THE COSTS OF CORPORATISATION:

ANALYSING THE EFFECTS OF FORMS OF GOVERNANCE

ABSTRACT

Public corporations have been constantly in the spotlight, with some commentators arguing that they can help governments provide better public services, and others insisting that their governance is simply too complex. Despite this ongoing debate, few studies have researched public-corporation performance. The present study offers empirical evidence of the effects of various forms of corporatisation on public-service costs. In particular, it examines public-service costs incurred under four different forms of governance: public agencies, public corporations, mixed public corporations with minority public ownership, and mixed public corporations with majority public ownership. The analysis considers eight types of public services in 874 Spanish municipalities between 2014 and 2017. The empirical results show that services provided by public corporations are no less costly than those provided by public agencies. In fact, the services offered by mixed corporations with government majorities tend to cost more than those provided by public agencies.

KEYWORDS: local services, costs, government, corporatisation, mixed firms

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INTRODUCTION

As local governments search for better ways to implement public services, the corporatisation of public services has received increasing attention (Voorn, van Thiel, & van Genugten, 2018). Public corporations are thought to deliver public services efficiently, either by developing more managerial flexibility (given that they operate under general or corporate law), establishing their own working conditions, or operating outside traditional political bureaucratic structures.

Since the 1990s, a number of studies have investigated why policymakers turn to public corporations (Cruz & Marques, 2011; Albalate, Bel, & Fageda, 2014; Lindlbauer, Winter, & Schreyögg, 2016; Tavares, 2017; Andrews, Ferry, Skelcher, & Wegorowski, 2020). Academics have also characterised the service-delivery performance of local bureaucracies (see Voorn et al., 2017). It is therefore surprising that so few studies have asked how local authorities can improve the performance of public corporations.

Corporatisation is the process by which functions carried out within a government bureaucracy are transformed into entities that are wholly or partly owned by the government, but allowed to operate in a commercial environment (Grossi & Reichard 2008; Skelcher, 2017). It is important to note that public corporations take various organisational forms, some of which collaborate with the private sector to offer public services (Lidström 2017). Studies of public corporations have compared the costs of in-house public-service production and private-sector service delivery (Voorn, van Genugten, & van Thiel, 2020). However, no multivariate empirical research has considered the effect on costs of the range of organisational forms used to create public corporations. To address this research gap, the present study explores the effects of different forms of corporatisation on public-service costs, focusing specifically on forms of governance that local authorities use to develop public corporations. These include public agencies as a baseline group, as they are external to organisations but operate under public law. Hence, this study examines the costs of public services implemented using four

different forms of governance: public agencies, public corporations, mixed public corporations with minority public ownership, and mixed public corporations with majority public ownership. This paper thus responds to recent calls for an enquiry into public-corporation governance (Ferry et al., 2018; Vorn, van Thiel & van Genugten, 2018).

Do public corporations incur lower costs than public agencies when implementing public services? What effect does the choice to combine a public corporation with the private sector have on service costs? These questions are addressed by analysing a broad sample of Spanish municipalities, with a special focus on eight service areas: solid-waste collection, waste treatment, sewage, street cleaning, waste-related environmental protection, water distribution, libraries, and social services. The database compiled for this study includes information about 873 Spanish municipalities in 2014–2017, corresponding to 40.4% of the population of the country. The first of the following sections reviews the existing empirical evidence on public-corporation performance, differentiating between public corporations that operate under administrative or business law, and between public corporations and mixed firms with private-sector participation. Second, the study outlines statistical models and cost measurements, together with several control variables. It then introduces the findings and discusses their statistically significant effects before delving into their relevance within the current state of research. Finally, this study draws theoretical and policy conclusions from evidence gathered using empirical methods.

CORPORATISATION

In and out: from administrative to commercial law

According to Tavares and Camões (2010), the typical municipal bureau, which provided most public services, used to operate under administrative law; it was tax-financed, subject to competitive budget allocations, and entirely dependent on the preferences of local elected

officials. By contrast, public corporations are often described as stand-alone organisations that 'rely on revenues derived from user fees, are governed by an appointed executive board, and have independent corporate status' (Tavares & Camões 2007: 535). Public corporations differ from private organisations, not only through their public-sector involvement, but also because they exist exclusively to serve the public (Barnet, 1924). Several terms are used to identify such organisations; they are often referred to as public authorities, commissions, boards, special-purpose public bodies, and corporations (Gerwig, 1961). Whichever term is used, public corporations are generally single-purpose organisations that operate under private law and tend to distance themselves from the influence of elected officials (Voorn, van Genugten, & van Thiel 2017).

What then is the difference between public services delivered by organisations operating under administrative law and services offered by organisations operating under commercial or private law? This can be challenging to determine because public corporations are subject to different laws from country to country. However, while it is difficult to pinpoint precise differences, certain general characteristics can be identified and defined, given that public corporations must adjust to different sets of national laws.

