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## **Reforming the local public sector: economics and politics in privatization of water and solid waste**

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Several empirical studies have analyzed the factors that influence local privatization. We examine the influence of transaction costs and political factors on local governments' choices through new variables. We consider two relevant services accounting for different amounts of transaction costs: water and solid waste delivery. Our results show that privatization is less common for water, which has higher transaction costs. Furthermore, we find that municipalities with a conservative ruling party privatize more often regardless of the ideological orientation of the constituency. Finally, we find that intermunicipal cooperation may be a suitable organizational form for some municipalities.

**Keywords:** privatization; contracting-out; local governments

**JEL codes:** L33, R51, H72

### **Introduction**

Many countries have instituted privatization of the delivery of local public services in the last decades of the twentieth century. Following this lead, an increasing number of municipalities turned the delivery of important local services, such as solid waste collection and water distribution, over to private providers. Private delivery of solid waste collection has increased with special intensity in the Scandinavian countries and has reached important levels in other European countries, such as the Netherlands (Dijkgraaf and Gradus 2007) and Spain (Bel 2006). Private distribution of water was systematically introduced in England and Wales in the early 1990s, and has significantly expanded throughout this decade in southern European countries such as France, Spain and Italy (Bel 2006). Private delivery of water has been less common in the US and in Central and Northern Europe, where public delivery remains the hegemonic form.

Nowadays, the geography of private delivery of local public services shows a wide diversity. On the one hand, we observe great diversity among countries in private delivery. On the other hand, we also find wide diversity in the extent of local privatization within each country. Hence, it is clear that – even if institutional factors at the national level can explain differences in levels of privatization – other factors must influence local government decisions on privatization.

In the last two decades many empirical works have analyzed why governments do privatize local services. The recent survey by Bel and Fageda (2007) shows that factors related to fiscal stress, cost reduction, political processes and ideological attitudes are the most

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common explanatory variables used in these studies. In this paper, we add new variables to examine the influence of transaction costs and political factors. Besides the standard consideration of variables reflecting political interests and ideological attitudes, we contribute to the literature on privatization decisions by jointly considering the effects of politics and ideology. While political factors and ideological attitudes have been a part of previous studies, this study considers the interaction between the two.<sup>1</sup>

In order to have a more complete picture of the decision process, we also include some potential alternatives to privatization (although not strictly incompatible), such as intermunicipal cooperation. Economies of scale or scope are considered one of the major advantages of local privatization (Donahue 1989). Recent empirical evidence suggests that local governments can use intermunicipal cooperation to exploit economies of scale in solid waste collection (Warner and Hefetz 2002a; Bel and Costas 2006). One of the contributions of our empirical analysis is to test whether intermunicipal cooperation competes with privatization as a means of realizing economies of scale.<sup>2</sup> We are not aware of previous analysis that empirically considers intermunicipal cooperation as a potential explanatory factor in privatization.

In our empirical analysis we use a 2003 sample of 559 Spanish municipalities. We use extensive information on two of the most relevant local services: solid waste collection and water distribution. Both services are among those with the largest impact in local government expenditures and are those that have received most attention in the literature. Results from our estimates show that privatization is more common for solid waste collection than for water. This finding is consistent with the fact that transaction costs are higher in water distribution because asset specificity is an important characteristic of water networks. Furthermore, we find that municipalities with a conservative ruling party employ private production more often, regardless of the basic ideological orientation of the constituency. Our main conclusion here is that even if both politics and ideology influence the privatization decision, political interests have more influence than ideological attitudes.

Finally, we find that intermunicipal cooperation is used sometimes as an alternative to local privatization, since intermunicipal cooperation is negatively related with privatization. This happens in solid waste, where municipalities can cooperate to exploit scale economies without using private production to aggregate output. In the same way, intermunicipal cooperation is negatively related with privatization in water distribution, where municipalities can cooperate to exploit economies of density derived from a joint network without using private firms. Interestingly, cooperation in solid waste occurs in much smaller municipalities than is common for joint delivery of water. This is consistent with the fact that economies of scale (related to output) are present in solid waste, whereas economies of density (related to network concentration) are present in water distribution.

We organize the rest of the paper as follows. In section 2, we review the background provided by the empirical studies on factors explaining local privatization. Section 3 presents our empirical strategy, providing information on data and sources, and we display and explain our empirical model. Section 4 presents the results from the estimation of our model and discusses the implications of our main results. Finally, section 5 summarizes the main conclusions from our empirical analysis.

### **Theoretical and empirical background**

A growing body of theoretical work has discussed privatization of local services in the last quarter of the twentieth century. Among the approaches most prone to endorsing

privatization, Public Choice was the first approach to analyze choices in local services delivery. Seminal work by Niskanen (1971) proposed that when politicians and bureaucrats monopolize public services delivery, overproduction and inefficiency is likely to be the outcome. Savas (1987) extended the Public Choice approach to the privatization of local services, and suggested that policy makers extract political and/or material rents from managing local public services. Following this approach, we can infer two basic hypotheses: contracting out by local governments will improve technical efficiency and will provide lower costs in the delivery of services.

Other theoretical approaches have also stressed the effect of costs in the service delivery choices of local governments. Transaction costs are important when a municipality chooses to make or buy a service (Williamson 1979, 1999) and factors such as monitoring and control play a central role (Sappington and Stiglitz 1987). From theoretical works it follows that the conditions that influence the level of transaction costs should be central in determining when a local service will be successfully privatized. Hence, asset specificity and ease of measurement are key factors in determining contract completeness and the difficulty of performance monitoring (Brown and Potoski 2003; Levin and Tadelis 2007). Overall, the following core hypothesis emerges. Privatization is more likely to be chosen when transaction costs involved in the delivery of the service are not huge.

Another important approach has emerged from property rights theory. The theory of incomplete contracts provides a useful analytical framework for studying situations in which contracting is a complex operation (Grossman and Hart 1986; Hart and Moore 1990). Within this framework, Hart *et al.* (1997) show that – with private production – the manager has incentives to reduce costs without concern for quality erosion. Therefore, privatization will likely reduce costs, but can also deliver a lower quality of service. As stressed by Whinston (2003), one must confront the richness of predictions from property rights theory with the lack of available data to test them. Still, we can test some hypotheses within this framework. For instance, Hart *et al.* (1997) propose the hypothesis that politicians have two alternatives for rent-seeking through service delivery. On one hand, those who look for political benefits from over-employment might prefer public production. On the other hand, policy makers looking for political benefits from material transfers (such as campaign funding, party organization funding, etc.) might prefer privatization. In short, a core hypothesis emerges: service delivery choice will be pragmatic rather than ideological, and interest groups will influence the delivery choices made by local policy makers.

