Contracting water services with public and private partners: a case study approach

Francisco Silva Pinto, Nuno Ferreira da Cruz and Rui Cunha Marques

ABSTRACT

The provision of water services is frequently a responsibility of local governments. Although municipalities remain accountable to the population for the availability, affordability, and quality of these services (facing the political repercussions of the perceived outcomes), the current operators may have different organizational models. Regardless of the utilities' governance model (direct or indirect delivery, public, private, or mixed ownership), it is a good practice to establish the rules, objectives, and administrative procedures between the competent authorities and the operators (or the partners) in a written agreement. In this paper we compare the contracts of two Portuguese utilities with different governance models: a public–private partnership and a public–public partnership. Since the best-practice guidelines are analogous, the (good) contracting practices should not differ significantly between the two arrangements. However, the results of the case-study analysis show that there are major differences in crucial details between the contracts employed, and that in many aspects the public interest is not safeguarded.

Key words | contracting, public–private partnerships, public–public partnerships, risk management, water utilities

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INTRODUCTION

In recent years, local governments around the world have been turning to diversified governance models for the delivery of local infrastructure services (Magara *et al.* 2007; Argento *et al.* 2010). Many factors contribute to this trend: decentralization of responsibilities, constraints on public finances, stricter quality standards, rundown infrastructures, among others (OECD 2007). To cope with these complex challenges, the attention of academics, policy-makers and practitioners shifted from technical issues towards the search for new 'managerial' and institutional solutions (Spiller & Savedoff 1999).

These 'managerial' approaches basically followed two paths. One was the delegation of water utilities' management to the private sector through concession contracts or other contractual arrangements. The second reform strategy kept the management of the utilities within the public realm, but tried to introduce management practices associated with the private sector in a continuous search for better performance (Schwartz 2008). The coexistence of different managerial approaches propelled a renewed interest among scholars in developing the capacity and analytic techniques to assess and measure (e.g., resorting to cost or production functions) water utility performance (Shirley & Ménard 2002).

Furthermore, those trends led scholars and practitioners to focus on additional particular objectives, as confirmed by Chenoweth (2012) in a pragmatic example. Also, Berg & Marques (2011) addressed several quantitative studies in which the 'objectives pursued' had a clear pattern, the most significant being: the market structure (e.g., economies of scale and scope), ownership (e.g., public vs. private), incentives (e.g., introduced by changes in regulation and governance), and performance (e.g., by comparison as in benchmarking).

In most of these topics, as highlighted in the literature surveys developed by Abbott & Cohen (2009), Berg & Marques (2011), and Carvalho *et al.* (2012), several practitioners

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and academics achieved antagonistic results. A number of studies have tackled the issue in terms of the influence of ownership on efficiency (Braadbaart 2002), or on the level of investment, as well as on the financial structure and costs of water utilities (see Romano *et al.* 2013). However, regarding the influence of the provider's ownership on relationship details, between principal (e.g., municipalities) and agent (i.e., operator), there is an evident scarcity of studies addressing the differences and similarities among the several arrangements. Nonetheless, contract management analysis can be found related to performance indicators, tariff-related issues, contract monitoring, mechanisms for conflict resolution, and risk mitigation.

That is particularly evident in public–private partnerships (PPP) related literature, with significant examples from around the world (e.g., see Casarin *et al.* (2007) for the Buenos Aires contract features and management and Marques & Berg (2011a) for a contract management analysis covering different PPPs in Portugal). Concerning a public–public (principal-agent) relationship, it is important to highlight the emphasis put on internal incentive contracting as a significant performance driver (Chang *et al.* 2003; Mugisha *et al.* 2007).

The lack of consensus in the literature (along with unique circumstances related to the access to water resources, national income differences, and different legal systems) contributed to distinct water utility arrangements being sought, leading to a great diversity around the world. In recent research efforts, the focus has been on the implementation of PPP arrangements (Yamout & Jamali 2007). However, local authorities have also been experimenting with a different type of partnership: the public–public partnership (PUP). In these agreements, local authorities (responsible for the provision of water services) form an institutional partnership with the central state (or a public company owned by the state).

In order to identify 'how' different governance models influence contracting practices and 'why' they were selected by the decision-makers, the current paper analyses two Portuguese case studies through the same lenses/themes: one purely contractual PPP (cPPP) and one PUP.

This paper is organized as follows: after this introduction, the second section briefly mentions the ideal-typical governance models for the delivery of utility services, comparing them in important theoretical governing aspects. The Portuguese water sector is broadly described in the third section while the two case studies are presented and discussed in the fourth section. The fifth section draws some concluding remarks.

SERVICE DELIVERY MODELS

Range of governance structures

Over the last decades, the management of infrastructure services has engaged into institutional and managerial reforms in order to evolve into more business-like and performance-based models with a degree of autonomy from local governments (Hughes 2003), resulting in the diversification of organizational forms and ownership structures (Wettenhall 2003). As shown in Figure 1 there are many conceptual models for utility service provision.

If a municipality chooses to produce the services itself, it can use a municipal department or create a structure with some degree of financial and administrative autonomy. Conversely, a municipality can choose to deliver the service through an autonomous entity (public, mixed, or private), extending the range of options.

Municipal (public) companies are owned by local governments. The PUP concept, although occasionally used with a broader meaning, refers to the cooperation between public authorities of different administrative levels in a third corporate entity (generally a joint stock company). The transition from public provision (direct or indirect) to indirect private provision are generally referred to as privatization and can assume a variety of forms, bearing the possibility to be designed upon different needs outlining the private involvement (Guislain & Kerf 1996).

The institutionalized PPP (iPPP) type is a hybrid mode of provision where the public and private partners are equity owners, the municipalities generally being the retainers of the dominant influence over the company. A purely contractual type (cPPP) is an investor-owned enterprise (da Cruz & Marques 2012). Nevertheless, private participation/involvement can differ depending on several aspects, such as asset ownership, responsibility for investments, assumption of risks, duration of contract, and the payment structure (how the private partner is paid for the

