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## INTERNATIONAL OVERVIEW OF REGULATION FRAMEWORKS FOR THE URBAN WATER CYCLE IN THE UNITED KINGDOM, CHILE AND SPAIN

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Almudena Semur, José Valin, José Carbonell



In collaboration with:



INSTITUTO DE ESTUDIOS ECONÓMICOS

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## ABSTRACT

This report is aimed to make a comparison of the water regulation frameworks in the United Kingdom, Spain, and Chile. The water industry has often been regulated, either by direct management of the government and state-owned entities, or through indirect controls on water companies by regulating prices, quality, benefit, subsidies, etc. Differing in governance regimes and political decentralization level, the United Kingdom, Chile and Spain possess particular regulatory models of water supply and sanitation in relation to fixing prices, quality and subsidies.

There are several alternatives of indirect control with private sector participation. One consists of full privatization, which has been adapted by part of the United Kingdom and some cities of Chile. Others are the public-private partnership (PPPs) forms, which can be the management contract, lease contract, mixed-ownership company and or concession, which are common in Spain and Chile. The UK (with 100% of companies privately owned), Chile (96% of population managed by private companies) and Spain (49% private market) are successful examples of regulated systems. Each country presents different patterns of organization: UK water operators are distributed by regional institutional segmentation; Chile, by administrative regional segmentation; while the political regime of Spain decided to delegate management to the municipal level.

In the UK, the private company offers water supply and sanitation service covering 99% of total population of the English and Welsh region. In Chile, virtually 100% of urban consumers are covered by private firms. Around 4.15% of the total population is served by public institutions or companies. In Spain, service provision is the responsibility of more than 8,000 municipalities, and the market structure is more diverse, mainly with 3 types of management: public companies and local entities (47% of the total population), private companies (36%), mixed public-private company (13%) and others (4%).

The success of a regulatory system depends on key aspects such as managerial and institutional regulation efficiency. Managerial efficiency refers mainly to the technical efficiency of the decision making unit, which has undoubtedly increased in recent decades. Regulation effectiveness is a complex issue to assess due to the peculiarities of each regulation system and the unclear correlation between regulatory frameworks and the technical efficiency of a water system. Generally speaking, the water regulation systems of UK, Chile and Spain have worked correctly in re-

cent years; they have evolved and allowed water and sanitation services to be developed, to be flexible and at the same time have adapted to each country's political structures and management cultures. All countries have increased the level of their services as a result of the introduction of technical improvements as well as strengthening their regulatory frameworks.

In England and Wales, OFWAT is the main regulator entity, responsible for economic regulation of the system, while the Environment Agency and the Drinking Water Inspectorate are responsible, respectively, for the environmental protection and control of the drinking water quality. In Chile, the Sanitary Services Superintendency (Superintendencia de Servicios Sanitarios –SISS) has a key role in the tariffs model and economic projections and goals of the company, while in Spain there are different entities which regulate the water industry, and the Ministry of Health controls the drinking water quality.

Both UK and Chile evaluate the relative efficiency for each company in the tariff design. The UK ranks the water company and sets the X–efficiency factor for each one, comparing to the industry average efficiency level. The evaluation of the relative efficiency is based on the data of past performance of current operators. Finally, the regulator publishes his final determination regarding efficient costs, initial tariff levels for that pricing period and the X factor for each company. Chile, by creating a hypothetical efficient firm model in assumption of an ideal operation environment, evaluates the gap of efficiency between the ideal virtual optimized water company and the actual operator. The standard of efficiency is set as the best solution to evaluate an efficient firm model.

In the price review in Spain, the company is not compared with either the industrial peers or a hypothetical best practice. Price is set up through market competition in PPP tenders, and under different private management models, where assets are never sold or transferred to private companies. It cannot be said that it is a privatized market but a PPP market, that enables competition itself, and indeed regulators review KPIs compliance. This competitive market exposure has allowed the sector and the Spanish companies to become a worldwide benchmark and to open up new markets.

UK and Chile are examples of centralized and mainly privatized systems, though with different business models, have implemented national regulation entities which approve 5 year business plans of water operators, set tariffs and investment policies. Nonetheless, companies are not usually di-

rectly comparable, differing in size, quality of service, operating environment and numerous un-quantifiable factors.

On the other hand, Spain is a decentralized system where water infrastructure and price setting policies are a power of municipal and regional administrations, following the Spanish decentralized political framework, where autonomous communities have high levels of powers in many domains. This decentralization to the municipalities enables a higher capacity to integrate local elements and sensibilities and gives more flexibility to municipalities to manage and cope with their local requirements on a yearly basis, and also for using different public partnership forms according to their needs, always following the European Union Water Framework Directive. In contrast to national regulators from UK or Chile, which set business plans for operators, in Spain the competitive market sets service targets and provides tailored solutions to the municipalities. In addition, decentralized systems are an opportunity to reduce intermediary bodies and costs of tariff review and reporting procedures, thus eliminating duplicities in functions and supervisory activities.

Towards the implementation of efficient goal-oriented systems, Water Framework Agreements have been adopted, as in Aguas de Barcelona and in other cities, where, in accordance with the holder/regulator, the companies have goals related to water quality, environment or customer management. Currently, when subjects such as the scarcity of water, energy efficiency or reuse have taken a central importance, these initiatives are even more necessary than decades ago.

### **Final conclusions**

Finally, every system has its advantages and drawbacks, but in terms of water and sanitation coverage and quality standards, all three countries, the UK, Chile and Spain, have reached excellent levels of technical efficiency, despite having different regulatory frameworks, investment financing models, privatization policies, water resources and natural hydrological characteristics.

A fundamental factor that all three countries — UK, Chile and Spain — have in common is the strength of their respective regulatory frameworks. This guarantees legal certainty and stability to investors and enables the development of the water industry. Regardless of how centralized or decentralized the different models are in each country, it is fundamental that the regulatory framework enable the level of investment that the systems require to improve the services to customers, that encourages innovation and technical developments and an efficient use of the resources.

