle and upper income households who were already connected to the water system would benefit from the concession since the tender was awarded on the basis of the lowest water tariff, and designed to bring substantial improvements in service. The suburban poor were also expected to benefit from increased access, as Table 5 shows. Although the poor were required to pay much of the cost of the expansion of the secondary network through a so-called infrastructure charge, the government staff who helped draft the contract thought that the poor could afford this infrastructure charge since the concession required the company to provide financing assistance for two years at 12 percent interest (field interviews).¹⁵ As we shall see, this proved to be a serious sources of problems

¹⁵ The nominal interest rate on debt at the time was over 20 percent.

later. Water worker opposition to the reform was reduced by the pledge of shares in the privatized firm. The close involvement of the union officials in the process also helped win their acquiescence. (The head of the union was part of the privatization committee.)

Table 5. Projected Socioeconomic Status of Households with New Water Connections

(first five years of concession)

	<i># of New Connections</i>	<i>Percentages</i>
High/ Middle High	90,200	15.44
Middle Low	282,250	48.31
Low	211,800	36.25
TOTAL	584,250	100

Source: Undersecretariat of Water Resources 1996. Based on actual and projected works.

Thus, in contrast to Santiago and Lima, the political economy of the Buenos Aires concession appeared to be a win-win decision politically with benefits for core constituents in the suburbs and potential swing voters in the center. Both Santiago and Lima would have had to raise prices substantially to cover their costs, while in Buenos Aires prices could be reduced through more efficient operation. Coverage could be expanded in Buenos Aires without putting much of a burden on existing customers, or so it seemed at the time of the concession, something that was clearly impossible in Lima. And the Buenos Aires concession might help the Menem administration's standing with important swing constituents, whereas Pinochet had little expectation of improving his support in Santiago when he faced the plebiscite in 1988, regardless of water reforms.

(iv) *Credibility of Water System Reform.* Even though the Buenos Aires concession was politically feasible and desirable, the government's promise to honor its contractual obligations also had to be credible. Otherwise, potential investors would not

participate or would demand a large risk premium (Levy and Spiller 1994, World Bank 1995). Investors also had to believe that commitments would be honored by future governments or they would try to front load their returns and invest less in expanding and maintaining assets. Three factors made the Buenos Aires concession agreement appear credible and a constitutional reform made it more likely that it would be sustained.

Credibility was strengthened first by the fact that by the time the water system concession was signed in 1993, the government had already implemented a market-oriented reform program and privatized majority ownership of large state enterprises in telecommunications, electricity, gas and airlines. A total of US\$18 billion in federal assets had been sold by 1993 (Shaikh, 1996) and by 1994, 90 percent of all federal enterprises had been sold.¹⁶

A second feature which enhanced the concession's credibility was the process of privatization, which was designed to build a broad base of support by involving both houses of Congress, all affected federal ministries, provincial and local governments, and the staff of the affected SOE. It also built workers' support by pledging to transfer 10 percent of shares in the new water company to them whenever the dividends paid to the government for these shares covered their book value (US\$12 million). A bicameral Congressional committee supervised the privatizations including the concession. An 11-member government committee was in charge of coordinating the privatization of OSN with representatives of most interested parties: the Ministry of Economy and Public Works, the Privatization Secretary, the Municipality and Province of Buenos Aires, OSN

¹⁶ In addition, the privatization of provincial water enterprises had already started (in Entre Rios).

managers and labor unions.¹⁷ Transparency was enhanced through the extensive use of technical advisors, the involvement of international agencies (IDB, UNDP, World Bank), and by monitoring by the government office responsible for SOE audits (Sindicatura General de Empresas Publicas).

Third, the favorable political situation described above also strengthened the credibility of the concession, as did popular attitudes. Shortly before the concession was signed 43 percent of the population of the Capital District and Greater Buenos Aires favored privatization of water and sewerage (Estudio Mora y Araujo, Noguera y Asociados in field interviews 1997). This is similar to support for other privatizations such as electricity and gas (47 percent), railways (47 percent), roads (43 percent), airlines (41 percent) and oil (37 percent). Since observers consulted for this study agreed that water was not a highly salient issue for most of the city's population, investors could reasonably expect little opposition to a reform that was billed as one that would reduce prices, improve service and increase access.

Thus, there was little reason to doubt the short run credibility of the reform, but the prospects that it would be sustained over the longer term were less secure. The popularity of privatization and the extraordinary political circumstances that made it possible could easily change over time, as indeed they have. We consider this issue in the next section.

¹⁷ OSN workers were members of the National Federation for Sanitary Workers and the Union for Sanitary Workers in Greater Buenos Aires.

III. CHARACTERISTICS OF THE BUENOS AIRES CONCESSION

The contracting literature suggests that a contract such as the Buenos Aires concession can be expected to improve firm performance only if it: (i) reduces information asymmetries; (ii) gives the firm incentives to comply with the contract; and (iii) provides credible signals that the contract will be enforced and that both parties will adhere to their commitments (see for example, Lafont and Tirole 1986, 1993; Williamson 1976, 1985; World Bank 1995; Shirley and Xu 1998, 1999). In the case of water, we are also interested in how well the contract addresses social issues, in particular access of the poor to water and sewerage. This section considers how the tender offer and the concession design determined the incentives, information and commitment of the contract, and affordability of access.

A. Information

(i) Competition for the Market and Tender Offer. Competition is an important mechanism to reveal information, and in that regard the Buenos Aires concession scores relatively well. The privatization committee opted for a 30 year concession for all of Buenos Aires, whereby a private or mixed company would assume responsibility for operation, maintenance and investment.¹⁸ The number of likely bidders was limited by the size of the concession, which was one of the largest ever bid in a developing country. As a result, the prequalification requirements limited tender offers to consortia with

¹⁸ The government chose a concession over a management contract or lease because they wanted the private investor to take responsibility for the massive amounts of new investments needed to meet their goals. Sale of assets was rejected because the government did not want to delay the tender in order to collect the information necessary to value the assets, furthermore OSN's assets were not believed to be worth much given their poor condition (field interviews).

experience in operating very large-scale systems.¹⁹ Some consideration had been given to dividing the concession area in two, which might have increased the number of potential bidders as well as allowing comparative competition, but this was rejected because it would require time and investment to separate the system. Since the least costly division would be between the central and suburban parts of the system, there would be few advantages to a split. The parts would not be particularly comparable because the suburban system would be so much less profitable and it would be harder to attract bidders for the less profitable area.

In the event, the bid was competitive. Five consortia prequalified.²⁰ This was reduced to three in the final phase of bidding because two French consortia decided to make a joint bid and the Spanish consortium's technical proposal failed to qualify.

As discussed, the concession was awarded to the consortium that offered the largest tariff reduction. The winner was Aguas Argentinas, headed by Lyonnaise des Eaux-Dumez, which offered a 26.9 percent reduction.²¹ This bid was followed closely by offer of a 26.1 percent reduction from the group headed by Thames Water. The third bid from North Water offered 10.1 percent.

The introduction of competition notwithstanding, a defining feature of the tender process was poor information. The emphasis on speed, discussed above, meant that weak

¹⁹ Specifically, the minimum requirements included more than US\$ 750 million in equity, ability to borrow at least US\$ 200 million, annual revenues above US\$ 600 million and experience in providing water and sewerage services for population of at least 10 million.

²⁰ The five prequalifying companies were: the two largest French water companies, Lyonnaise des Eaux-Dumez and Compagnie Generale des Eaux, the British companies, Thames Water and Northwest Water, and the Spanish state owned enterprise Canal Isabel Segunda.

²¹ The ownership of Aguas Argentinas was 53 percent foreign (besides the two French companies, (the other owners were the Spanish Aguas de Barcelona and UK's Anglian Water), 37 percent Argentine (including Sociedad Comercial del Plata, Meller, and Banco de Galicia) and 10 percent workers. In 1994 the IFC acquired a 5 percent stake.

and sometimes wrong information could not be improved before the auction. Although the government commissioned several studies, the concession contract explicitly stated that none of the government signatories assumed any responsibility for the quality or accuracy of the information provided. Indeed, the winning bidder used the first four pages of the bid document to describe the serious lack of information and the sad state of OSN. The fact that bids were based on such poor information suggests that the information content of the bid was not reliable. Bidders might have been misinformed or assumed that they could renegotiate as new information came to light; a subject we return to later.