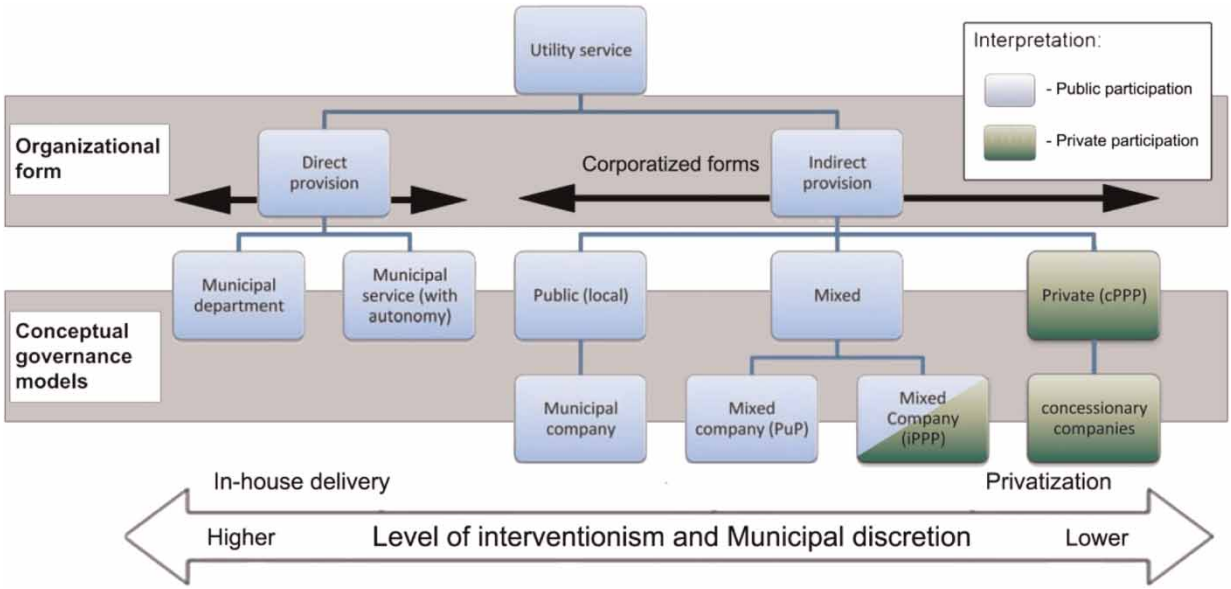

Figure 1 | Utilities conceptual governance models.

service: e.g., a fixed payment by the public partner or directly from tariffs).

What is the right governance model? Setting theoretical features for comparison

It is an interesting undertaking to compare the various models according to some important governing features in order to identify the main theoretical strengths and limitations, stressing possible 'trade-offs'. This way, following the basic characteristics delineated by the model's typology (as highlighted in Bakker (2003) and McGranahan *et al.* (2001)), such as organizational structure, accountability mechanisms, decision-making, goals and incentives, we inferred the theoretical propensity in which they shape those conceptual models, as illustrated in Table 1. Thus, Table 1 attempts to describe the ideal-typical models by allocating theoretical features (and not empirical results). The next subsection will further contextualize such classification. Note that those features are ranked from (– –) the least desirable, to (++) the most desirable.

A number of empirical studies have attempted to compare some of the ideal-typical governance models described in Figure 1, in several sectors (particularly regarding 'economic performance' or the 'social concerns' features, e.g., Bel *et al.* 2010); however, it is worth mentioning that empirical analyses in this context (e.g., efficiency analysis) are sometimes biased because local governments may be more prone to contract out the services when the services are unprofitable or when major investments are required (causing unbalanced data sets).

Depending on factors such as the business size and nature, demography, and geography, among others, the most adequate model might also change. Indeed, it would be simplistic to apply the same model and approach to services with very distinct conditions. If a municipal autonomous service provides an adequate response to the service demands, the adoption of a concession model (for example) could be 'overreaching'. Massarutto & Ermano (2013) state that the adoption of a 'one-size-fits-all' model might lead to widespread weak results (those authors addressed the concession model case in Italy).

Furthermore, the comparative analysis of financial costs of capital invested, personnel, and production costs is not enough to justify the choice for one of the alternatives to deliver public services (Brown & Potoski 2003). Those authors highlight that costs associated with negotiating, monitoring, and enforcing contracts (more generally, the transaction costs) must also be considered in the analysis of alternative forms of production.

Table 1 | Conceptual governance models comparison, based on specific theoretical features

Features	Municipal department	Municipal autonomous services	Municipal company	PUPs	iPPPs	cPPPs
Economic performance	−	−	−	+	−	++
	No specific obligation, nor priority	No specific obligation, nor priority	No specific obligation, nor priority	Efficient performance, contract obligations	No specific obligation, nor priority	Maximization of profit, efficient performance
Social concerns	+	+	+	+	+	−
	Concerns with feedback in public policy process	Concerns with feedback in public policy process	Concerns with feedback in public policy process	Concerns with feedback in public policy process	Concerns with feedback in public policy process	Mainly price signals and profit maximization
Information asymmetries (absence)	++	+	+	−	−	−−
	Public officials in charge, hierarchy	Link with managerial board exists, although separate entity	Link with managerial board exists, although separate entity	Slight link with managerial board through shared company	Slight link with managerial board through shared company	Trivial link with managerial board, only contract
Political patronage (ability to avoid)	−−	−−	−	+	+	++
	Public officials, voters opinion, hierarchy	Public officials, voters opinion, hierarchy	External entity although still highly connected	Shared entity, contract	Shared entity, contract	Only contract to enforce
Public perception	+	+	−	−	−	−
	Guardian of public interest	Guardian of public interest	Profit oriented or inefficient performance	Profit oriented or inefficient performance	Profit oriented or inefficient performance	Profit oriented or inefficient performance
Ease in long-term flexibility (for the municipalities)	++	++	++	+	−	−−
	Hierarchy, full ownership	Hierarchy, full ownership	Full ownership	Mixed ownership, only public partners	Mixed ownership, contract	Contract clauses
Ability to redeem assets and services	++	++	++	+	−	−−
	Hierarchy, full ownership	Hierarchy, full ownership	Full ownership	Mixed ownership, only public partners	Mixed ownership, contract	Contract clauses, take over, litigation
Low attractiveness to corrupt/ maladministration	+	+	−	+	−	+

(*continued*)

Table 1 | continued

Features	Municipal department	Municipal autonomous services	Municipal company	PUPs	iPPPs	cPPPs
	Public officials in charge, hierarchy	Public officials in charge, hierarchy	External entity, but nepotism in selection	Central state partner, multiple municipalities	Mixed ownership, nepotism in selection	Different players, contract
Ability to avoid overinvestment[a]	++	++	+	−	−	−
	Direct link, ratepayer opinion	Direct link, ratepayer opinion	Ownership external entity	Private shareholders, justify the partnership	Justify the partnership	Private investor
Human resources management	− −	− −	+	+	++	++
	Pure civil service	Pure civil service	Mix situation	Mix situation	Pure corporative status	Pure corporative status

[a]The background of the shareholders holds a significant meaning here as, in a worldwide basis, they enjoy deep connections with construction companies (da Cruz & Marques 2012).

Tavares & Camões (2007) argue that there are numerous factors with important weight, such as the costs of direct provision of the service, the influence costs resulting from hierarchical centralization of authority, the negotiation and monitoring costs of contracting with an external provider, the protection against uncertainty present in the political arena, and the protection of social values such as justice, equity, and the public interest.

