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"Barriers to and conditions for the involvement of private capital and enterprise in water supply and sanitation in Latin America and Africa: Seeking economic, social, and environmental sustainability"

PRINWASS

An Interdisciplinary Research Project

"ECONOMIC-FINANCIAL DIMENSIONS IN THE PROVISION OF DRINKING WATER AND SEWER SYSTEMS. PRELIMINARY CONSIDERATIONS BASED ON A HETEROGENEOUS GROUP OF INTERNATIONAL EXPERIENCES"

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Glosary

AMBA : Área Metropolitana de Buenos Aires.

BNDES : Banco Nacional de Desenvolvimento Econômico e Social.

CEPAL : Comisión Económica Para América Latina y el Caribe.

ETOSS : Ente Tripartito de Obras y Servicios Sanitarios.

EYDAP : Prestataria del servicio de agua y saneamientoa ambiental en Atenas (Grecia).

FLACSO : Facultad Latinoamericana de Ciencias Sociales.

OFWAT : Office of Water Services.

PNUD : Programa de Naciones Unidas para el Desarrollo.

SEMAPA : Servicio Municipal de Agua Potable y Alcantarillado.

SNIS : Sistema Nacional de Informaçoes sobre Saneamento.

UNICEF : United Nations Children's Fund.

UNIREN : Unidad de Renegociación y Análisis de Contratos de Servicios Públicos.

I. Introduction

Towards the end of November 2002, the Committee for Economic, Social and Cultural Rights at the United Nations released a document stating that the access to adequate amounts of drinking water for personal and domestic use is a *fundamental human right*.

In its General Commentary Nº 15, related to the statements in Articles 11 and 12 of the International Pact of Economic, Social, and Cultural Rights, the committee pointed out that "the human right to water is indispensable for living a dignified life. It is a prerequisite for fulfilling other human rights." In this aspect, it is not surprising that a few days after the World Health Organization considered that the declaration was "a step without precedence" that would contribute to achieving the United Nation's goal of reducing by half the number of inhabitants across the world who do not have access to drinking water and sewer systems by 2015. Without a doubt, this is a major international challenge, especially taking into account that "more than one billion people do not have access to drinking water, and more than 2.4 billion do not have access to adequate drains and sewer services."[1]

This goal has tremendous significance in the fields of health and quality of life: studies available show that more than 6,000 children die every day across the world from diseases transmitted through water.[2] In addition, the complex and diverse gamut of positive externalities of meeting this goal (in terms of the environment, of managing water resources, of the economies´ competitiveness, etc.) make this objective one of the most important initiatives of the 21st century. The additional requirements in terms of investment (and financing) are certainly significant. To achieve this goal, it would be necessary to invest around 17 billion dollars per year to satisfy the demand for drinking water, and an additional 32 billion for sewer systems and drains[3]. The necessary investment for achieving the objective set by the United Nations would involve over 56 billion dollars from 2000-2015 in Latin America and the Caribbean alone, involving an annual capital formation of around 3.75 billion dollars; depending on the country, this would represent between 0.1 and 2.1% of their annual projected GNP[4].

Without a doubt, meeting this goal would be a serious challenge (whatever the type of drinking water and environmental sewer services´ management system – in brief, public, private, or mixed). Factors related to this challenge include the financing for expanding the

[1] See Malloch Brown (2003).

[2] For more on these issues, consult World Health Organization/UNICEF (2001).

[3] See the Third World Water Forum (2003).

[4] According to estimated from the Inter-American Development Bank (2003).

networks, obtaining growing levels of micro measurements, the economic sustainability of the drinking water and drainage systems, the renovation of existing infrastructure, the rehabilitation and upkeep of equipments, etc. It is important to note that, unlike other public utilities, water is not a sector in which technological advances move at the same speed as in other areas (like that of telecommunications or even electric energy). Thus the life span of fixed assets in water is relatively superior: the elevated density of capital involved in the water pipe and draining networks also leads to capital costs that usually have a much higher relative gravitation, always in comparison to other public services via networks. In this sense, the issue of alternative financing infrastructure schemes acquires particular importance, especially in terms of expanding the service.

This objective is even more critical considering that the majority of the people who do not have access to drinking water and/or sewer systems include the neediest members of society: thus, they are also those with the least possibility to finance and repay the costs of expansion and rendering of such services. Although the universalization – or at least, the consolidation of a solid and consistent tendency towards this goal – should not be considered simply a utopia, the economic and financial issues are doubtlessly the most difficult to solve.

Whether these services are managed in the private sphere (with the necessary attention to the economic-financial balance required by the "market"), as a public license (state or municipal, with the resulting assignment of fiscal resources), or under a mixed scheme, the complex economic and financial issues are – and will continue to be – a subject for debate. This debate must transcend the ideological-political components that often accompany the topic – and often distort the real issues. These real issues are related to offering greater levels of service access while respecting the basic principles of equity and social solidarity.

This is particularly true in countries with relatively low levels of development, which show the highest levels of unsatisfied demand. In addition, in many cases these countries have undergone rapid (and often chaotic) processes of transference of public utilities to the private sphere without establishing solid regulatory institutions. It is important to add another item that is both obvious and decisive for the issue at hand: the low income levels of sectors with minor resources and the existing regressive patterns of income distribution, in addition to the limited resources that these countries possess. This is a critical factor in terms of expanding services for drinking water and sewer systems.

There are many specific issues to deal with, and on several different levels – the degree of coverage, the quality of services, levels of poverty and social exclusion, etc. However, in spite of these different variants, analysing the economic and financial

sustainability of the water and sewer systems of these countries is undoubtedly a complex phenomenon that involves all countries together.

Ultimately, it is about accessing an ideal scenario of auto financed systems, in which the revenues for rendering the services can then finance the costs of maintaining and improving the existing infrastructure. At the same time, this would also provide the capital costs that are needed to extend the current service coverage, the costs of improving the quality of the water and the treatment of the drain flow, and reasonable profits for the investors (or at least systems that no longer draw on fiscal resources, in the case of systems managed by the government).

Based on a complex and heterogeneous (in terms of scaling, development levels of basic infrastructure and of the economies themselves, service management models, successes and failures, etc.) group of international experiences involving Africa, America, and Europe[5], the following sections will confront some of the central issues of the field. When combined, these issues can contribute to offer a series of analytical elements to address the economic-financial aspects necessary to evaluate whether the objective proposed by the United Nations is viable, or not. In addition, the analytical objectives and proposals of the PRINWASS will also be analysed.

Issues related to financing, criteria for service rates, cost structure, revenue margins for the companies rendering the services, the range and orientation of investments, and the principal economic and social impacts will thus be the object of a comparative analysis. This analysis will lead us to certain considerations and analytical tools that will contribute to the debate on the future of providing this basic component of human rights: drinking water and environment sewer systems.

There are some restrictions imposed by the type of basic information available and the difficulties to access solid comparative indicators that allow the development of a global vision of the problem integrating the international experiences reviewed. However, this document develops an exploratory analytical exercise geared to confronting certain basic issues with respect to the economic-financial perspective associated to the rendering of services, the economies (or group of economies) in which such services are possible, and the integration of drinking water services and sewer systems.

[5] The cities and regions included in the study are: the metropolitan area of Buenos Aires and Tucumán (Argentina – 9.2 million and 1.3 million inhabitants, respectively), Athens (Greece –3.1 million–), Aguascalientes (Mexico –600 thousand inhabitants–), Cochabamba (Bolivia –close to one million–), Lahti, Kangasala, Lapua, Nurmo, Kuortane and Kauhava (Finland –approximately 115 thousand–), Limeira, Niteroi and Prolagos (Brazil – in total, a little less than one million inhabitants–), London (England –7.2 million–) and Nyeri and Tala Town (Kenya –less than 150,000 inhabitants–).

II. Financing sources

In general terms, we will consider an ideal situation in which the resources needed for the rehabilitation, maintenance and exploitation of the existing networks, as well as the expansion of service coverage (and the possibility of revenues for companies) complement each other in an adequate manner. In this scheme, the origin of incomes for licensee can have different sources: billing for services, local or international loans, direct or indirect subsidies by different governmental departments, and the contribution of resources ("fresh" capital contributed by shareholders – or by the government itself, in cases in which the services are being managed by the government – or reinvesting profits).

In this respect, given the fact that it is impossible to obtain homogeneous information with regards to the total resources of companies rendering such services in the different international contexts of this analysis, we have decided to focus on the topics that show similarities or discrepancies among the different operators in terms of the diverse possible financing sources.

On the one hand, there is an almost ideal analytical situation in terms of the information available on the financing of the firm Aguas Argentinas S.A. (service licensee in the city of Buenos Aires and part of the suburban area) after nearly nine years of administrating the service (Table Nº II.1). On the other hand, and to a lesser extent due to some restrictions in terms of a greater disaggregation of the company total profits, there is some information available from the British operator Thames Water Utilities Ltd. (Table Nº II.2). The economic and accounting data gathered for the remaining cases of the study limit the possibility of achieving a full information consolidation and comparison. In these cases, then, we must recur to specific references in which trustworthy information is available on the financing components.

In the first case, as can be inferred from the following study, which was the basis for this research[6], the relative weight of the net increase of third party financing exceeded 15 percent of the total of funding sources[7], whilst at Thames Water Utilities Ltd. this financing

[6] As noted by Azpiazu and Forcinito (2002 and 2003), Aguas Argentinas S.A. is the case of an enterprise with typical characteristics of a *project finance*, in which there is a minimal contribution of the firm's own resources combined with an excessive recurrence to third party financing, particularly from abroad.

[7] Aguas Argentinas S.A. achieved a focalized financing strategy in terms of accessing almost exclusively international funds at interest rates (of approximately 7 percent) much lower than those obtained in-country. These were equivalent to one third of the profitability on patrimony of the licensee, and did not take into account the implicit risk of monetary devaluation. At the beginning of 2002, when the Public Emergency Law and Exchange Regime Reform Law (Law 25.561) was passed, this led to an unsustainable financial situation in which Aguas Argentinas S.A. was forced to declare itself in default. At this point, the firm's foreign debt was close to 650 million dollars, with payments of close to 215 million dollars scheduled for 2002 and 109 million for 2003; after the devaluation, however, the firm's total income reached just 170 million dollars. For

was under 4 percent. As mentioned above, it is critical to take into account other important variables (for example, the capital contributions of shareholders); however, the revenues produced by billing for water services seemed to easily be the almost exclusive source of financing for this operator.

