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# “Remunicipalization of Local Public Services: Policy Drivers and Changing Prices”

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## *Abstract*

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Remunicipalization is triggered primarily by disappointment with the outcomes of private management of local public services, but an ideological preference for public management might also play a role. Even though urban water delivery is the service most affected by remunicipalization in developed countries, little empirical evidence is available on its effects. Using a sample of Spanish municipalities, this paper assesses the change in the price of urban water following remunicipalization as compared to privatization. The main finding is that remunicipalization leads to smaller increases in price; this outcome is, however, due to a few atypical municipalities with abnormally low prices for water before the policy reform. Once these influential observations are controlled for, the question of whether the reform consists of remunicipalization or privatization makes no difference regarding the change in prices. It is also found that remunicipalization is much more likely in local councils governed by extreme left-wing parties.

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Much of the 20th century has seen strong government intervention in the economy, grounded in the belief that the market is, by itself, incapable of ensuring efficient allocation of resources; the State must intervene accordingly to correct market failures. In the second half of the century, however, some theoretical perspectives critical of government intervention emerged, influenced by the *Chicago School*—led by George Stigler and Milton Friedman—and the *Virginia School*—exemplified by James Buchanan. These schools of economic thought soon began to exert major academic and political influence, and from the late 1970s onwards governments in many developed countries started to undertake policy reforms aimed at liberalizing and privatizing economic activity. Privatization policies received a major boost under Thatcher’s privatization program launched in the United Kingdom in the early 1980s, and rapidly spread worldwide. Market re-regulation and privatization were more evident in large industries operating at national level, but they were also present at the level of local public services, including refuse collection, urban transport, or the urban water service.

The privatization of the provision of urban water has generated more controversy than any other local service. In this regard, urban water shares some of the features of merit goods—at least up to a certain level of consumption. In addition, the water industry is organized around local natural monopolies. Both features were employed as arguments against privatization or, at least, to advise extreme caution when opting to privatize. In this respect, legislation in some developed economies did not allow for the privatization of urban water provision, while countries such as the Netherlands and Uruguay even safeguarded national regulations to ensure public provision. At the opposite extreme, in countries such as England and Wales the urban water service has been entirely privatized, while in the Czech Republic and Chile private utilities provide the service to the entire urban population. In France, Spain and Hungary—to name just a few European countries—private utilities deliver urban water to around half the population.

Nearly five decades after the first privatizations, and with no conclusive evidence as to the superiority of private management of urban water, numerous municipalities around the world have returned to public provision. They include large cities such as Berlin, Naples and Paris in Europe, Buenos Aires in Latin America, Atlanta and Hamilton in North America and Dar es Salaam in Africa; and also Malaysia in Asia. At the same time, citizen movements have sprung up in many countries, which—in addition to strongly opposing further privatizations—are calling for a return to public hands of concessions already granted. However, empirical evidence on the actual effects of remunicipalization of the urban water service is still rather limited, and mainly focuses on case studies; e.g., Paris (Le Strat, 2010; Turri, 2022a), Berlin (Lobina et al., 2019b) or Naples (Turri, 2022a). In particular, the impact of remunicipalization on the price of urban water has received scant attention and has also been limited to case studies—e.g., the papers mentioned above document that in Paris and Berlin prices dropped following remunicipalization, and there was also less investment in the network.

Against this background, this paper assesses the change in the price of water after remunicipalization as compared to privatization in a sample of 136 Spanish municipalities that either remunicipalized (52 cases) or privatized (84 cases) the delivery of urban water in the period 2000-2020. As far as the authors are aware, Porcher (2012) analyzed the variation in the price of urban water in a sample of French cities after changing the production mode, using difference-in-difference techniques and discontinuous data for years 1998 to 2008. In doing so, the change in prices in cities switching either from public to private management or to private to public management were both compared to changes in municipalities that did not alter production mode. The research in the present paper differs from Porcher's approach in that the year in which the policy reform occurred—either remunicipalization or privatization—is precisely identified, in addition to the price of water (and other relevant variables) in the year previous to the reform and one and four years later. Furthermore, and more importantly, the

objective is to compare the change in the price of water after remunicipalization regarding that following privatization, rather than comparing both to price changes in municipalities that do not alter production mode.

Consistent with expectations and existing evidence on the relationship between ownership and water pricing, the central finding is that the price of urban water increases less after remunicipalization than after privatization. However, this result is entirely driven by a few cases belonging to municipalities with extremely low prices before the policy reform, mostly privatizations. Once these influential observations are excluded from the sample, the question of whether the policy reform consists of remunicipalization or privatization makes no difference regarding the change in prices. These trends are largely consistent with the hypothesis that one of the reasons behind the privatization of local public services is to ensure users cover a greater share of delivery costs. Likewise, a process of convergence in prices after policy reforms is also observed, regardless of the direction of the reform. Concerning the drivers of remunicipalization, it is found that the likelihood of the service returning to public hands is larger when pre-reform water prices are high. Ideological issues also play a role, as return to public management is much more likely when the local council is governed by an extreme left-wing party.

The remainder of the paper is organized in five sections. The first section describes the theoretical background and empirical evidence on remunicipalization and urban water pricing and sets out the hypotheses to be tested in this research. The second outlines the main features of the process of remunicipalization of the urban water service that occurred in Spain from the mid-1980s. The third section describes the data and the econometric strategy. The fourth section presents the results, which are discussed in a final section that also concludes.

## **Theoretical Background and Empirical Evidence**

### **Theory and Evidence on Remunicipalization of Local Public Services**

Government reforms in the production of local public services are often choices between private and public forms of delivery. The literature has dedicated extensive theoretical and empirical work to the analysis of the drivers of privatization of public services (see for a review Bel and Fageda, 2017). Privatization theories can be used to illustrate the main theoretical ideas behind remunicipalization (Young and Macinati, 2012).

The primary reason for remunicipalization is the failure to achieve the cost savings that were expected from privatization. Concerns about the quality of the service might also drive remunicipalization, particularly in sectors where quality is not easily measurable and it is seen as crucial by policymakers (Levin and Tadelis, 2010). Indeed, the early empirical literature on remunicipalization in the US (e.g., Warner and Hebdon, 2001; Hefetz and Warner, 2012), otherwise referred to as ‘reverse privatization’, considers it a pragmatic decision in response to disappointment with the results of privatization.