(ii) Tariff Regime. One striking flaw in the concession was the decision to leave in place an inefficient and opaque tariff regime. Once again, the government actors did not think they had the time to develop a more transparent regime. They also feared that if they introduced a new regime it would be hard to evaluate the tender offers and to ascertain whether the operator was indeed implementing the agreed reduction in tariffs.

The tender regime left in place by this decision increased government and consumer information asymmetries vis-à-vis the company. Most consumers in Buenos Aires were and are charged a flat rate; at the time of the concession only one percent were metered. The unmetered tariff is set by taking the existing flat rate for the type of consumer (residential, non-residential, or real estate) and service (water only or water and sewerage) and multiplying it by a K factor. Thus, right after the concession was won with a bid to reduce tariffs by 26.9 percent, the K factor was 0.731. The resulting product is then adjusted up or down depending on five variables: where the property is located in Buenos Aires, the total area of the property, the square meters of the area that have

construction on them, and the type of construction (six categories from low budget to luxury) and its age. The coefficient on location has varied between 0.8 and 3.5 and the coefficient on type of construction, between 0.6 and 2.6.²² The metered tariff is no less complicated. It consists of a flat rate equivalent to fifty percent of the tariff that an unmetered customer with the same characteristics would pay, plus a variable charge calculated by multiplying the old OSN tariffs per cubic meter by K; (there is no variable charge for the first 30 M³).

The information asymmetries inherent in the tariff regime open the way for opportunistic behavior by the company. The company can change its tariff by negotiating not only an adjustment in K, but also by reclassifying consumers from residential to nonresidential, since non-residential pay twice as much as residential. It can also propose adjustments in users' lot size or building type or size, or changes in criteria for age or location (Artana et al. 1997). In every case the company will necessarily have better information on the revenue and consumer surplus implications of such changes than the regulator. Another drawback to this complex formula is that it is almost impossible for consumers to monitor their billing and protest arbitrary increases in factors other than K. On the other hand, information asymmetry might also prompt the regulator to exercise discretion. This issue has already come up; ETOSS disallowed a reclassification of 80,000 users from residential to nonresidential, a decision that the company contended cost it over US\$44 million over the first three years of the concession (Nasser 1997).

²² There is also a minimum bimonthly charge of US\$4 times K for residential water and sewerage and US\$8 times K for nonresidential water and sewerage.

(iii) Regulatory Weaknesses. Information asymmetries can be reduced through strong monitoring, but two factors worked against this in Buenos Aires: the inexperience of the regulator, and the poor information base on which the contract was designed.

The regulator's inexperience was natural since the agency was created quickly as part of the general rush to privatize, and set up without a clear regulatory framework or established procedures. Prior to the concession there was no independent regulatory body for water; OSN as we have seen, was largely self-regulated. There was the Sub-secretariat of Water Resources but its responsibilities were to develop and enforce a natural water resources policy and coordinate investments; there was also the Secretariat for Natural Resources and Human Environment, but it was in charge of environmental regulation.²³

In May 1993 ETOSS (Ente Tripartito de Obras de Servicios de Saneamiento, Tripartite Entity for Sanitary Services) was created to regulate Aguas Argentinas and monitor its compliance with the terms of the concession. Besides determining the tariff, ETOSS approves and monitors the company's five-year investment plans, hears and investigates complaints by consumers or others, and establishes penalties and corrective measures should it find the company is out of compliance with the regulation. Not only did the new regulatory agency have to learn on the job, it was staffed largely by former officials of OSN who were not experienced with arms length regulation of a commercial venture. Furthermore, according to water experts in Argentina and the World Bank, ETOSS staff is not highly qualified compared to other regulatory bodies in Argentina.

²³ Until February 1998 these two entities were part of two different ministries and coordination between them was a problem. Now both depend on the Natural Resources and Sustainable Development Secretariat of the Office of the Presidency.

The staff skills may not be the best for a regulator whose most important responsibility is tariff setting; ETOSS had only four economists and four accountants versus 20 engineers in 1995, for example (ETOSS, 1994/95).

The second problem was information. As we have seen, the tariff structure was nontransparent and there were mistakes and gaps in information in the concession about OSN's assets, customers, billing, etc. This opened the door to opportunism by the firm or the regulator. Moreover, because the drafters did not always have enough information to specify targets or end goals in the concession, they spelled out specific actions or projects that Aguas Argentinas would need to implement in order to achieve the goal the government had in mind. For example, instead of just specifying what targets the concessionaire must meet to provide optimal service, the contract provides that "the regulated firm must maintain and renovate all pumping materials, valves, hydrants, connections and other elements that are needed for the optimal provision of the service, regardless of their life span." This sort of drafting invited ETOSS to intervene unduly in the operational decisions of a commercial company (field interviews), and, according to some in Aguas Argentinas, empowers it to make arbitrary requests (field interviews).

B. Incentives

(i) *Investment and Other Obligations Under the Concession.* The contract set a number of targets for the company, some of which are shown in Table 6. Besides the targets in the table, the contract had goals for service quality (water pressure and quality) and metering. These targets implied that approximately one million people would be connected every five years for the first 15 years for a total investment cost of about US\$ 4 billion. Investment during the first five years would amount to some US\$240

million annually compared to OSN's average annual investment of only US\$10 million during the preceding decade.

Table 6. Performance Targets in the Buenos Aires Concession Contract

(percentages)

<i>Year of concession</i>	<i>Population coverage</i>		<i>Sewerage treatment</i>		<i>Network renovation (cumulative)</i>		<i>UFW*</i>
	<i>Water</i>	<i>Sewerage</i>	<i>Primary</i>	<i>Secondary</i>	<i>Water</i>	<i>Sewerage</i>	
0	70	58	4	4	0	0	45
5	81	64	64	7	9	2	37
10	90	73	73	14	12	3	34
20	97	82	88	88	28	4	28
30	100	90	93	93	45	5	25

* UFW is Unaccounted for Water

SOURCE: Aguas Argentinas Concession Contract

While the contract set significant goals, it also lifted some obligations from the company. First, none of OSN liabilities were transferred to Aguas Argentinas except for an undisbursed Inter-American Development Bank loan of almost US\$100 million.²⁴ Second, before the tender the government reduced OSN's work force by 1,618 through a voluntary retirement program that cost about US\$32.7 million or about US\$ 20,000 per worker. (During the first year of private operation Aguas Argentinas offered retirement to another 2,000 employees at a cost to the company of US\$ 50 million.)

To guarantee its performance the contractor had to post an inflation indexed performance bond of US\$ 150 million that was forfeit to the government if the

²⁴ The book value of the liabilities was US\$ 743 million, of which US\$ 502 million were contingent liabilities. So the value of realized liabilities was US\$ 241 million, almost half of which were owed to government.

concession were terminated for lack of performance.²⁵ ETOSS can also penalize the enterprise if it fails to fulfill its commitments. The fines are substantial and escalate with increases in water system tariffs.²⁶ The incentive of the company to achieve these targets depends not only on the penalties it may face if it reneges, but also on the credibility of the commitment it faces. The targets were considered optimistic at the outset by some experts, who predicted the need to renegotiate the contract later. If the company anticipated that it could negotiate lower targets, it would not be motivated by the threat of sanctions. We return to this issue later.

Guarantees and penalties can be important, but ultimately a successful contract is one that aligns the incentives of the operator with the goals of the agreement. Aguas Argentinas has an incentive to expand service since, as we will show, it earns a return on capital from its customers.²⁷ Also, under the original concession agreement, the infrastructure fee covered part of the cost of expansion, and could only be collected by building the network. The company also has an incentive to reduce UFW and wasteful consumption since this reduces the need for costly new investments in supply. By eliminating past liabilities and overmanning, the concession also freed Aguas Argentinas from some of the costs of past mismanagement. The tariff regime distorted the operator's incentives somewhat, however, which we consider next.

²⁵ If the government terminates the contract Aguas Argentinas is entitled to its bond, compensation for new assets that have not been fully depreciated and loss of revenue for the duration of the contract (based on the minimum profits in the five years preceding termination).

²⁶ Mismanagement and failure to provide requested information and reports are subject to a fine of US\$ 100,000. Failure to supply service or meet quality standards and violations of tariff rules are penalized with fines amounting to US\$ 500,000. Additionally, delays in the fulfillment of agreed five year investment plans warrant fines from US\$ 100,000 to US\$ 1 million. Any revenues from fines do not become part of ETOSS' budget, to avoid giving the agency an incentive to penalize the firm in order to collect the fine.