While there is no absolute agreement on what factors might influence local privatization, we can sensibly group the hypotheses derived from the theoretical approaches mentioned above into two economic and two political sets of variables. Economically, governments may be inspired by some combination of fiscal restraints and anticipated lowered costs, while politically, leaders may be moved by loyalty to an ideology or a desire to win the support of key interest groups.

### ***Fiscal restrictions***

Since the late 1970s, consistent with suggestions in Tiebout (1956), a taxpayers' backlash toward increasing local exactions has emerged. In addition, an increasing number of supra-municipal legislators have introduced legislation limiting increases in local taxation and local budget debt. Most studies of privatization included fiscal variables designed to measure the effects of such restrictions, and the usual hypothesis is that there is a positive relation between fiscal constraints and privatization. The variables more commonly used to test the hypothesis that fiscal restrictions influence (positively) privatization are the

following: tax burden, legal limitations on local tax levels and the size of transfers from the central to local governments.

Early studies for the US, those where data collection was completed in the 1980s, frequently find that financial restrictions on local governments influence the choice of production form (e.g. Feldman 1986; Ferris 1986; Morgan *et al.* 1988; Stein 1990; Miranda 1994; Hirsch 1995). Among these early studies, only McGuire *et al.* (1987) and Chandler and Feuille (1994) find that fiscal stress is not a significant influence on the privatization choices of local governments. In more recent studies for the US, those where data collection occurred from 1992 to 2004, fiscal stress appears as a significant explanatory factor only in the works of Kodrzycki (1998), Brown *et al.* (2008) and Hebdon and Jalette (2008), which also includes observations for Canada. Among the studies for European countries, only Dijkgraaf *et al.* (2003) find fiscal restrictions to be relevant in local service delivery choices. On the contrary, Bel and Miralles (2003) and Miralles (2006) find no influence from fiscal restrictions. It is worthwhile noting that taxpayers' revolts have been more moderate in Europe, and supramunicipal regulations limiting local taxation and debt have been less restrictive in Europe than in the US.

### *Economic efficiency*

Within the academic literature, two main explanations arise to link privatization to cost reduction. One proposes that privatization works by introducing competition where there is a public monopoly (Savas 1987). Hence, the potential for reducing costs may be higher in larger and metropolitan urban areas where the availability of external providers is higher. Levin and Tadelis (2007) find that large and urban areas tend to externalize production to private firms more often, while smaller towns tend to externalize to public agencies. In the same way, results from Warner and Hefetz (2002a) and Hebdon and Jalette (2008) imply that suburbs of metropolitan areas privatize more often than do rural areas. However, central cities privatize less than suburban areas.

On the other hand, the possibility of exploiting economies of scale is especially important when the public service has been delivered over a suboptimal jurisdiction (Donahue 1989). Privatization can be a useful tool in aggregating jurisdictions for the delivery of the service, because one firm can deliver services in several towns, thus operating at a more efficient scale. Thus, benefits from privatization due to the lower cost of operating at optimal scale may be especially important in smaller cities. The population of a city and demand for the service (when available) are the variables usually used for testing whether the possibility of exploiting scale economies is relevant to the privatization of local services. Evidence in studies that analyze just one service provides more support to the hypothesis that scale economies are a major determinant of privatization. Indeed, results from McGuire *et al.* (1987) for school buses and Feldman (1986) for urban buses support the hypothesis, as do the works by Hirsch (1995), Stein (1990), Bel and Miralles (2003) and Dijkgraaf *et al.* (2003) for solid waste. In contrast, most of the studies that consider a broad range of services do not find significant influence from scale variables. In sum, the possible exploitation of scale economies varies greatly between services.

Finally, it is worth noting that some recent studies pay special attention to the role of transaction costs in the delivery choices of local governments. In this sense, Ferris and Graddy (1991, 1994), Ménard and Saussier (2000), Levin and Tadelis (2007), Walls *et al.* (2005), and Brown *et al.* (2008) argue that the likelihood that production will be externalized is higher for services with low specific assets and whose performance is easily measurable. Additionally, Nelson (1997) argues that the positive relationship found

between privatization and population homogeneity is due to the lower transaction costs associated with such homogeneity.

### ***Political interests and ideological bias***

Non-economic factors such as political processes and ideological attitudes have been used to explain the decision to privatize services.<sup>3</sup> Two main motivations guide politicians in their decisions: on the one hand, politicians seek to win elections and obtain governmental positions; on the other, they have preferences for some policies over others according to their ideological attitudes.<sup>4</sup>

Within the domain of political interests, the decision to privatize is dependent on the existence and the strength of pressure groups having a particular interest in the rents derived from a given form of service delivery. The variables usually considered in the literature for capturing this effect are:<sup>5</sup> the degree of unionization of public employees, and the income level of households. In this field, it is commonly assumed that public employees and unions are in favor of internal production, while industrial interests have a greater preference for privatization. Early studies for the US usually find significant influence of interest groups: McGuire *et al.* (1987); Dubin and Navarro (1988); Chandler and Feuille (1994); Miranda (1994); Hirsch (1995); Nelson (1997). More recent studies for the US find influence from high-income households (Warner and Hefetz 2002a) or unions (Levin and Tadelis 2007).<sup>6</sup> Miralles (2008) is the sole work that analyzes the influence of interest groups on service delivery choices in Europe. He finds that the strength of industrial users influences privatization, and that stronger industrial groups promote privatization.

Ideology may also influence privatization. Since conservative parties have been associated with more pro-private business values, conservative governments should be positively associated with privatization. Similarly, because progressive parties are usually linked with collective values, they should be associated with public production. The influence of the ideology is usually captured in the literature through either the partisan affiliation of the local government or the percentage of progressive (or conservative) votes in elections. It is generally expected that there exists a negative relationship between privatization and progressive governments and the percentage of progressive votes. Among the studies for the US, ideology is found to be a relevant explanatory factor of privatization in the works by Dubin and Navarro (1988), and Walls *et al.* (2005) for solid waste collection. Among the studies of European countries, Dijkgraaf *et al.* (2003) examining solid waste collection obtain a similar result, whereas Bel and Miralles (2003) and Ohlsson (2003) do not find a significant relationship.<sup>7</sup>

The hypotheses most frequently considered and tested in the empirical literature studying factors explaining local privatization can be summed up in four statements. First, we expect that privatization increases when fiscal constraints are more binding. Second, privatization may be aimed at reducing costs, either through competition or by the exploitation of scale economies. Third, the relative strength of different interest groups, such as unions or industrial business, influences local governments' service delivery choices. Finally, conservative governments will be more prone to privatize local services, while progressive ones will favor the public production of the service.