Public corporations were originally created to provide a singular legal means of addressing the fiscal complexities of large-scale public-activity development (Gerwig, 1961); however, their ability to operate outside administrative law has affected development in other ways. Firstly, public corporations that operate outside administrative law are less subject to financial control, which can have ambiguous consequences, beyond the traditional chain of democratic accountability (Citroni, Lippi, & Profeti, 2013). Secondly, this system can significantly increase the flexible implementation of personnel-management practices. Public corporations operating under private or commercial law 'are allowed to deviate from municipal labour agreements and public-sector salary caps' (Voorn et al., 2020: 16). Thirdly, since public

corporations are not required to operate under the jurisdiction of administrative law, they are free to expand their services in accordance with their needs. Some authors have argued that 'corporatization enables a local authority to overcome legal constraints on its ability to undertake trading activities and thus can generate a new revenue stream. It can offer flexibility in employment and reward systems' (Ferry et al., 2018: 478).

However, in some countries, including the Netherlands and Norway, public corporations still operate under administrative law (Torsteinsen & Van Genugten 2016; Voorn, van Genugten, & van Thiel, 2017). Consistent with the effects described above, there is evidence that such public corporations have less legal autonomy and more hierarchical control (Van Genugten, Van Thiel, & Voorn, 2019); they are also more politicised (Flinders & Matthews, 2010).

Ultimately, the effects of operating under administrative or commercial law are reflected in public-service performance. Unfortunately, few empirical studies have measured the performance of public corporations. Vorn, van Thiel, and van Genugten (2018) argue that, in the absence of any reliable evidence that public corporations outperform traditional bureaucratic structures, policymakers tend to implement the latter for ideological reasons (Gradus & Budding, 2020) or due to isomorphic factors (Ashworth et al., 2009). Arguably, public corporations have more managerial flexibility, as they manoeuvre outside the confines of public and administrative law (Mitchell, 1999). Researchers thus expect the public services provided by public corporations to cost less than those provided by public agencies.

Hypothesis 1: Public corporations operate with lower costs than public agencies.

Public and private: purely public and mixed firms

Public corporations can be either purely public or mixed firms. In mixed firms, the public and private sectors collaborate through institutional public-private partnerships or public-private joint ventures. Eckel and Vining (1985), in one of the first studies to propose a theory of mixed enterprises, explained the factors that underpin their performance. According to these authors, the key to mixed-firm performance is the 'constrain[t] on government direction of the firm that can be exercised by private shareholders' (1985: 82). They argue that levels of government intervention in the activities of mixed corporations are reflected in firm share prices (Boardman, Eckel, Linde, & Vining, 1983). In their seminal article, Boardman and Vining (1989) compared mixed firms with other organisational forms, arguing on the basis of comparative indicators that private firms outperformed public firms and that public firms outperformed mixed firms. They concluded that 'partial privatisation where a government retains some percentage of equity…may not be the best strategy for governments wishing to move away from reliance on State-Owned Enterprises' (Boardman & Vining, 1989: 26).

A recent systematic review of the performance of municipality-owned enterprises provides more nuanced evidence of the consequences of including private-sector participation in public corporations (Voorn et al., 2017). The authors examined several large-N studies, which suggested that municipally owned corporations with private participation were more efficient than purely public corporations (Bognetti & Robotti, 2007; Garrone, Grilli, & Rousseau 2013; Marra 2007; Pérez-López, Prior & Zafra-Gómez, 2015; Prior et al., 2019). However, several other studies have yielded contradictory findings. For example, Roy and Yvrande-Billon (2007), note the negative impact of technical inefficiency on mixed corporations.

Other studies have shown that, although private participation in public corporations has many potential benefits, the practice is not always beneficial (Da Cruz & Marques, 2012; Marques & Berg, 2011; Campos-Alba et al., 2020). Drawing on principal-agent theory, Da

Cruz and Marques (2012) explain that this is largely due to goal conflict and a lack of alignment between parties. In fact, corporatisation implies an additional principal-agent relationship, alongside the traditional public-administration relationship between citizens (principal) and the elected official (agent). The new relationship involves the elected official (principal) and the firm manager (agent). As the principal-agent relationship is more complex, it can potentially lead to a deeper lack of alignment than is typically found in conventional principal-agent relationships in public administration.

The various investigations led by Oum (2006, 2008) compared large samples of airports around the world, revealing that airports totally or partially controlled by private investors, public firms, or autonomous, independent authorities were more efficient than those controlled by multiple agents, such as mixed corporations. These findings show that multiple principals can reduce the benefits of public-private collaboration. Finally, empirical research on another type of service, public water, has delved further into this issue. According to Bel, González-Gómez, and Picazo-Tadeo (2015), public corporations with private participation in the Spanish water industry are characterised by relatively high service prices, in comparison to classic externalisation initiatives. They argue that when local governments exert more direct control over service management in institutional public-private partnerships, it becomes more difficult to determine the quantity and quality of water services, leading toward higher costs and ultimately higher prices for the consumer.