## KEYWORDS

Regulation, water industry, United Kingdom, Chile, Spain, evolution, privatisation, ownership, market, operators, price regulation, investments, financing, sanitation coverage, direct management of the government, state-owned entities, indirect controls on water companies by regulating prices, regional institutional segmentation, administrative regional segmentation, privatisation at municipal level, England, Northern Ireland, Scotland, Wales, political centralisation, local government, regional authorities, national government, 1973 Water Act, Regional Water Authorities (RWAs), water only companies (WOCs), Water Service Regulation Authority for England and Wales (OFWAT), Water Industry Commission for Scotland, Department of the Environment, monopoly, unique national authority, Servicio Nacional de Obras Sanitarias (SENDOS), National Management Office, Regional Management Offices, decentralisation, Aguas de Barcelona, S.A. (AGBAR), public-private partnership (PPPs), management contract, lease contract, mixed-ownership company, concession, regional level, national level, municipal level, full privatisation, Water Industry Act 1989, operation rights, Spanish Water Law, Hydrological National Plan, European Framework Directive, public companies, private companies, mixed public-private company, Scottish Water, Northern Ireland Water, regional institutional segmentation, geographical segmentation, municipalities, water and sewerage companies (WASCs), administrative regional segmentation, Law No. 19549, Aguas Andinas, Sociedad General de Aguas de Barcelona, ESSBIO (Empresa de Servicios Sanitarios del Bío-Bío), ESVAl (Empresa Sanitaria de Valparaíso), local segmentation, Agbar Group, Canal de Isabel II, Environment Agency, Drinking Water Inspectorate, Sanitary Services Superintendency (Superintendencia de Servicios Sanitarios –SISS), Ministry of Health, country-specific price regulation model, price-cap regulation, no uniform price model, price review process, tariff, Competition Commission, two-step approval, two-step approval process, price commissions, Autonomous Water Body, price review circle, price regulator, instruments for regulating prices, mechanism used to approve and review the prices, European Regional Development Fund (ERDF)

## INTRODUCTION

This report is aimed to make an international comparison of the water regulation frameworks in the United Kingdom, Spain, and Chile. The water industry has always been regulated, either by direct management of the government and state-owned entities, or when the management is delegated to a specialized company. Publicly owned or managed water utilities, on not being linked to market discipline, run the risk of not being equipped with efficient cost structures and adequate investment programs. As a result, they may incur high building and operation costs, overcapitalization and an excessive use of debt streams, and an inefficient procurement process. Therefore, with the intention of encouraging greater efficiency and to satisfy the increasing investment demand of the sector, over the last 30 years the water industries of the United Kingdom, Chile and Spain have begun to work with the private sector in water supply and sanitation, with particularities concerning pricing, quality and subsidies.

Moreover, despite the distinct economic development situation and availability of water resources and coverage of sewerage service, the dominant operator in each region or locality practically runs the water supply and sewerage service as a natural monopoly. This structural characteristic justifies governmental intervention in the form of price fixing and control of the quality of the service in order to preserve the interests of the final consumers. The United Kingdom, Chile and Spain possess particular regulatory models of water supply and sanitation, which this report aims to compare and analyze.

The main features of UK, Chile and Spain are as follows:

Country	Area (km <sup>2</sup> ) <sup>1</sup>	Pop. (Mill.) <sup>1</sup>	GDP per capita <sup>2</sup> (USD)
UK	243,610	63	38,818
Chile	756,950	17	14,394
Spain	505,370	47	32,230

### 1. OVERVIEW OF THE EVOLUTION OF THE URBAN WATER CYCLE

The current situation of water supply and sanitation of the United Kingdom, Chile and Spain is affected by the institutional reforms, which allowed the participation of the private sector in the supply and sanitation systems. Each country presents different patterns of evolution: UK water

1 Source: CIA – The World Factbook

2 Source: World Bank.

operators are distributed by institutional regional segmentation; Chile, by administrative regional segmentation; while in Spain the private participation is at municipal level.

## 1.1 INSTITUTIONAL EVOLUTION

### United Kingdom

The United Kingdom is a unitary state, consisting of four nations: England, Northern Ireland, Scotland and Wales. The latter three of these are devolved administrations, each with varying powers, based in their capital cities. Therefore, the water supply and sanitation industry of each nation has gone through a different evolution. The whole country has experienced political centralization in terms of regulatory power: the responsibility for water supply and sanitation has been transferred from the local government to either regional authorities or to the national government.

Water services in England and Wales were taken over by local authorities from the late nineteenth century onwards, and a mixed pattern developed with some individual authorities running water companies, some large inter-municipal operators, and a surviving handful of private water-supply only companies, which were strictly regulated. However, the 1973 Water Act reorganized the industry: 10 unitary Regional Water Authorities (RWAs) were created,<sup>3</sup> each covering a river basin area, each responsible for water quality, water supply and sanitation throughout the area. Moreover, 29 privately owned water only companies (WOCs) supplied water within the boundaries of the RWAs.<sup>4</sup> Thus, the water industry has experienced the institutional centralization from local to regional level. The privatization that took place in 1989 furthered the political centralization from regional level to national level with the establishment of the national economic regulator in water industry: Water Service Regulation Authority for England and Wales (OFWAT).