Table Nº II.1
Origin of funds at Aguas Argentinas S.A., May 1993-December 2001 (in millions of pesos/dollars and percentages)

Origin	Amount	Percentage
Income from invoicing	3,640.2	78.1
Net loan increase	706.1	15.2
Contributions from partners	120.0	2.6
Other financial income	140.0	3.0
Other	54.0	1.1
Total	4,660.3	100.0

Source: The information on the table is based on data from the Economic Ministry – Commission for the Renegotiation of Public Works and Utility Contracts (2002).

On the other hand, even though there is no detailed invoicing information on different types of services for Aguas Argentinas S.A., in comparative terms, all factors indicate that the proportion of income for water is much higher than that of sewer systems (given the fact that the coverage of drinking water is much higher than that of sewer and drains, although the rates are the same). The opposite occurs in the case of Thames Water Utilities Ltd., where the latter represents 36.7 percent of the funds from rendering drinking water services[8].

Another aspect that is important to note is that in the case of both operators (and in contrast to a great part of the other international experiences analysed here), no public subsidies are involved.

more on the debt policy applied by Aguas Argentinas S.A., see Azpiazu and Forcinito (2004) and ETOSS (2003).

[8] This is related to the fact that the firm covers the totality of the basin of the Thames River (which includes the city of London, among others). As a result, the number of clients for the sewer system is much greater than that which needs drinking water, since Thames Water Utilities Ltd. is the firm that covers drains and sewers in the total river basin, but the distribution of water is also covered by other companies (especially in the area of London: according to available estimates, the number of sewer service users in 30 percent more than that of drinking water –Castro, 2003–). When combined with the rate structure (Section III), this can help to explain the reasons for the income from sewer system invoicing being much higher than that of drinking water.

Table Nº II.2
Origin of funds at Thames Water Utilities Ltd., April 1999-March 2003 (in billions of Sterling pounds at the 2002-2003 rates and percentages)

Origin	Amount	Percentage
Income from water services	2,335	40.7
Income from sewer services	3,191	55.7
Total income	*5,526*	*96.4*
Net increase of debt	.205	3.6
Total	5,731	100.0

Source: The information on the table is based on data provided by OFWAT (2004c).

One example that differs substantially from both the English and Argentine experiences is that of mixed operator EYDAP, which offers service in Athens[9]. In this case, in the category of "other income" (comprised, essentially, of a state subsidy equivalent to 44 million Euros per year) represents nearly one fifth of the firm's financing, even exceeding the income from sewer service invoicing (Table Nº II.3). As noted by Kallis and Coccossis (2003), the company has not recurred to external financing sources; to a large extent, this phenomenon could be related to the considerable state contributions received as subsidies.

Table Nº II.3
Origin of funds at EYDAP, 1998-2001 (in billions of Euros and percentages)

Origin	Amount	Percentage
Income from water services	761	61.8
Income from sewer services	232	18.8
Other income (including public subsidies)	239	19.4
Total	1,232	100.0

Source: The table is based on information taken from Kallis and Coccossis (2003).

One element in which the EYDAP experience could be similar (although to a lesser extent) to that of Aguas Argentinas, S.A. is the marked discrepancy between the income from the provision of drinking water with respect to sewer services (the latter represents less than one third of the former). In this sense, the case of Thames Water Utilities Ltd. is quite representative (see footnote number 8) as is another one of the cases analysed here, that of LV Lahti Water Ltd. (municipal company in Finland: in 2001, 34 percent of the income at LV Lahti Water came from water service invoicing, while 58 percent came from sewer system services and 8 percent from other services). In the remaining examples in which information is available, the income from water services are comparable (this is the case of Brazilian company Aguas de Limeira S.A.) or slightly higher than that of sewer services (in the case of another Brazilian firm, Companhia Águas de Niterói, two thirds of the total).

[9] In 1999, 39 percent of the shareholding capital of the firm was transferred to the private sector.

In addition to income for service invoicing (and its configuration), another financing source that is often significant (as in the case of Greek firm EYDAP) is that of public subsidies. There could be direct subsidies agreed upon in advance with the service operator, like the case at hand, or subsidies offered via public financing of the works to expand the service or even to cover possible operative deficits of the licensee (this is the case of the water licensee Aguascalientes S.A. de C.V. in Mexico). Other forms of public subsidy involve a cost-free transfer of certain works (upon conclusion) that the state is developing when the services are transferred to the private sector (this is the example of Aguas del Aconquija S.A. in Tucumán, Argentina, in which case the contract was rescinded); direct government contributions in cases of public rendering of the service (like in Cochabamba, Bolivia, where besides taking over the debt of the private company that rescinded on the contract in April 2000, the National Treasury makes regular contributions to the operator); rates subsidized by the state for the neediest sectors (originally in the case of both Tucumán and Limeira) and even more opaque forms, such as a government company providing the water to a private operator at prices that do not cover its production costs (Niterói).

Independently of the case of EYDAP, the remaining forms of subsidization are quite difficult to quantify. Apart from examples related to solidarity, equity, and proportionality – when subsidies are designed nor to negatively affect the economic-financial equation of the operator neither families with low incomes–, the mechanisms and criteria for determining and assigning subsidies are not usually characterised by their transparency. In cases of subsidies and or capital contributions related to public companies that render services, it is also impossible to easily determine whether such funds are assigned to satisfy social and political objectives or to cover the errors of deficient management.

As mentioned above, another basic component in terms of fund origins for service companies is owed to third party financing (domestic or international). In spite of the examples of Aguas Argentinas S.A., Thames Water Utilities Ltd. and EYDAP (in the last case, the company has not acquired debt), in the other experiences analysed here there is specific, heterogeneous information, what means that in only a few cases generalizations can be made on the significance (or possible significance) of operators falling into debt. In any case, these cases are not sufficient to reach solid conclusions related to the economic importance of third party financing for the companies´ financing.

For example, as can be concluded from Seppälä (2003), in Finland, there are contrasting situations like that of LV Lahti Water Ltd. (in 2001, third party financing represented just 5 percent of revenue accounts) compared to that of Lappavesi Ltd. & Lapua Severage Ltd. (in an attempt to avoid a hike in rates, this firm sought third party financing for an amount equivalent to that of its income from invoicing, close to one million Euros).

Similar considerations must be taken into account when analysing some of the experiences in Brazil. In the case of Niterói (Companhia Águas de Niterói), nearly half of the investments made over the past two years (investments that totalled approximately 45 million dollars, an amount equivalent to nearly a year and a half of invoicing) were financed by loans from the BNDES (Bank for State Development), 40 percent from direct contributions by shareholders, and the rest from profit reinvestment. Another case is that of Prolagos S.A.: through September 2002 (after a little more than three years of private management), all investments were financed with shareholder contributions. However, it is surprising to note that in this same year, the debt with third parties rose to nearly 1.7 million dollars (a little over 7 percent of the total income from invoicing). In any case, this business strategy (towards self-financing) seems to have been abandoned that same year, when the firm received first a 16 million dollar loan and obtained another loan from the Caixa Económica Federal (federal development bank) for another 22 million dollars. In relation to these amounts, it is important to note that the annual billing at the company is around 8 million dollars. Another case is that of Aguas de Limeira S.A.: in 2002, the percentage of interest payments in comparison with invoicing (around 5 percent) allows us to infer that the firm's debt will not grow significantly[10].

Finally, it is useful to note the case of the license in the Bolivian city of Cochabamba. During the conflictive private provision times when services were rendered by Aguas del Tunari (1999-April 2000) as well as during the time in which the state provided the service (from April 2000 to present), the main financing method has been acquiring debt. In this sense, it is noteworthy that from 1999-2003, the total debt was almost 160 percent higher than the total invoicing (however, in 1999 the debt/total income relation was 4:1, while between 2000-2003, it average 2:1)[11].

In short, these examples allow us to conclude that whatever the type of management (public, private, or mixed) of drinking water services and environment sewer systems and whatever the overall quality of services rendered, financing is a crucial issue to achieve the goals of the United Nations. We mean financing in all its dimensions, from simple maintenance of the "situation status", to the attempts to extend universalised coverage. From the inferences that can be drawn from the heterogeneous (and thus attractive) experiences being analysed, it seems clear that the income from service invoicing is not

[10] See Vargas (2003) and SNIS (several years).

[11] Two comments should be made regarding these issues. In the first place, the drop in the debt/total income quotient before and after the rescission of the contract is owed to the fact that the Bolivian government renegotiated the debt incurred by Aguas del Tunari and achieved interest reductions (while taking responsibility for this amount). In second place, when analysing the debt composition of SEMAPA at the end of 2003, the result was that more than 90 percent was local debt (Ledo *et al*, 2004 and SEMAPA, 2004).

sufficient to guarantee the economic-financial sustainability of companies, even in the countries with higher levels of development and/or less regressive distribution patterns. Recurring to third party financing (from direct state subsidies – even under private management – to seeking resources from private banking and/or multilateral credit organisms) tends to constitute a structural component in terms of the sources of funding for such companies.

III. Rate Structure and Criteria

To deal with the basic component of the economic-financial dimension, it is necessary to confront certain restrictions associated to a variety of issues, the most important of which we will address here. The first issue is of a socio-demographical nature, and it is related to the size and the characteristics of the populations covered by the services (in terms of the business costs involved, and considering both the real and potential scale of the markets: offering drinking water and sewer systems services in London, the city of Buenos Aires and suburban area, or Athens is quite different from doing so in Aguascalientes, Mexico; in the Finnish cities of Lahti or Kangasala, or in Nyeri and Tala Town, Kenya)[12]. The second is a geographical issue related to the proximity of the cities or areas of service to the generation and appropriation centres for water sources (in this sense, rendering service in the Buenos Aires metropolitan area is – or should be – much more economical, given the proximity to the Río de la Plata – than doing so in Aguascalientes, in Bolivian city Cochabamba or in Nyeri and Tala Town –place where, for different reasons, water constitutes a relatively scarce "good").

The combination of the aforementioned factors (to which we could add a few additional illustrative elements, such as the income distribution patterns that prevail in each country, the degree of expansion/coverage of both services, the type of services rendered, etc.) determines the range of costs in the services rendered and in the expansion and maintenance of the distribution networks and in the plants where water is sanitized. The result is that the vis-à-vis comparison of the existing rates in the different cases analysed is quite difficult and even futile. The following, then, is a brief analysis of certain issues that are considered important and which allow us to establish certain comparisons among the case studies: the principal existing criteria for rates, the current rate structure, and the adjustment mechanisms for the main rates and the evolution of rates for different types of service users. Other issues include the distinctive characteristics of the business

[12] With regards to these issues, it is important to note that at the beginning of this decade, the number of residents in the Buenos Aires metropolitan area was around 9.1 million people; in the city of London, 7.2 million and in Athens, 3.1 million: these populations are significantly higher than those in Aguascalientes (594,000 inhabitants) and in both the Finnish cities (115,000) and the cities of Kenya (142,000).

performance and the identification of a presence (or lack thereof) of some type of consumer subsidies for low-income users (crossed and/or direct subsidies, social interest rates, etc.).