Different governance models: a brief description

Municipal departments rely significantly on municipal budget allocations and therefore are more prone to political 'interference' (Tavares & Camões 2007). The mayor is politically and directly responsible for the effective satisfaction of citizens' needs which might lead to overzealous authorities and/or personal interest situations. There is an internal delegation of authority with latent costs that fall under the bureaucratic failure umbrella. In addition, the influence costs tend to increase with the number of hierarchical levels.

The civil service law enforced in in-house models is often seen as an obstacle to efficient management. However, this rigidity in human resources management is justified as a means to guarantee the continuity and political neutrality of public servants, even if it results in inefficient behavior. The department joint balance sheet and the relevant incapacity of some municipalities to raise financial instruments may endanger the sustainable development and maintenance of water services (OECD 2007). Underinvestment undermines the network robustness and makes it more vulnerable to disruptions (OECD 2007). The corporatized arrangements share several characteristics. As da Cruz & Marques (2012, p. 742) state, the rationale for corporatization itself resides in 'crafting a public governance structure incorporating certain appealing features of private enterprises, e.g.: clear and stable objectives, incentives for efficiency, flexibility in human resource management, and the use of accelerated procedures in the procurement by the special purpose entity'. This feature is not necessarily desirable since it may be a gateway for corruption or favoritism; nonetheless, it is usually perceived by decision-makers as a very useful tool.

However, municipal companies are often bounded by too many goals and, in practice, it is very difficult to replicate the discipline and performance of private companies (da Cruz & Marques 2011). Nonetheless, municipal corporations have larger managerial discretion in administrative and personnel decisions and are mainly self-financed. With this external delegation of authority comes the inherent contracting and monitoring responsibilities, and if the relationship between principal and agent does not have a sound basis (e.g., suitable contract specifications), it

might harm quality standards or hinder long-term economic sustainability of the services (if the corporatization mainly envisages off-budget spending). In the externalized governance models, there is a higher flexibility in both recruiting more qualified workforce and general staff management, related to the use of private law.

Among the corporatized models there is an option of partnerships with higher administrative levels, which might be able to provide the opportunity to induce capacity building, reduce inefficiency, and sharing investments, management overheads and other costly resources (PEAASAR II 2007). This is in line with recommendations from the OECD (2007), which highlights the urge for co-operation and constructive interaction among national, regional, and local governments in infrastructure planning and operation (e.g., to improve the reliability of infrastructures which depends on their geographical interconnectedness and access to funds).

The partnerships with private partners offer appealing possibilities to the existing municipal budgetary constraints allowing the financing of needed investments while avoiding public expenditure and/or debt. This private partner participation is also justified by a desirable efficiency increase in the use of public resources. These objectives arise due to high requirements of financial, technical, and resource management expertise, along with the maintenance of general sustainability conditions during the contract life cycle, possibly demanding innovative solutions. In theory, private sector involvement allows optimization of processes, operations, and management, granting a feasible opportunity to explore economies of scale and scope. In fact, there is a worldwide trend towards further private participation, which can improve with additional risk sharing knowledge in attempting to assign the respective risk to the contractual party that is best able to mitigate or to bear it (Lee 2010; Marques & Berg 2011b).

However, PPP agreements entail several downsides, such as high contract preparation costs, possible agent opportunism, contract renegotiation or termination, difficult risk allocation, and likely shareholders profit-seeking attitude (Marques & Berg 2010).

As Vining & Boardman (2008) state, companies that are jointly owned by private and public shareholders can lead to the worst of both worlds, where neither high profitability nor worthwhile social goals are achieved. Indeed, there might be agent opportunism with alarming consequences in negotiating, monitoring, and enforcing contracts; also, the financing and needed investments are subjective, and sometimes reveal permeability to nepotism (Guasch 2004). There are also latent market imperfections, namely the number of bidders and possible dominance of the market, raising the probability of collusive behavior (Bajari *et al.* 2009).

In the end, if the elected officials are relatively free to choose the governance structure of service delivery, the choice may fall on the option that enhances political benefits (e.g., electoral gains independently of the consequences in terms of economic efficiency). However, even if the choice of the governance model is a political decision, that selection should be sustained in objective technical studies, applying specific decision support tools (e.g., public sector comparator, affordability caps, economic and financial viability studies).

Marques & Berg (2011b) highlight the prospect that some major problems of local utilities might be neither technical nor solved by developments in science and engineering. Instead, contract design, institutional incentives, interagency collaboration, benchmarking, and management information systems represent the high payoff areas for those seeking to improve water sector performance, and they are clearly contingent upon the chosen governance model.

PORTUGUESE WATER SECTOR

Institutional and regulatory framework

In Portugal, there is a clear separation between the wholesale (bulk) and retail (end-user) activities in water and wastewater services, which are fashioned respectively into regional and municipal systems. The role of the state, as the main operator through state-owned companies, together with the existence of a sector-specific regulatory agency ERSAR (the Portuguese acronym for Water and Waste Services Regulation Authority) are important institutional features.

Prior to 1993, in Portugal, most water utilities were vertically integrated, managed in an unsustainable way and had

difficulties answering the new challenges that followed entry to the EU (Marques 2010). Thus, the Portuguese Government reorganized the sector so as to ensure universal access to continuous services at affordable prices, to guarantee a high quality of service and to promote environmental sustainability. Hence, some reforms that had important goals took place. One of such goals was to allocate the responsibility for water distribution and wastewater collection to municipalities, assigning to the state further investments in bulk activities through the creation of multimunicipal systems (state-owned systems that cover multiple municipalities) to be managed in a business-like fashion, through concessions to public companies. In the current paper by public companies we mean entities where the central state, directly or indirectly through another state-owned entity, has the majority of shares. These companies can be 100% owned by the central state or have municipalities or private investors as partners (minority equity owners), whenever adequate, under proper legal procedures.

Those systems, jointly with the establishment of conditions for shared management between the central state, municipalities, and possible minor private partners, promoted the development of PUP entities upon the creation of a state-owned 'national champion': the holding Águas de Portugal (AdP). Indirect management of municipal systems (municipally owned, mainly the retail segment), by way of concessions to private enterprises, was enabled through public tenders (Correia & Marques 2011).

As those reforms took place, it became imperative to monitor and supervise them; hence, a regulatory agency was set up in 1998 to regulate multimunicipal and municipal concessions. However, nowadays the regulatory model has broader regulatory competences and, since 2009, a wider range of activity covering all delivery models. ERSAR is a public institute endowed with administrative and financial autonomy but until now subject to the influence of the Ministry for the Environment (although receiving its budget from specific taxes). Its regulatory activities include three important fields, as mentioned in Table 2.