Besides pragmatic reasons, ideological and partisan motivations have also been suggested as drivers of remunicipalization; Young and Macinati (2012) argue that significant changes in the external environment in which relationships between governments and private companies occur offer opportunities to reorganize the services—in particular, to bring production back under public control. This point of view is emphasized by scholars who are against the involvement of private agents in the delivery of public services and support stronger community control over these services (e.g., McDonald, 2016; Lobina et al., 2019a). Cumbers and Paul (2022) warn, however, about the prospects of real control being placed in the hands of institutions rather than the community as such.

Research on the drivers of remunicipalization has increased substantially in recent years, drawing on both case studies and big data studies (e.g., Gradus and Budding, 2020; Albalade and Bel, 2021; Gradus et al., 2021; Warner and Aldag, 2021; Turri, 2022b; Mayol and Saussier, 2023). Voorn et al. (2021) review the existing empirical literature and conclude that while ideological reasons might explain remunicipalization in some cases, most evidence suggests that pragmatic managerial motivations drive governments' decisions on remunicipalization. In the same vein, a meta-analysis by Lu and Han (2023) finds that remunicipalization is driven by a combination of both political and pragmatic factors, with the latter being more relevant.

The evidence from multivariate empirical studies is quite consistent with the descriptive information provided in the Public Futures database from the University of Glasgow, which is by far the most extensive repository of remunicipalization cases worldwide—with more than a thousand documented cases between 2000 and 2022. In 9 out of every 10 cases, the information includes the main motivation given for the remunicipalization decision, the frequency of which is shown in Figure 1.

FIGURE 1 HERE

Evidence on the financial effects of remunicipalization is much scarcer than that on the drivers and is usually limited to case studies based on anecdotal evidence, in the context of a debate largely dominated by politically tainted assessments. This is particularly true in the case of remunicipalization of the urban water service (Bel, 2020). While the higher prices associated with private delivery have influenced remunicipalization, the effects of this policy on prices are difficult to estimate, beyond circumstantial evidence—e.g., the evidence reported by Le Strat (2010) for the case of Paris, as mentioned in the Introduction. Using a large database of French municipalities, Porcher and Saussier (2017) finds that water prices are significantly higher under private provision, but there are significantly fewer leaks. This suggests that lower



prices in public delivery might reflect insufficient investment and could therefore be unsustainable over time. Moreover, Porcher (2017) studies prices in water provision in France and finds that although they are higher under private management, the difference disappears when the ‘hidden costs’ derived from future debt repayments are considered. In other words, with private management the criterion of total cost recovery is applied, whereas public management is associated with lower prices but higher indebtedness.

As explained in the introduction, the only study that is similar to our own research is that by Porcher (2012), in which changes in the price of urban water after changes in the production mode are analyzed in a sample of French cities, using difference-in-difference techniques and discontinuous sets of data for years (1998, 2001, 2004 and 2008). Therefore, Porcher compared price changes in cities that went from public to private management or from private to public management with changes in municipalities that did not alter the mode of production. Results obtained were not systematic, and heavily dependent from the period being analyzed.<sup>1</sup>

Existing literature on the determinants of water pricing—particularly the effect of ownership on prices—is further reviewed below, which helps to establish the framework within which to conduct the empirical analysis in this research.

### **Urban Water Pricing**

The cost of delivering the service is the main determinant of the price of urban water. Costs are influenced by several factors, most notably the features of the environment in which the supplier operates (González-Gómez and García-Rubio, 2018). For example, the question of whether water comes from surface or groundwater influences energy costs; also, the size and geographical distribution of the population might allow the exploitation of economies of scale and density. In this regard, a regulation that strongly conditions urban water pricing in the

European Union—and therefore in Spain—is the Water Framework Directive passed in 2000 (European Commission, 2000), which mandates the principle of cost recovery in urban water pricing. Additionally, ideological and political factors may also play a role in intervened pricing. In this respect, left-wing parties are less likely to increase water prices and pass on the costs of producing the service to consumers (Martínez-Espiñeira et al., 2012; Hellwig and Polk, 2021). Likewise, the political cycle may explain price containment in municipal election years, as opposed to sharper increases just after elections (Klien, 2014; Picazo-Tadeo et al., 2020).

Beyond the abovementioned determinants of the price of urban water, managers' ownership has received particular attention. Most empirical studies have concluded that prices are higher under private management (e.g., Romano and Guerrini, 2014; Zhang et al., 2022).<sup>2</sup> One possible reason for this finding is that, in addition to recovering production costs, private utilities seek to make a profit. Failures in public tenders such as insufficient competition, collusion, and corruption could also lead to higher urban water prices (Chong et al., 2006). Furthermore, the prices set by private utilities might be higher simply because municipalities tend to privatize the service when its management is more complex and, therefore, costlier (Ruester and Zschille, 2010); or because of higher investment by private firms to improve the service (Zhang et al., 2022). Finally, higher water prices under private management as compared to public could also be due to public providers setting tariffs that do not allow the full recovery of the costs of producing the service (Alguacil-Duarte, 2020), as prices in strictly regulated sectors are often not cost-reflective.

There are, however, studies that find no empirical evidence that water prices are significantly different between private and public utilities (e.g., Romano et al., 2015; Silvestre and Gomes, 2017). It has also been suggested that there is no systematic difference in efficiency between public and private utilities (see review in Bel and Warner, 2008). In fact, De Witte

and Marques (2010) point out that it is not so much the ownership of the operator that matters in determining urban water prices, but rather the regulation they face, their incentives, and the control mechanisms implemented by public administrations.