In terms of the available evidence, it is clear that the criterion for determining the respective rate charts is closely related to the importance of micro measurements in each of the case studies.[13]. In this sense, if we sharpen the analysis, we can affirm that in the cities in which the use of meters is widespread (Aguascalientes, Limeira, Niterói and Prolagos), there are generally differential rates for different users. In principal, these differential rates are an attempt to offer equity and proportionality[14]; in contrast, in cities with a relatively low level of micro measurement, "mixed" rates predominate (this is the case of the metropolitan region of Buenos Aires, London, and Cochabamba).

Thus, for example, in the original license contract of Aguas de Aguascalientes S.A. de C.V., the rate system was based on marginal costs. In this agreement, differential rates were established based on socio-economic groups and levels of consumption (so that users with higher incomes and higher consumption levels would pay proportionally more than those with fewer resources and low levels of consumption)[15].

At Limeira (Brazil), the system was based on four user categories that pay identical rates for each of the services (drinking water and sewers). The categories are based on

[13] In terms of the issue of micro measurements, a short digression is needed. In many cases, the limited expansion of meter use has historically conspired against social consciousness of rationing water use. The scarce social value of water (and the idea that it is an infinite resource) is another serious challenge for the future, as says a high-ranking official at the World Bank, "the wars of the next century will be related to water" (Barlow, 1999). In this sense, the preservation and rational use of water will require us to invest in the expansion of micro measurements as one of the principal challenges to overcome.

[14] Although the nature of the basic information available does not allow us to reach significant analytical conclusions, the evidence offered by Seppälä (2003) allows us to argue that Finland has similar criteria to those of Mexico and Brazil in terms of establishing rate charts (in Finland, rates include operational costs, fixed costs, investment, and other charges for different services).

[15] However, Torregrosa *et al* (2003) note that bimonthly increases of 10 percent were applied to all consumption levels and rate levels (that is, the hikes were proportional). This is noteworthy, given that "although consumption is often linked to the socioeconomic level of families, the social groups with the highest incomes are those that consume the most. Thus increases in consumption are not proportionally consistent, since a family with high purchasing power will consume much less in relation to its income – even if it uses plenty of water – in comparison with a family with low income, which may have a single tap in their home. While the first family will have no problem paying their water bill, even if they pay the highest rate, the second may not even be able to pay the minimum rate, even if its consumption is low. Thus it is clear that even if the rate system were progressive, the differentiation of rates according to the socioeconomic level of the population would not be as proportional as it claims to be. This generates a population group that consumes a minimal amount but does not have the resources to pay." In relation to this last example, there is plenty of international experience on the correlation between income levels and water consumption at the residential level. Thus use of a greater number of home artifacts and facilities that consume water (the number of bathrooms, sprinkling systems, pools, etc.) by the middle and upper classes naturally leads to a higher consumption per capita than in needier homes (even more so when the micro-measurements do not exist). For more on the specific case, see Howe and Lineweaver (1967).

consumption patterns (in which home owners equal approximately one third of industrialists). In all cases, the increases were progressive and depended on a certain scaling of water consumption.

In Niterói (Brazil), a few months after the license had entered into effect, four user categories were established (residential users, public sector, commerce and industry). Diverse scales were added based on consumption levels (five strata in the case of home owners, two for public entities and four in the other two categories). The flat rate corresponds to residential users who consume less than 15 m^3 per month, and all the other rates depend on this rate (according to progressive increments depending on the consumption level of drinking water)[16].

In the case of Prolagos (Brazil), similar criteria to that in Niterói were used (four user categories and consumption scaling – 12 strata for home owners and three for the remaining categories). The flat rate corresponds to domestic users who consume up to 10 m^3 per month, and all other rates depend on this rate (according to progressive increments depending on the consumption level of drinking water)[17/18].

As mentioned above, the relatively low diffusion of consumption meters means that the criteria for drawing up rate charts at Aguas Argentinas S.A., Thames Water Utilities Ltd. and Bolivian SEMAPA are different than those already described. In the metropolitan area of Buenos Aires, two systems coexist. For those who do not have a meter (the great majority), the flat rate includes the "K" factor (any rate adjustments are applied to this factor). Coefficients for calculation include the residential area, total constructed surface of the property, dimensions of the lot and quality of the construction. Users who have meters must pay 50 percent of the flat rate and a charge based on consumption (these rates are established for each service – drinking water and sewers – and they are similar). At the

[16] As can be seen in the evidence offered by Vargas (2003), the sewer service rates are in all cases identical to what should be paid for drinking water services. In general, rates for the public sector are multiplied (based on the flat rate – that which is paid by home owners who consume up to 15m^3/month–) by 3; the correctional factor rises to 3-6 for stores and between 6-9 for industrialists.

[17] As in the case of Niterói, in Prolagos, the rates for sewer system services are the same as those for drinking water. Rates for the public sector do not differ substantially from those of residents, while merchants pay three times more and industrialists four times more. In the cases in which the service is not measured (just 15 percent of the total, in the case of drinking water), the rates are based on estimated consumption based on the number of rooms in the house, the number of constructed square metres and the area where the residence is located (Vargas, 2003).

[18] In any case, as we will see further on, in general this search for promoting equity and proportional water consumption (inherited from the scheme in place when the service was public) have been reduced or set aside, given the regressive impact that the behaviour of rates paid by different users on the different socioeconomic strata.

same time, two types of users are recognized (residential and non-residential) with identical criteria for determining rates[19].

The analysis of the criteria that are used to establish rate charts in the city of London indicate that in the case of users with meters (close to 90 percent of non-domestic user have meters, but only 20 percent of home owners do), the fixed rates corresponding to sewer and drains are quite higher (more than double in 2003) than those for drinking water. This relationship is inverted – although with a lower level of intensity – in terms of the variable charges (again, in 2003, the charge per m^3 of drinking water consumed was almost 45 percent high than the sewer costs). In terms of consumers without meters, the rates for both services vary according to the seven zones in which the service area at Thames Water Utilities Ltd. is divided.

In Cochabamba, where approximately two-thirds of users have meters, two systems also coexist (with meters and without), with rates that are based on two large groups: residential[20] and special[21] users. The users who do not have a meter pay a flat rate differentiated by category according to their average consumption (invoicing is based on the average consumption of the remaining users of the same category). In the case of users with meters, the flat rate is based on minimum consumption (12 m^3 per month), which varies according to the different categories, as well as a variable rate based on additional consumption. These rates are set exclusively for the drinking water service, since the charge for the sewer system totals 40 percent of the amount invoiced for water in the residential categories and 65 percent for special consumers.

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[19] In the Argentine province of Tucumán, the regulatory framework that was in effect from mid-1995 through mid-1997 – the point when both the firm and the provincial government decided to rescind on the contract (The firm claimed that it was "the fault of the province" while the government accused the firm of "not fulfilling the contract"), was characterized by the lack of regulatory mechanisms –either direct or indirect– on the profit margin of the concessionary (even though the provincial law of public works established a 10 percent limit on profits). On the other hand, within the privatization scheme, property owners were required to pay services when they had been exempt from doing so beforehand. The sector's regulatory framework established that rates "should reflect the economic cost of rendering the services. This includes the profit margin and the costs that arise from the approved expansion plans." Based on a definition of three user categories (general, commercial and industrial, and special), the rate was assigned the "K" factor, which included zone coefficients, constructed number of square meters, total surface meters, and the age of the residence. Consumers with meters (who represented just 10 percent of the total) were required to pay a minimum fixed amount of consumption (15m^3 per month) and a variable charge that depended on the number of cubic metres consumed (there was no free rate established for one category – pools, gardens, and stadiums). For more on these issues, see Crenzel (2003).

[20] At the same time, this universe of consumers is sub-divided into four categories (R1, R2, R3 and R4) according to the criteria of lot surface, number of floors, quantity of water points, and the status and quality of the building.

[21] Special categories are classified as commercial, special commercial, public, industrial and preferential; this was based on the type of water use (human consumption, raw material for production, etc.) on one hand, and the nature of the property (private business, public, social purposes, etc.) on the other.

The identification of the main criteria used to determine rate charts in the different cases analysed here is enriched if we incorporate the main characteristics of the respective rate structures. In this sense, the evidence presented on Table Nº III.1 suggest that, independently of the different situations in each country, in most cases, there is a progressive rate structure. This is reasonable (and predictable) given that in general, the deficits in terms of accessing drinking water and the sewer system and the level of difficulty that people have to pay their bills are usually focused primarily on users with the fewest resources.

However, there are two significant issues that must also be taken into account. The first is that obviously the aforementioned progressive nature varies in each case. The second, which is even more relevant, is that this progressiveness is revised when we consider the evolution of rates paid by different users and the incidence of this behaviour standard on the distribution of income (as we will see, when the rate dynamic is compared vis-à-vis with salaries or another indicator of the acquisitive power of the different socio-economic strata, it becomes clear that almost all of the cases studied are relatively more detrimental to consumers with the lowest income, with the resulting regressive implications in distributive terms.)

Table Nº III.1
Principal characteristics of the rate structure for drinking water and sewer system services for a selected group of cities/areas

City/Region – Company	Principal characteristics of the rate structure
Metropolitan area of Bs. As. (Argentina) – Aguas Argentinas S.A.	In its beginning, the "K" factor was used to take into account the area, age of the building, constructed square meters and total square meters of the property, plus a fixed charge for infrastructure costs. When this infrastructure charge was eliminated at the end of 1997, other fixed charges were incorporated like the SUMA (universal service and environment), CIS (charge for service incorporation), CMC (maintenance charge for connections) and CIA (charge for additional income). In addition, users must also pay the VAT (21 percent) and funds to finance the regulating entity (2.7% of invoicing).
Tucumán (Argentina) – Aguas del Aconquija S.A.	During the period when the service was private, the rate structure was similar to that in effect in the metropolitan region of Buenos Aires.
Athens (Greece) – EYDAP	The rate structure acknowledges four large categories: residential (with five strata of average consumption), industrial (with two segments, either less or more than 1,000 m^3/month), and the public and municipal sectors. Before the firm opened itself to private capital (in 1999), there was a high "penalty" for residential users who exceeded 27 m^3/month. These characteristics have been maintained throughout the past few years, but the gap between the different rates with respect to municipal buildings has shrunk substantially.
Aguascalientes (Mexico) – Concesionaria de Aguas de Aguascalientes S.A. de C.V.	Currently the rate structure and its application involve the following: an increase in the minimal charge volume from 10 to 20 m^3, a monthly adjustment for inflation, monthly invoicing, and extension of the minimal consumption to rural users. Schools and hospitals are now charged if they exceed a certain minimal consumption level.
Cochabamba (Bolivia) – SEMAPA	The categories are defined for charging rates under a system of meters and the following is a description of the structure. Residential categories (R1, R2, R3, R4) are differentiated according to lot surface, number of floors, number of water points, and the state and quality of the building. Special categories are classified as commercial, special commercial, public, industrial and preferential, according to the type of water use (human consumption, raw material used to transform products) and according to the property (business, public nature, or social purposes).