²⁷ Changes in the law also enable it to cut off service for nonpayment.

(ii) *Efficiency and the Tariff Regime.* Buenos Aires' tariff regime had perverse effects on incentives as well as on information. First, the tariff embodied large cross subsidies between customers. For example, a customer with a new luxurious home would pay a tariff seven times larger than a customer with an older, low budget home on a property of similar size. Large cross subsidies create an incentive for the firm to expand services first to those consumers who will pay more. In addition, the tariff provided no incentive to curb usage for the vast majority of customers since they pay a flat rate regardless of volume. As the system expands, Buenos Aires' high rates of consumption will begin to push against the capacity of the system to supply the service. This could motivate the company to reduce the pace of expansion if the cost of expanding supply to meet additional demand is larger than the returns to new investment plus any anticipated penalties for failure to comply with the contract.

The concession contract created perverse incentives for metering. Metering is expensive, especially in Buenos Aires where the cost of a meter was estimated to be US\$200, so the cost to meter all customers would be US\$300 million (Abdala 1996). It may not be economical to meter where water supply is ample, as it is in Buenos Aires. However, metering does make sense if metering would reduce the requirements for new capacity, and that capacity costs more than the price to meter. Moreover when consumers are metered, they can adjust the size of their bills by curbing consumption.

The original contract made it mandatory to meter non-residential consumers, but left it optional for residential connections. Ninety eight percent of all connections were classified as residential when the concession was signed in 1992; only 1 percent of connections were metered. Either the consumer or the company can request a meter, in

which case a meter must be installed and whichever party made the request pays the cost. Unlike Aguas Argentinas, most consumers are unlikely to have the information to know when metering would be advantageous for them. Metering becomes profitable for Aguas Argentinas when the variable charge for metered water is more than half of the fixed charge (Abdala 1996). Since those with low fixed charges are likely to be poor, in effect the tariff regime provides Aguas Argentinas with an incentive to meter those households that are the least able to afford the higher water bill.²⁸

The procedure to adjust prices is a further instance of perverse effects on incentives. Buenos Aires uses a mix of price cap and cost plus pricing regulation. Similar to a price cap, the K factor is subject to adjustment every five years, based on the investment plan for the following five years. K can go up or down, except in the second five-year period when prices can only be reduced. Between these periodic adjustments prices are not inflation indexed, as is usually the case with a price cap. Instead, whenever a composite cost index increases by a cumulative real rate of more than 7 percent in one year, the company can file for an equivalent increase in K.²⁹ This index is constructed by developing price indices for ten categories of costs, such as fuel, chemicals, electricity, labor, debt service, etc. Each cost category's index is based on one or more published price indices, such as the wage index for unskilled and skilled labor in industry and

²⁸ Abdala 1996 simulated what the unmetered and metered tariffs would be for two properties of the same size where one is new, well located, and luxurious and the other is old, poorly located and low budget, and assumes that the household in the more luxurious property is high income and the other is low income. In this example, metering reduces the bill for high income households who consume less than about 125 M³ and raises it for low income households who consume anything more than 50 M³.

²⁹ The company or the regulator can also request price adjustments should costs go up because the government requested changes in product quality or works, or because of changes in the tax, convertibility, environmental or other laws that affect the company.

consumption, which are 20 and 80 percent respectively of the cost index for labor. The cost categories are then assigned weights for each five-year period of the concession, depending on their incidence in Aguas Argentinas' operating costs as estimated in the firm's tender and five year plans. For example, personnel costs are 39 percent of the index and electricity is 11 percent during the first five years. The increase is not automatic; the request is studied by the regulator and has to be approved.

Theory tells us that price caps have an advantage over other forms of regulation: they give the company an incentive to reduce costs in the period between price adjustments since it can keep any additional profits. However, it is not clear that Buenos Aires' hybrid price system captures this advantage. The regulation reduces Aguas Argentinas' incentive to control costs whenever the increase in the cost index nears 7 percent. The complexity of the cost index also allows both the company and the regulator to behave opportunistically, as was evidenced in a dispute over the size of this cost pass-through in 1998, which we discuss in the Section V.

C. Credibility

Although political circumstances made the initial concession contract credible to the bidders, whether credibility will be sustained as political circumstances change depends on the mechanisms available to enforce government's adherence to the contract. As Levy and Spiller 1994 points out, if investors fear administrative expropriation they will limit their exposure. For example, if Aguas Argentinas fears that its prices will not be adjusted according to the contract or that ETOSS will act arbitrarily, it will want to delay or reduce its investment commitments. In this section, we discuss the institutions

that could potentially enforce the concession: regulation, legal redress, and the federal executive's concern with Argentina's reputation in international capital markets.

(i) *Enforcement by the Regulator and Judiciary.* The politicization of the regulator and the weaknesses of Argentina's judiciary made it less credible that the government would adhere to its side of the regulatory bargain if political circumstances changed. The contract also provides for international arbitration, but this is useful only as a last resort.

Politicization was built into ETOSS' structure. It is governed by a six-member board: two representatives of the Presidency, two of the Province of Buenos Aires and two of the Municipality of Buenos Aires; the presidency rotates between them. Directors are appointed for six years with the possibility of serving two terms. Although they are supposed to be removed only for just cause, most directors have spent no more than two years in their positions; only two have been with the regulator since it was created in 1993. The different levels of government represented on the board have brought pressure on the regulator to take politically motivated decisions. For example, in 1994 the mayor of Buenos Aires wanted to build a highway and promised to resettle residents of a shanty town that was in the route of the highway. He pressured Aguas Argentinas to build the necessary water and sewerage connections, and when the company asked for a tariff increase to cover the cost, the ETOSS' directors representing the municipality pressured the regulator for a tariff increase. Some observers (FIEL 1996) believe that this increase was too high and the change in responsibilities and tariff was in violation of the concession contract.

Not surprisingly, such a politicized board is subject to partisan disputes and paralysis. At the time of its creation the ETOSS board was dominated by the federal executive branch, since the presidency appointed the mayor of Buenos Aires. The mayor's position became directly elected in 1994 and was captured by the opposition party. Adding to the partisan divisions, the governor of the province was Menem's main opponent within the Justicialista party. This situation raised the risks that regulatory decisions would be based on partisan conflicts, and reduced the credibility of the concession.

In the event of a conflict between ETOSS and Aguas Argentinas, the company can appeal to the judiciary. The weakness of the judiciary and its vulnerability to political influence weaken the strength of such commitments, however. For example, one of Menem's first initiatives as President was to increase the number of Supreme Court judges from 5 to 9 and to appoint a large number of federal judges and state prosecutors (de Michele and Manzetti 1996).

Sustainability will be enhanced by a constitutional reform enacted a year after the concession was signed, which will make drastic revision in utility regulation less likely. This is because it changed electoral rules in ways that make it harder for one faction to capture the upper house and ignore the minority (Heller and McCubbins 1998).³⁰ However, this change will protect the company against arbitrary action by the legislature, but not from regulatory discretion.

³⁰ Prior to 1994, senators were elected by provincial legislatures from two-member districts by plurality rule. When the 1994 electoral changes take effect in 2001, senators will be elected in three member districts with the first two seats going to the party with the most votes and the third seat to the second-place party. In the 1995 and 1998 elections, senators up for election (one third every two years) were still elected by the provincial legislatures, but respecting the 1994 rules assuring minority representation. These rules have created more pressure for compromise with the opposition.

(ii) Reputation Effects. An important factor enhancing the credibility of government's commitment to the concession was the concern of the Argentine government with its reputation in global financial markets. Menem's market-oriented reforms had made the economy open and introduced a currency board that fixed the peso to the dollar. This openness to global economic influences meant that any future federal executive would be concerned about how foreign private investors might react should government renege on the regulatory promises it had made to Aguas Argentinas as part of a large and visible transaction. Reputation can be a powerful tool for contract enforcement, but also somewhat ephemeral. In this case, the force of reputation would depend how salient investors perceived the concession contract to be when compared to other reputation factors, as well as whether the firm appears to have reneged on its part of the bargain. As we shall show in Section V, the executive branch has intervened repeatedly to support Aguas Argentinas in conflicts with the regulator, and to bypass the regulator entirely in renegotiating the contract.

Reputation concerns of the company, also have an effect on the sustainability of the contract. The concession is one of the largest and its success is important to the reputation of the consortium partners that are competing in global markets for water contracts. This gives them an incentive to comply with the contract even if enforcement is weak. The strength of the incentive depends on the cost of compliance and whether government appears to have reneged on its commitments.