## **Hypotheses**

On the basis of the arguments presented above on both the theoretical background and empirical evidence regarding the remunicipalization of the urban water service, as well as the relationship between the price of water and the management of the service, several hypotheses are posed in this research. Two of them are related to the drivers of policy reforms regarding the management of the urban water service—either remunicipalization or privatization. The first hypothesis refers to the role played by water prices prior to the reform. Consistent with the argument regarding the disappointment with private management as a driver of remunicipalization, the hypothesis is:

Hypothesis 1 (H1). *The probability of remunicipalization of the urban water service is larger in municipalities with high prices for water.*

The second hypothesis concerns the ideology of the political party governing the city council at the time of the policy reform, and is formulated as follows:

Hypothesis 2 (H2). *The remunicipalization of the urban water service is more likely in municipalities ruled by left-wing parties.*

The central hypothesis posed in this research relates to the role played by the direction of the policy reform in the change in the price of water. In accordance with the literature on water pricing, this hypothesis is stated as follows:

Hypothesis 3 (H3). *The increase in the price of urban water is smaller when the management of the service is transferred from private to public ownership—remunicipalization—than when it is transferred from public to private ownership—privatization.*

Finally, a fourth hypothesis is also formulated. The 2000 Water Framework Directive mandates the application of the principle of cost recovery in urban water pricing in the European Union member states. This implies that any existing practices aimed at subsidizing urban water supply should be discontinued. Accordingly, the last hypothesis is:

Hypothesis 4 (H4). *Regardless of the direction of the policy reform—either remunicipalization or privatization—urban water prices tend to converge over time as a result of the application of the cost recovery principle.*

## **Remunicipalization of the Urban Water Service in Spain**

### **The Spanish Legal Framework**

The legal framework for the contracting out of local services in Spain was enacted in 1985 by Law 7/1985 Regulating the Bases of the Local Regime. Further regulations on public procurement were passed from the mid-1990s on, establishing that concession contracts for the provision of urban water can last for up to 25 years (see Government of Spain, 2017). Although local governments can regain the management of the service at the end of the concession term, legislation also provides for the possibility of bringing forward the remunicipalization if any of the following circumstances occurs: i) a mutual agreement between the local government and the concessionaire; ii) a breach of the contract conditions by either of the parties; and iii) reasons of public interest that justify remunicipalization.

The vast majority of the cases of remunicipalization of urban water services in Spain have occurred after the expiry of the concession contract. Complaints of non-compliance with the contract are rarely used since they open up a lengthy legal procedure, possibly lasting several years. Moreover, litigation can result in an unequal legal battle between the experienced lawyers of large water utilities and the modest legal services available to local councils of small and medium-sized municipalities. Unilateral termination of the contract by the local government for reasons of public interest can also lead to high compensation payments for the concessionaire. Therefore, in order to avoid lengthy legal proceedings or compensation costs, local governments often wait until the end of the concession contract to remunicipalize the service.

### **Time and Geographical Trends**

Following the approval of the abovementioned Law 7/1985, many Spanish municipalities opted to privatize the provision of urban water, joining the few cities that had already done so in the late 19th century (Ruiz-Villaverde et al., 2015). In the 1990s, the wave of privatization spread to the Mediterranean regions of Catalonia, Valencia and Murcia, in addition to Castile La-Mancha and some parts of Andalusia (González-Gómez et al., 2014). The duration of concessions usually ranged between 10 and 25 years, the maximum allowed by law if the contract did not include the building of infrastructure. As such, the first contracts began to expire in the 2000s, with growing numbers in the second half of that decade.

Spain has 8,131 municipalities but there is no official register of how they manage the provision of the urban water service. Some regional administrations, such as Catalonia and Andalusia, provide information on this issue, although not on a regular basis. It is thus difficult to know the exact number of cases of remunicipalization of the service. In this respect, the information provided by the Public Futures Database indicates that between 2000 and 2020

there were 39 processes of remunicipalization of water services in Spain—a few of them affecting several municipalities simultaneously. However, this research identifies a total of 75 cases during the same period, as detailed later; and this figure could even be an underestimate of the real number of remunicipalizations in these two decades. Moreover, one-fourth of the cases of public management recovery in the dataset took place between 2000 and 2010, and the remaining three-fourths from 2011 to 2020. Geographically speaking, most remunicipalizations occurred in Catalonia, Andalusia and Castile-La Mancha, which are also the regions most affected by privatizations.

### **The Influence of Political and Social Issues**

In the early 2000s, there was no significant political or social movement in Spain supporting the remunicipalization of the urban water service. In those years, the conservative Partido Popular (PP) and the social-democrat Partido Socialista Obrero Español (PSOE) held a dominant position in Spanish politics, alternating in power at different levels of administration. Although the PSOE leadership was on the ideological left, it was not openly opposed to the privatization of urban water services; in fact, many municipalities governed by this party adopted a pragmatic stance and initiated privatization processes (González-Gómez et al., 2011; Picazo-Tadeo et al., 2012). Only the post-communist party Izquierda Unida (IU) defended the public management of basic services, including the distribution of urban water; however, its position at that time—which coincided with certain citizen movements—was against further privatizations, but without yet advocating for remunicipalization.

Political and social movements in favor of the remunicipalization of the urban water service did not reach public attention in Spain until the second half of the 2010s, following the eruption on the political scene of the extreme left-wing party Podemos—its parliamentary caucus in those years included IU members. The remunicipalization of urban water distribution loomed

large in the political debate of the 2015 municipal elections, in which different left-wing coalitions gained notable representation. This resulted in growing demands for remunicipalization, although in most cases the measures aimed at making this policy reform effective were not implemented.

Beyond the political sphere, the main stakeholder in favor of the remunicipalization of urban water services is the Spanish Association of Public Water Supply and Sanitation Operators (AEOPAS). This association strongly supports public water management and advocates the recovery of the concessions granted to private utilities before contracts expire. In spite of the arrival of Podemos on the Spanish political scene and the proactive attitude of AEOPAS in favor of the early recovery of the public management of the urban water service—together with the pressure exerted by different platforms and citizens' movements at local level—remunicipalizations continue to take place mostly at the end of the concession, as explained previously.

## **Empirical Strategy**

### **Data and Variables**

The database built to conduct this research includes information from a sample of 136 Spanish municipalities where the urban water service was either remunicipalized—52 cases—or privatized—the remaining 84 municipalities—between 2000 and 2020. Gathering the sample and building the dataset involved several steps. In the first stage, the cases of remunicipalization and privatization in Spain during the analyzed period were identified. Given that there are no official statistics on this issue, the starting point has been the data in Albalade et al. (2017; 2022a; 2022b), which have been updated with information from several sources. These include the official websites of municipal councils, utilities' websites and management

reports; specialist sites for public tenders; the abovementioned Public Futures database; and the economic press. As a result, 75 cases of remunicipalization and 501 of privatization—576 in total—were identified which, statistically speaking, constitute the population of this research.