Due to water and wastewater services' inherent characteristics (e.g., natural monopoly), the quality of service and economic sub-fields are paramount regulatory activities. Since 2009, and effective as of 2011, ERSAR 'regulates' all delivery models; however, this development requires an increased maturity. Indeed, an improved compliance and standardization in reporting is needed, mainly by in-house models, related to the information requested by ERSAR, in order to enable prompt and efficient analyses, enhancing the regulatory procedure.

Furthermore, this 'universally applied' economic regulation is still at an initial phase; the system owner holds too much discretion in tariff-related issues, in several cases undermining the service sustainability (the municipal in-house models are such cases). Table 3 briefly describes the scope of ERSAR's regulatory activity in accordance with the mechanisms – that establish the relationship in legal terms (e.g., existence of contracts and the ERSAR's scope – that define the relationship between the system's owner (central state or municipalities) and the provider. Despite its important regulatory activity and the attempt to provide a culture of reliable and intelligible information for all, ERSAR still bears a limited coercive power, as the ability to impose sanctions is quite narrow (i.e., mostly regarding water quality levels).

Market structure

The reforms undertaken reshaped the market structure of water and wastewater sectors, which is now quite complex. Table 4 illustrates this, combining the type of providers, the

Table 2 | ERSAR's regulatory model for the water and waste sectors (adapted from ERSAR 2013)

Structural regulation	Regulation of operators' behavior	Additional regulatory activities
Contribution to: • the formulation of a national strategy of the sector • the clarification and improvement of the rules and legislation	Scope: • Legal and contractual monitoring • Economic regulation • Quality of service regulation • Water quality regulation • Consumer complaint analysis	Scope: • Collection, validation, processing and public disclosure of sound information • Innovation and technical support to the operators

Table 3 | Scope of ERSAR's regulation according to the provider's model (adapted from ERSAR 2013)

	State (including shares in multimunicipal systems)	Municipal (including intermunicipal systems)		
Scope	**Concessionaire**	**In-house**	**Delegation to local or mixed companies**	**Concessionaire**
Structural regulation[a]	The creation of such entity is established by a specific law decree for each entity	Opinion on its creation	Opinion on: • Viability studies • Procurement proposals and the public tender documents • Contract and its amendments	Opinion on: • Viability studies • Procurement proposals and the public tender documents • Contract and its amendments
Quality of service regulation	For all utilities, based on performance indicators, on its comparison and on the public display of such results (benchmarking, sunshine regulation), which has led to good outcomes by highlighting best practices and imposing a poor performance 'embarrassment' into the operators ensuing them to take efforts in correcting those deviations (Marques 2010)			
Economic regulation	Direct tariff regulation, mainly by evaluating tariff proposals, and budgets	Indirect tariff regulation, by a sample checking mechanism	Tariff regulation 'by contract', supervision	Tariff regulation 'by contract', supervision
Drinking water quality control	Evaluates the quality of drinking water supplied to end-users, compares with other operators and performs real-time follow ups on non-compliances, thus promoting greater quality of water			

[a]Each model has to follow specific laws that regulate the overall basis of the sector, and the general laws that define each model characteristics (e.g., in-house, associations, public enterprises, commercial societies, and public contracts).

Table 4 | Market structure of the Portuguese water sector (adapted from ERSAR 2013)

			No. of entities (Pop. × 1,000) [Pop. %]			
			Water supply		Wastewater	
Management model	**Main existing models**	**Systems' (infrastructure) ownership**	**Only bulk**	**Retail**	**Only bulk**	**Retail**
Multimunicipal concessionaire	State companies, PUPs	Central state	12, (6,147), [62.6%]	2, (575), [5.9%]	16, (6,728), [68.7%]	–
State/municipalities partnership	PUPs	Municipal	1, (265), [2.7%]	1, (332), [3.4%]	1, (265), [2.7%]	1, (333), [3.4%]
Municipal concessionaire	cPPPs	Municipal	1, (142), [5.5%]	27, (1,808), [18.4%]	2, (398), [4.1%]	22, (1,547), [15.8%]
Municipal companies	Local companies, iPPPs	Municipal	1, (51), [0.5%]	24, (1,766), [18.0%]	–	25, (1,784), [18.2%]
Municipal service with autonomy	–	Municipal	–	22, (2,232), [22.7%]	–	19, (2,191), [22.4%]
Municipal department	–	Municipal	–	191, (3,107), [31.6%]	–	197, (3,937), [40.2%]

systems' (infrastructure) ownership, the total number of entities according to their role in the supply chain, and the population covered.

Municipal departments are still the most common governance structures. However, in bulk water services multimunicipal concessionaires hold a significant share of the

population supplied. In the state–municipalities partnership model (PUP arrangements), the 'systems' (e.g., infrastructures, equipment) are owned by the municipalities. Thus, the municipalities and the state are required to sign a partnership contract, creating a single system and transferring the municipalities' responsibilities (e.g., drinking water delivery and wastewater collection) to the new co-owned entity, setting the basis for the delegation established by a management contract.

From a general point of view, Correia & Marques (2011) declare that in horizontal terms (e.g., number of utilities for a retail segment) there is a reduced degree of integration. ERSAR (2013) states that in the water supply sector nearly 38% are vertically integrated, although that value lowers to 33% in the wastewater sector. Concerning the services delivered, the utilities mostly provide water and wastewater services together, almost 95% and 60% for, respectively, retail and wholesale services (ERSAR 2013). Occasionally, the utilities competences include urban solid waste services and, less frequently, other activities such as urban transportation.

Today, almost the entire Portuguese population has access to water (95%) and wastewater (81%) services in good conditions, as there is an ensured water quality in 98% and proper wastewater treatment in 78% of cases (ERSAR 2013). However, the national situation encompasses a diverse set of realities, with dissimilar management models and scales, at different development stages and very distinct levels of service. Despite the extraordinary evolution in recent years, the current situation regarding the management of water and wastewater services continues to show some shortcomings in terms of capacity building in this area (e.g., some municipal departments are bound to have deficiencies at this level due to budget constraints) and in the search for efficiency (ERSAR 2013).

These asymmetries foster the creation of more integrated solutions at the local level or promote the privatization of the services. The two case studies presented correspond to these situations, which in accordance with the European doctrine and directives: (1) the PUP company is 100% public, and since the central state owns 51% of the shares it has to follow the state's business sector rules (whether this entity should be regarded as 'in-house' delivery – namely, if a public tender should have taken place instead of a 'direct award' to AdP – is not clear in light of the current legislation); (2) the cPPP is a private concession, as designated in the European Commission (2004) and is guided by the Eurostat rules (EPEC 2010) as described in da Cruz & Marques (2012). Namely, to be regarded as a PPP arrangement (and thus appealing features, such as the off-balance sheet treatment for the public partners, are applicable) 'most of the project risk' must be transferred to the private partner through a long-term agreement.