The centralization of the regulatory power in the water industry also happened in Scotland and Northern Ireland. In the past, twelve Regional and Island Councils (local authorities) were responsible for water supply in Scotland, alongside other local services. With the creation of the Water Industry Commission for Scotland, the duty of regulatory framework management and service control has been centralized at a national level. Up

3 Regional water and sewerage companies created in 1989 are the Following: Anglian Water; Dwr Cymru (Welsh Water); North West Water (now United Utilities); Northumbrian Water; Severn Trent Water; Southern Water; South West Water; Thames Water; Wessex Water; Yorkshire Water

4 The authorities were appointed by the government, not by municipalities, and so were not accountable to local government any more. The board meetings remained open to the public, until they were made secret by the Thatcher government in 1983.

to now, the water supply and sanitation service has been carried out by the state-owned company Scottish Water. In Northern Ireland, water and sewerage services were the responsibility of local councils prior to 1973. Later on, responsibility for providing these services was transferred to the Department of the Environment (Northern Ireland). As a national water and sanitation monopoly, Northern Ireland Water provides water service to the whole nation.

## Chile

In contrast, Chile has exerted efforts on tightening up a loose system of government-administered permits to enhance coordination by the reorganization of the fragmented sector structure, incorporating a multitude of public entities into one single national authority, with regional offices corresponding to each administrative territorial region of the country.

Before 1977, in order to guarantee its operation, the service was directly subsidized by the government, mainly by the Ministry of Agriculture and the Ministry of Housing and Urban Planning,<sup>5</sup> except for Santiago and Valparaíso.<sup>6</sup> 1977 witnessed the decentralization of the regulatory regime from a national to a regional level. With the reconstruction of Chile's water industry, the former regulatory entities were merged into one integrated national public water and sanitation company, the National Sanitation Service (Servicio Nacional de Obras Sanitarias, SENDOS),<sup>7</sup> which was structured through a National Management Office and eleven Regional Management Offices. The purpose of this reform was to reorganize objectives, to increase investment capacity, and to enhance coordination and decentralization at local level (especially in rural areas, which accounted for 15% of the total population), but having at the same time a centralized body aimed at leading and supervising the sector. The new structure allowed a more coherent development of the sector and management by private sector bodies, during which a new regulatory framework was created and public utilities were transformed. Meanwhile, tariffs were increased as in the United Kingdom, and a new system of subsidies for needy households was introduced due to the increase in the costs of consumers.

5 The water and sanitation departments of the Ministries were responsible for the urban water and sewer services and such services were provided by a multitude of public entities. The largest entity was the Sanitation Department (Dirección de Obras Sanitarias, DOS) dependent on the Ministry of Public Works, which was in charge of the service provision in the towns outside the country's main cities, Santiago and Valparaíso. In these two cities, the municipal utilities were responsible for service provision, and also had water and sanitation departments.

6 In these two cities, the municipal utilities were responsible for the service provision, on behalf of the largest entity which was the Sanitation Department (Dirección de Obras Sanitarias, DOS) dependent on the Ministry of Public Works.

7 In 1977 the National Sanitation Service (Servicio Nacional de Obras Sanitarias, SENDOS) was created in Chile, which integrated all the former entities operating in the sanitary sector.

## Spain

Spain maintains its long tradition of a decentralized regime in water management. Many agents are involved (both public and private) in both the service delivery and in the financing or construction of infrastructure, with the participation of different levels of administration (national, regional and local), and the split between ownership and management, with a variety of entities, agencies and companies involved.

In the following table a summary of the transition in the three countries is shown:

Table 1.1 Institutional Evolution of UK, Chile and Spain

Country	ReForm Characteristic	Year of the main reForm	Main transition
England and Wales (UK)	political centralization (local to regional level)	1973	Local authority→10 unitary regional water authorities (RWAs)
	political centralization (regional to national level)	1989	RWAs privatized in 1989→ OFWAT <sup>8</sup>
Scotland (UK)	political centralization (local to national level)	2005	12 Regional and Island Councils→ Water Industry Commission for Scotland
Northern Ireland (UK)	political centralization (local to national level)	1973	local councils→Department of the Environment
Chile	national to regional	1977	A fragmented sector structure with multitude of uncoordinated public entities → SENDOS as a newly created National Management Office and eleven Regional Management Offices (except for the V Region and the Metropolitan Region) <sup>9</sup>
Spain		1985	1879 Water Act allows administrative water concessions for private initiatives. 1985 Water Act repeals the previous law, clarifies its contents and powers of the local governments for the indirect management of water and sewerage network services.

Chart prepared by Aquae Foundation

## 1.2 PROCESS OF PRIVATE SECTOR INVOLVEMENT

The water industry has the characteristics of a natural monopoly, and the United Kingdom, Chile and Spain have long been seeking opportunities

<sup>8</sup> Water Service Regulation Authority For England and Wales (<http://www.ofwat.gov.uk/>)

<sup>9</sup> The municipal utilities in Santiago and Valparaíso were corporatized and modernized. The public utilities For Santiago and Valparaíso, EMOS (Empresa Metropolitana de Obras Sanitarias) and ESVAL (Empresa Sanitaria de Valparaíso), were strengthened through loans From the World Bank during that period. In parallel, the government of General Augusto Pinochet privatized the electricity and telecommunications sector.

to offset the negative aspects of this system in order to promote economic efficiency and productivity, thus enhancing the service provided to clients and their social well-being. In these three countries, water supply, sewerage and sewage disposal services used to be a public-sector responsibility. England and Wales (United Kingdom), and Chile both chose to privatize their water services encouraged by their governments, namely through the reforms in 1989 and 1998, respectively. With regards to Spain, with a decentralized political regime, the choice of PPP of water services in Spain is taken by the Municipal authorities whose decision was largely due to pragmatic reasons.

There are several alternatives of indirect control with private sector participation. One consists of full privatization,<sup>10</sup> which has been adopted by a large part of the United Kingdom and some cities of Chile. Others can be different types of (PPP)<sup>11</sup> such as management contract,<sup>12</sup> lease contract (afterimage contract),<sup>13</sup> mixed-ownership company<sup>14</sup> and concession. The PPP is very common in Spain and Chile.<sup>15</sup> Different in social development, economic and political patterns, the participation of private market players has introduced tremendous changes in the regulatory regime of these three countries.