Efforts in the second stage focused on obtaining information on urban water prices in the year preceding the policy reform (remunicipalization or privatization), one year later, and four years later. The main source of information in this regard was the Official Gazettes of the provinces to which municipalities in the population belong. The institutional framework for the water industry in Spain does not regulate the structure of urban water tariffs. The only feature common to most municipalities is the application of a nonlinear tariff consisting of a fixed charge for the provision of the service, and a variable rate that increases with blocks of consumption. A lack of information about the distribution of consumption, however, makes it difficult to build a variable representing the price of urban water. To overcome these difficulties, municipalities' tariff structures—fixed and variable components—have been employed to calculate the price of a representative monthly bill with a consumption of 12 m<sup>3</sup> of water (see Chong et al., 2006; Bel et al., 2015).<sup>3</sup> Since water prices are not systematically available, after a highly demanding search for information on all 576 cases of remunicipalization or privatization recorded in 2000-2020 in Spain, the water tariffs needed to perform this analysis have been successfully calculated for 52 remunicipalizations and 84 privatizations. Notably, water tariffs were not regularly published by some Official Gazettes in the early 2000s, which helps to explain the lower representativeness of the sample of privatizations as compared to remunicipalizations, which mostly occurred from the mid-2000s onwards.<sup>4</sup>



In addition to the price of urban water, other variables have been built representing political, socioeconomic and demographic issues. The choice of these variables is based on previous literature on public services management and water pricing, and is also conditioned by the availability of statistical information. A detailed description of these variables, including measurement units and sources is provided in Table A1 in the Appendix; moreover, Table 1 shows some descriptive statistics differentiating remunicipalizations from privatizations. Notably, a convergence trend in the price of water is observed after the policy reforms. In this respect, the average price in the year prior to the reform was €8.95 for remunicipalizations and €7.84 for privatizations; four years after, average prices were €10.59 and €10.51, respectively.

TABLE 1 HERE

### **Econometric Approach**

The econometric strategy followed to test the hypotheses posed in this research consists of the estimation of two equations: a policy reform equation and a price equation. In the policy reform equation, the probability of remunicipalization is estimated with logistic regression. The dependent variable is the dummy remunicipalization, which takes a value of 1 if the policy reform consists of remunicipalization, and 0 in the case of privatization. The covariates include the price of water prior to the reform, a set of variables standing for political issues, and some additional demographic and socioeconomic controls, in addition to regional dummies to account for region-specific common features of municipalities and markets.<sup>5</sup> Formally:

$$\begin{aligned} \text{Probability (Remunicipalization}_i = 1) &= \alpha + \beta \text{ Price of water } (t - 1)_i + \\ &\sum_{p=1}^P \delta_p \text{ Political variables}_i + \sum_{c=1}^C \phi_c \text{ Other control variables}_i + \\ &\sum_{r=1}^R \theta_r \text{ Regional dummies}_i + \varepsilon_i \end{aligned} \quad (1)$$

where  $i$  stands for the 136 observed policy reforms—either remunicipalization or privatization—and  $\varepsilon_i$  is a heteroscedasticity-robust error.

On the other hand, the price equation investigates the determinants of the change in water prices after the policy reform. The dependent variable is the change in the price of water between year (t-1)—with t being the year of the reform—and, depending on the specification, either (t+1) or (t+4). The covariates include the price of water prior to the policy reform—i.e., in year (t-1)—and the dummy remunicipalization, together with several political, demographic and socioeconomic controls, and also regional dummies. The price equation is estimated by Ordinary Least Squares with robust standard errors to account for the presence of heterogeneity. Two different specifications for the change in the price of water are estimated, the general one being:

$$\begin{aligned} \text{Change in the price of water (t - 1 to t + n)}_i = & \alpha + \beta \text{ Price of water (t - 1)}_i + \\ & \delta \text{ Remunicipalization}_i + \sum_{c=1}^C \phi_c \text{ Control variables}_i + \\ & \sum_{r=1}^R \theta_r \text{ Regional dummies}_i + \mu_i \end{aligned} \quad (2)$$

with i representing policy reforms and  $\mu_i$  being a heteroscedasticity-robust error.

## Results

The results for the probability of remunicipalization in the policy reform equation are in Table 2. Interestingly, the price of urban water in the year prior to the policy reform is positively associated with remunicipalization and, thus, negatively with privatization. Regarding political variables, the year of the policy reform and extreme left-wing party are both positively associated with remunicipalization, whereas the variable majority is negatively associated. The finding that the probability of remunicipalization increases over time is as expected. The reason for this is that contracts for privatizations began to become widespread in Spain in the mid-1980s and usually lasted about 20 years—although, as mentioned, they can be up to 25 years—; thus, most remunicipalizations emerged in the second half of the 2000s, as contracts were expiring. Moreover, remunicipalization is almost 9 times more likely than privatization in

municipalities ruled by extreme left-wing parties—the odd ratio in the last column of Table 2 is 8.903. Conversely, having a majority in the city council seems to facilitate privatizations; in this respect, the probability of privatization is 3.3 times larger than that of remunicipalization when such a majority exists—this figure is the inverse of the odds ratio estimated for the variable majority, namely, 0.298.

TABLE 2 HERE

The control variables density of population and the number of places in tourist accommodation establishments display a positive and statistically significant relationship with remunicipalization. Conversely, the relation is negative and significant with the Consumer Price Index in the year prior to the policy reform.