CASE STUDIES

Method

Financing restrictions, lack of capacity, new requirements, and the need to diversify service delivery made the municipalities opt for different institutional models instead of the 'classical' in-house department model of service provision (Argento *et al*. 2010; da Cruz & Marques 2011; Massarutto & Ermano 2013). The fact that cPPPs are being increasingly sought to solve local problems seems evident in the international literature (Guasch 2004; Schwartz 2008). However, privatization is often viewed as a hurdle from the political point of view, and thus municipalities are, increasingly, looking for further alternatives.

Thus, as PUPs are setting off on their initial steps in the Portuguese water sector, the company Águas da Região de Aveiro (AdRA) has an opportunity to undertake this analysis.

Contracts differ in their allocation of decision prerogatives, risks, and revenues, across the parties. Therefore, the comparison between different models seems of paramount importance, so as to understand the way they 'behave' in terms of risk and performance management: the former, linked to mitigation and allocation of 'project' risks; the latter related to the existing incentives and the consequences that might arise. For this purpose, we contextualized with the institutional environment (i.e., existing laws, market structure, and existence of a sector-specific regulator). To achieve such ends, there is a requirement to study institutional features, which necessarily places an emphasis on case-study research (Posner 2010).

In order to identify 'how' different governance models influence contracting practices and 'why' they were selected

by the decision-makers, the current paper analyses those two case studies through those same lenses/themes. Critics of this research strategy often argue that case studies have the problem of generalization (e.g., how can one make sure that the conclusions are valid elsewhere?). However, case studies are applicable to theoretical arguments and not necessarily to populations or universes. Moreover, as Yin (1994, p. 7) put it: 'how and why questions are more explanatory and likely to lead to the use of case-studies, histories, and experiments as the preferred research strategies. This is because such questions deal with operational links needing to be traced over time, rather than mere frequencies or incidence'.

Public–public partnership

The PUP entity analyzed is AdRA, and was created under a partnership contract signed in 2009 between the central government and several municipalities. The contract assumes the creation of a system consisting of the aggregation of all municipalities' water supply and wastewater previous systems, plus further equipment and infrastructure to be built, into one (designated as SARA, the unified system). The water and wastewater services are to be managed and operated by AdRA, which is a mixed central/municipal joint stock company. The SARA unified system and the entities responsible for water abstraction and delivery and wastewater treatment are depicted in Figure 2.

The 'web of contracts' and AdRA's overview are illustrated in Figure 3. The partnership encompasses 11 partners/shareholders: the central state (through AdP, holding a 51% stake in AdRA's equity) and 10 municipalities. In 2009 only nine municipalities entered the PUP agreement, the municipality of Ovar only signed the contracts in 2010. This triggered a review of the viability studies.

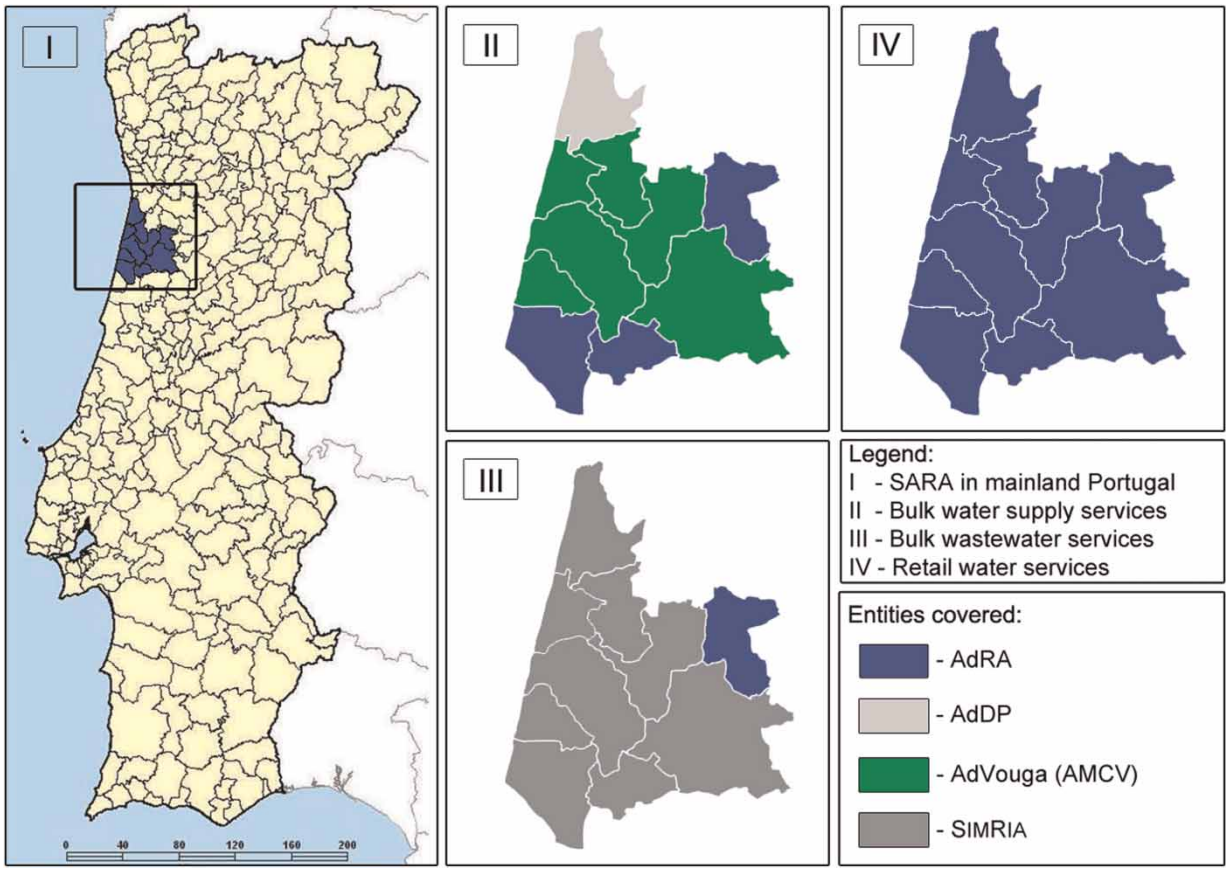

Figure 2 | SARA (unified system) and characterization of providers (updated as of 2011).