Studies comparing the efficiency of mixed firms and fully public productions have produced disparate results. Importantly, efficiency in heavily regulated sectors, where competition is limited or non-existent, does not automatically translate into lower costs (Vickers & Yarrow, 1991) because a competitive market is a prerequisite for translating technical efficiency into allocative efficiency (Kay & Thompson, 1986). The present study centres on eight local public sectors, heavily regulated by local governments and devoid of

market competition. It focuses on cost, rather than efficiency, since the costs assumed by governments and/or service users make a better proxy for allocative efficiency than a firm's technical efficiency (Kay & Thompson, 1986). Taking these factors into account, we present the following hypothesis:

Hypothesis 2: Mixed corporations incur higher costs than public corporations.

EMPIRICAL STRATEGY

Data and sources

This research analyses the relationship between delivery forms and costs for a wide sample of Spanish municipalities and eight local public services: solid-waste collection, waste treatment, sewage, street cleaning, waste-related environmental protection, water distribution, libraries, and social services.[1] A range of variables have been used to evaluate the cost of various forms of production in local public services (Cowie & Asenova, 1999). However, there is no consensus on the best type of data to use in such studies (Roy & Yvrande-Billon, 2007).

The present study uses 'effective cost' as an indicator of the service-delivery costs incurred by local governments; it is the best way to represent the resources used to provide a service. This is a new concept, drawn from the idea of efficiency as a guide to the decision-making process; its objective is to deepen compliance with the principles of efficiency and transparency in local governance (González-González & García-Fénix, 2020). The Spanish

[1] The database includes two additional services, public transport and sports facilities. These were excluded from the study because they can have important trans-municipal spillovers. As the dependent variable in this study was per-capita effective cost, the cost specifications of the two services were likely to be biased against municipalities in which services were frequently used by residents of neighbouring municipalities. Estimations of both services are available upon request.

The Government Ministry of Finance and Public Administration publishes effective cost data by municipality, in accordance with Ministerial Order HAP/2075/2014 (November 6, 2014). As the regulation states, effective cost comprises the total direct costs (salaries, current expenditures on goods and services, amortisation of investments, leasing interest, and current and capital transfer expenditures) and indirect costs (profit-and-loss accounts, supplies, amortisation of fixed assets, staff expenditure, and other usage-based expenditures) of public services, provided in accordance with the expenditure-execution data. As the guidelines established by this ministerial order are very detailed, they ensure data homogeneity.

According to these guidelines, it is mandatory to distinguish between direct and indirect costs, as well as service costs managed on an individual basis or in cooperation with other municipalities or local supra-municipal institutions. This makes it possible to break down the cost of each entity, according to the level of service. When the service is indirect, its effective costs correspond to the amount paid by the municipality to the contractor. When, by contrast, the service is user-paid, the revenue received from user contributions can be supplemented by subsidies received by the municipality.

In accordance with these guidelines, local governments are required to send information on the effective cost of services to the Ministry of Finance, where it is compiled and made available to the public. For practical reasons, this study takes into account the natural logarithm of the effective cost per inhabitant to avoid problems related to dimensionality.

We then considered the form of delivery adopted by local governments. The core objective was to use non-incorporated production tools to compare the costs incurred under different types of corporatisation with those incurred under government management. Existing classifications distinguish between five types of organisational form used to provide public services (Van Genugten, Van Thiel, and Voorn, 2020; Van Thiel, 2012; Torsteinsen and Van Genugten, 2016). At one end of the spectrum are public agencies, as traditional in-house

delivery mechanisms; at the other end of the spectrum, governments may have contractual relationships with public or private bodies that they do not own. There are also various types of arm's-length bodies (ALB), in which organisations hold varying degrees of structural and legal autonomy. This classification system has been adapted to the Spanish reality; the present paper thus distinguishes between 'corporatisation', defined as public firms (PF) that are fully owned by the government; mixed firms that retain majority government ownership (Mfgm); and mixed firms with majority private ownership (Mfpm). These three groups correspond to ALB Type 3 in Van Genugten, Van Thiel, and Voorn (2020). The last group, 'public agencies' (PA), which is non-strictly bureaucratic but does not 'incorporate' either delivery instrument, integrates ALB Types 1 and 2. This is the reference category used in this study.

Among corporations, mixed firms with majority government ownership are the most common form in most services, particularly technical services. Among personal services (social services and libraries), the hegemonic corporate form is the full public firm. Mixed firms with majority private ownership are much less common, although they have some relevance in water-related services, such as water distribution and sewerage.

In addition to the effective-cost-per-capita dependent variable, several other explanatory variables have been used to analyse differences in public-service costs among various organisational forms (financial, political, economic, and sociodemographic).

The relevant financial-factor variables relate to the financial condition of local entities (Zafra-Gómez et al., 2013). They include financial sustainability (non-financial budgetary balance), financial dependence (transfers index), financial solvency (via the local treasury surplus index), saving capacity (net-saving index) and a municipality's outstanding debt (in a natural logarithm). The average payment-to-providers period is included as additional variable.