The results for the price equation are in Table 3. Two different specifications have been estimated for the change in the price of urban water: from the year prior to the policy reform to i) one year later—the short-term equation; and ii) four years later—the medium-term equation. The estimated parameter for the variable capturing the price of water prior to the reform is negative and statistically significant at the 1% level in both equations, which means that the lower the starting price the higher its growth. This result suggests the existence of a process of price convergence after the policy reforms. Moreover, the parameter associated with remunicipalization is also negative and statistically significant in both the short- and medium-term equations, indicating that the increase in the price of water is smaller after remunicipalizations than after privatizations. Some controls in the short-term equation are also statistically significant, including population, density of population and income per capita, in addition to the Consumer Price Index in the year after the reform. The Consumer Price Index four years after the reform is the only significant control variable in the medium-term price equation.

TABLE 3 HERE

The finding that the increase in the price of water is smaller after remunicipalizations as compared to privatizations, however, depends crucially on a few influential observations in the sample. They are mostly privatizations in which the pre-reform price of water was abnormally low, and so the price increase after the policy reform was especially marked (Figure 2). In order to account for this feature, short- and medium-term price equations have been re-estimated excluding 17 influential observations—76.5% of which are privatizations—, which have been identified using a rule based on a deviation of 150% from the interquartile. The results are in Table 4. Remarkably, when these extreme observations are excluded from the estimations, the question of whether the policy reform consists of remunicipalization or privatization makes no difference regarding the change in the price of water in either the short- or the medium-term; i.e., the parameter associated with remunicipalization is no longer significant in either equation. The only result that holds in this scenario is the price convergence after the reforms.

FIGURE 2 AND TABLE 4 HERE

## **Discussion and Conclusion**

Remunicipalization has been one of the responses to the disappointment with the results of the privatization of local public services. Along with pragmatic motivations, ideological considerations have played a role in persuading governments to reclaim the management of local public services. Although it has not established a hegemony as a type of policy reform, remunicipalization has been particularly intense in urban water provision. There are abundant experiences of remunicipalization of this service around the world, and comparatively higher prices with private delivery have been an important factor in this proliferation.

Although there is ample evidence in the literature of higher prices with private management of water utilities, multivariate empirical analysis of the change in the price of water following remunicipalization are rather scarce. This paper takes advantage of a large database including 136 cases of a change in the mode of urban water delivery—either from private to public delivery (52 cases of remunicipalization) or vice versa (84 privatizations)—that occurred in Spain between the years 2000 and 2020. Drawing on existing theoretical knowledge and empirical evidence, several hypotheses on the drivers of remunicipalization and the pricing of urban water under public and private delivery are posed and tested in this paper.

Regarding the drivers of remunicipalization, it is found that both pragmatic and ideological reasons play a role. On the one hand, the higher the pre-reform water prices, the more likely the remunicipalization of the urban water service. Conversely, prices prior to the policy reform are negatively associated with privatization. This result might be interpreted as empirical evidence that disappointment with the higher urban water prices of private utilities is a driver of remunicipalization of the service, thus lending support to hypothesis H1. The finding also suggests that privatization might be a strategy in municipalities where the price of water is low and the costs of providing the service cannot be fully recovered.

Another finding is that ideology may have some influence on the decision to remunicipalize, as far-left parties are more in favor of returning the urban water service to public hands. This finding confirms hypothesis H2, and is consistent with results in Picazo-Tadeo et. al (2012), which show that parties on the ideological extreme-left exhibit a strong bias against the privatization of water services. Accordingly, studies analyzing both privatization and remunicipalization policies that do not distinguish the extremes of the left and right wings might be underestimating, or even neglecting, the influence of ideology.

The main hypothesis posed in this research—hypothesis H3—concerns the change in the price for urban water after policy reforms addressing the management of the service. It states that the increase in the price of water is expected to be smaller after remunicipalization than after privatization. Indeed, the empirical findings are consistent with this hypothesis, as remunicipalization is found to lead to smaller increases in the price of urban water than privatization does, in both the short- and medium-term. In addition to this, it is worth highlighting that none of the variables capturing the ideology of the political party in power in the municipal government at the time of the policy reform—left-wing and extreme left-wing—has an influence on the change in the price of water after the policy reform. In simpler terms, the empirical results in this research do not support the political discourse that left-wing parties tend to set lower urban water prices for social reasons—by either directly making tariffs more affordable for users after remunicipalization, or including clauses capping price increases in privatization contracts.

Nevertheless, the finding that larger water price increases are related to privatization is strongly dependent on a small number of municipalities in the sample where privatization was implemented after a period of abnormally low prices, and which experienced huge increases immediately after the policy reform. When these influential cases are removed from the analysis, no difference in urban water price increases after delivery reform—either remunicipalization or privatization—is found for the remaining cases.<sup>6</sup> These outcomes are consistent with the idea that privatization has often been used to increase user participation in covering the costs of delivering urban water, thereby freeing municipal budgets from subsidizing the service—like Bel and Miralles (2010) found for waste collection.

The abovementioned results can contribute to solving the puzzle posed by the existing evidence on urban water services, which points to higher prices with private management but

no significant differences in efficiency between public and private utilities (Bel and Warner, 2008). In fact, the higher prices of private utilities would reflect a higher rate of cost recovery through user payments and, consequently, less pressure on local public budgets. This would also be coherent with the results reported by Porcher (2017), which suggest that higher water prices with private delivery could be related to requirements for debt repayment in the future.

The final hypothesis posed in this research is hypothesis H4, which concerns long-term urban water price dynamics. Given the regulatory trend in the European Union aimed at increasing cost recovery with user payments—with the ultimate goal of full cost recovery, according to the 2000 Water Framework Directive—it is hypothesized that water prices will tend to converge over time, regardless of whether the reform was remunicipalization or privatization. The findings from this research are consistent with this convergence hypothesis, stated under regulation favorable to total cost recovery. In this respect, it is found that the lower the pre-reform urban water price, the larger its increase after the policy reform. This leads one to expect smaller price differences between public and private management of urban water services in the future, as long as the principle of total cost recovery is promoted and respected.

This paper constitutes an attempt to provide general insights into the relationship between remunicipalization of the urban water service and water prices, using a large sample of cases. However, the research is not without its limitations, which may pave the way for future investigation. The main weakness is that the quality of the service is not accounted for. Although there are some sources of information on variables that could act as a proxy for service quality and investment—e.g., leaks in the distribution network or water treatment for potabilization—unfortunately the data are only available for very few cases in the sample; moreover, available data display little variability across municipalities and, more importantly, across time. Furthermore, again because of data unavailability, the analysis does not capture

other factors that might influence policy reforms, such as potential corruption in private management. These factors are easier to document—when applicable—by means of case studies.