Continued

Continuation

City/Region – Company	Principal characteristics of the rate structure
Finland* – LV Lahti Water Ltd., Kangasala Municipality Water and Sewerage Utility	No information available.
Limeira (Brazil) – Aguas de Limeira S.A.	Four categories were established: industrial (rate 147 percent higher than for residential users), commercial (129 percent higher), public (23 percent higher) and residential. In all cases, the rate level is progressive according to consumption levels.
Niterói (Brazil) – Companhia Águas de Niterói	In general, this is a progressive rate structure in terms of user categories and consumption levels.
Prolagos (Brazil) – Prolagos S.A.	In general, this is a progressive rate structure in terms of user categories and consumption levels.
London (England) – Thames Water Utilities Ltd.	In the case of the meter system, this has a progressive rate structure in terms of consumption levels, while in the non-meter system, rates vary according to the area: seven service areas have been defined where water services are rendered.

* Includes the following cities: Lahti, Kangasala, Lapua, Nurmo, Kuortane and Kauhava.
Source: Author.

Now that the rate criteria utilized in the different cases under analysis has been identified along with the respective rate structure, it is important to present the analytical perspectives proposed here. Towards this end, Table Nº III.2 presents the mechanisms for rate updates that are used in the principal cities or regions analysed, in addition to the recent evolution of the rates paid by different types of consumers.

When considering the information on the reference chart, it is clear that the regulatory frameworks of the different cases studied show an adjustment mechanism for the rates. Some of the most important include ordinary and extraordinary revisions of the rate charts, adjustments for modification in the costs involved in rendering the services and/or according to the evolution of the domestic inflation rate (or, as in the case of the metropolitan region of Buenos Aires, based on the fluctuations of US prices)[22] and/or the purpose of transferring part of the productive or microeconomic gains – more appropriately, of the monopoly profits– to users and consumers from the companies rendering services (as in the case of Great Britain, where rate regulation is *price cap* type). As could be expected

[22] The example of Aguas Argentinas S.A. is particularly interesting due to the fact that almost simultaneously with the license (May 1993) an unusual process began. This was characterized by frequent contract revision that continually altered the "spirit" and the "letter" of the original contract, especially in terms of rate regulation. In mid-1994, as the result of a request for an extraordinary rate revision, the government gave the go ahead for a rate increase of more than 13 percent. Towards the end of 1997, when there was sufficient cause for rescinding on the license contract (given the way in which the firm was clearly not complying with the contract, as confirmed by the regulating entity), the Menem administration opted to renegotiate the conditions for the firm's operations. These terms were clearly in the company's best interest (some of the principal modification included a rate increase and the cancellation or postponement of a series of investment that were originally included in the contract). At the same time, the possibility of completing an annual extraordinary rate revision was added. In May 1998, the firm obtained another rate increase of around 5 percent. Following these license contract reviews, there were new negotiations that followed a similar logic as the earlier ones: among other aspects, there were new rate increases, the introduction of peculiar price adjustment clauses (the rates, set in pesos, were adjusted yearly according to the US inflation rate) and the modification of certain contractual obligations originally agreed to by the company. At the beginning of 2001, an Act-Agreement was signed between the federal government and the licensee. This agreement approved a new rate increase and the incorporation of new additional bimonthly charges. On this particular case, see Azpiazu and Forcinito (2003 and 2004) and Azpiazu and Schorr (2003a).

and in spite of a few exceptions, the existence (and, in most cases, the coexistence) of such different indexing modalities implied increases – with different levels of significance and variables according to each city or region– in the final rates paid by different users of drinking water and sewer system services[23].

Table Nº III.2
Mechanisms for rate adjustment and evolution of the water and sewer rates for a selected group of cities/areas

City/Region – Company	Mechanisms for rate adjustments	Rate evolution
Metropolitan area of Bs. As. (Argentina) – Aguas Argentinas S.A.	Originally, no periodic adjustments were planned (an extraordinary rate revision was only planned if increases exceeded 7 percent). After a series of additional contract negotiations, diverse fixed charged were added, and rates were indexed based on the US price index with 0.5 percent reduction of the cost increase threshold. In short, this is a "hybrid" mechanism that combines price cap and cost plus.	The average residential rate rose 88 percent between May 1993 and January 2002, compared to a 7 percent rise in consumer prices. Although there is no information on the evolution of average rates for the non-residential category, it can be inferred that its evolution is not very different from that of residential rates.
Tucumán (Argentina) – Aguas del Aconquija S.A.	The original contract established a regular rate revision fortnightly (in the first ten years, this could only decrease) with extraordinary revisions for eventual increases in costs, changes in the water or sewer quality norms, investment goals, or to establish a more efficient rate regimen. In practice (and with a few additional contract renegotiations), in the first year of the license, there was a 68 percent increase, and a 10 percent increase in the second year.	There were substantial increases in the real service rates based on renegotiations with the government. These did not take into account the criteria established in the original contract (taking into account the magnitude of increases, nearly 90 percent of the users – including the headquarters of the provincial government – decided not to pay their bill in protest).
Athens (Greece) – EYDAP	In the 2000 rate revision (valid for five years), rates were raised at an adjustment based on yearly inflation was established (in any case, in 2001, the rates were not modified).	Between 1996 and July 2000 (that is, before and after the partial privatization), rates rose for all types of service (residential, industrial, public and municipal), although in differing proportions: residents with low consumption thus paid 4 percent more; residents with high consumption, 5 percent; industrialists and the public sector, 5 percent as well, and municipal buildings, 35 percent.
Aguascalientes (Mexico) – Concesionaria de Aguas de Aguascalientes S.A. de C.V.	In the original contract, it was established that the rates would be modified at the request of the licensee (which was empowered to propose rate modifications twice a year). After the contract modification in 1999, the rate revision is done every four years, but in addition, the rate regimen has an automatic indexation (monthly) based on price variations in the principal costs.	There were rate increases before the private firm began offering the service; from then until the contract revision in 1996, there were new important rate increases. After this, in the framework of new indexation mechanisms, there were additional rate hikes.
Cochabamba (Bolivia) – SEMAPA	According to the original SEMAPA license contract, the firm has the right to request an extraordinary rate revision fortnightly when "unforeseen" increases in the costs of the firm arise.	Since the "water war" conflict (April 2000), rates have been frozen.
Finland* – LV Lahti Water Ltd. and Kangasala Municipality Water and Sewerage Utility	Each town defines rate variations.	No information available.

Continued

[23] Due to the intensity of the increases, it is important to return to the case of the water and sewer system supplier in the metropolitan area of Buenos Aires (Azpiazu and Forcinito, 2004). In favour of the multiple contract revisions, the average residential rate charged by Aguas Argentinas S.A. rose by approximately 88 percent between May 1993 and January 2002 (in the same period, consumer prices registered a 7 percent hike). This is noteworthy because the regulatory framework clearly established that rates could not increase for a period of ten years (in fact, they should have decreased as a result of the ordinary revisions outlined in the license contract).

Continuation

City/Region – Company	Mechanism for rate adjustment	Rate evolution
Limeira (Brazil) – Aguas de Limeira S.A.	From the beginning of the license until the renegotiation in January 2001, rates were frozen. Later, an annual adjustment based on the variation in the index of the Unidade Fiscal do Município de Limeira (UFML) was made. On the other hand, if technical, economic, financial or other reasons affect operational costs, investment financing or the economic-financial balance of the license, the rate can be either raised or decreased.	From the beginning of the license until the renegotiation in January 2001, rates were frozen. After a series of legal and parliamentary disputes, a scaled rate readjustment of 63 percent was achieved in comparison with an inflationary increase – during the period of frozen rates – of 40 percent (in any case, in comparison with other suppliers in Brazil, the average water and sewer rate is below local standards).
Niterói (Brazil) – Companhia Águas de Niterói	Periodic rate adjustments are made based on the price variations in a combination of representative activity costs.	In November 2001, after 20 months without adjustments, rates rose 18 percent (inflation for the same period was 10 percent). In November of the same year, the annual adjustment was 18 percent (compared to the 7 percent inflation rate for the period). The intensity of the rate adjustments had been identical for different user and service types and categories.
Prolagos (Brazil) – Prolagos S.A.	In spite of the adjustments that arose from the contract revision in February 2002, rate adjustment is based on the annual recognition of the increases of the values of a series of representative categories within service costs.	Until January 2002, rates rose 40 percent (a rise slightly lower than the rise of consumer prices). In the contract revision of February 2002, additional increases were included: 7 percent increases beginning in January of that year, 6 percent in January 2003 and 7 percent in January 2004.
London (England) – Thames Water Utilities Ltd.	There is a periodic fortnight revision completed by the economic regulator that establishes rate levels as well as eventual changes in the rate structure. This is a scheme known as *price cap*.	In the 1999 revision, the regulating entity demanded a rate reduction for the period of 1999-2004 to compensate for excessive profits during the previous period. These were associated to an increase of around 95 percent in the average rates during 1989-1999.

* Includes the following cities: Lahti, Kangasala, Lapua, Nurmo, Kuortane and Kauhava.
Source: Author.