### **The empirical strategy**

In this section, we provide information on the data available for our research and their sources. Next, we set up our empirical model. In doing so, we take into account the most

important hypotheses established in the literature and tested in the empirical works we have reviewed.

### **Data and sources**

The sample is based on municipalities in Spain that filled out the *Survey on Production of Local Services*, a survey designed and carried out by the authors' research unit. The survey asked Spanish municipalities of more than 2000 inhabitants about two local services; solid waste collection and water distribution. The implementation of the survey has obtained data for 539 municipalities in the case of solid waste collection services and for 546 municipalities in the case of water distribution. The empirical analysis aggregates observations for both local services, so that each municipality of the sample may involve one or two observations. As to how representative our sample is, the municipalities included are all part of the 24.9% of all Spanish municipalities with a population above 2000, and the overall population included is 74.2% of the total population in municipalities with more than 2000 inhabitants. It is worth noting that our sample includes all municipalities with more than 30,000 inhabitants.<sup>8</sup> Information contained in the survey is for 2003 and includes the form of delivery (i.e. whether it is publicly or privately produced), the level (local or supralocal) at which the service is produced and, if applicable, the year when the service was contracted for the first time.

We obtained population data in 2003 from the Spanish Statistics Institute. Information about the fiscal burden at the local level has been obtained from the Ministry of Treasury. Data for this variable refer to 2002 for municipalities of more than 2000 inhabitants, since the fiscal burden a year prior to a decision may have an effect on the choice made by the local government. Data for the relative strength of industrial interests are available in the 2004 Spanish Economic Yearbook published by La Caixa, a Spanish savings bank. The web site of the Spanish Ministry of Domestic Affairs provides data for electoral results (national, regional and local) at the city/town level (<http://www.mir.es>).

### **The empirical model**

The empirical model considers aspects that have been commonly analyzed in the existing literature. Thus, we include explanatory variables that capture the demand of local services at the municipal level, fiscal stress and interest group pressures. Additionally, we take into account the role of transaction costs. Finally, measures concerning political and ideological factors are included in different specifications of the equation. Altogether, the empirical model is as follows:

$$Y_i = \alpha + \beta_1 pop_i + \beta_2 pop_i^2 + \beta_3 coop_i + \beta_4 transaction\_costs + \beta_5 fiscal\_burden_i + \beta_6 industrial\_interests_i + \beta_7 (political\ and\ ideological\ factors)_i + \varepsilon_i \quad (1)$$

where  $Y_i$  is a dummy variable for the production form of the local service. This variable takes a value of 1 when the service is delivered by a private firm, and it is 0 when delivery is public.

We construct the explanatory variables included in Equation (1) as follows. We include a variable for population of the municipality,  $pop$ . This variable is a proxy for the demand for the local service. We expect the relationship between the demand size and the decision

to privatize to have an inverse U-shape (Bel and Miralles 2003). The square of the population,  $pop^2$ , appears in Equation (1) to test for the inverse U-shape hypothesis.<sup>9</sup> Indeed, small cities afford high supervision costs and modest quantitative potential benefits from privatization. On their side, the largest municipalities do not exploit scale economies from privatization and they usually have strong managerial capacities.

Additionally, we include a variable for municipalities that use intermunicipal cooperation to produce the service, *coop*. We construct this variable as a dummy that takes a value of 1 when the service is produced at the supramunicipal level, while it is 0 when production is municipal. As mentioned, intermunicipal cooperation can be used as a means of exploiting scale economies.

It is worthwhile noting that intermunicipal cooperation in Spain – as well as in most European countries – is compatible with private production. On the contrary, intermunicipal cooperation as it is understood in the US (e.g. Warner and Hefetz 2002a, 2002b; Levin and Tadelis 2007) is usually not compatible with private production, although it is seen as a form of contracting out. The main divergence between these different meanings for ‘intermunicipal cooperation’ is that in the US local governments contract out with other local government or public agencies. Therefore, delivery is in charge of an external (public) producer. In Spain, intermunicipal cooperation does not involve municipal governments contracting out the service to another government or public agency. Instead, they engage in city partnerships under a joint authority (either a supralocal institution – at county or province level – or a single purpose agency) in governance of which all involved governments play a role.<sup>10</sup> Within this framework, the choice is made of using private production, public production or mixed firms for the delivery of the service. Hence, cooperation and privatization are not incompatible (Bel and Fageda 2006). In fact, production form choices made by municipalities that engage in cooperation are diverse. Among all municipalities that elect intermunicipal cooperation in solid waste, 51% use private firms, 39% use public production, and 10% use mixed firms. Concerning water, among all municipalities that elect intermunicipal cooperation 30% use private firms, 62% public production, and 8% use mixed firms. Indeed, many communities that engage in municipal cooperation make a choice other than public production.

We measure the role of transaction costs in local service delivery choices using a variable for the considered service, *transaction\_costs*. This variable is constructed as a dummy variable that takes a value of 1 when the service is water distribution and 0 for solid waste collection. As mentioned above, the transaction costs of buying (and not producing internally) the service should be higher for water distribution than for solid waste. Indeed, the network nature of water distribution makes the specific assets associated to this service much more important than are those of solid waste removal. This is consistent with evidence in the literature showing that water distribution is characterized by higher transaction costs than solid waste collection (Brown and Potoski 2005).<sup>11</sup>

A variable for fiscal burden, *fiscal\_burden*, is also considered. According to legal specifications in the Spanish budgetary process, we construct this variable as the sum of the financial expenditures (chapters 3 (interests) and 9 (amortization) of the expenditures budget) over the sum of ordinary revenues of the local government (chapters 1 through 5 of the revenues budget). Data on fiscal burden are not available for nine municipalities. Because of this, 18 observations have been excluded from the sample. Data for the other nine municipalities are available only for 2001. Recall that according to theoretical insights and empirical evidence, the decision to privatize may be more likely as the budget constraints of the municipality become more severe.