To define the political variables, we first considered whether public corporations were created opportunistically (Blais & Nadeau, 1992) by politicians hoping to maximise their pre-

election exposure. Two political factors that significantly influence this type of decision are the government's political ideology and the degree of fragmentation in local-government components, with the latter providing a clear indication of political strength (Bel & Fageda, 2007; Chortareas et al., 2016).

The study variables that capture economic and sociodemographic aspects are municipality population (natural logarithm), the unemployment rate, net income per inhabitant (natural logarithm), and the tourism index. The first estimation of the whole sample included asset specificity and measurement difficulty, following Brown and Potoski (2005), with values adjusted to reflect Spanish local services (López-Hernández et al., 2018). Table 1 presents these variables, with details of their construction and source.

[TABLE 1 HERE]

The initial sample of Spanish municipalities, gleaned from information provided by the Spanish Ministry of Finance, needed to be refined for two reasons. First, certain municipalities had to be excluded because they did not report the effective cost of public services. Second, other municipalities reported data that were obviously erroneous or inconsistent. The sample was filtered by computing the median cost of each service per inhabitant and excluding municipalities with values that deviated more than 75% from the median effective per-capita cost. This procedure identified outliers and yielded a consistent sample, which was used to extract more robust findings.

Of the final database of 873 municipalities, 56.6% had fewer than 5,000 inhabitants, corresponding to 7.3% of all municipalities in Spain in that population range; 25.3% had between 5,000 and 20,000 inhabitants (i.e., 24.5% of all municipalities in this population range); 9.9% had between 20,000 and 50,000 inhabitants (i.e., 32.4% of all municipalities in

this range); and, finally, 8.25% municipalities in the database had more than 50,000 inhabitants (i.e. 48.6% of total municipalities above 50,000 inhabitants). Overall, the sampling represents 40.4% of the total Spanish population. Data are also available for 2014–2017.

Methodology

This study used three different models to analyse the panel-data sample (Hiestand, 2005):

a) **Pooled model**: An ordinary least squares regression estimated from all sample data.

b) **Fixed Effects Model**: The differences between transversal units can be identified via differences in the constant term, while the intercept term varies between each transversal unit. The error is therefore divided into two parts: the first is fixed, while the second can vary between each unit.

c) **Random Effects Model**: The individual effects are randomly distributed among the transversal units. To capture them, the intercept represents a general constant term. In other words, the fixed part of the error obtained in the previous model now follows a random distribution.

When considering the linear model for observations i=1 ... N grouped into units j=1... J

$$y_i = \alpha_{j[i]} + \beta x_i + \varepsilon_i; \varepsilon_i N\left(0, \sigma_y^2\right). \quad (1)$$

The effect of x on y is β, which is assumed to be the same for each unit, even though an additional variation in the level of y between units may persist after the effect of x is accounted for. The effect unit α_j captures the amount by which the predictions of y in units j must be adjusted, above or below, knowing only x. The notation $j[i]$ indicates unit j of the observation i (Gelman & Hill, 2007).

One way of interpreting unitary effects is to think of them as representing what is ignored, among other systematic factors that predict *y* in addition to *x*. If these factors were known, they could be included as additional covariates to explain the extra variation in *y*. The variations in α_j between units would thus be eliminated. As these variables are not included in the model, their effects are captured via α_j, whose variation may be partially or completely unsystematic.

When we assume that all unitary effects are equal, the equation above is reduced to the pooled model:

$$y_i = \alpha + \beta x_i + \varepsilon_i; \varepsilon_i N\left(0, \sigma_y^2\right). \quad (2)$$

This model is appropriate if α_j does not vary when x is included as an independent variable. However, there are two approaches to modelling the variation in α_j: fixed effects and random effects (Clark & Linzer, 2015). The Fixed Effects model adds a series of variables z_j for each unit where, if $z_{j[i]} = 1$, observation *i* is in unit *j* and takes value 0 otherwise:

$$y_i = \sum_{j=1}^{J} \alpha_j z_{j[i]} + \beta x_i + \varepsilon_i; \varepsilon_i N\left(0, \sigma_y^2\right). \quad (3)$$

α_j in the Random Effects model follows a probability distribution, with the data used to estimate the parameters. This distribution is normal, with mean μ_α and variance σ_α^2 (Greene, 2012):

$$y_i = \alpha_{j[i]} + \beta x_i + \varepsilon_i; \alpha_j N(\mu_\alpha, \sigma_\alpha^2); \varepsilon_i N\left(0, \sigma_y^2\right). \quad (4)$$

Several tests can determine which model is best suited to each type of service, given the available data. The first step is to verify whether a nested or grouped-regression model should be used, with either fixed or random effects. It is important to determine whether the variance of errors differs significantly from 0, regardless of whether the distribution is fixed or random. The present study has also used the Breusch-Pagan test (also known as the Lagrange Multiplier) (Breusch & Pagan, 1980), where the null hypothesis corresponds to a variance of errors that differ significantly from 0. In cases where the null hypothesis is rejected, a nested regression model is preferred.