D. Access and Affordability

A final characteristic of the concession with important implications for performance is affordability of access. As we have seen, the cost to expand the primary network was shared by all users as part of Aguas Argentinas' general tariff, while the cost of expansion of the secondary network was charged to new customers, along with the cost of connection. The total access charge is given in Table 7; (to this must be added any cost to modify household plumbing and appliances).

All consumers were required to connect to piped water and sewerage when it was made available. Since most of those not connected to the municipal water system relied on wells and cesspools, we can compare these construction and operation costs with the cost of connection. Abdala 1996 estimates that the cost to construct a well and cesspool in 1995 (US\$3,506) was considerably more than the total access charges that year (maximum US\$1,528), but for most users these costs were already sunk. The annual cost to operate an electric pump and evacuate a cesspool (US\$189) was more than the annual cost of water and sewerage usage (US\$109). However, many of the unconnected households were poor and probably many used hand pumps and other less expensive forms of water and sewerage. Plus, these numbers do not include the considerable costs to modify plumbing inside the home.

Table 7. Access Charges in 1995
(US Dollars)

	<i>Minimum</i>	<i>Maximum</i>
Water		
Connection fee	\$208	\$297
Infrastructure charge	\$ 43	\$340
Total water access charge	\$251	\$637
Sewerage		
Connection fee	\$284	\$319
Infrastructure charge	\$572	\$572
Total sewerage access charge	\$856	\$891
Total access charge	\$1,107	\$1,528

Source: Abdala 1996. The charge varied depending on the total property area (ST), and a factor R that takes into account the type of soil and level of repair needed to streets and sidewalks. (The formula is $ST * R * \$0.825/M^3$.) Abdala 1996 assumed an average soil and repair coefficient of 1.03 and land areas of 50 M² for the minimum and 400 M² for the maximum.

Affordability of the connection was a problem for poorer households. Aguas Argentinas was required by the concession to help new customers finance the infrastructure charge. The repayment period had to be at least two years. Although Aguas Argentinas could have allowed a longer repayment period, it opted for two years, which made the average monthly charge of \$44. Although the community could build the connection itself, rather than pay Aguas Argentinas, consumers would still have to cover the cost. Some 85 percent of the unconnected consumers had low or low to middle incomes. Many of these were in the poorest sections of the city, where average monthly household income was US\$200 to 245 a month, such that the infrastructure charge alone was 18 percent of their income.

Even new consumers who could afford the access charges resented the requirement to connect, partly because they had alternative water and sewerage systems that were now outlawed. These alternatives were risky – unconnected consumers had higher rates of waterborne diseases because their well water was contaminated by their cesspools – but many were not well informed about their risks and undervalued water

quality. As for sewerage, since it has large externalities consumers almost always place too low a value on it (Munashinghe 1992). Another source of resentment was the fact that customers who had been connected before the concession had not had to pay an infrastructure fee; instead the cost of expanding the secondary network had been spread over all customers. The infrastructure charge was a new feature introduced by the concession. As we report below, the access fees were adjusted several times but affordability problems combined with resentment led many customers to refuse to pay the access charges and helped precipitate the renegotiation of the contract in 1997.

IV. REVISIONS AND RENEGOTIATION

Since the contract was signed, several major changes were implemented and the concession was renegotiated. These illustrate the weaknesses inherent in the initial design of the agreement and in the underlying institutions that supported enforcement.

(i) Revisions to Tariffs and Other Changes. The first revision occurred in 1994, when the K factor was increased by 13.5 percent. Part of this was a 9.5 percent cost pass-through increase because Aguas Argentinas' cost index had increased by more than 7 percent during the year. The rest was due to changes in the contract requested by the government and agreed to by the company.³¹

³¹ One was the increase to cover the municipality's request that we just described asking the company to extend service to a shanty town moved because of a highway (at an estimated cost of US\$9.8 million). A second change was to accelerate the investment in the upgrade of the Belgrano water plant and the expansion of the distribution system to 30,000 people (US\$80.4 million), and an acceleration in the program to substitute nitrate contaminated wells with clean ones (US\$31.8 million). (Aguas Argentinas failed to deliver on all of these new commitments and was fined by ETOSS, something that became an issue in the renegotiation described below.)

In addition, the minimum water connection fee was increased by 84 percent and the water infrastructure fee by 38 percent, while the minimum sewerage connection fee was increased by 42 percent and the sewerage infrastructure fee by 46 percent. These increases aggravated the affordability and resentment problems we described earlier.

In May of 1995 ETOSS decided it should modify this abrupt increase in the access charge somewhat. The minimum connection fee for water was reduced by 16.1 percent, still far less than the earlier increase, and the maximum by 48 percent. In addition the infrastructure fee for water was changed from a flat fee to one that varied depending on the size and characteristics of the property. These two changes combined to reduce the average infrastructure fee for a property of 100 M³ by 81 percent. (One effect of these changes was that sewerage access became substantially more costly than water.) In September 1995 the infrastructure fee for both water and sewerage were reduced again, this time by 15 percent, when by contractual agreement the firm passed on to consumers a drop in its labor taxes.

Notwithstanding these reductions, the infrastructure fee combined with the connection fee was still a problem for many poor consumers. An increasing number of people refused to pay the fee, and Aguas Argentinas became concerned about these growing receivables, which reached US\$30 million at the end of 1996. The Menem government was also concerned because opposition politicians were exploiting the issue, which affected one of Menem's core bases of support. The growing arrears led to the renegotiation of the contract, which we consider next.

(ii) Renegotiation of the Contract. In February 1997 the company asked to renegotiate the contract. Aguas Argentinas argued that its revenues after three years of

the concession were US\$217 million lower than anticipated, of which US\$143 million resulted from factors beyond the control of the company. The company also requested suspension of fines that ETOSS had imposed because of various delays, including Aguas Argentinas failure to meet the accelerated investment targets agreed to as part of the 1994 tariff increase.³² Regardless of the merit of these claims, there was clearly a problem with the collection of the infrastructure charge, and that convinced the government that renegotiation was necessary. The administration also wanted to use the renegotiations to address environmental concerns, including measures to reduce contamination of the Matanza and Riachuelo rivers.

Following the firm's request for renegotiations, ETOSS and Aguas Argentinas presented a series of widely differing proposals. There was little ground for compromise, and the negotiations bogged down, partly because of the political polarization of ETOSS' board. Ultimately, ETOSS staff were bypassed and two Federal Ministries – the Public Works Secretariat and the Natural Resources and Human Development Secretariat – reached an agreement directly with the company. The final agreement was passed in August 1997 and had bipartisan approval, including by the Office of the President, a Bicameral Congressional Commission and representatives of the Province and City of Buenos Aires.

The renegotiation introduced the following main changes:

1. Replaced the infrastructure charge to new users with a Universal Service and Environmental Improvement Fee (SUMA) imposed on all customers. Part of the SUMA was to cover the loss of the infrastructure charge, including past

³² By 1996, the promised works on the Belgrano treatment plant and the distribution network were only about 30 percent completed, the work on the shanty town was about 60 percent completed.

receivables, and part would fund environmental improvements that were not included in the original contract. Thus, in the case of water, a charge of US\$2.01 was imposed to cover the cost of expanding the system to new users, and another US\$0.99 was imposed to finance the environmental improvements. The change was required to be revenue neutral, and a methodology was specified to try to assure this.

2. Created a connection charge (CIS) for new users with an average value of about US\$120 for water. The CIS could be paid off in installments averaging about US\$4 every two months.
3. Reduced Aguas Argentinas' contractual obligations by: (i) cutting expansion targets for the first five year plan by about 15 percent for water and about 13 percent for sewerage;³³ (ii) changing the date for completion of the first plan from the end of April to the end of December 1998; (iii) eliminating the fines imposed by ETOSS for the failure to complete the goals of the investment program.³⁴

As Table 8 shows, as a result of these changes the average bimonthly bill for already connected residential consumers increased by 19 percent from US\$37.26 to US\$44.52, while the average bill for new consumers decreased by 74 percent, from US\$60.69 to US.\$15.92.

³³ The fines are supposed to result in lower SUMA charges and increased investment in a new neighborhood (Puerto Madero).

³⁴ The targets for sewerage connection in the second plan (1998-2003) were increased by 240 thousand people.