Accordingly, future studies on the relationship between policy reforms regarding management and prices in the urban water service should make greater efforts to identify variables that can account for the quality of the service. Also desirable are larger samples and datasets to improve the representativeness of the results. Likewise, since the empirical analysis carried out in this research focuses on Spanish municipalities, comparable analyses in other countries with similar (or different) regulatory frameworks might help to ascertain whether the findings can be generalized.

## Notes

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<sup>11</sup> Also related to this research, Chong et al., (2015) compared water prices in France between municipalities that renewed private contracts for the provision of the service and those that remunicipalized, in order to assess whether earlier price differences could explain the change from private to public management. However, the actual effect of changing the delivery mode on urban water prices was not analyzed.

<sup>2</sup> Beyond the dilemma of pure public *versus* pure private management of the urban water service, it is worth noting the analysis by Porcher (2016) that associates concurrent sourcing in the water sector in France with higher quality, but also with higher prices. Esteve et al. (2023) find that private management of water services delivers higher quality when the service is financed through user fees. Koppenjan and Enserink (2009) argue that price increases after privatization are not always followed by improvements in quality, as there may be breaches of contract; this is more common in small municipalities.

<sup>3</sup> According to the Spanish Statistical Office (INE), the average monthly urban consumption of water in Spain was 14 m<sup>3</sup> per household in the early 2000s. This figure had fallen to around 10 m<sup>3</sup> in 2020 due to both a reduction in average consumption per person per day and a fall in average household size.



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Therefore, 12 m<sup>3</sup> per household per month is considered to be representative of the average consumption in the period 2000-2020.

<sup>4</sup> A further difficulty in obtaining water prices is that not all municipalities review tariffs annually, and there is no official source indicating when tariffs are to be reviewed. Moreover, there are Official Gazettes that fail to provide advanced search engines for performing an automated search, which makes it difficult, if not impossible, to find the required information.

<sup>5</sup> The urban water market in Spain has a markedly regional dimension regarding issues such as private involvement in the provision of the service, the degree of market concentration and regulation—with some regions having their own regulatory agencies (Bel et al., 2013). Moreover, there are some utilities that operate mainly at the regional level (Bel et al., 2015).

<sup>6</sup> In this regard, Porcher (2012) did not find systematic effects on urban water prices in France from the change in production management. This paper was updated by Porcher (2019), but the analysis related to our research did not differ in any respect.

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Table 1. Descriptive statistics of the variables in the policy reform and price equations

Variable	All observations (136)		Remunicipalization (52)		Privatization (84)	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Policy reform and price variables						
Remunicipalization (dummy)	0.382	-	1	-	0	-
Price of water (t-1) (€)	8.26	4.30	8.95	4.14	7.84	4.36
Price of water (t+1) (€)	9.55	4.61	10.07	4.61	9.23	4.61
Price of water (t+4) (€)	10.54	5.19	10.59	5.14	10.51	5.26
Change in the price of water (t-1 to t+1) (%)	24.6	60.7	15.8	28.0	30.1	73.7
Change in the price of water (t-1 to t+4) (%)	39.2	74.7	21.8	35.2	50.0	89.5
Other variables						
Left-wing party (dummy)	0.441	-	0.480	-	0.416	-
Extreme left-wing party (dummy)	0.125	-	0.250	-	0.047	-
Same party (dummy)	0.632	-	0.576	-	0.666	-
Majority (dummy)	0.705	-	0.634	-	0.750	-
Same majority (dummy)	0.580	-	0.538	-	0.607	-
Years to next local elections (number of years)	1.52	1.04	1.12	1.12	1.72	0.94
Consumer Price Index (t-1) (base period 2021)	87.2	6.3	85.3	9.0	88.4	3.3
Consumer Price Index (t+1) (base period 2021)	90.1	5.5	88.2	8.1	91.3	2.2
Consumer Price Index (t+4) (base period 2021)	93.6	4.1	92.7	6.0	94.1	2.3
Population (number of inhabitants in logs)	8.28	1.48	8.51	1.52	8.14	1.44
Change in population (t to t+4) (percentage points)	-0.08	7.34	1.63	5.83	-1.15	7.98
Density of population (inhabitants per km <sup>2</sup> )	194.5	393.3	235.9	537.3	168.8	269.1
Income per capita (year 2010 in €)	18845	5078	18377	4875	19134	5206
Tourist places (number of bed places)	236.4	720.3	263.1	909.4	219.9	578.9

Note: t refers to the year in which the policy reform, either remunicipalization or privatization, takes place; (t-1) refers to the year before the policy reform, while (t+1) and (t+4) refer to one and four years after the reform, respectively.

Table 2. The policy reform equation. Logistic regression estimates for the probability of remunicipalization

Variable	Estimated parameter	p-value	Odds ratio
Constant	-2137.8***	0.000	-
Price of water (t-1)	0.1594**	0.039	1.172
Political variables			
Year of the policy reform	1.0954***	0.000	2.990
Years to next local elections	-0.0504	0.881	-
Left-wing party	0.7694	0.227	-
Extreme left-wing party	2.1864**	0.034	8.903
Majority	-1.2098**	0.045	0.298
Other control variables			
Log of population	-0.1152	0.691	-
Density of population	0.0016*	0.077	1.001
Income per capita	-0.0001	0.200	-
Tourist places	0.0007**	0.032	1.001
Consumer Price Index (t-1)	-0.7434***	0.000	0.475
Regional dummies	Yes		
Pseudo R-squared	0.435		
Number of observations	136		

Note: \*\*\*, \*\* and \* stand for statistical significance at 1%, 5% and 10%, respectively. (t-1) refers to the year prior to the policy reform, either remunicipalization or privatization. Robust standard errors are computed. Odds ratios are only reported for statistically significant variables. Estimated parameters and p-values for the regional dummies are not reported.