The form in which the regulatory frameworks and the resulting rate behaviour impacted on the economic performance of the different firms is a key arising issue. Although it is not possible to carry out a rigorous comparison of the evolution of the different business costs (operations, management, amortisation, financial costs, capital costs, etc.), or of the relation of these costs with the companies' income and costs structure[24], it is useful to introduce a few conclusions that arise when analysing the internalised companies' profit margins. From this perspective, two situations can be identified:

[24] In spite of these limitations, it is important to offer some empirical evidence on these issues. The information available indicates that in the case of Aguas Argentinas S.A., there is a gradual, persistent reduction in operational costs that is accompanied by an increase in the costs of commercialisation and administration (which grew from 30 percent of the total costs at the beginning of the concession to nearly 50 percent in 2001; in the same period, the operational costs went from approximately 73 percent of the revenue accounts to less than 40 percent). In the case of Cochabamba, between 2001 and 2003 the expenses of the licensee exceeded, on average, the total income by nearly 12 percent and the revenue accounts by 18 percent. In the Finnish cities in this study, operational costs represented between 40 and 50 percent of the revenue accounts of the companies. When analysing the operational costs/sales income for the service firms in Limeira and Niterói, this was 40 percent and over 57 percent respectively (in Prolagos, the operational costs of the firm were higher than the amount invoiced). In the case of Thames Water Utilities Ltd., the data corresponding to the six-year period from 1998-2003 indicate that the operational costs represented, on average, 40 percent of the firm's total income. See Azpiazu y Forcinito (2003), Castro (2003), Ledo *et al* (2004), Seppälä (2003), Vargas (2003) and OFWAT (2004a and 2004b).

- That of companies which registered positive profit percentages: this is the case of Aguas Argentinas S.A. (between 1993 and 2001, the average profit percentage in terms of sales was 13-20 percent with respect to the firm's net patrimony)[25]; at Greek firm EYDAP (in the four year period 1998-2001, net profits represented around 17 percent of the firm's total income)[26]; at Finnish firms LV Lahti Water Ltd. and Kangasala Municipality Water and Sewerage Utility[27]; at Brazilian Companhia Águas de Niterói (in 2002, the profit margin grew to 9 percent of total assets and to almost 17 percent of liquid assets); at Thames Water Utilities Ltd., the average return rate on capital between 1998 and 2003 was 8 percent[28]; and

- That of firms which obtained negative profits margins: this is the case of Argentine company Aguas del Aconquija S.A. (until the contract was rescinded in 1997, the firm operated systematically with accounting deficits); at Bolivian SEMAPA (between 1994 and 2003, it always registered negative results); and, at Brazilian Aguas de Limeira S.A. and Prolagos S.A., in 2002, the first reported losses totalling 1 percent of its total assets, a percentage that rises to more than 33 percent in the case of the latter.

Before wrapping up this section and as a complement to the considerations above, it is useful to incorporate some brief comments related to an extremely relevant question. Considering, on the one hand, that drinking water is a *fundamental human right* and, on the other, that deficits in the sector (in terms of network expansion, the quality of services rendered etc.) tend to affect users with the lowest purchasing power more than others, the

[25] Without a doubt, these are extraordinary profit levels at both the national and international level. In this sense, it is useful to note that during the time of the period in question, the largest two hundred companies in Argentina registered (on average) a profit percentage of approximately 3 percent in terms of annual sales, and that the levels of profitability (percentage of invoicing and with respect to net patrimony) at the company that offers water and sewer services in the metropolitan region of Buenos Aires has been far above the levels of the private firms operating in the water sector in the principal countries of the world (for example, in the United States, the profit percentages on net patrimony in the 1990s fluctuated between 6 and 12 percent; in the United Kingdom, available evidence indicate that the reasonable rate for the sector is between 6 and 7 percent, while in France an acceptable return rate is around 6 percent). In this respect, see Azpiazu and Forcinito (2003 and 2004) and Philips (1993).

[26] As noted by Kallis and Coccossis (2003), the strong performance of the company offering services in the city of Athens is not related so much to a rise in productivity, but to a considerable reduction in the amortisation costs that resulted when an important part of the EYDAP fixed assets were transferred to the Greek government (between 1998 and 2001, the depreciation costs diminished by nearly 40 percent) and with state subsidies to the company. The information available allows us to affirm that the other side to the relatively successful performance of the firm was a significant distribution of dividends among private shareholders (keep in mind that since 1999, 39 percent of the social capital at the company is in private hands, as mentioned earlier).

[27] According to Seppälä (2003), both firms are "economically healthy and profitable" and their recent performance has been better than expected (especially in the case of LV Lahti Water Ltd.).

[28] According to information from the regulating entity (the OFWAT), this profit margin is similar to the average margin of the British "water industry" (for more information, visit the following website: http://www.ofwat.gov.uk).

issue, then, is whether there is a subsidy mechanism in any of the cases analysed in which low income consumers can access drinking water and environmental sewer systems at a "reasonable" price.

As proposed by Solanes (2003), not all public utilities users have the resources to pay for the costs of these services (including the capital costs). Thus, for reasons of public interests (such as preventing illnesses transmitted by water, like cholera) as well as human interests and equity, countries are usually interested in facilitating access to all public utilities, but especially to water and sewer systems. In the case of consumers with low income, this access requires that the funds needed to pay for the services be provided by other individuals and not the direct beneficiaries (like, for example, other users, the government, or the company itself). In this respect, there are three basic strategies: the user of traditional crossed subsidies that can offer access by creating an internal redistribution among the users of a given sector; direct subsidies provided by the government, and the implementation of a social interest or solidarity rate. Ultimately, the goal of these mechanisms is to increase the level of coverage of users with the lowest income levels and/or those who cannot access the services at all (potential users)[29].

Given the central nature (socio-economic and even political) of the issue at hand, and in order to answer the proposed issue, Table Nº III.3 attempts to present the modalities of existing crossed subsidies and the social interest tariff in the licenses being analysed. In addition, due to its close relationship to the issue at hand, information is also included on what happens in the different cities/areas when users do not pay their water bills.

Table Nº III.3
Presence/absence of crossed subsidies and a social interest rate, and modalities for suspending water and sewer services due to lack of payment in a selected group of cities/areas

City/Region – Company	Are there crossed subsidies?	Is there a social interest rate?	Will the company suspend service for lack of payment?
Metropolitan area Bs. As. (Argentina) – Aguas Argentinas S.A.	Yes, but these are increasingly opaque given the proliferation of fixed charges (specifically, as of 1997).	A social rate was introduced in 2001 for sectors with the fewest resources (the amount equals about 1 percent of invoicing). The cost of this rate is the responsibility of the company.	Yes, if the water bill is not paid for three consecutive two-month periods.
Tucumán (Argentina) – Aguas del Aconquija S.A.	During the private administration of services, there were crossed subsidies, given that zone coefficients (based on the type of construction and its age, etc.) suggested the presence of crossed subsidies from the (supposed) sectors with higher income towards those with lower income.	During the private administration of service, there was no social interest rate.	This was originally planned, but later the provincial legislature prohibited the suspension of services as a result of lack of payment.

Continued

[29] For a more detailed examination of these issues, see Lee and Jouravlev (1992) and Solanes (2003).

Continuation

City/Region – Company	Are there crossed subsidies?	Is there a social interest rate?	Will the company suspend service for lack of payment?
Athens (Greece) – EYDAP	In principle, there would be crossed subsidies from residential users with medium-high consumption towards residential users with low consumptions, towards municipal rates, and to a lesser extent, toward industry and the public sector.	The license contract acknowledges the figure of the "protected consumer" (individuals from the sectors with fewest resources that could deserve special treatment).	The suspension of services is allowed in response to lack of payment.
Aguascalientes (Mexico) – Concesionaria de Aguas de Aguascalientes S.A. de C.V.	Yes, although the available evidence indicates that they are insufficient.	Based on the contract revision in 1996, the "social support fund" was acknowledged. This figure was aimed at subsidizing the consumption of the neediest members of the population (to access this, users had to pay 50 percent – or even less – of the bill if their consumption did not exceed 20 m^3/month).	The suspension of services is allowed in response to lack of payment.
Cochabamba (Bolivia) – SEMAPA	There is a sort of crossed subsidy of non-domestic users (especially those in the special commercial category) towards residential users (specifically, those in the lowest categories).	A social rate was not introduced for the sectors with fewest resources, but there is a base rate per category for users without meters.	Yes, if the user does not pay for two consecutive months.
Finland* – LV Lahti Water Ltd. and Kangasala Municipality Water and Sewerage Utility	There is a sort of crossed subsidy that varies according to user types and categories and from region to region.	There is no social interest rate.	The suspension of services is allowed in response to lack of payment, although the evidence shows that disconnections rarely are effected.
Limeira (Brazil) – Aguas de Limeira S.A.	Yes, from the industrialist and commercial sectors towards homeowners (basically geared towards those with lower consumption levels).	Residential users who consume under 15m^3 per month pay 50 percent of the rate. Those who consume between 16-30m^3/month have a 25 percent discount. These discounts comprise the so-called popular residential rate for needy homes (and cannot be extended for more than twelve months). Municipal properties used for activities such as water connections for public cleaning, water trucks, etc. are exempt from paying the water and sewer system rates.	Service suspension is outlined in the service Rules in response to non-payment and after notifying the user, who must then confront the costs of suspending and later re-establishing service.
Niterói (Brazil) – Companhia Águas de Niterói	Yes, public users and especially merchants and industrialists pay rates must higher than those paid by homeowners.	Residential users with low income who consume less than 15 m^3/month receive a 40 percent discount on their bills.	The suspension of services is allowed in response to lack of payment.
Prolagos (Brazil) – Prolagos S.A.	Yes, in both the differences and the scaling among user categories (from merchants and industrialists towards residential users with low consumption), as in the case of users without micro-measurements, when it is clear that those who live in better areas and residence subsidize those who live in smaller and/or needier homes.	As decided by the company, the rate corresponding to the band of users consuming less than 10m^3/month constitutes a social rate.	The suspension of services is allowed in response to lack of payment, after applying fines and penalties to the user for non-payment.
London (England) – Thames Water Utilities Ltd.	In the information offered by the OFWAT, it is clear that in the case of users with micro-measurements, rates increase progressively according to the level of consumption. For users without micro measurements, rates vary according to the service area where the building is located.	There is no social rate system, but there is a reduced rate that is applied only to users with specific needs who have a meter.	Since the privatization of the service, there have been no disconnections for non-payment; however, in 1999, a law was passed prohibiting service disconnection for residential users who could not pay their rates. Along these lines, it is noteworthy that 20 percent of British and Welsh families are currently in debt to the water companies.

* Includes the following cities: Lahti, Kangasala, Lapua, Nurmo, Kuortane and Kauhava.
Source: Author.

The facts presented on Table Nº III.3 allow us to reason that in all of the cases under analysis, there is (or there has been) some mechanism designed to assist users with low income to access water by paying a "reasonable" price (whether this be achieved by crossed subsidies and/or a social interest rate)[30]. In any case the impact (which is usually

[30] At most of the licensee firms, there are crossed subsidies and/or some sort of solidarity rate; direct subsidies have acquired particular importance in Athens and in Aguascalientes.

regressive) of the recent behaviour of rates paid by different customers presents certain issues in terms of the efficiency of such subsidies; this is augmented in some cases, like that of the Buenos Aires metropolitan region and that of Cochabamba, by the relatively low degree of coverage of both the drinking water and sewer system services (in other words, the universe of potential beneficiaries is reduced).