Table 8. Comparison of Average Bimonthly ChargesBefore and After Contract Renegotiation^{a/}

Average Charges for Already Connected Residential Customers	Before	After
Water and Sewerage Services	\$30.00	\$30.00
Regulatory fee (2.67%)	\$0.80	\$0.80
SUMA charge	--	\$6.00
VAT (21%)	\$5.46	\$7.72
TOTAL	\$37.26	\$44.52
Average Charge for a New Customer (water only)	Before	After
Water Services	\$6.00	\$6.00
Regulatory fee (2.67%)	\$0.16	\$0.16
SUMA charge	--	\$3.00
CIS charge	--	\$4.00
Infrastructure Charge	\$44.00 ^{b/}	--
VAT (21%)	\$10.53	\$2.76
TOTAL	\$60.69	\$15.92

a/ In Argentinean Pesos (equivalent to US\$)

b/ Average monthly payment for the first two years.

SOURCE: Diario La Nación 24/02/98.

The renegotiation made two fundamental changes in the nature of the concession contract. First, whereas under the original contract the firm received payment for expanding the secondary network only when the work was done, the introduction of SUMA meant that Aguas Argentinas would be paid beforehand. This reduced the government's leverage to assure that the works were promptly completed. At the same time, the decision to delay the timing of planned investment without penalizing the firm may have been a recognition that the original targets were unrealistic, but it also established a precedent that the company would not be held accountable for delays.

Second, the regulations associated with the renegotiation shifted the tariff regime from a

form of price cap cum cost plus, towards something more akin to rate of return regulation. The new rules require the regulator to evaluate the impact of regulatory changes on the company's level of indebtedness. (These criteria are currently under review by ETOSS.)

The 19 percent increase in bimonthly bills did not excite much public comment, perhaps because the absolute amount was small relative to the average income of connected households. Nevertheless, various consumer associations filed suit to stop the SUMA from going into effect, and the Ombudsman (Defensor del Pueblo) for Buenos Aires also requested that the two decrees authorizing the renegotiation be annulled. The judge initially suspended the universal service decree, but it was reinstated upon appeal by the Natural Resources and Human Development Secretariat, the government of the Province of Buenos Aires and a group of 16 mayors of those districts where expansion works were planned.

More recent tariff changes did excite public opposition, however, since they came on top of the earlier increases and at a time when economic growth was slowing. In 1998 Aguas Argentinas requested an 11.7 percent cost pass-through increase, since its cost index had gone up by more than 7 percent. The proposed hike stimulated strenuous opposition from the two ETOSS directors appointed by the Mayor of Buenos Aires, whose constituency had been the most affected by the SUMA. The ETOSS board voted on the increases cost by cost instead of on the entire cost index, and granted only a 1.6 percent increase. The two Buenos Aires directors voted against any increase. The Federal Executive Branch again intervened: the Secretary of Natural Resources granted

Aguas Argentinas another 3 percent on top of the 1.6 percent awarded by ETOSS, for a total of 4.6 percent, still less than the 11.7 originally requested.

The adjustments and renegotiation contributed to a highly partisan debate in the press and some public disillusionment with the concession.³⁵ Some commentators (FIEL, Delfino) argue that the adjustments show the company acted opportunistically from the beginning, underbidding and accepting patently unreliable information in the expectation that tariffs would be renegotiated later. The fact that Aguas Argentinas signed a loan agreement with IFC in 1994 that required it to meet a debt to net worth ratio that it could only achieve if prices were increased or its investment targets reduced, seems to suggest an expectation of renegotiation.³⁶ If this is true, than at least one other bidder would have had to be equally strategic, since the second offer from the consortium headed by Thames Water was so close to the winning bid (26.1 percent versus 26.9 percent). Regardless of the truth of this assertion, the subsequent adjustments of the contract illustrate the risks of auctioning and regulating with such poor information, the problems inherent in a politicized regulator and weak judiciary, and the difficulty of winning public trust under such circumstances.

V. EFFECTS ON PERFORMANCE AND WELFARE

Notwithstanding the flaws in the concession and the institutional weaknesses we have described above, the concession led to major gains in performance and in consumer

³⁵ Public support for privatization in general has decreased from 38 -39 percent in 1990-91 to 16-18 percent in 1996-97. Centros de Estudios Unión parra la Nueva Mayoria. This opposition is due to a sense that privatized enterprises are reaping profits at public expense because of weak regulation. Field interview with Manuel Mora y Araujo, public opinion expert, February 1998.

³⁶ Based on assumption that all profits are fully reinvested; see Abdala 1996.

welfare. Furthermore, the revisions and renegotiation did not have substantial negative effects on these achievements.

(i) *The Effects of the Reform on Performance.* The most dramatic effect of the concession was the increase in investment (Figure 2). Aguas Argentinas estimated that to achieve the original targets under the (pre-renegotiation) concession for the first five-year period it would have to invest US\$1.2 billion. Actual investment was less, about US\$1.05 billion from 1993 to 1997. As a result of this investment new connections increased by 11 percent over the five years and coverage increased from 70 percent of customers in the service area in 1992 to 83 percent by 1997 (Figure 3).

Figure 2. Investment by OSN and AA, 1991-1998

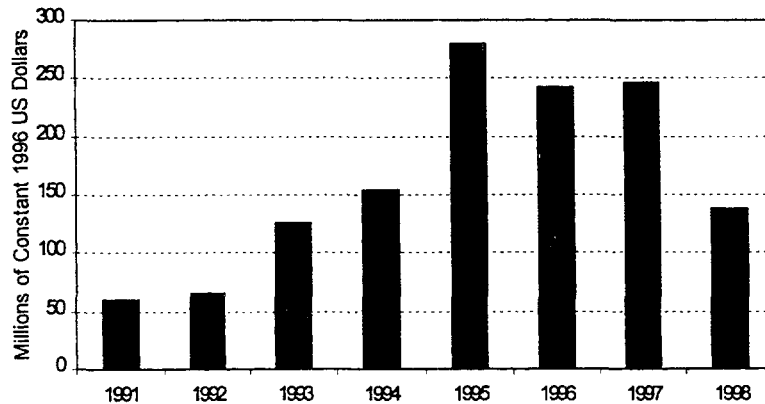
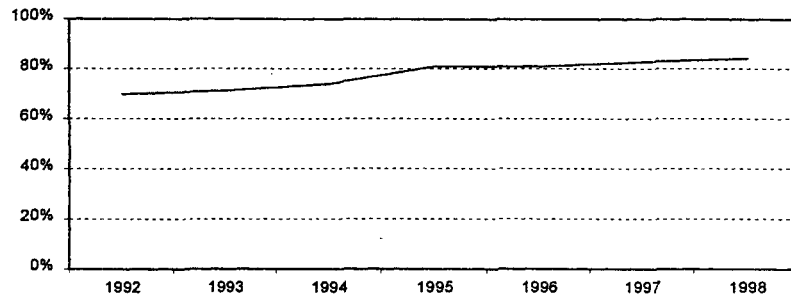
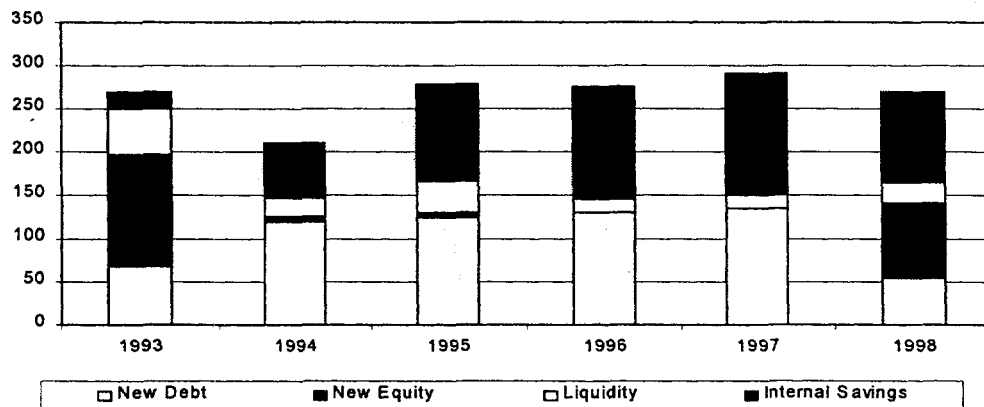


Figure 3. Water Coverage
 (% of Population in Service Area with Connections)



This new investment was financed largely through internal funds and debt (Figure 4). In contrast to OSN, which had been allowed to borrow only twice from 1980 to 1993, Aguas Argentinas raised its debt:equity ratio from 1.17 in 1993 to 2.37 in 1996 by issuing short term commercial paper and long term borrowing from IFC (0.38 in 1992).