Table 3. The price equation. Linear regression estimates (OLS) for the change in the price of urban water

Variable	Short-term price equation: Change from (t-1) to (t+1)		Medium-term price equation: Change from (t-1) to (t+4)	
	Estimated parameter	p-value	Estimated parameter	p-value
Constant	29.4833	0.694	-55.0126	0.683
Price of water (t-1)	-5.0232***	0.007	-6.5975***	0.001
Remunicipalization	-23.7594**	0.024	-38.7960***	0.004
Control variables				
Years to next local elections	5.4180	0.192	5.3211	0.338
Left-wing party	16.0905	0.162	10.4485	0.475
Extreme left-wing party	14.1137	0.318	13.1131	0.500
Majority	-7.8419	0.452	-	-
Same majority	-	-	-2.0171	0.884
Same party	-	-	1.5122	0.918
Log of population	-18.2419*	0.081	-17.1163	0.125
Density of population	0.0289*	0.062	0.0233	0.172
Income per capita	0.0031**	0.039	0.0036	0.180
Tourist places	-0.0085	0.280	-0.0142	0.160
Consumer Price Index (t+1)	1.9191*	0.097	-	-
Consumer Price Index (t+4)	-	-	2.9754*	0.079
Change in population t to (t+4)	-	-	-0.5137	0.748
Regional dummies	Yes		Yes	
R-squared	0.327		0.331	
Number of observations	136		136	

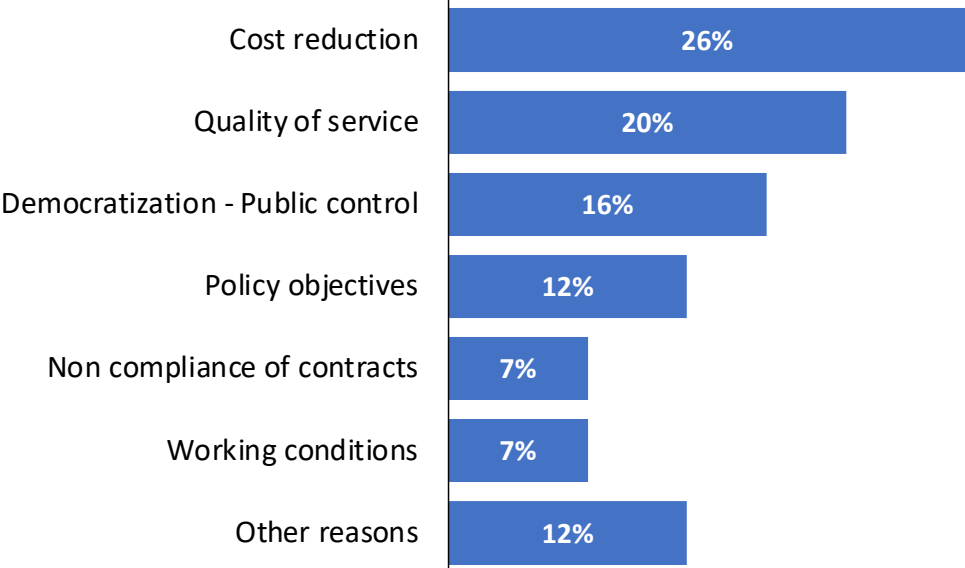
Note: \*\*\*, \*\* and \* stand for statistical significance at 1%, 5% and 10%, respectively. t refers to the year in which the policy reform, either remunicipalization or privatization, takes place; (t-1) refers to the year before the policy reform, while (t+1) and (t+4) refer to one and four years after the reform, respectively. Robust standard errors are computed. Estimated parameters and p-values for the regional dummies are not reported.

Table 4. The price equation. Linear regression estimates (OLS) for the change in the price of urban water excluding influential observations

Variable	Short-term price equation: Change from (t-1) to (t+1)		Medium-term price equation: Change from (t-1) to (t+4)	
	Estimated parameter	p-value	Estimated parameter	p-value
Constant	58.0576	0.363	62.8764	0.363
Price of water (t-1)	-0.9214*	0.085	-1.2471**	0.017
Remunicipalization	-1.4711	0.669	-7.3995	0.139
Control variables				
Years to next local elections	-0.6339	0.771	1.4678	0.535
Left-wing party	-0.2698	0.953	0.3233	0.947
Extreme left-wing party	7.5364	0.318	10.1642	0.260
Majority	-3.9851	0.439	-	-
Same majority	-	-	6.9643	0.192
Same party	-	-	1.3442	0.790
Log of population	-1.5291	0.402	0.4420	0.877
Density of population	0.0047	0.273	-0.0009	0.855
Income per capita	0.0002	0.590	0.0001	0.862
Tourist places	-0.0013	0.602	0.0008	0.778
Consumer Price Index (t+1)	-0.2607	0.605	-	-
Consumer Price Index t+4	-	-	-0.4407	0.504
Change in population t to (t+4)	-	-	0.2446	0.520
Regional dummies	Yes		Yes	
R-squared	0.147		0.149	
Number of observations	119		119	

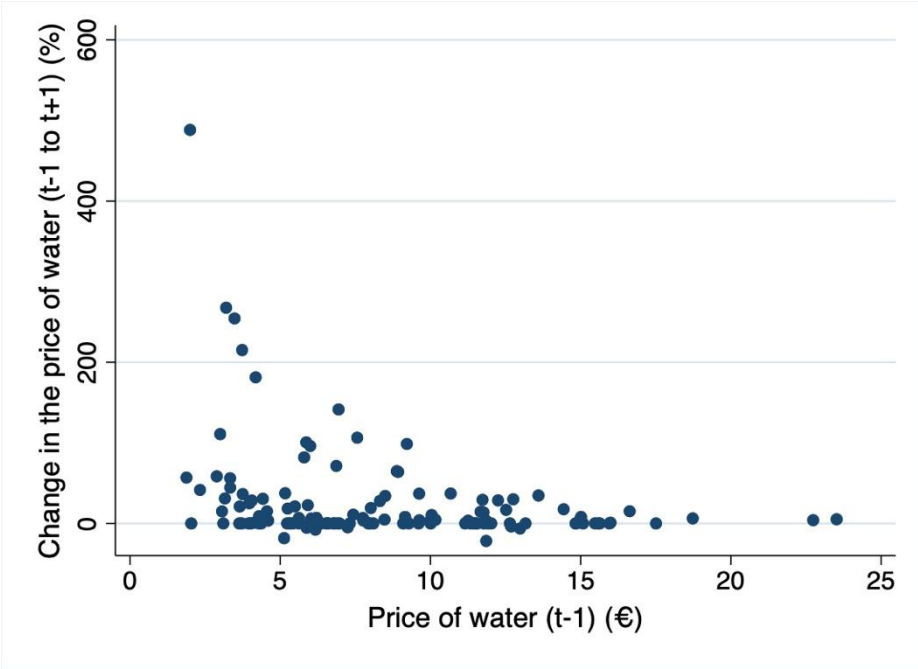
Note: \*\*\*, \*\* and \* stand for statistical significance at 1%, 5% and 10%, respectively. t refers to the year in which the policy reform, either remunicipalization or privatization, takes place; (t-1) refers to the year before the policy reform, while (t+1) and (t+4) refer to one and four years after the reform, respectively. Robust standard errors are computed. Estimated parameters and p-values for the regional dummies are not reported.