Table 1.2 Policy Review

Country	Decision making	Justification For review	Type of privatization
United Kingdom	Regional level (England and Wales)	1985: Inability to invest by the public Water Authorities when there was a need for significant investment to meet European water quality directive.	Full privatization
Chile	National level	Critical level of water resources deficiency; conflicts between the administration and the private sector on socio-economic and property issues.	1. Full privatization 2. Public-private partnership: concession
Spain	Municipal level	Water resources efficiency improvement, social and population effects	Public-private partnership: Mixed ownership companies/ concessions/lease contract

10 In a Full privatization, assets are permanently sold to a private investor:

11 In PPPs, the ownership of assets remains public and only certain functions are delegated to a private company for a specific period.

12 The private operator is only responsible for running the system, in exchange for a fee that is to some extent performance-related. Investment is financed and carried out by the public sector.

13 Assets are leased to the private operator who receives a share of revenues. Thus, the commercial risk is higher than under a management contract. Investment is fully or mostly financed and carried out by the public sector.

14 A private investor takes a minority share in a water company with full management responsibility vested in the private operator.

15 In Spain, the private sector participation occurred in more than 1000 municipalities, mainly organized in public-private form of mixed ownership companies, concessions and lease contract. In Chile, all urban areas are served by private market participants with either full privatization or concessions systems.

## United Kingdom: Regional level

The water sector privatization in UK occurs in two out of four nations, namely England and Wales. In the other two nations, Scotland and Northern Ireland, water supply and sanitation service remain operated by public companies.

In 1989, the government of England and Wales privatized the ten public WRAs through a public share offering, floating the companies on the stock exchange as a divestiture (sale of assets).<sup>16</sup> The responsibilities relating to water resources management were separated and retained by the public sector in what is now the Environment Agency. At the same time the regulatory agency, the Water Service Regulation Authority for England and Wales (OFWAT), was created. The 10 RWAs were privatized and became publicly quoted water and sewerage companies (WASCs). The 1989 Water Industry Act gave them evergreen licences for sanitation and water supply in the areas that they already covered. The reform also granted evergreen licences to the historical private water only companies (WOC) to operate the water service as a monopoly in those areas where they were already doing so.

## Chile: National level

The privatization of Chile's largest water companies began in late 1998, a process prompted by the rising demand for sewage treatment, for which the government lacked funding. The participation of the private sector occurred in two different ways. From 1998 to 2001 — when the largest 5 of the 13 regional water companies serving more than 75% of users were privatized — the majority of the water companies' shares were sold to the private sector. After 2001, the government in office decided not to transfer the companies' property, but to grant the operation rights of said companies to private agencies for 30-year terms. This way of obtaining private participation, which is also known as concession, differs from selling the companies' shares in that (a) the private participation is limited to 30 year terms, and (b) the infrastructure remains the property of the Chilean State.

## Spain: Municipal level

Spain has a long tradition in public water management (the first water law being made in 1879) at different levels from ministry to muni-

<sup>16</sup> A type of "Full privatization". In this case a sale of the operator firms, including all tangible assets, to private investors takes place.

icipalities, including users' communities. A lot of these organizations are anchored in very old ways of working, and the private sector was given limited opportunity to participate. The recently approved changes in the former Spanish Water Law, limiting water rights and introducing a water market, the new and expected Hydrological National Plan and the European Framework Directive, reinforce the opportunities of the private sector to participate, giving financial resources, technological advances and quick answers to new social concepts in technical water procedures. Governance is decentralized so the choice to award water services management is with local government.

Local governments award the management of water services (not the assets) to tackle the problems arising from more complex operating environments and also in the case of potential financial difficulties to carry out investments. With smaller rural municipalities, local or united associations allow greater technical efficiency to be achieved and increase the probability of involving specialized private management.

Small municipalities have greater difficulties to carry out an efficient management of the water service (or other public services) as they have fewer economic and specialist technical resources. The private sector can act by integrating the management units, ensuring higher quality standards are achieved than the legal requirements in force.

### 1.3 OWNERSHIP AND MARKET OPERATORS

In England and Wales, the private company offers water supply and sanitation services to 99% of total population and only 1% of the population have private water supplies to their homes, which are not "mains" supplies.<sup>17</sup> In Chile, virtually 100% of urban consumers are covered by private firms,<sup>18</sup> and around 4.15% of the total population is served by public institutions or companies. In Spain, the market structure is more complicated, mainly with 3 types of management: public companies and local entities (47% of the total population), private companies (36%), mixed public-private company (13%) and others (4%). Table 1.3 describes the management regime and the characteristics of current market operators.

17 Most private supplies are situated in the more remote, rural parts of the country. Source: Drinking Water Inspectorate (DWI) 2011 (<http://dwi.defra.gov.uk/index.htm>).

18 Source: Superintendencia de Servicios Sanitarios ([www.siss.gob.cl](http://www.siss.gob.cl)).

Table 1.3 Ownership and Market Operators

Country	Ownership				No co's	Notes
	Public	Private	Mixed	Others		
England and Wales (UK)	0	99% Welsh Water is a not for profit organization	0	1%	34*	<ul style="list-style-type: none"> <li>• 10 regional WASCs</li> <li>• 11 regional WOCs</li> <li>• 6 local companies providing either water or sewerage services or both.</li> <li>• 7 water supply licensees offering water services to large user customers.</li> </ul>
Scotland (UK) <sup>19</sup>	100%	0	0	0	1	Scottish Water
Northern Ireland (UK) <sup>20</sup>	100%	0	0	0	1	Northern Ireland Water
Chile <sup>21</sup>	4.15%	95.51%		0.34% (co-operative societies)	53*	<ul style="list-style-type: none"> <li>• Most companies provide both water and sewerage services.</li> <li>• Smaller companies, which serve small communities specialize in either water or sewerage services.</li> </ul>
Spain <sup>22</sup>	47%	36%	13%	4%	Around 2000 water operators in 8,115 municipalities	Municipalities can provide services directly or with public private partnerships

### UK: Regional institutional segmentation

There is a distinct institutional and regional diversity in the UK water market. There are 12 firms simultaneously distributing water and providing sewerage disposal. The regional distribution in England and Wales is featured with different river basin areas represented by 10 private RWAs, created in the 1973 political concentration reform and privatized in 1989. The remaining firms in the industry are 11 regional water only companies<sup>23</sup> (WOCs). In the areas supplied by WOCs the regional water and sewerage companies (WASCs) provide sewerage services only. Those WASCs and WOCs operate as monopolies in a given area assigned to them. The situation in Scotland is different, with one public sector company (Scottish Water) now providing water and sewerage services to hou-

<sup>19</sup> Source: Scottish Water ([www.scottishwater.co.uk](http://www.scottishwater.co.uk)).