We also control for the influence of industrial interests on privatization, *industrial\_interests*. This variable reflects industrial activity by measuring the dimension of

industrial activity in the city relative to the whole country level. It is constructed as an index based on the tax revenues share of the city over the whole country. Here tax revenues refer to local taxes for industrial activities.

Rather than using a single political variable, we seek to estimate the distinct effects of political and ideological influences by creating two variables, which can be looked at separately. In this way, we estimate three specifications of Equation (1) and we differentiate them according to the political and ideological factors considered.

Indeed, we first consider the political affiliation of the mayor, *mayor*. We construct this variable as a dummy variable that takes a value of 1 when the mayor belongs to a conservative party and 0 when the mayor belongs to a progressive party. We exclude from this estimation those municipalities whose mayors do not belong to a standard political party (parliamentary representation either at national or regional (state) level), since we cannot precisely infer where such mayors lie on the conservative/progressive continuum. We cannot include the variable of independent mayors as a dummy in Equation (1) because mayors in this set are very divergent from the ideological point of view. Moreover, quite often the independent (from the conventional parties) lists<sup>12</sup> are based on a strong personal-ity of the candidate to mayor (the person in the top position in the list). There is a minority of municipalities with an 'independent' mayor: only 57, which represents 10.2% of the municipalities in our sample (559). The frequency of independent mayors is much higher in the less populated municipalities (13.1% of municipalities below 20,000 inhabitants). It decreases in the intermediate municipalities (8.9% of municipalities between 20,000 and 50,000), and reaches the lowest frequency in the largest cities (6.1% in municipalities above 50,000).

Second, we consider the ideological position of the constituency in national elections, *ideology*. We construct this variable by measuring the mean percentage of votes obtained by conservative parties in the national elections of 2000 and 2004. In our view, the ideology of the constituency is reflected in its stance in national elections. This is so especially if we remember that Spain has a parliamentary system, and the Prime Minister is elected by the Parliament. Hence, national elections are the most ideologically motivated elections in Spain. One might wonder whether elections to the European parliament are more ideologically driven than national elections. However, abstention in European elections (54.86% in 2004) is very important, and much higher than abstention in national elections (24.34% in 2004). National elections are widely seen as the most important elections in Spain.

On the other hand, the political affiliation of the mayor may differ from the basic ideology the constituency demonstrates in national elections. In fact, a mayor's affiliation might also depend on the relative strength of interest groups such as industrial unions, trade unions, and coalitions at the local level, etc. In this regard, it is worth noting that the correlation between the variables *mayor* and *ideology* is 0.53. This indicates that we should not consider these two variables jointly since multicollineality may prevent identifying each individual effect. However, these variables may be capturing different aspects of the decision since they are far from being identical.<sup>13</sup>

Furthermore, we construct complex political variables that combine *mayor* and *ideology* variables. Hence the following dummies are created: *C-C*: Conservative mayor – Conservative constituency; *C-P*: Conservative mayor – Progressive constituency; *P-C*: Progressive mayor – Conservative constituency; *P-P*: Progressive mayor – Progressive constituency. A conservative constituency is one that gives conservative parties a majority of votes in national elections (and the opposite for progressive constituency). Concerning the probability of privatization, we expect that  $CC > CP > PC > PP$ . Indeed, municipalities with conservative mayors will privatize more than municipalities with progressive mayors, regardless of the

ideological stance of the constituency. This would imply that interest groups might be successful in promoting privatization through a conservative mayor, even if the constituency is progressive oriented (and the opposite).

Table 1 summarizes the description of the variables used in the empirical analysis and their expected relationship with the form of production used by local governments.

Table 2 shows the descriptive statistics for solid waste collection and water distribution concerning the form of production (private production, public production and mixed firm production)<sup>14</sup> and the level at which the service is produced (local or supralocal). It can be seen that private production is more common for solid waste collection than for water distribution.

Although production at the supramunicipal level is more common for solid waste, around 25% of cities use intermunicipal cooperation in the delivery of water. In addition, municipalities that cooperate are less likely to use private production in water or solid waste services than are those that do not cooperate. To this point, it is worth noting that the mean

Table 1. Summary of variables and hypothesis.

Set of variables	Variable	Description	Hypothesis
Cost and efficiency	<i>pop</i>	Local population	Privatization increases with population (+)
	<i>pop</i> <sup>2</sup>	Square of local population	The intensity of the population effect decreases as population increases (-)
	<i>transaction_costs</i>	Dummy variable (1 = water distribution, 0 = solid waste collection)	Privatization decreases with higher transaction costs (-)
Fiscal stress	<i>fiscal_burden</i>	Sum of financial expenditures over sum of ordinary revenues of the local government	Privatization increases with higher fiscal burden (+)
Intermunicipal cooperation	<i>Coop</i>	Dummy variable (1 = service produced at the supra-municipal level, 0 at the municipal level)	Privatization decreases with intermunicipal cooperation (-)
Political and ideological factors	<i>industrial_interests</i>	Relative share of industrial activity in the city/town	Privatization increases with higher relative strength of industrial interests (+)
	<i>mayor</i>	Dummy variable (1 = mayor belongs to a conservative party, 0 = mayor belongs to a progressive party)	Privatization increases with mayors from a conservative party (+)
	<i>ideology</i>	Percentage of votes obtained by right wing parties in the national elections	Privatization increases with a conservative constituency (+)
	<i>CC</i>	Conservative mayor – Conservative constituency	CC > CP > PC > PP
	<i>CP</i>	Conservative mayor – Progressive constituency	CC > CP > PC > PP
	<i>PC</i>	Progressive mayor – Conservative constituency	CC > CP > PC > PP
	<i>PP</i>	Progressive mayor – Progressive constituency	CC > CP > PC > PP

Table 2. Selected descriptive statistics for individual services.

