

PRIVATISATION OF WASTE COLLECTION SERVICES IN RESPONSE TO FISCAL STRESS IN TIMES OF CRISIS

Zafra-Gómez, José Luis

Associate Professor in Accounting, University of Granada (Spain) (corresponding author)

Campus de Cartuja s/n, BOX 18071, Granada (SPAIN)

Plata-Díaz, Ana María,

Lecturer in Accounting, University of Granada (Spain)

Pérez-López, Gemma,

Lecturer in Accounting, University of Granada (Spain)

López-Hernández, Antonio Manuel,

Full Professor in Accounting, University of Granada (Spain)

© This manuscript version is made available under the CC-BY-NC-ND 4.0 license
<https://creativecommons.org/licenses/by-nc-nd/4.0/>.

This paper is the Submitted Version of a published paper in URBAN STUDIES with DOI -
<https://www.jstor.org/stable/26151187>

Please cite as: Zafra-Gómez, J. L., Plata-Díaz, A. M., Pérez-López, G., & López-Hernández, A. M. (2016). Privatisation of waste collection services in response to fiscal stress in times of crisis. *Urban Studies*, 53(10), 2134–2153. <https://www.jstor.org/stable/26151187>

ACKNOWLEDGEMENTS

We are grateful to the anonymous referees, for their comments and suggestions, which contributed greatly to the general improvement of this article. We are also grateful for the financial support of ECO2013-48413-R received from Ministerio de Economía y Competitividad (Spain), PRY(139/14) from Centro de Estudios Andaluces, Junta de Andalucía (Spain), and P11-SEJ-7700, from Proyectos de Excelencia de la Consejería de Innovación, Ciencia y Empresa, Junta de Andalucía (Spain).

Abstract

According to the conventional theoretical framework, fiscal stress is an explanatory factor of privatisation, since the latter can provide economies of scale and cost savings, as indicated by the theory of public choice. However, urban planning theories suggest that public choice does not take into account the collective needs of those receiving public services. The present study aims to clarify two major issues. Firstly, in the presence of fiscal stress, do public managers really privatise? And secondly, does privatisation harm the public interest? To investigate these questions, we constructed and analysed a discrete-time survival model, which was applied to the period 2000-2010, to reflect the effects of the current global financial crisis on the fiscal

stress-privatisation relationship with respect to urban waste collection services. The results obtained indicate that when certain aspects of financial condition worsen, the likelihood of public services being privatised increases. This was the case during the Great Recession of 2008-2010, especially when a neighbouring municipality had previously privatised its services. After privatisation, service quality did not vary significantly, and so we conclude that public choice does not prejudice the public interest.

Key words: Privatisation; Municipalities; Fiscal stress; Waste collection; Recession.

Introduction

During the last few decades, cities have undergone various crises caused by fluctuations in economic cycles, and these have had an indirect effect on local government finances, as the financial condition of local government reflects the extent to which it has adapted its fiscal structures to demands, pressures, opportunities and constraints and to likely future changes in the environment (Clark and Ferguson, 1983). As a result, when the economic environment becomes adverse, local tax revenues decrease and the municipal government is subjected to fiscal stress (Hendrick, 2004). In this context, the local manager can consider various strategic options (Levine, 1978), such as deciding which services should be considered of priority importance for the community and which may be reduced or eliminated; alternatively, the tax base may be raised (Rose and Page, 1982) or service quality reduced (Boyne 1998; Zafra-Gómez and Muñiz, 2010).

However, these are not the only alternatives open to local administrations facing a difficult financial situation; another option is to orient public services toward market forces and competition, perhaps through privatisation. According to the theory of public choice, the market and the private sector offer cost savings and greater efficiency in the provision of public services (Donahue, 1989; Berenyi and Stevens, 1988). Thus, the privatisation of public services may rescue public managers from the dilemma of either raising taxes or reducing service quality, in response to fiscal stress (Christoffersen and Bo Larsen, 2007; Zafra-Gómez and Muñiz, 2010). However, recent theories on urban planning, with respect to the privatisation of public municipal services, have highlighted growing concern that the market may not consider privatisation offers advantages over the public provision of services, associating it with a loss of fairness, community and citizenship (Morgan and England, 1988). Under recent planning theory, i.e., communicative planning, it has been proposed that such market failures are motivated by the development of individual interests rather than collective ones, detracting from the quality of life in society as a whole (Denhardt and Denhardt, 2000; Allmendinger, 2002; Hefetz and Warner, 2007). In this theoretical context, when addressing a situation of fiscal stress, the public manager must evaluate the possible harm to collective interests if public services are privatised.