<sup>20</sup> Source: Northern Ireland Water([www.niwater.com](http://www.niwater.com)).

<sup>21</sup> Source: Superintendencia de Servicios Sanitarios ([www.siss.gob.cl](http://www.siss.gob.cl)).

<sup>22</sup> Source: AEAS 2010.

<sup>23</sup> The water only companies were Former statutory companies and do not provide sewerage services.

seholds and wholesale services to businesses. Retail competition is now in place for the commercialization market (reading, billing, collection and customer service), so industrial users can choose the company that provides this type of services. In Northern Ireland, the water service remains part of a governmental department. Therefore there is a public monopoly in these two regions.

The larger companies in UK in terms of revenues are WASCs companies such as Thames Water, United Utilities, Severn Trent and Anglian Water, with revenues over EUR 1.2 Bn individually.<sup>24</sup>

### Chile: Administrative regional segmentation

Regarding water supply organization, in specific terms, Chile has two distinctive market structures, depending on whether a certain territory is located in an urban or rural area. The vast majority of the population is located in urban areas. An explanation for such segmentation is that before privatization began, the state transferred the sanitary public provision to a set of public companies, consisting of one per region. This geographical segmentation has been maintained after the privatization process, since Law No. 19549 in 1998 limited horizontal concentration. As a matter of fact, in urban areas most companies offer the complete water cycle, including the catchment, transportation, distribution and sanitation of water. Also, the same companies provide the sewerage and wastewater treatment services. Only some smaller companies, which serve small communities, are specialized in only one of these activities. The vast majority of firms operating in the Chilean water market are private.

In Chile, a total of 53 entities provide the water supply and sanitation services in urban areas. In order to prevent monopolization, the providers were classified into three different categories according to the population percentage served by them. No individual or corporation is allowed to own more than 49% of the total companies within each category:

Category	Criterion	Number of companies	% of total population attended
Big company	Serves more than 15% of total population	2	50.5%
Medium size company	Serves between 4 and 15% of total population	6	34.3%
Small company	Serves less than 4% of total population	45	15.2%

Source: Superintendencia de Servicios Sanitarios (<http://www.siss.gob.cl>).

<sup>24</sup> Source: Water Services Regulation Authority, OFWAT ([www.ofwat.gov.uk](http://www.ofwat.gov.uk)).

The largest company in the Chilean water market is Aguas Andinas (majority owned by the Spanish water company Agbar Group), serving Chile's capital, Santiago, with ESSBIO (Empresa de Servicios Sanitarios del Bío-Bío) in the sixth and the eighth regions and ESVAL (Empresa Sanitaria de Valparaíso) in the Valparaíso Region, being the other two main companies. Altogether, the three companies, Aguas Andinas, ESSBIO and ESVAL, serve 63% of urban water customers in Chile.

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### **Spain: Local segmentation**

Service provision is the responsibility of the more than 8,000 municipalities of Spain. Municipalities can provide services directly or through a public company or local entity (47% of market share), through concessions to a mixed public-private company (13%), private companies (36%) and others (4%). Almost half of the population is served by private or mixed private-public water companies, which operate under concession contracts with municipalities. The largest of the private water companies, with a market share of about 50% of the PPP market, is the Agbar Group. The largest public company is Canal de Isabel II, which serves almost the whole Autonomous Community of Madrid.

Under the different private management models, assets are never sold or transferred to private companies. So we cannot say it is a privatized market but a PPP market, that enables competition itself.

## **2. MAIN CHARACTERISTICS OF REGULATION FRAMEWORK**

### **2.1 REGULATORY INSTITUTIONS**

The table below summarizes the main regulators in UK, Chile and Spain in respect of regulation, finance and economics, as well as environment and drinking water quality.

Table 2.1 Regulators in the UK, Chile and Spain

Country	Regulation and Legislation	Finance and economics	Environment	Drinking water quality
England and Wales (UK)	OFWAT		Environment Agency Natural England	Drinking Water Inspectorate
	Non-ministerial government department		Executive Non-departmental Public Body	Government: Department for Environment, Food and Rural Affairs (Defra)
Chile	General Water Directorate under the Ministry of Public Works	Sanitary Services Superintendency (Superintendencia de Servicios Sanitarios - SISS) With 15 Regional Offices of SISS	The Ministry of Environment	SISS and Environment Superintendency
Spain	- National Water Council (consultative body) -General State Administration- Hydrographical Confederations (Basic Regulation, Public Water Domain, Upstream Supply) - Regional Govt. of Autonomous community	- Local government - Commonwealth	The Ministry of Environment	The Ministry of Health

Source: Aquae Foundation.

In England and Wales, OFWAT is the main regulator entity, responsible for the economic regulation of the system and for setting management standards every five years, while the Environment Agency and the Drinking Water Inspectorate are responsible, respectively, for environmental protection and control of drinking water quality. In Chile, the Sanitary Services Superintendency (Superintendencia de Servicios Sanitarios –SISS) has a key role in the tariffs model and economic projections and goals of the company. In Spain there are different entities regulating the water industry, and the Ministry of Health controls drinking water quality.