Solid waste collection			
	Percentage of municipalities	Mean population	Standard deviation population
Private production	65.68	57,999.48	192,176.8
Public production	29.68	45,459.94	82,003.72
Mixed firm production	4.64	57,985.60	125,847.4
Cooperation at supramunicipal level	29.31	20,128.18	28,957.32
Production form (only municipalities that cooperate)			
Private production	51.27	23,330.89	37,044.54
Public production	38.61	17,219.11	16,622.05
Mixed firm production	10.13	15,003.69	15,315.46
<b>Water Distribution</b>			
	Percentage of municipalities	Mean population	Standard deviation population
Private production	49.82	46,371.95	110,140.9
Public production	40.84	64,809.56	223,654.4
Mixed firm production	9.34	81,020.10	132,981.1
Cooperation at supramunicipal level	24.36	79,273.14	300,217.3
Production form (only municipalities that cooperate)			
Private production	30.08	81,571.85	249,493.04
Public production	61.65	86,443.52	341,043.94
Mixed firm production	8.27	17,465.27	17,324.17

Source: The authors.

population size of municipalities that cooperate is much lower for solid waste than for water. This can be explained by the different cost structures of these services. Fixed assets are required for producing both services but water distribution has network features linked to important sunk investments. In this regard, scale economies affect solid waste, while density economies are critical for water distribution. Scale economies imply that unit costs are reduced when the amount of output increases. Such effect may be approximated by the amount of inhabitants from municipalities to which the producer delivers the service. On the contrary, density economies imply that unit costs are reduced when population density concerning the municipalities to which the producer delivers the service is higher.

Hence, we expect intermunicipal cooperation for water distribution to take place more frequently between nearby municipalities located in major urban areas. Interestingly, our data show that Levin and Tadelis's (2007) finding that large municipalities (in terms of population) are more prone to contract out whereas small towns are more prone to cooperate is heavily dependent on the nature of the potential scale economies involved in the specific service. In this way, our data for solid waste are consistent with Levin and Tadelis (2007), but our data on water are not. In the latter case, economies of density are more relevant than scale economies. Economies of density emerge in metropolitan areas with populated

contiguous municipalities, rather than in non-metropolitan areas where population is much lower, and towns cannot share an existing network for water distribution.

Table 3 presents the descriptive statistics of both continuous and discrete variables used to estimate our model. Concerning the continuous variables, our sample contains a large diversity of municipalities in terms of population size, fiscal burden, the strength of industrial interests, mayor's party affiliation,<sup>15</sup> and ideology. Furthermore, data from Table 3 show that a high number of municipalities have privatized the production of the local service. In addition to this, around 30% of the municipalities use intermunicipal cooperation, which can be seen as an organizational administrative form that allows exploiting scale economies or scope economies.

Interestingly, the political affiliation of the mayor differs from the ideological orientation of the constituency in national elections in more than 25% of the municipalities of the sample. In our view, there are several and compatible reasons why there can be a conservative (progressive) mayor in a progressive (conservative) jurisdiction. Strong personal characteristics can play a role, as well as the fact that local policy agendas are different from national policy agendas. Besides, a proportional system with lists and non-direct election of a mayor can result in a more complex city council, and different types of coalition forming to elect a mayor. All these factors are likely to be more influential in those jurisdictions where a large ideological majority does not exist. This can be seen in Table 4, which displays information on the mayor/ideology distribution in the sample. First, the average population in municipalities where the mayor's affiliation and ideological majority (CP and PC) diverge is smaller than the average population when the mayor's party and ideology are

Table 3. Descriptive statistics of variables in the model.

Continuous variables	Mean	Standard Deviation	Min	Max
Pop	54,088.54	166,644.1	2,033	3,092,759
Fiscal_burden	0.087	0.068	0.00002	0.823
Industrial_interests	0.0025	0.0028	0.0002	0.030
Ideology	0.488	0.107	0.18	0.80
<b>Discrete variables</b>	<b>Percent 1</b>	<b>Percent 0</b>	<b>N</b>	
Production form (1= private, 0= public)	62.08	37.92	1,010	
coop. (1=production at the supramunicipal level, 0=production at the municipal level)	26.82	73.18	1,085	
transaction_costs (1=water distribution, 0=solid waste collection)	50.32	49.68	1,085	
Mayor (1= Conservative mayor, 0= Progressive mayor)	44.34	55.66	972	
CC (1= Conservative mayor – Conservative constituency, 0=other)	33.13	66.87	972	
CP (1= Conservative mayor – Progressive constituency, 0=other)	11.21	88.79	972	
PC (1= Progressive mayor – Conservative constituency, 0=other)	13.99	86.01	972	
PP (1= Progressive mayor – Progressive constituency, 0=other)	41.67	58.33	972	

Source: Authors.

Table 4. Distribution of municipalities according to the mayor affiliation/ideological majority combination.

	Conservative mayor – Conservative constituency CC	Progressive mayor – Conservative constituency PC	T-statistic (Average differences)	Conservative mayor – Progressive constituency CP	Progressive mayor – Progressive constituency PP	T-statistic (Average differences)
Number municipalities	169	71		56	206	
Average population	67,716	39,353	1.397	53,184	53,973	0.045
(Standard deviation)	(251,821)	(51,342)		(111,596)	(129,181)	
Average ideological majority	0.58142	0.54866	4.116***	0.45889	0.39495	8.211***
(Standard deviation)	(0.0686)	(0.0502)		(0.0427)	(0.0765)	

Note 1: Percentages in 'average ideological majority' are to be read as follows: 0.58142 in CC means that the conservative parties obtained 58.142% of votes in the CC municipalities (as average) in the national elections of 2000 and 2004.

Note 2: Significance at the 1% (\*\*\*), 5% (\*\*), 10% (\*) levels.

Source: Authors.

coincident (CC and PP). More importantly, average ideological results in CP and PC cities are notably more moderate than those in CC and PP cities, where the respective ideological majority is more significant.

### **The empirical results**

The estimation is made using the logit technique since the dependent variable is of a discrete nature. Table 5 shows the results of the estimation for the different specifications of Equation (1).

Results of the estimates show that the size of the municipality in terms of population does not have a strong effect on the probability of using private firms. We find that the variables related to population have the expected sign – privatization increases with population (+ sign for *pop*) – but the intensity of that effect decreases as long as the population increases (– sign for *pop*<sup>2</sup>). However, the coefficients we find are not significantly different from zero when considering the variable for population. The square of population is statistically significant at the 10% level except in the specification that considers ideological factors. This latter result implies that the largest municipalities tend to privatize less often because they are large enough to completely exploit scale economies.

However, it is clear that privatization is not the unique choice available to local governments for exploiting scale or density economies. On the contrary, privatization is less likely when the production of the local service is made at the supramunicipal level.<sup>16</sup> Hence, we can infer that many local governments prefer to use intermunicipal cooperation rather than privatization to exploit scale economies. Indeed, intermunicipal cooperation also allows small municipalities to aggregate demand to achieve a scale of production higher than the minimum efficient one. In such a case, those small municipalities obtain less benefit from

Table 5. Estimates of the equation of factors explaining local privatization estimates (logit).