Next, we carried out the Hausman test to determine which nested regression model suited the data best. Estimates based on the Fixed Effects and Random Effects models were compared and the null hypothesis was equality in both estimates (Hausman, 1978). When the null hypothesis is rejected, the model that best fits the data is the Fixed Effects model. The Random Effects model is preferred when the null hypothesis is accepted.

RESULTS

Basic statistics

The number of municipalities offering data differed for each service, as noted in row 'N. observations' in Tables 3 and 4 below, toward the bottom of the list of estimates. There were two reasons for this. First, many municipalities did not report all of their effective cost data for every single year between 2004 and 2017. Second, some services included in the study were not compulsory for certain municipalities, in accordance with the law that regulating the Basis of the Local Regime in Spain. This is clearly shown in Figure 1. Descriptive statistics used for the general estimation and that of each service are available as supplementary materials.

[FIGURE 1 HERE]

It must be noted that the four organisational forms in this study (public agencies, public firms, mixed firms with majority government ownership, and mixed firms with majority private ownership) did not all exist in each of the eight services in the sample. For example, there are no public firms in fields of waste treatment or waste-related environmental management. Similarly, no libraries are run by mixed firms with majority government ownership. There are no mixed firms with majority private ownership in five services (libraries, social services, street cleaning, waste-related environmental protection, and waste collection).

The set of controls considered in the modelling suggests a potential risk of multicollinearity. For this reason, the average and individual Variance Inflation Factor (VIF) was calculated to probe for multicollinearity, which becomes relevant when the VIF value is above 10 (Mansfield & Helms, 1982). The first verification suggested that three variables (average payment period, unemployment rate, and population) were particularly likely to induce multicollinearity in several models. Consequently, as Table 2 notes, variables that excessively inflated the variance from the final estimations were excluded. In the final VIF analysis for each sector (available on request), all of the VIF averages were less than the value of two, while individual VIFs were less than three.

Empirical results

We began by estimating the complete database to carry out an initial comparison of organisational forms and to assess the potential influence of asset specificity and measurement difficulty. We achieved this by using the set of indicators proposed by Brown and Potoski (2005), as adjusted in López-Hernández et al. (2018). The Random Effects model yielded the most robust estimation, measured using the appropriate tests (described above). Table 2 presents the results.

[TABLE 2 HERE]

In addressing the key research question in this study, all three estimations revealed that the costliest organisational form was a mixed firm with majority government ownership, which incurred significantly higher costs than the agencies. The two other types of corporation showed no significant cost differences, in comparison to agencies. Table 5 compares these findings vis-à-vis each corporation type.

Focusing now on the preferred estimation, random effects, our results suggest that both variables used to measure transaction costs are significantly and positively related to costs. Particularly significant ($p<0.01$) is the finding on measurement difficulty. In the general estimation, both ideological and political variables are significant: left-wing municipalities have lower costs, as do governments with more political strength. Finally, costs are positively related to unemployment, suggesting that the organisational types examined here could be used to implement 'employment policies' in cases where unemployment is the most serious problem.

After analysing the complete sample, we focused on eight specific services. The Lagrange multiplier test was significant for six of the eight services, indicating that they needed a panel estimation; a pooled estimation was best suited to the two remaining services (water distribution and libraries). The results of the Hausman test were significant for two of the models (environmental waste management and waste collection), suggesting that these two models should be estimated with fixed effects. Furthermore, the Wald test (Buse, 1982) of these two services pointed to heteroskedasticity, leading to corrections in applying the Prais-Winsten regression procedure (Prais & Winsten, 1954). The four remaining services (sewerage, social services, street cleaning, and waste treatment) were estimated using the Random Effects model.

Table 3 presents the estimation results. As previously discussed, the estimations reflect the models that best fit the data for each service. Half of the services were adjusted using the Random Effects model, two were adjusted using the Fixed Effects model, and the remaining two were adjusted using the Pooled model. Half of the models revealed a significance under 1%, with two under 5% and two under 10%. The control-variable results in Table 3 show that no variable had a systematic significant effect; this is consistent with the services' structural heterogeneity. In all eight cases, however, several control variables were significant, increasing the explanatory power of most estimations. The low influence of the financial variables overall is worth noting.

[TABLE 3 HERE]

Table 4 includes the results from the random-effects estimation of all eight services; it was designed to better compare the effects of various organisational forms on costs with respect to public agencies. This approach made it possible to compare differences between services, using a common method. To simplify matters, it included only the symbols of coefficients and their levels of significance.

[TABLE 4 HERE]

The present findings indicate that the choice of organisational form does not affect the cost of four services: social services, waste treatment, waste collection, and libraries. In the case of libraries, fully public services are the only form of public corporation, apart from public agencies. For this reason, other factors are needed to explain the differences between the four services.

The findings also show that the costs of organisational forms of corporatisation do have significant effects on the other four services: sewerage, street cleaning, waste-related environmental protection, and water distribution. Interestingly, government-owned mixed-firm models are much more costly than public agencies. However, this form has no significant impact on social services, waste treatment, or waste collection (there are no mixed-firm libraries).