Accordingly, the aim of this study is to verify whether privatisation decisions by local public managers are related to the presence of financial problems, to determine whether privatisation leads to reduced service quality and to consider whether the postulates of social choice and/or communicative planning are visible in the real world.

Specifically, we use a survival model to analyse the probability of the public waste collection service being privatised when the municipality is undergoing fiscal stress, this analysis spanning an extended period of time (2000-2010), taking into account, moreover, diverse political and socioeconomic factors. The waste collection service is of particular importance among municipal services due to the major environmental impact it has on urban environmental development (Guerrero et al., 2013). Furthermore, it is one of the issues that has been most thoroughly studied in the field of urban services (Bel et al., 2010; Zafra-Gómez et al., 2013; Plata-Díaz et al., 2014)

Relationship fiscal stress and privatisation. Theoretical framework according to Public Choice.

A generalised financial crisis impacts directly on the financial condition of municipal governments. Urban planning research, and specifically the structuralist approach, indicates that the fiscal needs of a city and its geographic limitations determine the economic development of policies and activities (Hammer and Green, 1996). In other words, environmental factors directly affect revenues and expenditures (Bahl, 1984; Ladd and Yinger, 1989), and the demographic, socioeconomic and fiscal conditions shaping a community affect the provision of municipal services (Hammer and Green, 1996; Zafra-Gómez et al., 2009b). Accordingly, the financial condition of local government can be defined by the action of government officials, who can alter revenues and fund balances, subject to the bounds established by the governing culture and/or established policies. However, there are certain aspects of the socioeconomic environment, such as property values, population density and crime levels, that affect spending needs and revenue limits and that change more slowly and respond less quickly to government actions (Hendrick, 2004:81).

Public managers may adopt diverse strategies in response to financial difficulties: taxes may be raised, (Levine, 1978), municipal debt increased or service delivery reduced. Alternatively, service quality could be lowered, thus reducing costs and easing fiscal stress (Levine, 1978; Christoffersen and Bo Larsen, 2007). However, the adoption of any of these options could provoke a situation in which, to escape from budgetary fiscal distress – defined by Bradbury (1982) as the difficulty encountered in balancing the municipal budget – an even worse one might be created, namely ‘citizens’ fiscal distress’, in which citizens would complain about the high taxes imposed or the reduced service quality received. In short, fiscal stress occurs when the municipality is no longer able to perform its essential functions and deliver due services, or when it is no longer able to meet debt, thus leading to the loss of urban services that citizens have a right to expect.

Urban planning theorists have proposed an alternative to the above procedures to overcome fiscal stress, namely the adoption of regional solutions, i.e., consolidation (Altshuler et al., 1999) to obtain economies of scale and cost savings (Warner, 2012). However, the existence of a high degree of local autonomy can discourage such consolidation (Warner and Hefetz, 2002) and in countries with a strong tradition of fragmentation it may not be an optimal solution (Warner, 2012).

However, there is another means by which municipalities can obtain the benefits offered by consolidation, through the creation of economies of scale (Parks and Oakerson, 1993). Thus, public choice theory suggests that in regions with high levels of fragmentation, the markets may enable such economies of scale (Donahue, 1989) and increased efficiency (Warner and Hefetz, 2002). Thus, the market incorporates competition into public monopolies (Savas, 1987). This is achieved, especially, through the privatisation of public services, with competitive bidding processes resulting in lowered costs (Niskanen, 1971). Economies of scale are achieved because the private operator can provide the same service in different municipalities (Morgan and Hirlinger, 1991). Clearly, thus, public managers can adopt privatisation as a means of reducing both municipal fiscal stress (Bel and Fageda, 2007) and citizens' fiscal distress. In view of these considerations, therefore, we formulate a first hypothesis relating the situation of local government public finance with the privatisation of public services.