## 2.2 WATER PRICE REGULATION

Large infrastructure industries, such as the networks to distribute water, gas or electricity, constitute natural monopolies in their fields; there is considerable fixed cost and comparatively low marginal costs for Distribution System Operators.

The water industry is very important. As a daily necessity, water plays an indispensable role in the life of human beings. Everyone demands it. This industry deals with issues of great consequence to human health and the environment. Since consumers cannot switch supplier, there is rarely competition between water companies targeted to domestic customers, who have no alternative but to choose the company which supplies their local area. The monopoly characteristic in the water sector is reinforced by the fact that there are no close substitutes for the services offered and that demand is relatively inelastic. Therefore, regulatory intervention plays a crucial role in balancing and ensuring the interests of both parties. The most important issues in the spotlight of the regulators are the following: the efficient allocation of water resources, the universal access to water supply, the coverage of sanitation service, the quality control of services, and an affordable tariff. The regulatory authorities of each country play a fundamental role to keep an eye on the reasonable cost of water bills and the service quality provided by each operator to its customers.

When designing its tariff policy, each regulator incorporated the external factors and the regulatory decentralization level into their basic models and developed their own price regulatory regimes, aimed to attain the highest market efficiency.

### **Country-specific price regulation model**

In England, Wales and in Chile, the authorization to set prices is held by the national regulatory institutions, OFWAT and SISS. In Spain, by contrast, the responsibility of retail water tariff regulation is held by the municipalities and autonomous communities, consistent with the existing decentralized political regime.

The UK and Chile use price-cap regulation at a national level. The tariffs in both countries are capped for a five-year period. In the UK, a RPI±K (K=Q-X) model is developed from the common price cap pattern RPI-X. RPI is the retail price index and the X factor is specific to each company, representing its relative efficiency in the industry. The higher the X factor is set, the less efficient the company was in the past, indicating more potential in reducing costs and that more effort should be exerted to "catch up" with industry best practice.

Chile also follows the price cap regime, but not the same pattern of RPI-X as UK. Tariffs are set based on operational and maintenance costs, initial capital expenditure, and an optimal on-going investment program of a

hypothetical efficient company designed to satisfy the projected demand for the next 35 years.

In Chile, the price review is performed every five years. Both United Kingdom and Chile base their price reviews on a long-term perspective, assuming the efficiency according to the projected demands for each country. In the UK, the projection is for 25 years.

In Spain each company should hand in its price proposals to the regulator, based on the cost recovery principal, and the local regulators will decide the price based on the proposals. Nonetheless, proposals have to meet environmental goals and comply with the regulation of European Union services on a national and regional level.

There is no centralized price regulation model imposed by a national regulator, due to the municipal competition of the supply and sanitation services established by law. Therefore no uniform price model, price review process and tariff can be found at national level, but this fact does not hinder the existence of good levels of efficiency in the industry. Service concession contracting with municipalities is a tough competitive process where efficiency and operational excellence are key and the contract defined under competition is in itself a regulatory framework in terms of performance, determination of efficient costs, tariff model, return on investment, allocation of risks. The market competition determines the quality standards and promotes operating excellence above the minimums required. Spain is a good example of a successful competitive policy which some private water companies have developed internationally, exporting know-how and efficiency in their operations worldwide.

In Spain, price is usually reviewed once a year. There is no uniform deadline for the price review process. When disputes in price setting arise between water companies and regulators, no third party has been appointed to solve the discrepancies. The Competition Commission, in the United Kingdom, and the Expert Committee, in Chile, deal with such disputes.

Prices of urban water supply and sanitation service are subject to a two-step approval process, in the context of an authorized tariff regime. Firstly, each water operator should hand in their annual price proposal to the local regulator. Then, the prices are provisionally approved by the municipality, with the autonomous regions, through their Price Commissions providing the definitive approval of the prices proposed by local governments. The second step enables a common approach to the price setting process among the municipalities within the same region, thus providing the Au-

tonomous Water Body with valuable information to properly control and approve the tariffs, taking into account also the particular circumstances of each municipality.

The following table makes a comparison of the main characteristics among the price regulation models:

Table 2.2 Country-specific Price Regulation Model

Country	Model	Price review circle	Price regulator	Instruments For regulating prices	Mechanism used to approve and review the prices
UK	Medium-term incentive-based RPI±K model	Every 5 years	OFWAT	Price cap RPI+(q-x), where q is the price increase and x is the productivity offset	Regulator proposes prices and firms decide to accept or to appeal.
Chile	Mid-term projected hypothetical efficient firm model	Every 5 years	SISS	Model of the efficient firm (EF)	Price proposed by the SISS and approved by the Ministry of Finance.
Spain	Short-term cost recovery model	Every year	Municipality	Analysis Investment and Operating Objectives and Requirements	Companies propose prices and plenary and prices commission decide.

Source: Aquae Foundation.

In UK and Chile, in addition to prices, technical and economic targets are also set for the water utilities by the regulator, and are compared among water utilities of the country. In Spain, the driver to reach target services is the market and competition, and public tenders, which ensure solutions tailored to the needs of the municipalities are considered, obviously always improving on the minimum legal standards.

It is very important that the price regulation process does not become a political negotiation and that objective criteria predominate. Decisions motivated by other elements of political interest introduce legal uncertainty and endanger the economic sustainability of the system and the long-term cost recovery.

## 2.3 INVESTMENTS AND FINANCING

Although investment demands vary between regions due to the combined effect of factors such as industry characteristics, management

regime, price regulation, quality and service needs, two major sources of investment in the water industry are universal for each country: the impact on the bills paid by customers and public or private direct funding.

In England and Wales, the capital invested is mainly from companies. After privatization, England and Wales and Chile have undergone a tremendous increase in capital invested in the industry. The attributes of the water industry as a natural monopoly pose challenges for the companies: requirement of economy of scale; indivisibility of water provision; capital-intensive nature and non-transferable costs. In England, Wales and in Chile, the investment financing schemes have allowed these challenges to be met, reducing the system operational risks and improving the quality of the services.