Overall, there is no evidence that corporatisation creates cost advantages for public-agency service production. When a public firm has private participation but retains majority government ownership, service production tends to be more expensive. This may indicate that governance costs are particularly high in this organisational form.

Furthermore, all eight models were re-estimated using the Random Effects model, with an alternating reference category to compare the costs of public and mixed firms. The results, simplified in Table 5, do not suggest significant cost differences between organisational forms (full public and mixed firms), contradicting Hypothesis 2.

[TABLE 5 HERE]

Finally, although we had no a priori expectation of the results, the present study took advantage of re-estimations to compare the costs of mixed firms with majority government ownership to those of firms with majority private ownership. There was no evidence of significant cost differences in any of the three services in which comparisons were feasible. Therefore, these results are fairly consistent with the observations of Voorn, Van Genugten, and Van Theil (2020), who argued that researchers studying local corporatisation should focus less on traditional principal-agent conflict.

DISCUSSION

The present analysis demonstrates that public corporations do not incur lower costs than public agencies. In fact, while it did not identify cost differences in half of the services, it did find differences in the other half. These costs were higher when public corporations provided services, particularly in the case of mixed firms with majority government ownership. According to Voorn, van Genugten, and Van Thiel (2017), the idea that operating outside administrative law gives public corporations overhead and labour advantages may not apply to all countries: 'in countries where labour unions are relatively powerful, such as in Spain and Portugal, unions have been known to demand higher salaries for the same jobs to accept the creation of MOCs, to compensate for workers' reduced job security' (Voorn, van Genugten, & Van Thiel, 2017: 825). The overall lack of cost differences may thus reflect labour conditions. While corporations are more flexible than public agencies in managing human resources and the labour force, collective bargaining is very restricted among organisations that operate under administrative law, particularly when it comes to issues such as wage determination. For this reason, unionisation and labour-related conflicts may be more widespread in corporations than in public agencies, potentially leading to higher wages.[2]

Vining, Boardman, and Moore (2014) offer three tentative models to explain mixed corporations. The first model combines the best elements of both worlds, merging public- and private-sector strengths to successfully deliver public services. The second model combines the worst elements of both worlds, causing mixed corporations to operate with the shortcomings of both sectors. The third models argues that mixed corporations can suffer from

[2] See García Blasco and Vila Tierno (2019) for a detailed investigation of the regulation of labour relations among public employees in Spain (and the differentiation between civil servants, non-statutory employees, and employees in public firms). These differences can translate into wage differentials in different labour conditions (Albalate, Bel & Calzada, 2012).

profit collusion when governments are focused on their own objectives, such as maximising votes or political benefits.

The results of the current study confirm the validity of the second model, which combines the worst of both worlds, implying higher costs for some services implemented by mixed corporations, which serve both the public and private sectors (Boardman & Vining, 1991). Services with conflicting or incompatible goals can experience high-level service inefficiencies (Vining, Boardman & Moore, 2014). The present findings are thus in line with previous research. They highlight the difficulties inherent in successfully governing an organisation that mixes public and private sectors (Da Cruz & Marques, 2012).

The higher costs of mixed firms with majority government ownership may include the governance costs of more complex management and multiple principals; these may outweigh the potential benefits of flexibility. Interestingly, the association with higher costs disappears when the private sector holds the majority share in a mixed corporation. Potentially, costs are lower because private partners are in charge of day-to-day operations (Warner & Bel, 2008). According to these authors, corporations tend to bring in the private sector in order to take advantage of its expertise. In private-sector-led mixed corporations, the negative effect of having more than one master tends to be lower. Thus, mixed firms with majority private ownership may achieve better alignment between their principal objectives and the actions of various actors because the government, as a minority shareholder, limits its role to monitoring and supervision.

CONCLUSIONS

In recent decades, local governments have sought different ways of externalising local public services. While extensive research has explored the notion of contracting private firms, few studies have delved into other forms of externalisation or corporatisation. Corporatisation

consists of producing local public services via public corporations. These are organised through various combinations of public and private participation; they include fully public firms, mixed firms with majority government ownership, and mixed firms with majority private ownership. The current study compares the service-delivery costs of various types of corporations with the costs incurred by public agencies, which are entirely run by government and operate under administrative law. While public corporations have been the subject of numerous academic studies over recent decades, little is known about how they compare to public agencies, or whether bringing in the private sector as a corporate partner leads to higher or lower costs.

The present study asks how different organisational forms affect public-service costs. It examines the cost of public services provided by four different forms of governance: public agencies, public corporations, mixed public corporations with minority public ownership, and mixed public corporations with majority public ownership. While most research on forms of externalisation tends to rely on a single sector, this study encompasses eight sectors (solid-waste collection, waste treatment, sewage, street cleaning, waste-related environmental protection, water distribution, libraries, and social services). The database compiled for this analysis comprises information from 874 Spanish municipalities in 2014–2017.