H₁: The probability of a local public service being privatised rises when fiscal stress increases.

As noted above, municipal financial stress and managers' consequent need to reduce costs may lead to service quality being reduced and/or taxes increased, thus provoking citizens' fiscal stress. To avoid such a situation, public managers may prefer to privatise municipal services. As observed by Boyne (1998: 476), when costs are reduced as a result of privatisation, service quality may fall, rise or remain unchanged. And even if service quality falls, this may be proportionately less than the decline in spending. However, the evidence for this outcome is not clear (Hart et al., 1997). We propose the following hypothesis¹:

H₂: The appearance of fiscal stress reduces the quality of municipal services and increases the probability of their privatisation

Relationships between fiscal stress, privatisation, choice and democracy. Theoretical framework according to Social Choice.

The above theoretical framework is based on the economic standpoint, i.e. regarding the economies of scale and enhanced efficiency that the market can provide. Nevertheless, it is also necessary to remember that the local population must receive the service in question. The question was posed by Warner and Hefetz (2002): does the market provide services with a view to maximising the public interest? The same question can also be presented in the context of an agency relationship, in which private

interests (those of the company providing the service) may conflict with collective ones. Public choice does not offer an optimal solution because the market seeks to maximise the value of private interests (Lowery, 2000). As observed by Warner and Hefetz (2002:85), “Market solutions rest on the logic of individual community self-interest, and this constrains their ability to address the broader collective well-being of the region”.

The main concern of municipal managers is that privatisation may limit public access to certain services, which would not be supplied by the private sector, among other reasons, because they are not profitable (the absence of efficient market allocation, according to Stiglitz, 2000); due to the non-exclusion and non-rivalry characteristics of public services (Tiebout, 1956); due to the presence of externalities, producing a divergence between private and social costs (or benefits) (Bel and Costas, 2006); or because of the propensity of private enterprise to reduce costs to the detriment of quality, because the latter is hard to measure in the public realm (Hart et al., 1997). Concern about these issues has given rise to various theoretical approaches being proposed, from different fields of knowledge, such as communicative urban planning (Hefetz and Warner, 2007). Communicative planning is based on the need to reflect social values, identifying citizens’ preferences (Healey, 1996) and satisfying them through the provision of public services (Denhardt and Denhardt, 2003).

This context gave rise to the social choice theory, which is intended to occupy an intermediate position between the market (and the theories that justify its implementation) and social communicative theory (Sager, 1998), providing an optimal approach between these two perspectives (Hefetz and Warner, 2007). This theory recognises the potential of the market to provide services at a lower cost, but it also values citizens’ opinions and requirements (Thomas and Palfrey, 1996), recognising that they may disagree with certain market solutions and proposing that an optimal solution be achieved by means of discussion and negotiation (Hefetz and Warner, 2007).

Thus, in order to determine whether there exists a relationship between fiscal stress and privatisation, we must verify that the latter process does not harm collective interests. Studies by Warner and Hebdon (2001), Warner and Hefetz (2002) and Hefetz and Warner (2007) have analysed these arguments, examining whether public managers have in fact reversed the privatisation of many services in the opinion that they do not meet the collective needs of the population.

In the present study, which focuses on a single municipal service, we consider it appropriate to assess service quality as a measure of compliance with the tenets of social choice. According to this theory, and with respect to service quality, the introduction of market forces reduces the motivation to address collective interests, and so the privatisation of the waste collection service would result in lower levels of service qualityⁱⁱ. Accordingly, we propose the following hypothesis:

H₃: Service quality tends to fall after privatisation.