With respect to the previous issue, the information offered on the reference table allows us to conclude that, with the exception of England[31], the regulatory framework in all cases permit the companies to suspend service for users who incur in "non-payment". This is critical given that in the majority of the countries included in this study, unequal income distribution patterns prevail. Thus there is a higher risk that consumers with the fewest resources will be able to access drinking water and/or sewer systems (for such users, these services are relatively more costly than for the social strata with medium-high incomes). Thus these individuals have trouble paying their bill (and fall into the late payment category, or the "unable to pay" category).

IV. Capital Formation and Financing

In the previous sections, an attempt has been made to determine the origin of funds generated by the different water and sewer service providers included in the research, in addition to distinctive aspects of the firms' recent economic performance and the principal elements that explain these performances. This section, then, seeks to complement – and, when possible, to enrich – the earlier analyses, by dealing with two highly relevant issues (especially when considering that water constitutes a *fundamental human right* and that "provision deficits" mainly characterize and affect underdeveloped countries). These two issues are those problems related to the investment made by the company (its magnitude and intensity, its profile, etc.) and to the different privileged mechanisms available for firms to finance capital formation.

An initial analytical perspective is that which arises when comparing the investments that the companies agreed to[32] in comparison to those actually made. The evidence offered on Table Nº IV.1 allow us to conclude that for different reasons, in almost all cases under analysis, the established investment goals (which include issues as different as the extension and/or rehabilitation of the water network, improvements to treat effluents, the increase of degrees of service coverage, the installation of new factories for making water potable, etc.) were to a greater or lesser extent not complied with (obviously in different proportions –

[31] Under the Labour Part, the British Parliament prohibited disconnections for non-payment, arguing social reasons and public health.

[32] In the case of the private companies, this is about the commitments to make investments that are included in the respective concessionary contracts and/or in certain revisions or renegotiations of the contracts.

although this is difficult to quantify, given the nature of the data available – which varies from case to case).

In this sense, it is useful to bring up the examples of Aguas Argentinas S.A. (according to the regulatory body, the contractual non-compliance in terms of capital formation involves a deficit with respect to the original agreement of providing 800,000 inhabitants with drinking water; of providing more than 1 million inhabitants with sewer system services, and of supplying more than 6 million people with primary water treatment)[33]; of Greek firm EYDAP (since the partial privatisation of the firm, many of the investment agreements have not been met); of the license of Aguas de Aguascalientes S.A. de C.V. (in spite of the fact that the original contract was renegotiated in 1996, few of the investment goals have been attained, and there is still an important gap in terms of the physical efficiency of the network), and the events in Cochabamba (amidst a conflictive rendering of services handled by private firm Aguas del Tunari, none of the agreed investments were made – now the national company that inherited the license, SEMAPA, must confront a series of deficiencies in terms of the networks and the connections)[34].

Table IV.1
Investment obligations and characteristics of investments in water and sewer systems in a selected group of cities/areas

City/Region – Company	Investment Obligations	Evolution and characteristics of the investments made and the level of service coverage
Metropolitan area of Bs. As. (Argentina) – Aguas Argentinas S.A.	The licensee originally agreed to invest 3.95 billion dollars during the 30 years of the license. This period was segmented into six five-year periods and at the end of each of these, the investments for the following five year period were to be planned.	According to information from the company, between 1993 and 1999, investments in infrastructure expansion reached 678 million pesos/dollars; investments in rehabilitation and renovation totalled 211 million pesos/dollars, plus an additional 158 million pesos/dollars were spent on other areas. Again, according to the company, by 2002, nearly 3 million new users had been incorporated, but the regulating entity (ETOSS) deemed that the level of non-compliance with the investments actually made (in comparison with those outlined in the contract) reached 42 percent during the first five years of the administration and 33 percent between 1999 and 2002. This meant that although the firm committed itself to attaining an 88 percent service coverage for water, it only achieved 79 percent; the percentages in the case of the sewer system were 74 percent versus 63 percent (respectively). As a result of the firm's non-compliance (and not just in terms of investments), the ETOSS fined the company (according to the entity, in July 2003, the fines totalled 40 million pesos, but the company had only paid 42 percent of these).

Continued

[33] See ETOSS (2003).

[34] In this respect, see Azpiazu and Forcinito (2003 and 2004), Kallis and Coccossis (2003), Ledo *et al* (2004) and Torregrosa *et al* (2003).

Continuation

City/Region – Company	Investment Obligations	Evolution and characteristics of the investments made and the level of service coverage
Tucumán (Argentina) – Aguas del Aconquija S.A.	The firm originally agreed to extend the connection network and increase existing coverage in terms of access to drinking water and sewer systems until achieving universal coverage after eight and 13 years (respectively).	As a result of the social conflict generated by the license, the expansion goals were not met and the advances in terms of increasing coverage were practically null (keep in mind that at the beginning of the 1990s, the coverage of drinking water via public networks had reached around 80 percent of the population of the province, while coverage in terms of sewer systems – which were mainly concentrated in the capital of the province – was lower than 35 percent).
Athens (Greece) – EYDAP	From 2000-2008, EYDAP agreed to invest close to 1.2 billion Euros.	During 2000, the investments made were 20 million Euros below those agreed to. The information available indicates that in the following years, such discrepancies continued (the firm executives claim that this is owed to the fact that the Greek government has not complied with its contract obligations, which involve the state subsidising up to 60 percent of investments). In terms of increasing coverage, it is worth noting that in the period before the partial privatization, service expanded significantly (reaching almost 100 percent coverage for water and sewer systems).
Aguascalientes (Mexico) – Concesionaria de Aguas de Aguascalientes S.A. de C.V.	According to the original contract, the licensee would invest in maintenance and infrastructure for efficient rendering of services. The work of rehabilitation and extension would be covered with the corresponding rate fraction, in addition to federal, state, and municipal contributions. Later, in 1996, the firm was quite lax with regards to these obligations.	The investments made from 1993-1999 reached 110 million pesos (nearly 12 million dollars). The company's greatest achievement was reducing residential leaks and increasing the number of home meters, and thus the objectives mentioned as essential – the physical efficiency solution – have not been met to date (it is useful to note that the public sector contributes an important part of the resources destined to financing system maintenance and development). Before the privatization, Aguascalientes had a high level of coverage (in 1990, 96 percent of homes had piped water, a rate that rose to 98 percent in 2000. The rate of homes with sewer drains was 93 percent in 1990 but rose to 97 percent in 2000).
Cochabamba (Bolivia) – SEMAPA	During the license of Aguas del Tunari (1999-2000), initial investment obligations totalled 214 million dollars (the investments planned included an extension of the drinking water network and the construction of a new water treatment plant, the extension of another network, the creation of crude dyke water plus the installation of pipelines from Misicuni to the valley of Cochabamba, more drinking water and irrigation, and the generation of electric energy). In the case of SEMAPA, there are no exact data on investment obligations, although it is useful to note that the firm applied for loans from different organisms in order to complete several investment projects.	Due to problems between locals in Cochabamba and Aguas del Tunari, none of the investments were made. There are currently many problems in terms of both networks and connections, which SEMAPA plans to resolve by taking out local and international loans. The information available indicates that water coverage is at around 52 percent for all of Cochabamba.
Finland* – LV Lahti Water Ltd. and Kangasala Municipality Water and Sewerage Utility	Towns must define investment plans for the companies.	Investments made were geared to guaranteeing sustainable service in the middle/long term. Coverage levels are high (drinking water: LV Lahti Water Ltd., 98% and Kangasala Municipality Water and Sewerage Utility, 87%; sewers: LV Lahti Water Ltd., 97% and Kangasala Municipality Water and Sewerage Utility, 83%).
Limeira (Brazil) – Aguas de Limeira S.A.	Originally, the licensee agreed to make investments totalling 98 million dollars (35 percent of these during the first five years of the license).	The original obligations were not fully met by the company when rates were not adjusted. In 2002, investments totalled 9 million Reales (close to 3 million dollars); nearly 60 percent went to the sewer system, a little over 20 percent to providing drinking water, and the remaining 20 percent to other ends. In terms of coverage, the goals established in the license contract (95 percent for drinking water and 80 percent for the effluents) were fully satisfied (what is more, these goals had already been met when the contract was signed).

Continued

Continuation

City/Region – Company	Investment Obligations	Evolution and characteristics of the investments made and the level of service coverage
Niterói (Brazil) – Companhia Águas de Niterói	During the 30 year license period, investments of more than 100 million dollars were planned.	Towards the end of 2001, 90 percent of investment had gone to expanding the drinking water network and just 10 percent to the sewer system. In 2002, 91 percent of the investment went to the sewer system and to treating effluents. In terms of the degree of service coverage, the goals in terms of drinking water (90 percent for the area covered in the first three years) were fully met. In terms of sewers, the goal of reaching 60 percent coverage within three years had been achieved in 2001.
Prolagos (Brazil) – Prolagos S.A.	The original investment totalled 152 million Reales over 25 years (90 percent of this total was to be concentrated in the first five year period).	In the first thirty months of operation, the investment reached 60 million Reales, but later dropped significantly. However, in 2002, there was a significant recovery. The firm's commitment (which it kept) was to achieve 80 percent coverage in water provision and 30 percent in terms of sewer systems by the third year of the license (these percentages must reach 83 percent and 40 percent respectively by the eighth year of the license).
London (England) – Thames Water Utilities Ltd.	The company plans to invest 3.5 billion Sterling Pounds between 2005 and 2010 in infrastructure. The information available indicates that in terms of investments, there are two important "bottlenecks": (a) the main network is nearly a century old and (b) almost no advance has been made in terms of recovering losses since privatization. In addition, there is a relatively low level of micromeasurements in the area of residential consumers.	From 1998 to 2003, accumulated capital investment reached 2.4 million Sterling Pounds (44 percent of the firm's income). Of this total, 56 percent corresponded to water and 44 percent to sewers. In terms of the coverage issue, this is not a relevant problem in London, given the high existing levels of coverage.

* Includes the following cities: Lahti, Kangasala, Lapua, Nurmo, Kuortane and Kauhava.
Source: Author.