The results of this study, in contrast to those of other authors, suggest that corporations do not achieve better cost-performance than public agencies. Furthermore, corporations that choose to share ownership with the private sector are unlikely to reduce their service costs. In fact, mixed corporations with majority government ownership tend to incur higher costs than public agencies. Our findings delve further into the theory of mixed firms; they support the argument that mixed corporations can ultimately reflect the worst of both worlds, with their governance costs outweighing any potential savings.

This study has two policy-related implications; it also contributes to the theories of public corporations and mixed firms. First, the expectation that corporations can be used to

reduce costs should be downplayed. Corporatisation must be based on other types of outcomes, which are not evaluated in this study. Secondly, if local governments want to engage corporations to reform service delivery, it is better for them to retain full ownership of public firms or allow private partners to take a majority stake than to maintain majority government ownership of mixed firms.

The evidence provided here has several limitations. The research findings focus on the cost of public services, as the dependent variable. While this offers vital performance data, it does not include a full picture of what public services should aim to achieve. Future research should take into account other aspects of performance, investigating the extent to which different organisational forms can influence public-service quality. Similarly, while previous studies have suggested that differences exist among different types of public agencies (Van Genugten, Van Thiel, and Voorn, 2020; Van Thiel, 2012; Torsteinsen and Van Genugten, 2016), our sample does not differentiate between levels of structural autonomy among public agencies that operate under public law. Similarly, our database does not contain information on the number of shareholders in each mixed enterprise. Future researchers could include this information to test whether multiple principals had an effect on service performance. Furthermore, while this analysis considers a wide set of heterogeneous public services, future studies should use a larger number of samples to develop a better understanding of the advantages and disadvantages of public corporations and mixed firms, as vehicles for delivering more efficient public services.

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TABLES

Table 1: Variables, specification, and sources

Variables	Specification	Source
Effective cost (per capita)	LN Per-capita effective cost	Ministry of Finance; National Institute of Statistics
Public firms	Dummy=1 if fully government-owned	Ministry of Finance; Inventory of Public Entities
Mixed firms—government majority	Dummy=1 if majority government ownership	Ministry of Finance; Inventory of Public Entities
Mixed firms—private majority	Dummy=1 if majority private ownership	Ministry of Finance; Inventory of Public Entities
Asset specificity	Dummy=1 if specificity of assets is high	Brown & Potoski (2005); López-Hernández et al. (2018)
Measurement difficulty	Dummy=1 if difficulty to measure results is high	Brown & Potoski (2005); López-Hernández et al. (2018)
Non-financial budgetary balance	Non-financial expenditures / Non-financial revenues	Directorate General for Financial Coordination with Regional and Local Authorities (DGCFCAEL, Ministry of Finance)
Financial independence	Budget expenditures / Budget revenues (minus subsidies)	Directorate General for Financial Coordination with Regional and Local Authorities (DGCFCAEL, Ministry of Finance)
Treasury surplus	Treasury cash / payment commitments (%)	Directorate General for Financial Coordination with Regional and Local Authorities (DGCFCAEL, Ministry of Finance)
Average payment period	Number of days to pay external providers	Ministry of Finance
Net-savings index	Revenues – payments commitments (loan amortisation adjusted)	Directorate General for Financial Coordination with Regional and Local Authorities (DGCFCAEL, Ministry of Finance)
Outstanding debt	LN Debt	Ministry of Finance
Political ideology	Dummy=1 if left-wing party in government	Ministry of Home Affairs
Political strength	Dummy=1 if party in government holds an absolute majority	Ministry of Home Affairs
Population	LN Inhabitants of municipality	National Institute of Statistics
Unemployment rate	Active unemployed population (%)	National Institute of Statistics
Income (per capita)	LN Per capita income	National Institute of Statistics
Tourist index	Index measuring tourist activity	National Institute of Statistics

Source: authors.

Table 2. Results of the General Model Estimation

	Pooled	**Fixed**	**Random**
Public firms	-.301	-.120	-.386
Mixed firms—government majority	**.077****	**.017***	**.107****
Mixed firms—private majority	-.143	-.433	-.153
Asset specificity	-.049	-.349	**.031***
Measurement difficulty	**.110***	**.150***	**.244*****
Non-financial budgetary balance	**.262****	.004	**.089***
Financial independence	-.001	.056	-.018
Treasury surplus	.001	-.001	.001
Average payment period	.001	-.001	-.001
Net savings index	-.058	-.84	-.093
Outstanding debt	.013	-.005	.004
Political ideology	**-.141*****	.053	**-.046****
Political strength	**-.061***	-.102	**-.029***
Population	**.057*****	**.802***	**.053*****
Unemployment rate	**.007****	**.012*****	**.010*****
Income (Per capita)	-.071	-.161	-.098
Tourist Index	-.001	.000	.000
Constant	**4.351*****	**3.160*****	**5.367*****
N. observations	2032	2032	2032
N. groups	-	986	986
R2 within	-	.0189	.0094
R2 between	.0693	.0226	.0612
R2 overall	.0615	.0349	.0572
Prob.>chi2	**.000**	**.0707**	**.000**
Breusch-Pagan Test		**1288.1 (.000)**	
Hausman Test		**15.52 (.2141)**	

Significance: *** .01 ** .05 * .1. Public agencies as reference category.