If it's good enough for my neighbour... I'll privatise, too

Another aspect that should be considered in analysing the relationship between fiscal stress and privatisation is the fact of interdependence between the decisions of different municipalities, due to their geographical proximity or to neighbouring diffusion patterns (Berry and Berry, 1999; Girard et al., 2009; Mohr et al., 2010). When municipalities share a regional space in conducting their activities, there is a certain interaction in the decisions taken by their respective local managers (Dahl and Hansen, 2006). In other words, when municipalities in a region face similar problems, they tend to adopt similar solutions. This outcome has been termed regional mimetic isomorphism (DiMaggio and Powell, 1983). This theoretical argument has been translated to the solutions proposed by local public managers in response to fiscal stress. In this respect, too, Knoke (1982) observed that imitation tends to follow a spatial gradient, and reported evidence that cities take their cues for municipal change from the reform experience of their closest neighbours. Similarly, Dahl and Hansen (2006: 448) found that “organizations will be more likely to imitate the organizations they interact with”, and obtained empirical evidence that municipalities imitate others in the same region. This finding was later corroborated by Bhatti et al. (2011). In view of these considerations, we include the ‘neighbouring’ effect among the explanatory factors affecting the decision to privatise public services, defining it as the phenomenon whereby one municipality may adopt the same public service management formulas used in a nearby municipality (Bel et al., 2010). This approach could produce economies of scale for the supplier, facilitated by geographic proximity, and this would favour privatisation (Donahue, 1989; González-Gómez et al., 2011).

Accordingly, the following hypothesis is formulated:

H4: The existence of other nearby municipalities that have already done so will increase the probability of a municipality deciding to privatise its own public services.

Influence of the Great Recession on the fiscal stress-privatisation relationship

As discussed above, the economic and social environment influences local finances and the demand for public services (Hammer and Green, 1996; Zafra-Gómez et al., 2009b). In addition to this specific environment, we can also consider the existence of one of greater magnitude, a macro-environment containing not just one city, but a wide-ranging set of municipalities with no direct geographic connection, in the view that certain events may affect large regions, countries or even continents in a similar way. Such was the case of the global economic and financial crisis that emerged in 2008. This transnational event affected large regions and, in turn, affected the development of public service provision by many local authorities.

Therefore, it is essential to distinguish fiscal stress, in the sense of financial problems that are private or restricted to the municipal context, from the concept of a “transboundary crisis”, with a global impact and capable of “infecting” a large number of countries and affecting all levels of government (Gonzalez and Oosterlynck, 2014).

Most previous studies hypothesise that public managers use privatisation to cut costs and to relieve fiscal stress. If we accept this, then with the Great Recession and the ensuing pressure to reduce budget deficits, at all levels of government, local authorities would be vigorously promoting privatisation (Funkhouser, 2012). Accordingly, we propose the following hypothesisⁱⁱⁱ.

H₅: The present global financial and economic crisis has increased the probability of public services being privatised.

Political factors and privatisation

Traditionally, the ideological stance of the governing party has been included in models seeking to identify the main factors influencing privatisation (Bel and Fageda, 2007). An inverse association is expected between privatisation and government by a left-wing party, while a positive relationship would be expected when the governing party has a conservative ideology. However, very few studies have found any significant relationship between political ideology and privatisation (Dubin and Navarro, 1988; Dijkgraaf et al., 2003; Bel and Fageda, 2007). Nevertheless, following the postulates of political theory, we propose the following hypothesis:

H₆: The presence of a conservative party in government is positively related to the probability of public services being privatised.

Ashworth et al. (2005) developed a theoretical model in which political fragmentation was associated with a higher probability of increased long-term public spending, in view of the concessions made to minority parties and to different stakeholders in order to obtain their support (León et al., 2010). In consequence, there would be a greater probability of privatisation, in order to reduce the cost of service provision. However, other authors have suggested that the relationship between these two concepts may be negative, because political fragmentation could lead to political instability and thus discourage private suppliers from responding to offers of privatisation (Rodrigues et al., 2012). Accordingly, we propose the following hypothesis:

H₇: The probability of public services being privatised will be higher/lower in local governments presenting political fragmentation.

Socioeconomic factors and privatisation

Our study includes a set of variables to measure the impact of the social and economic characteristics of the municipality, because these may influence the cost of

public services and therefore favour or inhibit privatisation. According to Bel et al. (2010:41) the population variable can be considered a proxy for the demand for local services and therefore a rising population, requiring increased municipal services, may increase the likelihood of privatisation. We also include an index of municipal tourism, as Bel and Mur (2009) have observed that tourist areas with a high seasonal population may have higher costs than elsewhere, and might be more likely to privatise services.