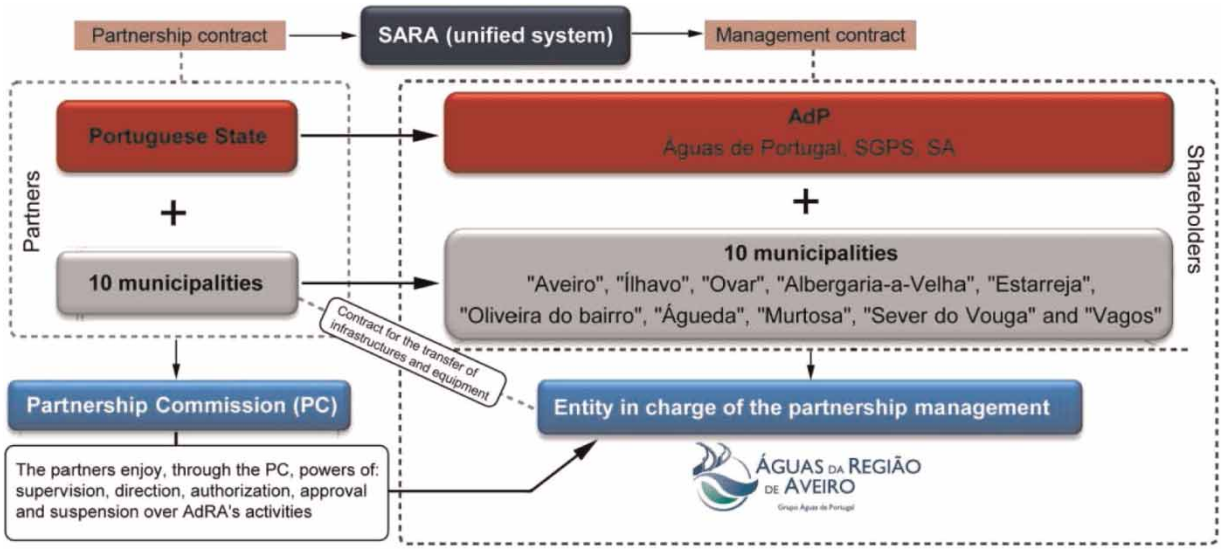

Figure 3 | AdRA's management model.

The PUP lifetime is 50 years, starting from the date of the management contract signature (September 2009). Figure 4 highlights the management contract timeline and the period in which this analysis was undertaken (2011, the first fully operational year), with reference to tariff periods and shareholders' investments rate of return criteria. The management contract is an agreement signed by the partners and AdRA that mainly contains: the partnership management details; specific objectives to be achieved; and execution deadlines for the main strategic initiatives. Furthermore, the partnership contract is preceded and justified by economic and financial viability studies. These studies legitimize the partnership by revealing the advantages of such integration at the local and national level. At the end of each tariff period/subperiod, the studies are reviewed.

Tariffs and risk management

Tariff setting will be subject to several periods. The first has the objective to harmonize all the previous tariff levels into one, with different development procedures for the municipalities but with the same end (to reach an even level). They are two-part tariffs consisting of a fixed charge plus a variable charge reflecting water consumption: the first has the objective to recover the access costs and the latter, depending on the usage degree, to recover the remaining costs. The tariff set for the first period is to be updated yearly in accordance with the Harmonized Consumer Price Index (HCPI). After the first tariff period, a mandatory review of the economic and financial viability studies and their assumptions will take place. Those reviews will support the next tariff levels, to be enforced in the respective tariff periods/subperiods.

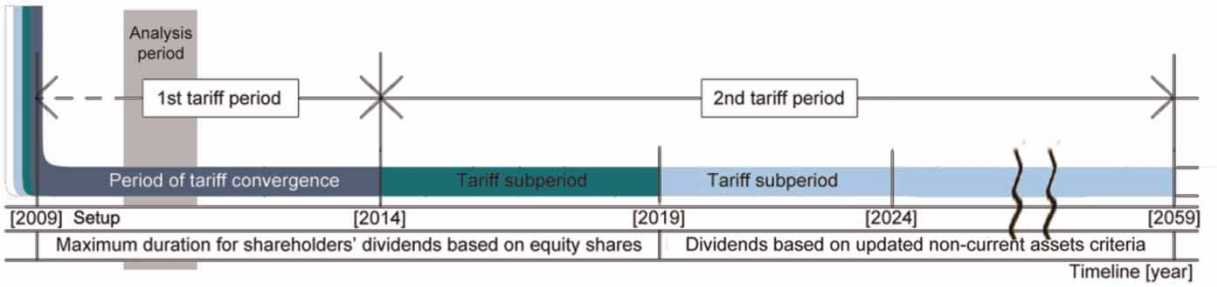

Figure 4 | AdRA's timeline.

The reviews will continue to be made on a 5-year basis. In the whole second tariff period the tariff levels will be updated according to a Factor Productivity Index (FPI), that considers the mentioned HCPI, the tariff variations of bulk segments and energy, the variation of personnel costs and financing costs (based on financial cost and debt). The FPI factors might be evaluated and adapted during the viability studies review in each quinquennial period.

It is mandatory to deduce directly into costs the estimated income not arising from tariffs themselves, including any supplementary income, operating subsidies, and financial income. The restoration of the economic/financial equilibrium related to the first tariff period deadline assumes a deviation between assumptions made and costs incurred, preventing full cost recovery (including taxes and shareholders' returns) to be achieved. The second tariff period reviews may also give place to a restoration if the previous conditions are confirmed. The restoration of that equilibrium may be settled via:

- tariff review;
- extension of the management contract deadline;
- direct compensation provided by those municipalities at fault;
- revision of municipalities' remuneration;
- any combination of the previous.

Tariff deviations are to be notified to the partnership commission, and fully recovered by integration in the next tariff periods. The proposed tariffs account for the minimum level from which it is possible to cover the activities commitments and dividends owed to shareholders.

In AdRA there are two different situations with important backlashes on risk allocation. The first is related to the transfer of infrastructure and equipment from the municipalities. It is settled upon the need to unify the systems, leaving, however, residual ownership to the municipalities. To reimburse for the transfer, the municipalities receive the mentioned return based on annual turnover bearing some risks, which are:

- any environmental liability raised due to infrastructures incorporated in AdRA's investment plans, dating back to situations prior to their investment deadlines written in the contract;
- civil liabilities conceived dating back to a date prior to their assignment into the contract;
- any financial liability associated with the condition of infrastructure/equipment, when there is a mismatch in the information provided by each local partner, upon the partnership formation.

In addition, new taxes (e.g., different municipal taxes) or a considerable increase in the existing ones, related to AdRA's main activities, are to be deduced from the respective issuer. The second issue is linked to the activity itself (the system operation and management). It comprises a set of 'rules' whose application leads to a 'cost plus' tariff model, assuring that the return on shareholders' equity will result, in an identical value, to the equivalent annualized return rates applied over the management contract life period, regardless of the company's performance. Indeed, the shareholders' return rate was made into a 'guaranteed' return rate that only varies according to the risk-free return rate index, over the contract life cycle period. This provides little incentive for efficient operation or investment and risks are transferred to the customers (Marques & Berg 2011b).