The aforementioned example differ greatly from what occurred at Aguas de Limeira S.A., at the Companhia Águas de Niterói and at Prolagos S.A. (in these three cases, it is possible to say that the goals set in the respective contracts for water and sewer services during the first years of the license were fully met – however, it is necessary to note that for sewer drains, coverage is still relatively low).

In this sense, another characteristic that is common to most of the international cases of this analysis is the different level of investment maturity and the resulting advance to cover the unsatisfied demand index, depending on whether this corresponds to the provision of drinking water or environmental sewer systems.[35]. In this last field, the delays are the greatest, both in terms of the capital formation completed (and in its relationship to that agreed to with the corresponding licensees), and with respect to the unsatisfied needs of the population[36].

Although the treatment and analysis of the principal financing modalities utilized by water and sewer companies included in this investigation were mentioned in Section II, it is

[35] The example of British firm Thames Water Utilities Ltd. is illustrative in this sense. In the five year period from 1998 to 2003, the firm made capital investments totalling approximately 2.4 million Sterling Pounds (56 percent of this total went to water service and the remaining 44 percent to sewer systems). For more on this case, see OFWAT (2004b).

[36] This phenomenon tends to repeat that confirmed by the Inter-American Development Bank in Latin America and the Caribbean (Inter-American Development Bank, 2003).

useful to investigate which firms have utilized such mechanisms to finance their investments (Table Nº IV.2).

According to the information available, it can be generally argued that in the universe of companies analysed here, there are four types of phenomena that arise from the predominant financing forms. The first is comprised of the companies that have privileged the contribution of third party resources, especially in terms of acquiring debt on the domestic and/or international market (this is the case of the service providers in the metropolitan area of Buenos Aires and of Brazilian firm Prolagos). The second includes licenses in which a considerable proportion of the capital formation of the firms has been financed with state contributions and/or subsidies (Athens and Cochabamba). The third is made up of those firms that have financed a great part of investments with their own resources (Aguas de Limeira S.A.). The forth corresponds to the companies that have recurred to more than one source of financing (this category includes service companies in Aguascalientes, in the cities of Finland, and in Niterói and London – in these cases, investment "credit" came fundamentally from revenue accounts, public contributions and/or debt acquisition, although in varying proportions)[37].

[37] As can be seen on Table Nº IV.2, with the exception of Aguas Argentinas S.A. (according to information from this firm, between 1993 and 2001, approximately 76 percent of profits were reinvested – however, the aforementioned document of the ETOSS states that "Aguas Argentinas S.A. opted for a capital structure with a level of debt acquisition superior to that foreseen in the offer, as well as exceeding the level of debt acquisitions appropriate for such companies at the international level.... The specific law was again flexible in favour of the company when the contract was renegotiated from 1997-99, when debt levels higher than those acquired by the company were accepted, and thus the company avoided contributing its own capital to cover the financial demands of the license") and the Companhia Águas de Niterói (where there were high levels of profit reinvestment), in most cases analysed, the reinvestment of the surplus generated during service management has been reduced or even null (either because the companies declared losses – as occurred in the case of Tucumán, Cochabamba, Limeira and Prolagos– or, as in Greece and England, because shareholder decided to implement a "generous" dividend distribution policy).

Table IV.2
Principal financing mechanisms of the water and sewer system investment in a selected group of cities/areas

City/Region – Company	Financing mechanisms	Reinvestment of profits
Metropolitan area of Bs. As. (Argentina) – Aguas Argentinas S.A.	Nearly 70 percent of the capital formation was financed with third party resources (debt acquisition, usually abroad), while the contribution of the firm's own resources was minimal. In these cases, no capital formation came from recapitalization, but from revenue accounts.	According to information from the firm, from 1993-2001, it reinvested 76 percent of its profits.
Tucumán (Argentina) – Aguas del Aconquija S.A.	The financing costs for infrastructure geared to extending the water and sewer system network and to ensuring the quality of service as agreed in the original contract were mainly paid by users. This was achieved through a phenomenal rate increase approved soon after the license began with a charge that was paid per infrastructure (250 pesos/dollars per property for a connection to drinking water and 300 pesos/dollars for financing the drainage network and sewers). In any case, due to the intense social conflict caused by the rate increases, none of the planned investments were made.	There was no reinvestment, since the licensee faced losses during the entirety of the license.
Athens (Greece) – EYDAP	Although different financing mechanisms are acknowledged (own funds, increases in the capital quota, capital market, etc.), the reality is that a great part of financing came from public contributions.	In spite of the important public resources transferred to the company, delays in investment after the partial privatization led to an absence of reinvestment (to this we could ass the "generous" dividends distribution policy that was implemented for private shareholder).
Aguascalientes (Mexico) – Concesionaria de Aguas de Aguascalientes S.A. de C.V.	Fundamentally, via consumer rates, public contribution and debt acquisition (especially in the initial period before the 1996 contract revision).	No information available.
Cochabamba (Bolivia) – SEMAPA	In 1994, nearly 20 percent of the capital formation was financed by contributions from the National Treasury, while in 2000, this financing rose to nearly 60 percent (in both years, the service was rendered by the public sector).	From 1994-2003 (that is, during both the public and private administration), the company suffered losses, and thus there was no profit reinvestment.
Finland* – LV Lahti Water Ltd. And Kangasala Municipality Water and Sewerage Utility	Initially, the towns financed expansion projects through taxing, but since the 1980s, financing has come mainly from water and sewer charges (the financing can also come from municipal subsidies, and from subsidies from the Finnish government and from the EU). In 2001, revenues at LV Lahti Water Ltd. Allowed the company to finance its own investments. In the case of Kangasala Municipality Water and Sewerage Utility, in 2000, a significant part of the investment was financed by the town.	Although there is no specific information for this case, the reduced dimension of the populations served and the fact that an important part of financing comes from the firm's incomes and/or municipal contributions, it can be concluded that the levels of reinvestment needed to maintain a working infrastructure are quite low.
Limeira (Brazil) – Aguas de Limeira S.A.	65 percent of the company's financing comes from its own resources and 35 percent from other sources (no information available on the origin of this financing).	There has been no reinvestment, given that the licensee has lost money since it began offering service.
Niterói (Brazil) – Companhia Águas de Niterói	The principal financing sources include contributions from the Banco de Desarrollo Estatal, the contribution of shareholders and profit reinvestment. In 2000, 65 percent of the investments made was financed with the firm's own resources.	Although there is no information available, the firm's profit margin and the decisive contribution of its own resources for financing investment suggest a high level of reinvestment.
Prolagos (Brazil) – Prolagos S.A.	The little information available suggests that in the past few years, the firm has opted for debt acquisition on the local market to finance investments.	The company has only registered operational and accounting losses.
London (England) – Thames Water Utilities Ltd.	Fundamentally, via resources derived from service invoicing and debt acquisition (at the end of the 2002-2003 fiscal year, the company's net debt totalled approximately 2.3 billion Sterling Pounds – the evidence available suggests the existence of an high proportion of self-loans).	According to the information offered by the regulating entity (the OFWAT), in the past few years, the company has had a very "generous" dividends distribution policy.

* Includes the following cities: Lahti, Kangasala, Lapua, Nurmo, Kuortane and Kauhava.
Source: Author.

In short, there are many considerations in terms of the mechanisms chosen by the firms to finance investments. However, the principal conclusion of this section is that the majority of the cases considered show that capital formation has been far below that originally agreed to. This is noteworthy, given that water and sewer services are probably

the public utility with the highest incidence on the quality of life of the population. In this sense, deficits in terms of verified capital formation – especially in countries with low levels of development – doubtlessly constitute one of the greatest challenge to resolve in the near future. This is even more true if we consider that these deficit end up affecting the socio-economic strata with the lowest incomes[38]. In other words, the social costs of exclusion are higher, in some cases, than generous dividend distribution policies, ignoring the rational use of the resource, less predisposition to face environmental sewer works (which are generally more costly and less profitable), etc.

V. Principal Economic and Social Impact

Before reaching the main conclusions that can be drawn from the analysis on the economic-financial dimension of water and sewer service providers in the international experiences included in this study, it is useful to incorporate certain considerations on one of the central aspects of the performance of these companies: their diverse impact on certain social, economic and macroeconomic variables that are particularly significant. Although these are not directly related to the economic-financial dimension at the microeconomic level (in terms of respective performances in this area), they constitute one of its many results. In other words, this involves the effects of the operator on the labour market, on income distribution, on the economy's ability to compete, on the fiscal treasury, etc. In short, these are sensitive variables from a systematic vision of the management of drinking water and sewer drainage.

In this area, the asymmetric nature of the basic information (which is not easy to obtain and/or update) for a global and rigorous examination of the phenomena at hand leads to considerations of a qualitative nature (and are thus mere approximations) that arise from the different case studies.

Therefore, with regards to the impact of service provision on the labour market, we can distinguish three major typologies. The first, in all cases (even in those that ended with the rescission of the contract – as in Tucumán and Cochabamba) is associated with the transfer of service management to private capital: this denotes a marked shift from overemployment to important increases in average productivity (this occurred at both Aguas Argentinas S.A. and at Aguas de Limeira S.A.). A second phenomenon is seen in the cases of mixed operations (as seen in Athens beginning in 1999) or state-run operations (different cities of Finland): in these cases, there have been no major effects on the level of

[38] Although it is not related to the goals of this study, it is useful to note that the involvement of public authorities will play a decisive role in the resolution of the aforementioned deficits (this role involves designing and implementing policies for sector expansion, the precise definition of the most relevant works, a strict control over the mechanisms to finance investments, etc.).

employment. Finally, the experiences of the Companhia de Aguas de Niterói and Prolagos S.A., both in Brazil, reveal a growing level of employment, at least over the past few years[39].

In any case, consistent with what we would expect (linked, in many cases, to management failures – a tendency to overemployment, a traditional twist at many public utilities firms that are state-run), the transfer to private firms has meant a lower level of demand of direct labour (the usual recurrence to outsourcing certain activities does not allow us to evaluate the effects as a whole) and most likely, relative increases in labour productivity.

Whatever the indicator (direct or indirect) to consider, the effects on income distribution or, in other words, the evolution of average service rates via-a-vis the local price indexes and/or average salary indexes comes out as a more or less general phenomenon. The examples offered by Aguas Argentinas S.A.[40] and the rescinded license contracts in Tucumán and Cochabamba (whose institutional crises were owed to excessive rate increases applied by the companies – in both cases, in a context of strong economic and social crises in which the levels of poverty rose considerably)[41] are extreme. In the majority of the experiences analysed here, the presence of real rate increases can be detected, both in terms of local price indexes (with the resulting impact on the relative price structure of each economy) as well as salary indexes. Thus it is clear that in all of the remaining experiences analysed, in terms of income, the users with the lowest income pay proportionally more for service than middle and high-income sectors[42].