Finally, we examine whether the probability of the waste collection service being privatised may also be affected by the existence of a higher number of population centres within the municipality. The more complex the service required, the higher the cost and therefore the greater the likelihood of privatisation (Bel and Miralles, 2003; Bel et al., 2010). This conclusion is based on economies of density, according to which public service costs are reduced when the population density is higher (Prieto et al., 2009). On the contrary, Mohr et al. (2010) observed that geographic dispersion may make it more difficult to attract a sufficient number of bids from private contractors for the case of small and rural municipalities.

Empirical evidence of the privatisation of waste collection services in Spanish municipalities

Municipalities are usually responsible for waste management in the cities, and due to the rapidly urbanising global society, to inadequate organisation, the lack of financial resources, the increasing generation of waste and the complexity of a multidimensional system (Guerrero et al., 2013:220) they have difficulties in providing the population with an effective and efficient waste management system.

Data

For this study, we used yearly data, obtained from several databases, for all Spanish small and medium sized municipalities with 1,000-50,000 inhabitants, a total of 3,253 municipalities. After a filtering process required by the information heterogeneity of the databases examined, the sample was reduced to 1,043 municipalities for the period 2000-2010^{iv}. We then excluded those which had already privatised their waste collection service, to achieve a final sample of 614 municipalities, of which 137 privatised this service during the period 2000-2010, leading to 6,285 observations. Table 1 shows the cumulative numbers of privatisations during this period.

[Insert Table 1]

To identify forms of public service provision, we consulted the inventory of local public sector bodies maintained by the Ministry of Finance and Public Administration^v, which lists the entities operating in the municipality, when they were created and to what purpose. We also consulted the Survey of Local Equipment and Infrastructure (EIEL), compiled by the same Ministry, to ensure that the management methods considered for each municipality were identical during the period considered.

If there was any discrepancy, this was resolved by means of a telephone inquiry. To determine the forms of private management, we hired a company to compile and analyse economic and financial information for the period in question, published in official provincial gazettes, where municipalities are required to publish all privatisations carried out, identifying when the contract was awarded, its duration, the identity of the company, the fee payable (if any), etc.

In this study, fiscal stress is measured by means of four indicators. According to Boyne (1998), one of the main problems encountered in measuring the relationship between fiscal stress and privatisation is the paucity of good measures of fiscal stress. In addition, Bel and Fageda (2007) observed that in many cases the only measures used to represent fiscal stress are legal limitations on indebtedness and the allowable tax burden. Thus, many studies in this field do not use a broad concept to measure fiscal stress, but employ just a single variable to test their hypotheses. For this reason, the present work seeks to contribute a broad range of indicators to measure fiscal stress, taking as our basic concept that of financial condition, adapted to the Spanish context by Zafra-Gómez et al. (2009a, 2009b, 2009c).

For Groves et al. (2003), the concept of financial condition can be measured by four magnitudes: cash solvency, budgetary solvency, long-term solvency and service-provision solvency. Greenberg and Hillier (1995) and CICA (1997) remarked that an organisation's financial condition could be measured using three indicators: sustainability, flexibility and vulnerability.

The present study examines cash solvency, defined as the organisation's ability to generate sufficient liquidity to pay its short-term debts (Groves et al., 2003); flexibility, its ability to respond to changes in the economy or in its financial circumstances, via modifications to public debt (Greenberg and Hillier, 1995; CICA, 1997; Pérez-López et al., 2013); budgetary sustainability (or service-level solvency), its ability to maintain, promote and protect the social welfare of the population, employing the resources at its disposal (Greenberg and Hillier, 1995; CICA, 1997; Groves et al., 2003; Hendrick, 2011); and financial independence, the level of dependence on external funding received via transfers and grants (Berne, 1992; ICMA, 2003; Honadle, 2003; Zafra-Gómez et al., 2009a). Finally, we consider long-run solvency, using a broad time horizon.

The definitions of the different elements of fiscal stress that may influence privatisation decisions are given in Table 2 and the corresponding correlation matrix, in Table 3. The latter table highlights the low correlations obtained between the indicators of fiscal stress, which reinforces the argument that it is necessary to measure fiscal stress across several dimensions. The other independent variables and their sources are shown in Table A1 in the Annex. Table A2 in the Annex contains the descriptive statistics.