	Specification (1): mayor	Specification (2): ideology	Specification (3): combined mayor- ideology
Pop	3.13e-06 (3.63e-06)	1.48e-06 (3.43e-06)	3.01e-06 (3.61e-06)
pop <sup>2</sup>	-2.61e-11 (1.41e-11)*	-2.11e-11 (1.33e-11)	-2.56e-11 (1.40e-11)*
Coop	-1.24 (0.16)***	-1.13 (0.16)***	-1.24 (0.17)***
Transaction_costs	-0.69 (0.15)***	-0.68 (0.14)***	-0.69 (0.15)***
fiscal_burden	1.42 (1.11)	1.24 (1.11)	1.44 (1.11)
Industrial_interests	16.69 (29.56)	28.42 (27.13)	14.73 (30.16)
Intercept	0.77 (0.20)***	0.17 (0.38)	0.77 (0.22)***
Mayor	0.33 (0.15)**	-	-
Ideology	-	1.60 (0.67)**	-
CC	-	-	0.30 (0.17)*
CP	-	-	0.47 (0.26)*
PC	-	-	0.06 (0.22)
N	818	913	818
Pseudo R <sup>2</sup>	0.08	0.08	0.08
$\chi^2$ (joint sig.)	77.97***	81.55***	78.27***
Log pseudolikelihood	-505.61	-564.98	-505.38

Note 1: Standard errors in parentheses (robust to heteroskedasticity).

Note 2: Significance at the 1% (\*\*\*), 5% (\*\*), 10% (\*) levels.

privatizing the service, since transaction costs are likely higher for contracting out to a private firm than for joining a joint powers authority.

We also find that privatization is less likely for water distribution than for solid waste, given the value of the other explanatory variables related to the characteristics of municipalities. A sensible explanation for this result is that transaction costs are higher for water, so local governments may have fewer incentives for using private firms to produce this service. Thus, our evidence supports the hypothesis that privatization will be less likely for services with larger transaction costs.

A local government's service delivery choices are not clearly influenced by its financial situation. The sign of the coefficient of this variable is positive, thus suggesting the expected positive relation between financial restrictions and privatization. However, the coefficient is not significantly different from zero. As we mention above, this 'no significant effect' result is much more frequent in empirical analysis for European countries, where supramunicipal regulations imposing restrictions on local budgetary decisions are less restrictive.

We do not find a substantial effect from the relative strength of local industrial groups on the privatization decision of local governments. The sign of the coefficient is the expected positive one but it is highly non-significant. It may be that industrial lobbying is more an action of those private players in the market for local services than a product of local industrial groups. Our variable reflects only local industrial groups, and this could explain its lack of statistical significance.

On the contrary, the variables that capture political and ideological factors play a significant role in explaining the decision to privatize.<sup>17</sup> Indeed, we find that local governments where the mayor belongs to a conservative party privatize local services delivery more often

(specification 1 of Equation (1)). In addition, local governments with conservative constituencies also seem to privatize service delivery more often (specification 2 of Equation (1)). However, the dummy variables that combine both political and ideological factors give us further insights into this issue (specification 3 of Equation (1)). Indeed, governments with conservative mayors privatize more often regardless of the ideological orientation of the constituency.<sup>18</sup> This shows that political interests that influence the result of local elections are more important than the basic ideological stance of the constituency.

Tables 6, 7 and 8 display the results from estimating Equation (1) for sub-samples of municipalities according to different population ranges. In this way, we consider small municipalities to be those with less than 20,000 inhabitants, medium-sized cities are those whose population ranges from 20,000 to 50,000 inhabitants, and large cities are those with more than 50,000 inhabitants.

For all sub-samples of municipalities, we find that privatization is chosen less commonly when the local service is delivered at the supramunicipal level. Additionally, privatization takes place less often for water distribution than for solid waste. The results confirm those previously obtained for the whole sample of municipalities. Intermunicipal cooperation emerges as an alternative organizational form to privatization, regardless of the size of the municipality. In the same way, the fact that transaction costs associated to water are higher is relevant for both small and large cities.

Concerning small municipalities, we find that the relationship between privatization and population has the expected inverse U-shaped form. Indeed, the variables for population and the square of population are statistically significant with the expected sign. Fiscal restrictions also seem to condition delivery choices of these municipalities given that the variable for fiscal stress is statistically significant (with a positive sign) in two of the specifications

Table 6. Estimates of the equation of factors explaining local privatization estimates (logit). (Municipalities with less than 20,000 habitants).

	Specification (1): mayor	Specification (2): ideology	Specification (3): combined mayor- ideology
Pop	0.00018 (0.00009)**	0.00024 (0.00008)***	0.00018 (0.00009)**
Pop <sup>2</sup>	-6.54e-09 (4.38e-09)	-1.02e-08 (4.04e-09)**	-6.46e-09 (4.42e-09)
Coop	-1.10 (0.25)***	-0.91 (0.23)***	-1.11 (0.25)***
transaction_costs	-0.67 (0.22)***	-0.67 (0.20)***	-0.67 (0.22)***
fiscal_burden	2.88 (1.67)*	2.41 (1.64)	2.99 (1.71)*
Industrial_interests	7.21 (35.38)	23.65 (32.96)	3.85 (36.47)
Intercept	-0.32 (0.48)	-0.88 (0.64)	-0.31 (0.51)
Mayor	0.16 (0.21)	-	-
Ideology	-	1.02 (0.89)	-
CC	-	-	0.12 (0.25)
CP	-	-	0.37 (0.37)
PC	-	-	0.07 (0.32)
N	407	469	407
Pseudo R <sup>2</sup>	0.07	0.07	0.07
$\chi^2$ (joint sig.)	32.09***	30.59***	32.52***
Log pseudolikelihood	-255.77	-294.23	-255.50

Note 1: Standard errors in parentheses (robust to heteroskedasticity).

Note 2: Significance at the 1% (\*\*\*), 5% (\*\*), 10% (\*) levels.

Table 7. Estimates of the equation of factors explaining local privatization estimates (logit). (Municipalities whose population ranges from 20,000 to 50,000 inhabitants).