Performance management

Poor performance in a given financial year will only burden future tariffs without financial penalties to the shareholders, as the shareholders' return will be on debt to be paid in future years, being only postponed. Conversely, a good performance in a given financial year will also only influence future tariffs design, without financial benefits to the shareholders.

There are no requirements (meaning that there are no incentives) to avoid unbalanced budgeting (e.g., underestimate income/overestimate costs). Also, the shareholders do not have any penalty over their returns due to mediocre budgetary implementations. There is no sharing over results, since they always influence tariffs only; and it might be difficult in some cases to preserve the quality of service, as there are no penalties for low quality levels.

In AdRA the labor contractual relations are bound by the previous status of municipal employees who worked in the municipal 'in-house' systems. Thus, most of AdRA's employees went through an external mobility procedure

(loan of a public employee from the municipality to AdRA, due to public interest). In most of those there has been an adequate adjustment to the remuneration and contractual context of a private status labor relation; however, these labor contracts decreased from 81% in 2010 to 76% in 2011. Besides, there is a residual amount of cases where the employees retained the previous civil servant status (6% in 2010 and only 5% in 2011). Moreover, in 2011, the number of fixed-term contracts had risen from 5 to 11%, alongside contracts with indefinite duration from 7 to 8%.

Public–private partnership

The cPPP analyzed is Águas do Vouga (AdVouga). AdVouga is a municipal concessionaire encompassing a significant number of municipalities of the SARA system. It was created in 1996 to manage the bulk water supply system of an association of municipalities (AMCV) under a public procurement procedure. Hence, this partnership is regulated by the concession contract (and its amendment), the initial bid or proposal and the public tender documents (Marques & Berg 2010).

The AdVouga system expansion, fostered since 2003 by several studies and initiatives, was established through a contractual amendment in June 2012, enclosing two more municipalities (Vagos and Oliveira do Bairro) to improve the bulk water supply system. The amendment was preceded and justified by economic and financial viability studies, which legitimized the investments required and the value to be attained, related to the system reinforcement and extension. That solution entailed a 30.4 million euros investment that triggered a tariff review and extended the contract duration until October 2026.

AdVouga is owned by Aquapor, one of the main private providers in the Portuguese water sector, holding 36% of the private equity invested in municipal concessions (ERSAR 2013). The amendment performed included a reinforcement and extension of the previous system. Therefore, an investment had to be guaranteed amounting to 30.4 million euros, in which AdVouga was to contribute with 13 million euros through rent payments via medium- and long-term commercial bank loans, as highlighted in Table 5. This amount was established mainly based on the National Strategic Reference Framework (NSRF) contribution rate, the minimum flows thresholds, and the tariffs to be applied. Note that the NSRF is a programme for the 2007–2013 period, supervised mainly by the Ministry of Finance, it has broad objectives related to the promotion of sustainable development, subsidizing important projects with community funds (EU). The construction of water supply infrastructures is, naturally, eligible. Any change implies a revision of those values.

As a result, the rents to be paid to AMCV changed (see Table 5), the AMCV, nonetheless, being liable to apply them, when applicable, to finance the system expansion investment plan. Any delay in the rental payments shall give rise to the payment of interest at a rate equal to the Euribor (6 months). In addition, the regular rents are to be yearly updated according to the Consumer Price Index excluding housing. Those rents will be reviewed, if the investment plan features (e.g., contribution rates, schedule, or its actual value) or the consigned assets, suffer any change.

Tariffs and risk management

The concession contract establishes that AdVouga has to provide maintenance to the water system in question (infrastructure and equipment). Hence, AdVouga is fully liable for operational purposes; as for remuneration, AdVouga retains the revenue collected from the bulk water provided to

Table 5 | AdVouga concession financial details

				Tariffs	
Sources of financing	**Total (€)**	**Rent payments (€)**	**Year**	**€/m³**	**Period**
Cohesion Fund-NSRF (55.4%)	16,841,974	6,649,024	2012	0.3117	2012–2013
AMCV-AdVouga's rents (42.7%)	13,000,000	6,350,976	2013	0.3117	2012–2013
AMCV-Own funds (1.8%)	554,884	300,000	2014–2025	0.3922	2014–2019
Total investment	30,396,859	225,000	2026	0.4706	2020–2026

AMCV through AdRA, bearing in mind the existence of minimum amount thresholds. Upon the system expansion, AdVouga is liable to expand the delivery accordingly; and the rents, tariffs, and their updates, are to be reviewed. However, the ownership of infrastructures and responsibility to make investments remain with AMCV, being those based on specific biannual investment plans to be developed together with AdVouga.

The tariff model to be charged, which includes all operating costs and rents to be paid to AMCV, is a uniform volumetric charge that will evolve as displayed in Table 5. Any delay in the tariff payments shall give rise to the payment of interest at a rate equal to the Euribor (6 months) plus 2 p.p., further delays may allow AdVouga to suspend the water supply or any payments due to AMCV (e.g., rents). Those tariffs will be yearly updated by a formula based on labor costs, energy, and HCPI values, to be reviewed upon a system expansion or if any of those indices undergo a change greater than 20% from the values initially foreseen in the contract.

In the case where the amount of water supplied has a growth higher than 20% of the minimum flow threshold, the tariff charged will be modified. Further situations can also lead to that end, as: (1) meaningful change of the rules or legislation that leads to the alteration in procedures or costs not foreseen when signing the contract; (2) change in operating costs, as foreseen in viability studies due to technical improvements in, mainly, reagents (25%), energy (30%), or both (15%); and (3) change in rental payments to AMCV due to those reasons previously described. In addition, for tariff structural purposes, the shareholder's internal rate of return is 10.7%, as established in the viability studies. Further, concerning AdVouga's risk management, Figure 5 highlights the risk allocation as established in the regulatory contract.