[Insert Table 2 and 3]

Methodology

A survival (or duration) analysis was performed, to take into account that the probability of the municipality deciding to privatise its waste collection service may vary over time. Thus, we determined the factors that influence the timing of the municipality's decision to privatise this service.

The survival models implemented in this study are of the discrete time proportional hazard type, in which duration (time) is treated as a discrete variable, not because it is discrete (here, the time is continuous) but because the data are available only annually and therefore, the observations for each municipality are observed in a discrete way. Consequently, each municipality is repeatedly measured over time until it moves from public to private delivery. In discrete time models, the discrete-time hazard function is the probability of transition at discrete time t_j , $j = 1, 2, \dots$, given survival up to time t_j (Máñez et al., 2008). Thus, it is the probability of a municipality privatising its waste collection service during time period t conditional on its not having done so previously, within the period considered. Taking into account these considerations, together with the data specification obtained, our first step was to derive a complementary log-log model with no unobserved heterogeneity – i.e., the clog-log model^{vi} for linking the municipality's hazard rate to the time-varying covariates (see Prentice and Gloeckler, 1978). This model allows us to study factors that determine the privatisation process for waste collection services during the period 2000-2010, taking into account the influence of the passage of time on the probability of privatisation.

Our second step was to create another clog-log model including unobserved heterogeneity (or frailty), which is assumed to follow a gamma distribution^{vii} as, according to Jenkins (2005) and Máñez et al. (2008), failing to control for unobserved individual heterogeneity may cause problems. In this respect, too, Esteve-Pérez et al. (2008) observed that “ignoring unobserved individual heterogeneity may lead to strongly inconsistent estimates of the included covariates”.

Hypothesis 3, on the possibility of reduced quality in the privatised service, was tested by means of a test of nonparametric measures for related samples.

Results

Table 4 shows the results obtained with the two models examined, following the methodology described above. We present hazard rates, which are easier to interpret (Campolieti et al. 2014). The first column contains the estimation of the clog-log model with unobserved heterogeneity (Model 1), and the second column shows the corresponding figures for a clog-log model incorporating unobserved individual heterogeneity assumed to follow a gamma distribution (Model 2). The likelihood ratio test of the importance of the unobserved heterogeneity is conducted automatically during the estimation of the frailty model (Model 2). The unobserved heterogeneity is a factor of some importance because when it is included in the model we can reject the null hypothesis that the unobserved heterogeneity variance component is equal to 0.

Thus, in view of the inadvisability of ignoring unobserved heterogeneity, we consider Model 2 to be the more suitable for our purposes, and so our comments are based on this model (although, in fact, the two models produce very similar results).

[Insert Table 4]

To interpret the hazard rate for each covariate, we assume that a value greater than 1 corresponds to a positive effect on the hazard rate, and a value of less than 1 corresponds to a negative impact.

In accordance with these assumptions, the variable Duration Dependence^{viii} has a positive effect on the hazard. This means that the passage of time raises the probability of municipal waste collection services being privatised. The same result was reported by González-Gómez and Guardiola (2009) with respect to the privatisation of the municipal water service.

In relation to variables concerning fiscal stress, we recorded a positive but not significant effect of short-term solvency (Cash Surplus Index) on the hazard rate. The same was the case with the second indicator of fiscal stress; financial flexibility had no influence on the hazard rate. Therefore, we are unable to confirm that the worsening level of fiscal stress experienced when tax revenues are insufficient to meet the financial burden – debt plus interest – leads public managers to privatise the waste collection service. Nevertheless, if these results had been statistically significant, they would have been in line with those of previous research (Bel and Fageda, 2007), especially as regards the USA, because most studies use variables related to fiscal constraints to measure fiscal stress.

The third indicator of fiscal stress was used to examine whether privatisation is influenced by the greater fiscal stress caused by the presence of a budget deficit. Our results show that the Non-financial Budgetary Current Budgetary Payable Result Index, which has a coefficient value of less than one, has a negative effect on the hazard rate^{ix}. Therefore, this indicator of sustainability reveals that the presence of a budget surplus decreases the risk of the service being privatised. From these findings, we conclude that studies of the relationship between fiscal stress and privatisation should include budget deficit/surplus variables, which are relevant to this relationship.