Table 3. Results. Model with the best fit for each service

	Random Effects				Fixed Effects		*Pooled*	
	Sewerage	**Socials Services**	**Street Cleaning**	**Waste Treatment**	**Waste-related environmental protection**	**Waste collection**	**Water Distribution**	**Library**
Public firms	-.062	.11	.383	-	-	**.266***	.187	**-.218***
Mixed firms—government majority	**.229***	.302	**.405***	-.134	**.457*****	.039	**.222****	-
Mixed firms—private majority	.225	-	-	.159	-	-	.009	-
Non-financial budgetary balance	.397	-.016	-.589	-.093	.005	.194	.117	.268
Financial independence	-.178	-.060	-.015	**.164***	-.444	-.069	.054	-.372
Treasury surplus	.006	.002	.022	.000	.002	.000	-.008	**.052****
Average payment period	-	-	-	.000	-.001	.000	**-.002***	-
Net savings index	-.022	**-.316****	.022	-.14	-.307	-.119	**-.001***	-
Outstanding debt	**.055*****	-.013	**.114****	-	.028	.008	-.013	.052
Political ideology	**-.221****	-.029	-.148	.014	**.241***	.005	.041	.109
Political strength	-.176	-.045	.148	**-.153*****	.125	**.092***	.109	**.176***
Population	-	-	-	**.097*****	**-.140****	-.004	-	-
Unemployment rate	-.005	**-.013*****	**.019***	-	-	-	-	-
Income (per capita)	**-.447***	-.217	.778	**.459*****	**-.862****	**.342*****	-.334	.226
Tourist index	.000	.000	.000	.000	.001	.000	**-.002****	.000
Constant	**5.411****	**5.954*****	-5.96	-1.744	**10.557*****	.32	**6.174*****	-1.005
N. observations	176	504	73	403	80	476	207	112
N. groups	94	238	41	198	46	217	-	-
R2 within	.07	.45	.04	.01	.60	.83	-	-
R2 between	.22	.03	.37	.21	-	-	.15	.19
R2 overall	.20	.03	.38	.22	-	-	.09	.11
Prob.>chi2	**.00**	**.07**	**.09**	**.00**	**.00**	**.03**	**.00**	**.01**

Significance: *** 0.01 ** 0.05 * 0.1. Public Agencies as reference category.

Table 4. Results of the Random Effects Estimations

	Sewerage	Social Services	Street Cleaning	Waste treatment	Waste-related environmental protection	Waste collection	Water distribution	Library
Public firms	-.062	.11	.383	-	-	.164	.274	-.276
Mixed firms—public majority	**.229***	.302	**.405***	-.134	**.516****	-.017	**.293****	-
Mixed firms—private majority	.225	-	-	.159	-	-	-.020	-
Non-financial budgetary balance.	+	-	-	-	-	+	+	+
Financial independence	-	-	-	**+***	-	+	-	-
Treasury surplus	+	+	+	0	+	0	-	+
Average payment period				0	+	-	0	
Net savings index	-	**-****	+	-	-	-	-	+
Outstanding debt	**+*****	-	**+****		+	0	-	
Political ideology	**-****	-	-	+	+	+	+	+
Political strength	-	-	+	**-*****	-	+	+	+
Population				**+*****	**-***	+	-	+
Unemployment rate	-	**-*****	**+***					-
Income (Per capita)	**-***	-	+	**+*****	-	**+****	-	+
Tourist Index	0	0	0	0	0	+	-	0
Constant	**+****	**+*****	-	-	**+****	+	+**	-
N. observations	176	504	73	403	80	476	207	112
N. groups	94	238	41	198	46	217	104	43
R2 within	.07	.45	.04	.01	.06	.02	.05	.00
R2 between	.22	.03	.37	.21	.30	.04	.12	.23
R2 overall	.20	.03	.38	.22	.34	.04	.11	.14
Prob.>chi2	.00	.07	.09	.00	.20	.40	.21	.51

Significance: *** 0.01 ** 0.05 * 0.1. Public Agencies as reference category.

Table 5. Comparison of the Costs of Full Public and Mixed Corporations, Based on Random-effects Estimates

	General		Sewerage		Water Distribution		Social Services	Street Cleaning	Waste collection	Waste Treatment
	Full Public	Mixed Public Majority	Full Public	Mixed Public Majority	Full Public	Mixed Public Majority	Full Public	Full Public	Full Public	Mixed Private Majority
Mixed Gov. Majority	-.492	-	.292	-	.019	-	.192	.021	-.181	-.294
Mixed Priv. Majority	-.260	.237	.288	-.004	.294	-.313	-	-	-.244	-

The second row shows the reference category in each case. None of the coefficients is significant.

FIGURES

Figure 1. Services that are compulsory, depending on municipality population