[39] In the case of Great Britain, the evidence available indicates that as a product of the implementation of important reductions in the number of personnel as a result of the reforms to public companies that began in the 1970s, private firms that took over the water and sewer services in England and Wales received "rationalized" companies in terms of the number of workers (Castro, 2003).

[40] Thanks to multiple renegotiations of the original contract, the average residential rate paid by users rose 76 percent in real terms between May 1993 and the first few months of 2002. As could be expected, when combined with the new rate charges and the scarce distribution of meters, this had major regressive implications in terms of income distribution. In this respect, Azpiazu and Forcinito (2004) mention "the notable concern caused by the current rate structure, in that the strong – and growing – gravitation towards different fixed charges incorporated in the renegotiations make the real service costs fall disproportionally according to income strata. Thus, for 10 percent of the population of Greater Buenos Aires with the highest incomes, paying for the service represents just 1.3 percent of their resources, while on the opposite end, for the group with lowest incomes, water service represents 9 percent of their already deteriorated resources (for the average user, this percentage drops to 1.9 percent." On this particular case, see also Arza (2002).

[41] See Crenzel (2003) and Ledo *et al* (2004).

[42] For more in this respect, see Castro (2003), Kallis and Coccossis (2003), OFWAT (2004a), Torregrosa *et al* (2003) and Vargas (2003).

In relation to the latter, the regressiveness in terms of rates seems to be a common denominator for diverse reasons[43], with the exception of the Finnish towns included in this study (according to the data available, the Finnish towns attempted to preserve the economic-social impact of rate behaviour)[44]. In various cases, the adoption of rate criteria that, even in the examples in which these are compensated with different social rate mechanisms, imply the consolidation of certain regressive twists can be added.

The considerations involving the verified impact on the capacity to compete of each economy are not substantially different. In this sense, setting aside the rate issue and referring to the metropolitan area of Buenos Aires, the World Bank itself has emphasised that the impacts on the living and health conditions of the populations, in addition to those related to water supply and environmental contamination, have had negative consequences on the domestic market competitiveness (this could also be noted for the majority of the cases included in this study – especially those of underdeveloped countries)[45].

Finally, it is useful to add some brief comments related to the impact that the licenses analysed had on governments´ public finances (national, provincial, or municipal governments, depending on the case). In terms of the data available, there is an initially positive effect (especially at the companies that registered accounting profits) derived from the costs transferred to the population in the concept of taxes (profit taxes, municipal taxes, etc.). In some cases, resources were increased by charging taxes on the economic use of public assets (this is what occurred in the case of Aguas de Limeira S.A. y la Companhia de Águas de Niterói)[46]. In other, public revenues were affected – in this case, negatively – by the direct subsidies that the public sector offered the service operators (the case of Athens and Aguascalientes).

In short, despite the heterogeneous cases reviewed (in terms of scales, type of management, successes and failures, etc.), the principal economic and social implications of the privatisation processes lie (especially in those cases which have not been accompanied

[43] Among others, the proliferation of fixed charges in the case of the license of the metropolitan region of Buenos Aires; the notable and asymmetrical rate increases – which were not compensated by the application of the 1999 efficiency coefficient – in the case of England; the connection charges that went from representing 65 to 164 percent of one month of minimum wage from 1994 to 2003 (Limeira), and the fact that connection costs are equivalent to approximately one month of minimum wage (Niterói).

[44] See Seppälä (2003).

[45] See World Bank (1999).

[46] In the first case, beginning in January 2001, the licensee had to pay taxes (in fact, this is a regulatory percentage) of a little under 10 percent of monthly invoicing. In the second case, according to what was established in the contract, after the thirty-first month of the license, the firm must pay a little over 3 percent of its monthly invoicing. In terms of Prolagos S.A., the firm originally was obliged to pay a tax, but this tax was eliminated in the contract revision of February 2002 (Vargas, 2003).

by solid legal and regulatory institutions) in the consolidation, and often in the exacerbation, of certain regressive aspects and/or aspects that do not coincide with the economic-social trends that are needed and that must be implemented in order to achieve the goals set by the United Nations for 2015.

VI. Final Thoughts

In closing, grounded on the evidence analysed, it is interesting to bring up certain general considerations on what has been already mentioned and/or suggested with regards to the decisive effects that drinking water and environmental sewer systems have on the living conditions of the current population and future generations, on an economy's ability to compete, on the rational use of resources, and on the environment, among others. It is no coincidence that the United Nations recently declared water to be a *fundamental human right* and that the organization has declared that one of the principal challenges of this century is to considerably decrease the (currently high) number of people who do not have access to this essential public service (either because they lack the sufficient resources to pay for it and/or because, for different reasons, they do not constitute a "profitable market group" in microeconomic terms – this last issue is usually more significant in the case of services offered by a private operator).

With respect to these issues, in terms of the international experiences analysed here, it was possible to verify that the aforementioned deficits in terms of expanding drinking water systems and especially sewer systems are particularly acute in developing countries. In addition, the socio-economic strata with the fewest resources are most hardly hit by this problem for two basic reasons. Firstly, because the rates paid by these poorer sectors are quite high in comparison to their incomes. In other words, low-income sectors must use a greater portion of their (much) lower income to pay their bills in comparison to medium and high-income users (in spite of the fact that in the majority of the cases studied, rates and rate structures responded to progressive criteria). The second reason is that the insufficient coverage of the unsatisfied demand is not preponderantly focused on this segment of the population; the same can be argued of the various deficiencies that are usually part of the service (among others, this includes the quality of water delivered, the operations of the sewers, the fact that environmental issues are ignored, and a management of water resources that only produces deficit). On another level, and taking into account the economic development studies and the respective profiles of income distribution, many of these problems are also reproduced in the experiences that correspond to developed countries.

In fact, independently of whether or not the services are offered by the government, by private firms or by mixed companies, it is unquestionable that the extension of networks,

the improvement of the treatment of sewer effluents, the construction of new plants to make water drinkable, etc. are desirable aspects in itself. This is true not only in terms of improving services in both quantity and quality (and thus reducing the above mentioned deficits), but also for the direct – and positive – impacts that this would have on distributive equity and on social solidarity for both the current population and the generations to come.

This last point is closely related to the issue of financing or, more specifically, with the response that the next questions demands: what resources are available to make the required investments? To simplify, there are five large instruments (that can often be used simultaneously) to finance the growth and development of the infrastructure necessary to efficiently provide drinking water and environmental sewer services: private contributions, funds from international organisations, national resources, some mechanisms for crossed subsidies among users and/or some modes of social interest rates.

The analyses presented in the previous sections, in addition to the abundant information available, allows us to conclude that in the specific case of developing countries (which, it must be emphasised, is where the principal sector "bottlenecks" are found; thus this is also where the efforts must be focused to at least partially achieve the goals established by the United Nations for 2015), the first three tools mentioned were not sufficient and/or are not recommendable for a series of reasons (for example, the instrumentation of private strategies – supported, by action or by omission, by public regulation – to prioritise dividend distribution among shareholder and reduce profits reinvestment, the growing external dependence that characterises the majority of the nations on the periphery, and the often critical situation of public finances).

In view of this situation, the two most interesting, economic, and equitable mechanisms from an economic-social (and even financial) perspective to expand service and improve its quality seem to be the implementation of crossed subsidies and/or solidarity rates that favour consumers with the lowest incomes. The formulation and implementation of crossed subsidies (and the more explicit and transparent, the better) in favour of low-income users could come as a relief to many households that are not able to pay their bills and thus often face having their service suspended. However, it is nearly impossible to consider that this measure alone will be enough to attain universalisation in the access to drinking water and sewer systems and/or to avoid (or considerably reduce) late payment and non-payment, which often leads to the suspension of services. This is why it is critical for a crossed subsidy policy to be accompanied by a regime of solidarity rates[47/48].

[47] Azpiazu and Schorr (2003b) present a series of strategies for financing the application of a social interest rate.

The combination of both measures (included, naturally, within an organic, sustained, and sustainable plan of development and water resource management) would allow users with greater purchasing power and consumption to finance the expansion of service towards low-income users or users that have problems to pay their bills or no access to service.

Finally, it is necessary to add one last digression that arises from the different analyses. One of the principal suppositions of the privatising models supported mainly by multilateral credit organisations is that, especially in the water and sewer sector, privatisation per se is the necessary and sufficient method to extend service and to thus increase the efficiency of such services.[49]

However, the long list of international experiences analysed in this study create more doubts than certainties in this respect. Our research appears to support a statement made by two specialists who analysed the British privatisation process in depth: "When there are mass economies of scale and scope and elevated barriers that block – or appear to block - the entrance, private property does not produce positive results. The incentive and opportunity to exploit consumers threatens the efficiency of the assignation, and the absence of competitive norms leads to inefficiency and internal negligence…. [Thus] the water industry appears to be the most dangerous in terms of privatisation, since it combines a lack of concern for the environment, a natural monopoly, and reduced investments in infrastructure. Although there could be a margin for outsourcing certain operations (for example, drain treatment and pipe maintenance), in general, there is little to be gained from privatising the water industry, and many problems await if this industry is privatised. We would maintain public ownership of the industry assets and uphold the principle of the integrated management of fluvial basins." (Vickers and Yarrow, 1991)[50].

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[48] In view of achieving the aforementioned goals of distributive equity and the expansion of the water and sewer system network, in addition to the rational use of water as a resource, the increase of the levels of micro-measurements is another important challenge to confront.

[49] After playing an active role in the formulation and implementation of market-oriented reforms for many years, and as a result of the many critiques of the privatisations made from different realms due to their blatant economic and social implications, the World Bank itself recently acknowledged that privatisations has not had the effects expected for local populations (these effects, it should be noted, were once widely publicised as a justification for transferring public assets to the private sector. For more on this issue, see Kessides (2004).

[50] Along these lines, these authors emphasise certain "negative effects for the efficiency of the economy" that are produced by the privatisation of the "water industry": "the loss of economies of scope as a result of giving up integrated management of fluvial basins...; the probable effects of placing private decision criteria above social criteria when evaluating the need to measure (or not to measure) domestic water supplies; the establishment of an industrial structure less favourable to promoting competition...; the incentives of private companies to reduce service levels and the difficulties that regulators face to stop them;... and the danger that, due to a lack of clear long-term policies to stop unrecoverable dividends from going to private shareholders (a common policy), capital expenditures in the industry could be too low," (Vickers and Yarrow, 1991).

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