The last component of fiscal stress analysed was that of financial independence. In this respect, we expected reduced external funding to lead public managers to consider privatisation; we infer that increased dependence would make it more difficult for the municipality to meet its liabilities from income without transfers. The value of this indicator, which was higher than one, was positive, and this had a significant effect on the hazard rate. Thus, municipalities that enjoy higher levels of financial independence will be more willing to privatise their services. In other words, the absence of subsidies and grants raises the possibility of this public service being privatised. Our calculations indicate that a municipality with a 1% higher proportion of

this ratio of independence will have an 11.28% higher probability of privatising the service. These results concur with those obtained by Bel and Fageda (2007) and Rodrigues et al. (2012).

With respect to Hypothesis 2, we found no evidence that public managers, when they perceive reduced service quality, resort to private management in an attempt to avoid a situation of citizens' fiscal stress; in our analysis, this variable was not statistically significant. Hypothesis 3 (Table 5), according to which quality levels fall after privatisation, was not confirmed, either; the mean value for service quality during the year prior to privatisation ($t-1$) was the same as the average value for the year of privatisation ($t+1$) and for the following year ($t+2$). These results do not corroborate the tenets of social choice, according to which the introduction of market forces reduces the concern to address collective interests, and so the privatisation of the waste collection service would result in lower levels of service quality.

[Insert Table 5]

Our study reveals that as expected, the neighbouring effect has a positive significant effect on the hazard rate. Thus, the higher the percentage of municipalities that have carried out privatisation within the same province, the greater the likelihood of privatisation taking place. Our results in this respect coincide with those of Bel and Miralles (2003), who found that the neighbouring effect positively influences the decision to contract out, for two main reasons: because when the supplier is closer to the municipality where the service is to be provided, economies of scale can be obtained, which increases the motivation for entering into the process of privatisation (Donahue, 1989); and because it enables the municipality to compare the management of the service with that provided in the neighbouring areas, which reduces the uncertainty and risk associated with any change in the management.

A further contribution made by this study is that we consider the possibility that the current global economic crisis may have affected decisions to privatise the waste collection service. The corresponding variable introduced into the model (Great Recession) showed that it had a positive significant influence on the hazard. Thus, the Great Recession produced a markedly higher risk of privatisation (the hazard rate for the period of crisis was over 136% higher than during the period of economic stability). This result corroborates the view that in the three years of global crisis evaluated (2008-2010), public managers implemented privatisation at a greater rate than in periods not affected by the crisis, seeking to alleviate the fiscal stress being suffered. Figure 1 illustrates this situation. Thus, once we control for other fiscal stress measures, this variable appears to have an independent impact on the probability of the waste collection service being privatised.

[Insert Figure 1]

Figure 2 illustrates the Kaplan-Meier survivor function, and shows that over time, an increasing number of municipalities have privatised their waste collection

service, although the process is very slow: after five years, only about 10% of the municipalities had privatised this service, and after ten years, the figure had still not reached 25%.

[Insert Figure 2]

Regarding the political variables, the results obtained show that neither political orientation nor political strength influence the probability of privatisation. Thus, we did not find evidence to support Hypotheses 6 and 7. These results confirm the hypothesis proposed elsewhere that political ideology does not affect the restructuring of public services (Warner and Hebdon, 2001; Bel and Miralles, 2003; González-Gómez and Guardiola, 2009).

We also examined whether socioeconomic factors influence the privatisation of waste collection services. Confirming earlier findings (Bel et al., 2010), we show that as the number of inhabitants rises, so does the likelihood of the waste collection service being privatised. This variable, which has a coefficient higher than one, has a positive significant effect on the hazard rate. In other words, municipalities with a greater demand for public services tend to make greater use of privatisation, as concluded previously by Bel et al. (2010). The variable “Index of Tourism” in the municipality had no influence on decisions to privatise the waste collection service.