The present high coverage of drinking water and sewerage in Chile has been a result of the privatization process, and as a consequence of the Government's early concern to improve its population's quality of life through investment and gradual and sustained improvement of the services.

In Spain, investment in urban water services has been important. In addition to the investments made by private companies, there has been substantial public funding. Investments are financed by public agents other than the holders of the services (Municipalities) such as: the Ministry of Environment; autonomous communities, and the European funds.

The distribution of powers of such agencies also follows the decentralized political regime. The General Administration of the State makes direct investments in infrastructure in the public interest through the General Directorate of Water of the Ministry of Environment. Funding for these activities has been made mostly by European funds (ERDF<sup>25</sup> and Cohesion Fund<sup>26</sup>) and state budgets. Moreover, through the provincial council and autonomous communities, the infrastructure is co-financed to ensure the performance of water supply and water treatment of the municipalities.

It would be convenient to establish uniform rules of financing the water systems so that the tariff ensures the full recovery of the costs, and thus avoid cross-subsidies, both of the different administrations for the water service and of tariff resources to finance services and other aspects not

25 The European Regional Development Fund (ERDF) is a Fund allocated by the European Union.

26 The Cohesion Fund of the European Union contributes to interventions in the field of the environment and trans-European transport networks. It applies to member states with a Gross National Income (GNI) of less than 90% of the EU average. As such, it covers all 12 new member states as well as Greece and Portugal. Spain is also eligible for the Cohesion Fund, but on a transitional basis (so-called "phasing out").

related to water, which do not bring efficiency to the management of the water service and hinder the transparency and comparability of the different systems.

## 2.4 WATER SUPPLY AND SANITATION COVERAGE

Access to improved water supply and sanitation in the UK is universal. It is estimated that 97% of households are connected to the sewer network. Access to water supply and sanitation in Spain is also universal, 98% of the urban population and 93% of the rural population is connected to sewers, while the remainder is served by on-site sanitation systems such as septic tanks.<sup>27</sup>

The last twenty years have witnessed the fast improvement of water supply and sanitation in Chile. The coverage of improved drinking water sources in rural areas has increased by 27% and the sanitation facility access of rural population has increased by 35%, reaching a national level of 96%.<sup>28</sup>

According to the regulatory agency SISS, in 2006 the Chilean urban areas' access to water supply stood at 99.8% and access to sanitation at 95.2%, which is one of the highest levels in Latin America.

## 3. CONCLUSIONS

### Efficiency evaluation and methods

The success of a regulatory system depends on key aspects such as managerial and institutional regulation efficiency. Managerial efficiency refers mainly to the technical efficiency capacities and tools of the operator, which has undoubtedly increased in recent decades. Regulation effectiveness is a complex issue to assess due to the peculiarities of each regulator. Generally speaking, the water regulation systems of UK, Chile and Spain have worked correctly in recent years; they have evolved and allowed water and sanitation services to be developed, to be flexible and at the same time have adapted to each country's political and cultural structures. The countries have significantly increased the level of their services as a result of the introduction of technical improvements as well as strengthening their regulatory frameworks.

27 Moreover, about 10% of treated wastewater in Spain is being reused, primarily for irrigation and landscaping.

28 UNICEF / World Health Organization Joint Monitoring Program (JMP) for Water Supply and Sanitation, "Progress on Drinking Water and Sanitation 2012" However, these results may contain bias because the research conducted by JMP covered just partial population in each country; 7% in the United Kingdom, 19% in Chile and 14% in Spain.

The availability, access and quality of information are a key issue in the interaction between water operators and regulators. Thanks to the available information it is easier to set strategic goals and conduct the water policies that each country needs. Likewise, it is important for benchmarking analysis and the market can be an important ally to define quality standards and for the regulators to review their compliance.

Both UK and Chile evaluate the relative efficiency for each company in the tariff design. The UK ranks the water company and sets the X-efficiency factor for each company compared to the industry average efficiency level. The evaluation of the relative efficiency is based on the data of past performance of current operators. Finally, the regulator publishes its final determination taking into account efficient costs, initial tariff levels for that pricing period and the X factor for each company. Chile, by creating a hypothetical efficient firm model in the assumption of an ideal operational environment, evaluates the gap of efficiency between the ideal virtual optimized water company and the actual operator. The standard of efficiency is set as the best solution to evaluate an efficient firm model.

In the price review in Spain, the company is not compared with either the industrial peers or a hypothetical best practice. Despite this and the improvement in information that this would represent, the market competition defines optimal standards above the regulated minimums and the regulators review KPIs compliance. The water industry in Spain has thus succeeded in becoming an international benchmark, taking its solutions and technology to new markets.

### **Centralized vs. decentralized models**

UK and Chile are examples of centralized and mainly privatized systems, though with different business models. They have implemented national regulation entities which approve 5 year business plans of water operators, set tariffs and investment policies. Nonetheless, companies are not usually directly comparable, differing in size, quality of service, operating environment and numerous unquantifiable factors.

On the other hand, Spain is a decentralized system where water infrastructure and price setting policies are in the hands of municipal and regional administrations, following the Spanish decentralized political framework where autonomous communities have a high level of powers in many domains. This decentralization to the municipalities enables a higher capacity to integrate local elements and sensibilities and gives more flexibility to municipalities to manage and cope with their local requirements on an

annual basis. It also uses different public-private partnership forms according to their needs, always following the European Union Water Framework Directive. In contrast to national regulators from UK or Chile, which set business plans for operators, the market and the competition in Spain set the service targets and provide tailored solutions to the municipalities. In addition, decentralized systems are an opportunity to reduce intermediary bodies and costs of tariff review and reporting procedures, thus eliminating duplicities in functions and supervisory activities.