	Specification (1): mayor	Specification (2): ideology	Specification (3): combined mayor- ideology
Pop	0.00010 (0.00016)	0.00021 (0.00015)	0.00013 (0.00016)
pop <sup>2</sup>	-2.36e-09 (2.43e-09)	-3.86e-09 (2.31e-09)*	-2.84e-09 (2.44e-09)
Coop	-1.24 (0.33)***	-1.23 (0.32)***	-1.24 (0.34)***
Transaction_costs	-0.70 (0.30)**	-0.59 (0.29)**	-0.70 (0.30)**
fiscal_burden	-0.30 (2.19)	-0.25 (2.18)	-0.34 (2.25)
Industrial_interests	98.62 (80.46)	97.06 (66.57)	106.08 (70.63)
Intercept	0.09 (2.68)	-2.65 (2.62)	-0.26 (2.68)
Mayor	0.36 (0.31)	-	-
Ideology	-	1.83 (1.25)	-
CC	-	-	0.39 (0.37)
CP	-	-	-0.25 (0.56)
PC	-	-	-0.48 (0.38)
N	230	252	230
Pseudo R <sup>2</sup>	0.12	0.10	0.12
$\chi^2$ (joint sig.)	26.37***	26.72***	28.55***
Log pseudolikelihood	-133.40	-147.36	-132.13

Note 1: Standard errors in parentheses (robust to heteroskedasticity).

Note 2: Significance at the 1% (\*\*\*), 5% (\*\*), 10% (\*) levels.

of Equation (1). On the contrary, political and ideological factors are not statistically significant in any of the specifications of our equation for explanatory factors of local privatization. This latter result is also obtained when considering medium-sized municipalities. The relationship between population and privatization does not seem to be a relevant factor for medium-sized and large municipalities. This is also the case with respect to the influence of fiscal burden on local governments' delivery choices. Importantly, politics and ideology are both relevant factors explaining local privatization for large municipalities.

Overall, these results suggest that delivery choices of local governments are more pragmatically oriented for small municipalities, while politics and ideology play a major role for governments of large cities. Indeed, small municipalities may have difficulties in generating fiscal revenues and the quantitative advantages of privatization should be modest. In addition to this, it is sensible to argue that the politics of large cities is more dependent on ideological orientation, while personal interaction between politicians and citizens is a key issue in small towns.

Results from the estimation for sub-samples of municipalities according to different population ranges suggest significant differences for small and large municipalities. This may imply that different equations are needed to examine local governments' service delivery choices. In this way, we have implemented the Chow F-test for structural change considering the residuals of the estimation for the whole sample of municipalities, and the residuals of the estimation for municipalities with more (and less) than 20,000 inhabitants. The Chow test is a test of whether the coefficients in two equations on different data are equal. Within our context, under the null hypothesis there do not exist significant differences in the coefficients of the equations for municipalities with more (and less) than 20,000

Table 8. Estimates of the equation of factors explaining local privatization estimates (logit). (Municipalities with more than 50,000 inhabitants).

	Specification (1): mayor	Specification (2): ideology	Specification (3): combined mayor- ideology
Pop	-2.63e-06 (6.59e-06)	-2.82e-06 (6.89e-06)	-3.64e-06 (5.73e-06)
pop <sup>2</sup>	-1.16e-11 (1.63e-11)	-1.07e-11 (1.75e-11)	-8.77e-12 (1.24e-11)
Coop	-1.69 (0.44)***	-1.86 (0.48)***	-1.75 (0.44)***
Transaction_costs	-0.72 (0.35)**	-0.75 (0.35)**	-0.77 (0.35)**
fiscal_burden	0.24 (2.00)	-0.08 (1.95)	0.21 (2.02)
Industrial_interests	18.51 (135.27)	49.15 (135.11)	20.27 (133.73)
Intercept	1.25 (0.61)**	-1.13 (1.001)	1.09 (0.59)*
Mayor	0.67 (0.35)*	-	-
Ideology	-	5.37 (1.83)***	-
CC	-	-	0.82 (0.40)**
CP	-	-	1.32 (0.66)**
PC	-	-	0.99 (0.53)*
N	181	192	181
Pseudo R <sup>2</sup>	0.17	0.18	0.18
$\chi^2$ (joint sig.)	27.12***	28.78***	29.49***
Log pseudolikelihood	-102.46	-106.96	-100.38

Note 1: Standard errors in parentheses (robust to heteroskedasticity).

Note 2: Significance at the 1% (\*\*\*), 5% (\*\*), 10% (\*) levels.

inhabitants. However, the value obtained is about 100, which is highly above the 1% critical values of the corresponding F-statistic. Thus, empirical analyses on factors explaining local privatization must account for the size distribution concerning the sample of municipalities used.

## Conclusion

This paper has developed an empirical model aimed to identify factors explaining local governments' service delivery choices in Spain. In this way, we have taken advantage of a rich data set using a survey for Spanish municipalities with more than 2000 inhabitants concerning two very relevant local services; solid waste collection and water distribution.

The empirical model has considered variables related to fiscal stress, cost reduction and political and ideological factors. We contribute to the previous literature in several ways. There is an agreement that transaction costs are relevant in explaining local governments' service delivery choices. However, few empirical works have been able to capture their effect. In our paper, we capture the effect of transaction costs using a new variable that differentiates between services associated with different levels of transaction costs.

In addition to this, ours is the first empirical analysis that jointly considers the influence of politics and ideology on local government choices by using measures that account for the political affiliation of the mayor, the ideological standpoint of the constituency and the joint effect of both. We argue that ideology is mainly captured by the constituency stance in national elections, while the political affiliation of the mayor may well depend on the relative strength of interest groups.

Finally, this is the first empirical analysis considering intermunicipal cooperation as an explanatory factor for local privatization. Indeed, local governments may use intermunicipal cooperation as an alternative organizational form to privatization for reducing costs by exploiting scale or density economies.

Our main empirical findings are as follows. We find that private production is less common for water distribution than for solid waste collection, given the value of variables for the characteristics of the municipalities. From this result, we infer that transaction costs matter in explaining why local governments adopt or reject contracting out of local service, since transaction costs are higher in the case of water distribution.

We also obtain evidence that politics and ideology are relevant explanatory factors for local governments' service delivery choices. We also find that the effect of political interest is more important than the effect of ideological attitudes. Conservative mayors use private production more often, regardless of the ideological position of their constituencies.

Furthermore, our results show that intermunicipal cooperation is an alternative to privatization for exploiting scale or density economies. Private production is much less frequent under intermunicipal cooperation, and intermunicipal cooperation negatively influences privatization.