Figure 1. Motives for remunicipalization (frequencies)

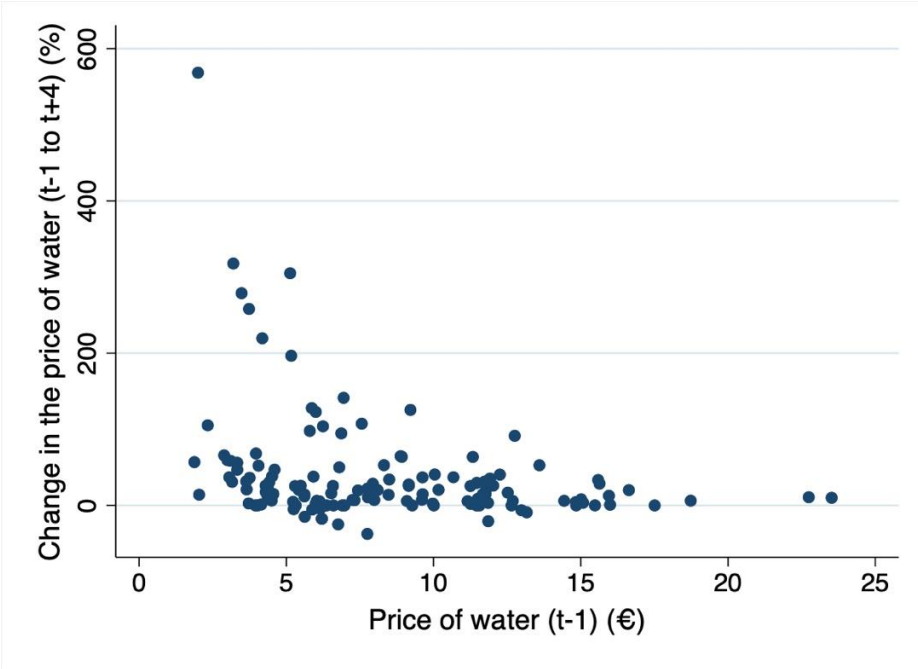


Source: Authors, based on data in Public Futures.

Figure 2. Scatterplot of the price of water prior to the policy reform and its change after the reform: Influential observations



Panel a. Change in the price of water from (t-1) to (t+1)



Panel b. Change in the price of water from (t-1) to (t+4)

Source: Authors.

## Appendix

Table A1. Description of the variables, measurement unit and source

Variable	Description and measurement unit	Source
Policy reform and price variables		
Remunicipalization	Dummy equal to 1 if the policy reform consists of remunicipalization of the urban water service; and 0 if the policy reform consists of privatization.	Own elaboration
Price of water	Price of a representative monthly bill including both the fixed charge and a consumption of 12 m <sup>3</sup> of water (€).	Official Gazettes, city councils and utilities
Change in the price of water	Change in the price of water before and after the policy reform (%).	Own elaboration
Other control variables		
Year of the policy reform	Year in which the policy reform, either privatization or remunicipalization, takes place (from 2000 to 2020).	Own elaboration
Years to next local elections	Number of years remaining until the next municipal elections at the time of the policy reform.	Own elaboration
Left-wing party	Dummy equal to 1 if a left-wing party (PSOE, IU, Podemos, CUP, ICV, BNG and other local left-wing parties) was in power in the local government at the time of the policy reform; 0 otherwise.	Ministry of the Interior
Extreme left-wing party	Dummy equal to 1 if an extreme left-wing party (IU, Podemos, CUP, ICV, BNG and other local extreme left-wing parties) was in power in the local government at the time of the policy reform; 0 otherwise.	Ministry of the Interior
Same party	Dummy equal to 1 if the mayor's party is the same at the time of the policy reform and four years later; 0 otherwise.	Ministry of the Interior
Majority	Dummy equal to 1 if the mayor's party has an absolute majority at the time of the policy reform; 0 otherwise.	Ministry of the Interior

Table A1. *Continued.*

Variable	Description and measurement unit	Source
Other control variables		
Same majority	Dummy equal to 1 if the same mayor's party has an absolute majority at the time of the policy reform and also four years later; 0 otherwise.	Ministry of the Interior
Consumer Price Index	Consumer Price Index; base period 2021 (2021=100).	Spanish Statistical Office (INE)
Population	Number of inhabitants at the time of the policy reform.	Spanish Statistical Office (INE)
Change in population	Change in the number of inhabitants (percentage points).	Spanish Statistical Office (INE)
Density of population	Population density at the time of the policy reform (inhabitants per km <sup>2</sup> ).	Spanish Statistical Office (INE)
Income per capita	Yearly income per capita in the municipality in 2010 (€).	Spanish Tax Office
Tourist places	Number of places in tourist accommodation establishments in the municipality at the time of the policy reform.	Spanish Statistical Office (INE)

The logo for UBIREA, consisting of the letters 'UBIREA' in a bold, white, sans-serif font, set against a dark blue rounded rectangular background.

**UBIREA**


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A large, decorative graphic element in the bottom half of the page, consisting of a semi-circular shape filled with a dense, fine-lined pattern of parallel lines, creating a textured effect.