With the aim of implementing efficient goal-oriented systems, Water Framework Agreements have been adopted, such as in Barcelona (Aguas de Barcelona) and in other cities, where the companies have certain goals related to water quality, environment or customer management. Currently, when subjects such as the scarcity of water, energy efficiency or recycling have taken a central importance, these initiatives are even more necessary than some years ago.

Along these lines, an improvement in the regulation mechanisms, based on benchmarking techniques and an increase in the comparative information, together with the advantages of the competitive market indicated, can continue to provide progress in the industry.

### **Final conclusions**

Finally, every system has its advantages and drawbacks, but in terms of water supply and sanitation coverage and quality standards, all three systems, have reached excellent levels of technical efficiency, despite having different regulatory frameworks, investment financing models, private sector involvement policies, water resources and hydrological characteristics.

A fundamental factor that all three countries — UK, Chile and Spain — have in common is the strength of their respective regulatory frameworks. This guarantees legal certainty and stability to investors and enables the development of the water industry. Regardless of how centralized or decentralized the different models are in each country, it is fundamental that the regulatory frameworks enable the level of investment that the systems require to maintain optimal service levels, that they encourage innovation and technical developments and that they promote an efficient use of the resources.

## BIBLIOGRAPHY

AGBAR, Cátedra “L’Aigua a Catalunya, una perspectiva per als ciutadans”, (Barcelona, Spain) (2006)

DOMPER, María de la Luz, “Desregulación del sector sanitario en Chile”; *Revista de derecho administrativo económico / Pontificia Universidad Católica de Chile, Facultad de Derecho*. (Santiago, Chile). Vol 4, nº 1 (Jan-Apr 2002); 187-200.

GÓMEZ-LOBO, Andrés, VARGAS, Miguel, “La regulación de las empresas sanitarias en Chile: una revisión crítica”; *Perspectivas: en política, economía y gestión / Universidad de Chile, Departamento de Ingeniería industrial*. (Santiago, Chile). Vol. 6, No. 1 (2002), 79-109.

History of the health sector in Chile; <http://www.siss.gob.cl/577/w3-article-3681.html>

JOURAVLEV, Andrei, “Regulación de la industria de agua potable”; *Serie recursos naturales e infraestructura / Comisión Económica para América Latina, División de Recursos Naturales e Infraestructura*. (Santiago de Chile). No. 36 (Dec. 2001), 2 v.

Ley de Aguas, Boletín Oficial del Estado (Madrid, Spain) (2012)

CHANG, MIAGO. Master Thesis of the programme “Master Management, Organization and Business Economics” (MMOBE), UAB, 2012. This study “International Overview of Regulation Frameworks for the Urban Water Cycle in the United Kingdom, Chile and Spain”, contains extracts based on the author’s Master Thesis.

Ministerio de Agricultura, Alimentación y Medio Ambiente, “Libro Blanco del Agua” (Spain)( 2000)

PERALTA ANABALÓN, David, “El marco jurídico e institucional del sector sanitario chileno”; *Revista de derecho administrativo económico / Pontificia Universidad Católica de Chile, Facultad de Derecho*. (Santiago, Chile). Vol 2, nº 2 (Jul-Dec 2000); 437-454.

PERALTA ANABALÓN, David, “Visión general del derecho sanitario de agua potable y alcantarillado: sus principales instituciones”; *Revista de derecho administrativo económico / Pontificia Universidad Católica de Chile, Facultad de Derecho*. (Santiago, Chile). Vol 1, nº 2 (Jul-Dec 1999); 409-416.

PERALTA ANABALÓN, David, “Imperfecciones de la regulación de los servicios sanitarios de agua potable y alcantarillado”; *Revista de derecho administrativo económico / Pontificia Universidad Católica de Chile,*

- Facultad de Derecho. (Santiago, Chile). No. 16 (Jan. /Jun. 2006), 157-166.
- SÁNCHEZ C., José Miguel, SANHUEZA, Ricardo A., "Autonomía y regulación en el sector sanitario chileno"; *Estudios públicos / Centro de Estudios Públicos*. (Santiago, Chile). No. 77 (summer 2000), 165-185.
- "El precio del agua. Aspectos jurídicos y financieros en la gestión urbana del agua en España", *Fundación Agbar* (Barcelona, Spain) (2012)
- BALLANCE, Tony & TAYLOR, Andrew. *Competition and economic regulation in water: the future of the European water industry*. London: IWA Publishing, 2005.
- UK Round Table on Sustainable Development. *Economic regulation: the role of economic regulation of energy, water and transport in furthering sustainable development*. England, 1998.
- ROUSE, Michael J. *Institutional Governance and Regulation of Water Services: The Essential Elements*. London: IWA Publishing, 2007.
- DEFRA. *Water for Life: Market Reform Proposals*. England: DEFRA, December 2011.
- HELM, Dieter. *Water, the Environment and Regulation: Changing Functions, Changing Frameworks*. England: New College, Oxford, 20th. February, 2005.
- HELM, Dieter. *The Draft Water Bill – A Critique*. England, 10th. September, 2012.
- HELM, Dieter. *A new regulatory model for water: the periodic review, financial regulation and competition*. England, 6th May, 2008.
- ERBETTA, Fabrizio & CAVE, Martin. *Regulation and efficiency incentives: evidence from the England and Wales water and sewerage industry*. England: University of Warwick. Published online, 1st December 2007.
- UK Water Industry Research. *Research and Innovation in the UK Water Industry*. England, 2011.
- Sir BYATT, Ian. *Water: Supply, Prices, Scarcity and Regulation*. England: Institute of Economic Affairs, 6th August, 2012.
- OFWAT / DEFRA. *The Development of the Water Industry in England and Wales*. England, 2006.
- BALLANCE, Tony & TAYLOR, Andrew. *Competition and economic regulation in water: the future of the European water industry*. London: IWA Publishing, 2005.

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