Our research provides new insights into the factors influencing the decision to privatize local services. It also suggests interesting questions for future research. We find it particularly compelling to consider variables related to quality of services, although measurement of this variable for empirical work has proven to be a very difficult task. In addition, studying the dynamics of mixed firms can provide a deeper understanding of the dynamics of local government reform. Future research will devote more attention to these issues.

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### Notes

1. Joint effects of political interests and ideological attitudes have been considered in Bel and Miralles (2006) when analyzing the economics and politics of local public services financing.
2. It is worth noting that whereas intermunicipal cooperation in the US is not compatible with privatization (Warner and Hefetz 2002a, b; Levin and Tadelis 2007), intermunicipal cooperation in Spain – as well as in most European countries – is compatible with private production. Hence, decisions on engaging in cooperation and/or privatizing are not taken simultaneously. Section 3 deals in detail with this issue.
3. Beyond the decision to privatize local services, there is an interesting recent literature that analyzes the politics of the formation of public or private governments (Carr and Feiock 2004). In this view, creating private governments is a solution to collective action problems that emerges because of a political process of crafting a relational contract among members of a community (Baer and Feiock 2005).
4. This double dimension of the politician has been named the *citizen-candidate* approach. Osborne and Slivinski (1996) and Besley and Coate (1997) offer theoretical insights; Levitt (1996) and Lee *et al.* (2004) offer empirical support.
5. Another variable used in several studies is the percentage of public employees over population. On this we must recall that the determination of service delivery choices and the percentage of

- public employees is done simultaneously. Hence, the variable for the weight of public employees is statistically biased. Indeed, a more intense use of external suppliers implies *per se* a reduction in the number of public employees. Because of this, we do not consider here results obtained from using the variable percentage of public employees. A complete discussion of this methodological issue can be found in Bel and Fageda (2007).
6. Still for the US, following the proposition that politicians obtain the support of public employees under public production, Lopez-de-Silanes *et al.* (1997) test the hypothesis that political patronage affects service delivery choices. They find that state laws imposing accountability requirements in contracting for personnel encourage privatization. However, later studies by Kodryzcki (1998) and Walls *et al.* (2005) do not confirm these results.
  7. Miralles (2006) obtains mixed results. Christoffersen and Paldam (2003) find no relation between ideology and privatization in their univariate study for Denmark.
  8. Bel (2006) contains more detailed information on the sample. The rate of response for the survey was 24.9% for municipalities of over 2000 inhabitants, and 100% for municipalities of over 30,000 inhabitants.
  9. Note that including this variable does not pose a problem of multicollinearity, which would only be an issue if the sample size were within a very small population range. Other works (e.g. Warner 2006) find an inverse U-shape curve for local privatization too. However, in Warner's case, the curve is related to the geographical continuous metro-suburbs-rural, whereas our curve relates to the city/town population.
  10. Levin and Tadelis (2007) refer to exceptional cases of this type of city partnership or public agencies partnership in California, and they consider this a special form of public sector contracting. Instead, they are much more frequent in continental Europe, and especially in France, the Netherlands and Spain (Kelly 2007).
  11. In this way, Brown and Potoski (2005) measure asset specificity and ease of measurement for 64 local services in the US. They build indicators ranging from 1 (low specificity, or easy measurement) and 5 (high specificity, and difficult measurement). They find asset specificity of 3.94 and ease of measurement 2.44 for water distribution; assets specificity is 3.00 and ease of measurement 2.06 for residential solid waste. For commercial waste, ratings are 3.06 and 1.97. Levin and Tadelis (2007) build indicators on contract difficulty, as perceived by city managers, and find that contract difficulty is over the average for water services, whereas for all services related to waste, contract difficulty is below the average. Bel (2006) provides evidence that contract terms are longer in water than in solid waste, thus reflecting higher relevance of sunk costs in water.
  12. Local elections in Spain are based on party lists. In this way, independent parties are those parties that are strictly local. The members of the city council are elected on a proportional basis (corrected with the d'Hondt system). The election of the mayor is not direct: after being elected, the city council members elect the mayor in the first meeting of the council. An absolute majority (50% + 1) of votes from the city council members is required to be elected as mayor in the first round. If no candidate obtains such a majority, then the top member of the list that obtained the largest fraction of votes in the election is automatically elected as mayor.
  13. Otherwise, the correlation between the variables *industrial\_interests* and *major* is low.
  14. We exclude from the estimation those observations in which a mixed firm is in charge of delivering the service. Observations excluded are 76, which represents 7% of the sample. Mixed firms are firms whose stakeholders are both the corresponding governments and private investors. Such mixed public/private firms are usual in many European continental countries, but they are a very rare organizational form in countries like the US (Warner and Bel 2008). Whenever a mixed firm is involved, we are not able to make clear standard inferences about the ownership status of the producer. In this way, we do not know with precision the structure of the firm ownership. Including mixed firms in the estimation would distort the analysis of the choice between public and private form of production since mixed firms are a hybrid organizational form.
  15. After pooling the data for our two local services, the number of observations excluded in the estimations with the variable '*mayor*' has been 95. We had initially 111 observations for cities with 'independent mayor'. However, 16 of them had already been excluded because of mixed firms or unavailability of fiscal data.
  16. One could argue that the variable for intermunicipal cooperation implies an endogeneity bias as the decision to cooperate could be made simultaneously with the decision of contracting out. However, as we mention above, intermunicipal cooperation as it is understood in Europe is a decision that can be undertaken under any production form setting. Thus, the possible endogeneity bias is not an issue in our context.

17. In the empirical analysis, we exclude observations in municipalities that first externalized the delivery of the local services considered before local democracy was restored in Spain in 1979. Observations excluded are 78, which represents 7.2% of the sample. Inclusion of service delivery choices made in the authoritarian political context of Franco's dictatorship might distort the analysis of explanatory factors, particularly concerning the political factors, since these decisions were not taken within a democratic decision context. Many of these concessions, particularly on water, were still in place in the early 2000s. Considering in the estimation cities that first externalized the service before democracy was restored yields similar results to those obtained in our analysis. Political variables show less robust results, even if they keep significance.
18. We exclude from the estimation the following dummy variable that combines political and ideological factors: *P-P*: Progressive major – Progressive constituency. We exclude this variable from the estimation to avoid perfect multicollineality with the other dummy variables for political and ideological factors. This variable is set as the reference variable for these other dummy variables.

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