The contract has clauses protecting the private sector from bearing several risks while ensuring economic and financial equilibrium during the contract. The minimum flows threshold and the establishment that an increase of 20% in the volume of water delivered leads to contract renegotiation are clauses that transfer those risks to the public sector, and it is an opportunity for the private partner to renegotiate without competition. Thus, it is important to prevent renegotiation, so as to avoid a noncompetitive (and, generally, nontransparent) environment, in which there are, usually,

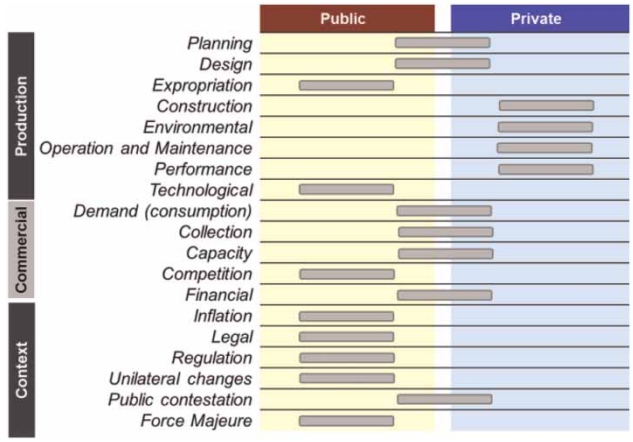

Figure 5 | Allocation of risks as established in the AdVouga contract.

substantial differences in information, legal skills, and technical support. Furthermore, the private partner may reopen other issues to its benefit. Hence, this circumstance by itself may promote opportunistic behavior (Guasch 2004).

The amendment created some unrest in a number of local decision-makers (www.regiaodeagueda.com/tag/agua-inquinada (consulted 12/10/2012)), as it was conceived as an apparent violation of competition principles (contract duration extended without public tender), lacking transparency and wasting the potential benefits that could arguably be achieved through an open tender procedure (access to competitive tenders/market is an important strength of the cPPP model).

Performance management

For monitoring and supervision purposes, AdVouga has to present monthly reports on: (1) the amounts of abstracted, treated, and pumped water; (2) the amount of water provided to each reservoir or delivery point; (3) accidental interruptions and system malfunctions; (4) analytical control and supervisory interventions; (5) reagents and consumables used; and (6) maintenance and other interventions together with the resources used/replaced. Further reports have to be presented on a yearly basis, related to the system functioning and based on joint inspections, specifying: (1) technical characteristics; (2) the yearly volumes of water, as developed for the monthly reports; (3) system efficiency, costs, revenues, staff, and financial situation; (4) renewal and repair measures developed; and (5) a global assessment. In addition, a report

on the biannual investment plans' development needs to be provided. In the case of noncompliance (e.g., deadlines), a penalty can be applied.

There are further penalties that can be applied by AMCV to AdVouga, mainly related to interruptions in water supply and the quality of water. If those failures harm the water quality and public health, AMCV may take over (during a reasonable period) the service management and operation. Then, all the measures conceived as needed shall be enforced, all costs being borne by AdVouga.

The contractual amendment created a monitoring committee composed of three members (one appointed by AMCV, another by AdVouga, and the last by these two appointed members). Despite not enjoying a binding force on its issued opinions, the committee has additional responsibilities, such as: (1) issue an annual report regarding the contract compliance, to be sent to AMCV and the sector-specific regulator ERSAR; (2) issue an opinion on the applicability of contractual penalties and their respective amount; (3) issue opinions, when required, on the risks effectively borne by AMCV and on disputes between parties (mainly related to contract clauses interpretation); and (4) hear both sides and collect their contributions to contract amendments.

Regarding the sunshine regulation carried out by ERSAR, AdVouga enjoys the highest qualitative evaluation in most indicators, except in the average collection period (financial) indicator in which it achieved the 'average' qualitative level, and in the cost recovery ratio (operator sustainability) where it achieved the 'unsatisfactory' level (ERSAR 2013). In addition, concerning water quality, AdVouga has a 100% rate of analysis within the parametric values.

CONCLUSIONS

Several recent case studies have continued to demonstrate that, irrespective of the actual governance model, good contracting practices are still not widely implemented by public authorities. Particularly, the two case studies analyzed contributed with specific details. Such outcomes are influenced by the contractual/legal basis and context, and are as follows.

The current study indicates that collaboration with different actors enables municipalities to undertake important investment plans, with clear benefits for the consumers in quality (especially in small municipalities where otherwise it would not be possible to carry out such investments) and a regional growth and development. By having AdP as shareholder, some benefits are attained: for instance, the presence of relevant know-how and experience acquired in the sector (e.g., by fostering the use of important management tools); and the possibility to further use commercial bank loans (e.g., municipalities have strict debt ceilings).

However, some problematic features were also identified. The shareholders' rate of return and the employment structure provide few incentives for an efficient operation. As observed with AdVouga, the existence of premiums and penalties (which are not allowed in the public sector) is what drives performance because otherwise there is no causality. Even if there is a performance evaluation framework, without significant incentives it will not be as effective. Perhaps the inclusion of performance drivers in the contract could be a notable improvement (see Mugisha *et al.* (2007) for some possible insights). Moreover, the cPPP model may take advantage of competitive pressures (if the access to the contract is regulated through an open tender with clear and measurable criteria).

The two case studies show that the poor protection of the public interest is not limited to contracts established with private partners. Among the many new models devised to cope with the financial hurdles of water utilities, the PUP arises as a way to increase the scale of operation and raise tariffs 'without privatization' (which may have some political advantages). Nevertheless, the fuzzy lines of accountability and the lack of performance monitoring mechanisms prevent the proper performance incentives to be put in place. A priori, it is not possible to name the best partnership model (public–public or public–private).

Governance models are not inherently 'good' or 'bad'; it all depends on the proper and effective allocation of risks and the existence of actionable contract management instruments. Indeed, when it comes to introducing appropriate incentives to operator efficiency and service quality, as well as effective risk allocation between the public authority, operator, and end-users, the devil is in the detail of the contractual mechanisms introduced and their rigorous enforcement.

The comparison of the contracting practices of the two partnerships leads to some unexpected conclusions.

Although the transference of risks to the private sector is somewhat limited, in the PPP agreement some risks are effectively allocated to the private partner (which, theoretically in the partnership, is better equipped to manage and mitigate most production and commercial risks). In the PUP agreement, the risk sharing is 'defined' mainly by contract, instead of clear guidelines in a specific law, all risks are kept on the public sector and, in reality, the customers bear the downside risks (which are transferred to them through tariff reviews).

Moreover, the existence of an external sector-specific regulator should be considered. In fact, regulators are originally designed to monitor private operators. The diversity in scope of ERSAR's regulatory activity, namely concerning tariff setting (or review) procedures, highlights the difference in power that the regulator enjoys according to the operators' governance model. In fact, legal and political difficulties arise in the cases where the regulator should sanction public providers (Ehrhardt & Janson 2010). These difficulties might be contentious for the specific case of PUP agreements where the major shareholder (the central state) oversees the external regulator. Indeed, the central state 'acts' both as a player (operator in retail services) being arguable the nonexistence of tender procedures along with its effect on the market, and as a referee (regulator). Furthermore, from a public interest normative point of view, external regulators should have the same economic regulation power over all operators, irrespective of their governance model.

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