Figure 4. Aguas Argentinas: Sources of Funds
 Millions of 1996 US Dollars

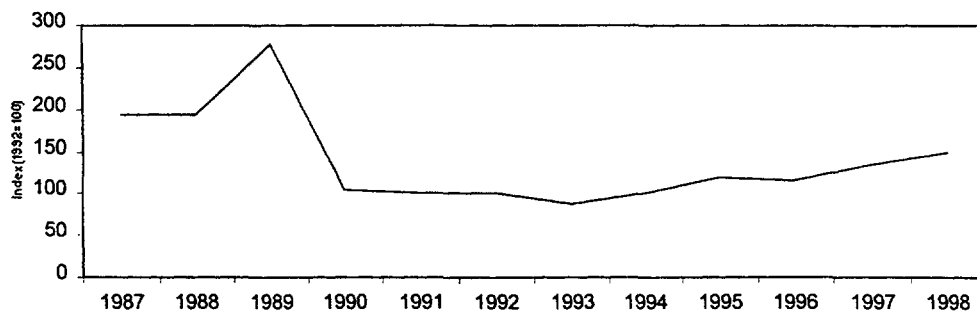


Internal savings were an important source of capital thanks to the fact that operating revenues expanded despite the initial price reduction. Prior to 1997, most of the increase in operating revenues was due to improved billing and collection. Judging

from changes in accounts receivable, collections went from 90 percent of amount billed in 1992 to 97.8 percent in 1993, then dropped to 94.4 percent by 1997.

Overall trends in real consumer prices for water services are hard to judge because the initial drop in the K-factor was partly offset by changes in access fees, the introduction of SUMA and the reclassifications of consumers to higher rate categories. The trend in real operating revenues per cubic meter of water delivered to the consumer (i.e., minus UFW), is shown in Figure 5, suggests that unit prices have risen since the initial drop, but are not yet back to 1992 levels. Controversy has arisen over Aguas Argentinas' prices because some observers, adding up revenue neutral increases and increases due to cost inflation, have concluded that the company bid strategically with a plan to increase prices later. However, taking into account all adjustments since 1992 including SUMA, an already connected customer was paying about 23.4 percent more for water services in 1998 than in 1992; during that same period the consumer price index increased by 21.2 percent.

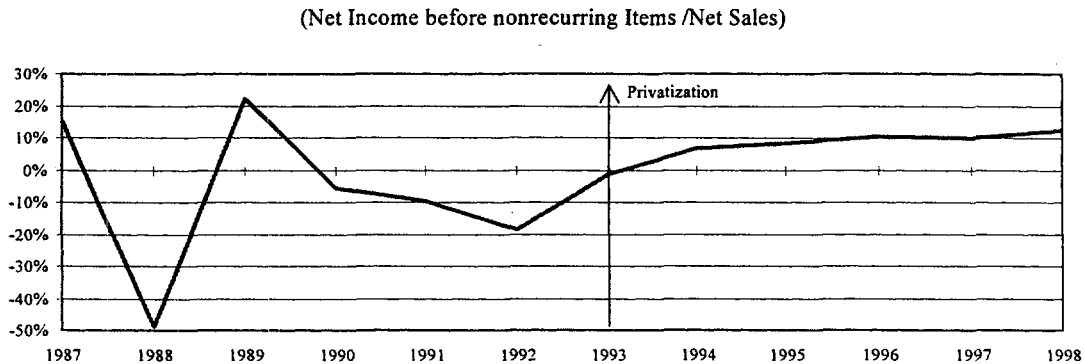
Figure 5. Aguas Argentinas: Real Revenues Per Cubic Meter of Water Produced
(Index 1992=100)



The margin of profits to sales has increased (Figure 6) but is not exceptionally high. Unfortunately return on assets is hard to calculate since the company does not own

most of the assets of the system. Estimates which estimate fictional assets, including assets owned by the government but operated by the firm, suggest a return on assets of about 3 percent in 1998.

Figure 6. Net Profit Margin

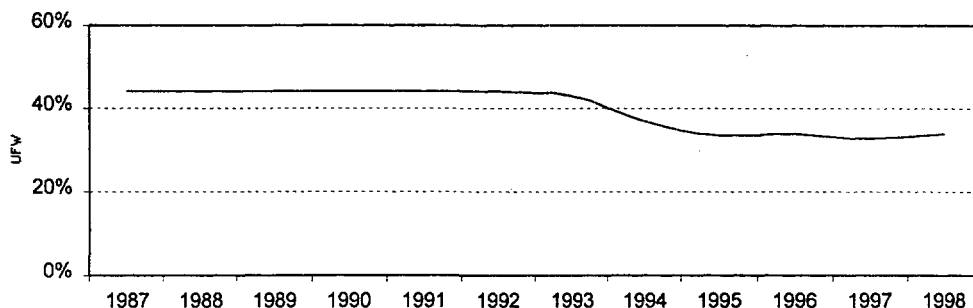


The increase in operating profits and in the generation of internal savings for investment were largely a result of reductions in Aguas Argentinas' operating costs, which fell by more than 14 percent in real terms from 1992 to 1998. This decline was partly due to a sharp reduction in labor costs thanks to the retirement programs described earlier. The number of employees went from 7,666 in 1992 to 3,829 by 1996, then rose to 4,494 by 1998, which brought labor per thousand connections down from 3.3 to 1.5 and back to 1.7 by 1998, similar to other efficient companies such as EMOS in Santiago or Thames Water in the United Kingdom. The real cost of intermediate inputs also fell as the company improved its use of chemical products for water treatment and brought down its real electricity prices by bargaining for a term contract as a large customer in Argentina's wholesale electricity market. At the same time, production of water increased only moderately, to 1.4 billion cubic meters a year, or a total of 4 percent from 1992 to 1998. UFW was curtailed, from 0.44 in 1992 to 0.34 by 1998 (Figure 7).

However, consumption of water by final users continued to be high and metering remained low, increasing from 1 percent before the concession to 12 percent by 1998.

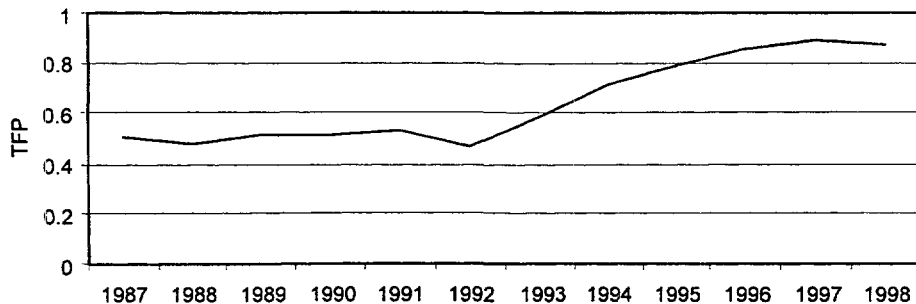
Figure 7. Unaccounted for Water

% of water production



As a result of these changes and the increases in revenues, operating expenses dropped from about 99 percent of operating revenues in 1992 to 61 percent by 1998. Again this is not much higher than other low cost systems, such as EMOS in Santiago where the ratio was 47 percent in 1997, or Thames Water in London (58 percent), and even more remarkable given the massive rehabilitation program. Total factor productivity also increased dramatically the first three years of the concession (Figure 8).

Figure 8. Total Factor Productivity



Service quality also improved markedly after the concession, see Table 9.

Although the number of complaints increased this was probably because channels of communication improved. Response time to complaints dropped sharply despite the larger number. And water pressure, which was always good in the Federal District, improved in Greater Buenos Aires as well.

Table 9. Service Indicators

	<i>Before Concession(1992)</i>	<i>After Concession (1995)</i>
Water complaints (no.)	43,800	143,739
Response time (hr.)	144	48
Sewerage complaints (no.)	99,400	164,911
Response time (hr.)	240	30
Customers with pressure >8wcm (%) Greater BA ¹	17% ²	54% ³

¹wcm = water column meters where 10 wcm = 1 atmosphere. ²May, 1993. ³April 1996.
Source: ETOSS and Aguas Argentinas.

(ii) *Welfare Effects of the Concession.* We measured the welfare effects of the concession by comparing the performance of Aguas Argentinas after the concession with what the expected performance would have been had the company not been privatized. To do this we projected the flows generated by the firm to the different parties involved – consumers, workers, government, buyers – and compared them with the counterfactual flows under continued public ownership. The methodology is based on Jones, Tandon and Vogelsang 1990 and details on the analysis can be found in Abdala 1996. The data cover 1987 to 1998. We use the period of actual public operation to construct a counterfactual public Aguas Argentinas and project its operation for ten years after privatization to 2002, and the actual private operation to project the private Aguas

Argentinas to the same year.³⁷ We assumed that Aguas Argentinas would fulfill the terms of the concession with some exceptions; we incorporated the changes introduced by the 1997 renegotiation in our calculations.³⁸ Thus, the actual and projected years are the following:

1987.....	1993.....	1998.....	2002
Actual public	Counterfactual	Projected public	
	Actual private	Projected private	
<u>WELFARE CALCLUATION PERIOD</u>			

To construct the counterfactual we made three assumptions about the effects of the concession. First we assumed that the concession removed an investment constraint. Thus, if OSN had not been privatized, we assume that investment would have risen only enough to permit connections to expand at the same low rate observed during the actual period of public operation – about 1.5 percent a year in both water and sewerage. This assumption seems reasonable since the Menem government’s policy was not to prop up investment in SOEs that were not being privatized. Indeed, following the 1994 so-called Tequila crisis, resources for public investment projects were cut. For example, funds for the Yacyretá hydroelectric project were cut from \$300 million to \$66 million in 1996 and to zero thereafter. A lower rate of increase in its customer base would result in less revenues for the counterfactual company than Aguas Argentinas captured, and we therefore assume it would not have had funds to reduce UFW or increase metering. The counterfactual company would also have had less funds than Aguas Argentinas to

³⁷ Of course there would be gains beyond this period but they would be reduced by discounting.

³⁸ Our assumption is that Aguas Argentinas would not have met the investment targets even if the renegotiation had not occurred. We made this assumption because the company could not meet the targets without violating its loan agreement with the IFC that the debt:equity ratio would be less than 1.9 from 1998 onwards.

improve service and product quality, and collection rates would have been lower because of lower investments in information systems and management.

Second, we assumed that much of the gains in labor productivity and intermediate inputs would not have occurred without the concession. Instead, we assume that the counterfactual company would continue OSN's historic trend in labor productivity, which improved by an annual rate of 6.5 percent a year from 1987 to 1992, largely through attrition. Aguas Argentina's retirement program would have been difficult for OSN to finance in the absence of a serious reform program and might not have been credible to workers without privatization. Aguas Argentinas' real reductions in operating expenses were not likely to have occurred without privatization either. OSN had shown no efforts to minimize input purchases and it seems unlikely that this would have changed.

Finally, we assumed that the reduction in prices in 1993 would not have occurred without the auction of the concession, and therefore, the counterfactual's nominal prices would have remained the same. Other state enterprises in Argentina did not change prices in the absence of privatization. Moreover, nominal prices would not have increased since the Convertibility Law fixing the parity between the peso and the dollar prohibited indexation clauses, nor would prices have gone down since that would trigger the need for funds from the Treasury to finance the company's operating deficit. Average prices between the counterfactual and the actual scenarios differ for other reasons as well. As we have seen the net effect of the SUMA was to raise prices for some consumers. In addition, Aguas Argentinas was able to reclassify about 11 percent of residential customers who should have been charged as non-residential (still not as

many as the company wanted, as we have seen), and to meter some customers. The company's photographic and on-site inspections also enabled it to correct the reported size of built areas, which led to increases for some 425,000 customers.

Table 10 shows that the welfare gains from the concession over continued public operation total US\$1.16 billion. Since these gains are the next present value of a flow in perpetuity, the final column of the table expresses the annual equivalent of the net welfare gains as a percent of OSN's sales revenue in the last year before sale. The big winners are consumers, with eighty percent of the increased gains; 79 percent of the gains are reaped by domestic actors.

Table 10. Welfare Effects from Concession

1992 US\$ Millions

	NPV (US\$M)	92 Output %	Annual Welfare per Group
GOVERNMENT	(137.97)	-4.60%	
DOMESTIC INVESTORS	66.76	2.23%	
FOREIGN INVESTORS	349.60	11.66%	
WORKERS	49.52	1.65%	\$11,602 /Employee (\$US)
COMPETITORS	2.27	0.08%	
CONSUMERS	1,326.58	44.25%	\$519.13/Connection \$US)
TOTAL DOMESTIC	1,656.77	55.27%	\$175.80/ Per capita (\$US)

Source: Authors' calculations based on ETOSS and Aguas Argentinas data (see Abdala 1997).

Government loses slightly as a result of the concession. Although Treasury gets more in taxes, we must deduct from that the levy government collects to pay ETOSS' costs. Government receives fewer quasi-rents as a shareholder of Aguas Argentinas than as the owner of OSN, plus it has to pay for the transaction and OSN's debts.

Employees do better because they own 10 percent of Aguas Argentinas' shares. We assumed that workers who took voluntary retirement did so because the payments

were sufficient compensation for being laid off. Buyers are better off by US\$416 million, thanks to the quasi rents they earn on their investment in the company. Competitors in the effluent business lose slightly because Aguas Argentinas takes some of their market.

Consumers are the big winners, better off by almost US\$ 1.33 billion. The gain in consumer surplus is calculated using a demand elasticity based on studies of willingness-to-pay in similar cities.³⁹ This is a conservative estimate of their gains since it does not take into account improvements in product and service quality or the effects of improved public health and reduction of sewerage overflows. It does take into account the benefits from reduced interruptions.

The gain in consumer surplus disproportionately benefited high and middle-income users. A large part of this welfare gain results from the drop in tariffs following the concession tender, despite subsequent tariff increases prior to the renegotiation. Most of this gain accrued to predominately higher income consumers who were already connected at the time of the concession. The other major source of gains in consumer surplus is reduced rationing of demand thanks to Aguas Argentinas' higher pace of building new connections. As we saw in Table 5, almost two thirds of the expected beneficiaries from new connections were lower middle to upper income. Moreover, as we have seen the infrastructure charge proved unaffordable for the very poor. In addition during the first two years after privatization the company did not try to reach low-income households. Hence, it seems likely that the percentage of new connections going to poor households, at least until 1998, was lower than the 36 percent that Table 5 suggests.

³⁹ See Abdala 1997. The elasticity in the base case was -0.35 for residential users and -0.85 for non-residential.

We tested the sensitivity of the results to our assumptions about rationing policy, elasticity of demand, prices, discount rate, investment costs, labor productivity and the like. Changes in most of these parameters had little impact, so we focused on the few that did (Table 11). The direction of the results are robust to these changes which only have an effect on magnitudes. The most important effect on consumer welfare comes if we change the rationing policy. We assumed that demand is rationed by willingness-to-pay. If instead demand is rationed randomly, than the gains to consumers would be much less. Random rationing, however, is not a realistic assumption given what we know about the city. Clearly people with connections or getting connections first were wealthier than those without connections which suggests that rationing was by willingness-to-pay.

We also tested changes from our basic assumptions of +/- 0.25 in elasticity for residential and non-residential consumers. As we would expect a lower residential price elasticity raises consumer surplus substantially.

Gains to investors are most sensitive to changes in output prices and dividend pay out ratios. If prices increase by 1 percent a year in real terms, buyers are slightly better off (by about US\$ 10 million) and consumers are slightly worse off (by about US\$ 30 million). If 100 percent of dividends are paid off, buyers' gains are almost tripled, while government is worse off.

We also compared the gains to what they would have been had the 1997 renegotiation not occurred. The effect was negligible. While the SUMA reduced consumer surplus for those already connected it raised it for new customers, so the net effect was slight. The reduction in Aguas Argentinas' investment targets does not cause

much difference, since we already had assumed that the company would have to curtail investment to meet the conditions of the IFC loan. We also tested the effects of lifting the constraints on Aguas Argentinas' investment, but the gains in consumer surplus are too small to offset the loss to shareholders and the net effect on welfare is negative.

Table 11. Sensitivity Analysis

	GOVERNMENT		DOM.INVESTORS		WORKERS		CONSUMERS		TOTAL DOMESTIC	
	NPV (US\$M)	92 Output %	NPV (US\$M)	92 Output %	NPV (US\$M)	92 Output %	NPV (US\$M)	92 Output %	NPV (US\$M)	92 Output %
Base	(138)	-4.60%	67	2.23%	50	1.65%	1,327	44%	1,657	55%
Random Rationing	(138)	-4.60%	67	2.23%	50	1.65%	604	20%	934	31%
Residential Elasticity -0.6	(138)	-4.60%	67	2.23%	50	1.65%	1,207	40%	1,537	51%
Residential Elasticity -0.1	(138)	-4.60%	67	2.23%	50	1.65%	2,045	68%	2,376	79%
Non-Res. Elasticity 0.95	(138)	-4.60%	67	2.23%	50	1.65%	1,226	41%	1,556	52%
Non-Res. Elasticity 0.75	(138)	-4.60%	67	2.23%	50	1.65%	1,454	49%	1,784	60%
Proy. Annual Price Incr. 1%	(127)	-4.23%	77	2.56%	56	1.86%	1,297	43%	1,702	57%
Proy. Dividend Payout 100%	(183)	-6.11%	191	6.36%	128	4.27%	1,327	44%	2,396	80%

VI. CONCLUSION

This paper finds that the Buenos Aires water system concession had large benefits for consumer welfare, along with smaller gains for buyers and employees. Performance improved dramatically. The average annual investment of Aguas Argentinas in the first six years of the concession was 2.4 times that of OSN in the last decade of its operation, its operating efficiency improved markedly, and product and service quality were much higher. There were also important social and external benefits from the increase in coverage. Some 1.46 million people who now have access to piped water and 583 thousand with access to sewerage will no longer be consuming contaminated well water or polluting groundwater or rivers.

What features of the concession account for these gains? First was competition. Despite the flaws in information, the competitive auction of the contract produced a major price reduction and made it clear that the market was contestable. Second was appropriate alignment of incentives. The company's revenues increase when access expands, since average prices allow the company to cover the cost of service and earn a return on its investment, plus the company can be penalized if it fails to meet its targets. The strength of the incentive has been diminished somewhat with the introduction of SUMA and the credibility of regulatory penalties was reduced when ETOSS fines were waved during the 1997 renegotiation. The company also has an incentive to curb UFW and wasteful consumption, since this reduces the amount it must invest in new production. Third, the currency board, the privatization program more broadly and the general openness of Argentina's economy gave the concession credibility with investors.

Even though it is not unusual for an economic crisis and sector problems to bring about circumstances where efficient change is possible, the political circumstances that made the concession politically feasible, politically desirable and credible in Argentina are not common. Radical changes are atypical in democracies, and it is unusual for an administration to exploit the opportunity for consensus as effectively as the Menem government did. It is very rare for water to have such a low cost that government can attract an investor to reverse years of disinvestment and neglect – and also offer a lower consumer tariff. Low cost raw water was not the only reason this was possible. It was also important that the concession was credible to private investors, thanks to the government's prior history of privatization, the transparent auction and broad base of support built through the privatization process, and favorable public attitudes.

The sustainability of the concession was and is less secure, however. Although the 1994 constitutional change will make it harder to overturn the concession in Congress, the weakness of the regulatory framework has put sustainability in doubt. ETOSS is vulnerable to politically motivated interventions in its decisions, as evidenced by the 1998 price decision, and can be paralyzed by partisan disputes in its board, as during the renegotiation of the contract. It suffers from serious information asymmetries created by poor historical data and the newness and weakness of its staff. The provision for cost pass through when Aguas Argentinas' cost go up by more than 7 percent adds to ETOSS' information burden, since it is ambiguous and requires more judgment than a simple inflation adjustment. The lack of metering and the obscure nature of the tariff formula also make it harder for the regulator to judge the revenue effects of price increases. It gives the company an incentive to negotiate individual tariff components, such as the classification of users or the location coefficient, rather than just the K factor, further complicating the regulator's task.

ETOSS' weakness feeds consumer doubts that their interests are not being protected, and that in turn increases political pressures to renege on agreed price increases. The lumpy nature of the cost plus increases adds to consumer concerns. The poor information base, lack of transparency in regulatory decisions and ad hoc nature of executive branch interventions make it harder to reassure consumers that their welfare is being protected.

Taking more time to get information on the system and rationalize the pricing policy could have reduced many of these problems. However, it is hard to know whether delay would have ultimately halted the concession, as the administration feared. Delays

in other cities, such as Lima, Mexico City, Santiago, ending up derailing planned privatization of the water system.

The concession agreement states that the operator assumes the information risks and that “claims based on defects of information provided will not be allowed.” Yet Aguas Argentinas’ claim for redress of costs beyond its control stated that about half these costs were due to wrong information from OSN. Nasser, FIEL and other observers have argued that the winning bid was aggressive given the poor information base, suggesting that the company was assuming that it could shift the burden of the information risk to the government. However, the second bid was very close to the winning bid, which suggests that more than one party was acting aggressively, possibly in response to some reasonable expectation that renegotiation would be feasible. The company was also responsible for collecting all usage and access fees under the contract, another risk that was lifted during negotiation. Here again, part of the problem was lack of information--in this case, the government’s lack of information on affordability.

There are several lessons from the Aguas Argentinas’ concession. First the experience reinforces conventional wisdom that risks and responsibilities, as well as the grounds for renegotiation, should be spelled out as clearly as possible in the contract. It also suggests that contracts that shift all information risk to bidders may not be credible.

Second, safeguards are needed to reduce the risk of regulatory capture by the company or politicians. One such safeguard is to reduce regulatory discretion by enshrining in law less ad hoc procedures for setting tariffs. Since the 1994 constitutional change made laws harder to reverse in Argentina, detailing tariff regulations in the law would likely enhance regulatory stability, as it has in Chile. It might also reduce

consumer opposition. Experience in other countries suggests that consumers are more likely to react to tariff increases that seem unfair or unjustified than to high tariffs per se. Cities such as Santiago, for example, have higher tariffs and lower per capita incomes than Buenos Aires' yet there have been no protests when water tariffs were increased for the private and public operators.⁴⁰ This is partly because the laws detail a technical process that occurs automatically no more than once every five years, with inflation adjustments in the interim. The cost-plus provision in the Buenos Aires concession makes interim tariff increases ad hoc and lumpy. We have argued that these increases, the additional tariff adjustments to cover new tasks and the renegotiation and the perceived weakness of the regulator have contributed to the public's sense of being poorly protected from arbitrary change, and this increases the risk of politically motivated manipulation of price policy.

Transparent, rule-based decision making, such as that used in Santiago, for example, is important to maintaining public confidence in regulated industries. Ad hoc intervention by the federal executive in regulatory decisions is inconsistent with rule based regulation, which can only be overturned by a pre-established process of appeal.

Another safeguard against political intervention is to avoid a politicized board; ETOSS' board currently pits partisan interests against one another, and allows short term, sectarian interests to control decision making. ETOSS' board could be replaced or enlarged with technical appointees (such as economists and hydraulic engineers) to reduce the dominance of political appointees. U.S. experience suggests that better public

⁴⁰ Although most of Santiago is served by a public company, about five percent of consumers are served by a privately owned water company. Santiago's means tested subsidy for water services also reduces opposition to increases.

information on regulatory decisions and an open public comment period would also protect against capture by narrow political interest or by the regulated company.

Third, the Buenos Aires experience raises questions about the practice of bidding on the basis of consumer price in systems where there are large benefits from expanded coverage, and those without access are poor. The concession could have been bid on the basis of the cost of access, in order to maximize new connections. The welfare gains of already connected consumers would have been lower, but the gains to newly connected households and from reduced health externalities would have been greater than they were, along with much more equitable redistributive effects. As it was, the price reduction was based on unrealistic assumptions about the willingness and ability of poor new consumers to pay large fees for access. The introduction of SUMA has created another unsustainable contract. By virtually eliminating the incentive of the company to expand services to the poor (who pay below marginal cost), SUMA opens the way for future problems. Buenos Aires' experience suggests that the poor benefit more from subsidized financing for access than from subsidized usage charges, which benefit the rich disproportionately.

Finally, the Aguas Argentinas experience suggests that the information benefits from metering need to be considered more carefully in designing regulatory policy. Typically, the cost of metering is measured against the benefits of reduced consumption, which may be low in a system where raw water is cheap and capacity is not constrained, as in Buenos Aires. But metering also reduces the information burden for regulators and makes it possible for consumers to monitor billing and reduce their bills by controlling consumption and these benefits, albeit intangible, may be high in weak regulatory settings.

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