Finally, we found that the variable urban agglomeration (number of population centres within the municipal area) has a negative effect on the hazard rate^x. This finding contrasts with that of Bel et al. (2010), who used a similar variable and reported the existence of economies of density. Nevertheless, our estimations agree with those obtained by Bel and Miralles (2003), who also obtained a lower tendency to contract out in municipalities with a greater dispersion or a larger number of population units within the city area. Our findings may reflect the fact that private operators are aware of the increased cost of service provision where population centres are more dispersed, and therefore have less interest in providing the service. Furthermore, we analysed municipalities with fewer than 50,000 inhabitants, most of them with between 1,000 and 20,000 inhabitants, and these are often characterised by widely separated population centres, which would corroborate the above conclusion.

Discussion and Conclusions

Fiscal stress is one of the main variables included in models used to identify the factors explaining why local governments privatise services. However, most such models have little explanatory power, possibly due to methodological difficulties in reflecting the nature of privatisation decisions. In turn, this difficulty is due to the fact that most studies are based on cross-cutting data, rather than long-term time horizons in which a broader perspective can be obtained of the privatisation process (Bel and Fageda, 2007; González-Gómez and Guardiola, 2009).

Accordingly, this paper records the exact moment at which local governments have privatised waste collection services, using a broad time horizon and examining a sample of over 600 Spanish municipalities with a population between 1,000-50,000 inhabitants. In addition, we performed a survival analysis which, in contrast to previous approaches in which discrete choice models have been implemented, enabled us to determine the influence of the passage of time on the decision to privatise this service; in other words, to take into account the existence of variables that change over time. In this respect, our findings support the existence of positive duration dependence. That is, the greater the passage of time, the greater the likelihood of these waste collection services being privatised.

Another factor that can account for the limited explanatory power of previous models is the inadequacy of the fiscal stress measures used (Boyne, 1998). For this reason, we incorporated a broad set of variables, rather than the single measure traditionally considered. We believe that the construction of this broad set of indicators of fiscal stress adds value to the traditional approach to studying the fiscal stress-privatisation relationship, and better enables us to understand the real situation of the municipal finances and to determine the impact of each element of fiscal stress on the decision to privatise this service.

The results obtained show that more measures should be considered in evaluating the fiscal stress-privatisation relationship. This is due to the low correlations measured between the indicators of fiscal stress, and to the results obtained in the survival model. These findings reflect the need to study a broad range of elements, as each one affects privatisation processes in a different way. In the case of waste collection services, such measures would include the level of independence regarding transfers received from other public administrations. Our findings suggest that local governments which enjoy greater financial independence are more willing to privatise the waste collection service. On the contrary, the indicators of flexibility and short-term solvency were not found to be significant in the models analysed. This finding suggests that future studies should include a sensitivity analysis of the different elements of municipal financial condition, since the use of one indicator or another may influence the fiscal stress-privatisation relationship.

With respect to the implications of our findings regarding the provision of public services based on the introduction of market mechanisms and the possible consequences for the public interest, we found no evidence of worsened service quality after privatisation. This fact may be related to the empirical evidence regarding the importance of the passage of time on the fiscal stress-privatisation relationship. Consequently, it may be necessary to undertake a longer-term study of the impact of privatisation on the collective interests of the population.

Another noteworthy finding is that the neighbouring effect positively influences the decision to privatise. Thus, public managers' decisions are subject to a benchmarking effect, one that may have been accentuated in our study sample, which

was restricted to small and medium sized municipalities. Hence, we obtained empirical evidence that municipalities follow the example of privatisation decisions taken in neighbouring municipalities, at least with respect to this particular public service.

Another contribution made by our study is its evaluation of the relationship between fiscal stress and privatisation in the context of the present global financial crisis. Theoretical arguments in this regard have held it highly likely that the global crisis produced a reduction in local authorities' financial resources, and thus they would seek to reduce spending, among other means through the privatisation of public services. In this respect, we present empirical evidence of the positive and significant effect of the Great Recession on the privatisation of waste collection services. It seems that public managers do indeed view the privatisation of this service as a means of reducing fiscal stress and thus of alleviating the effects of the crisis on municipal finances. In short, the results obtained show that local public managers' perceptions of this question tend to coincide; in the presence of economic and financial difficulties, provoking fiscal stress, they will seek to alleviate its effects by privatising public services. Moreover, in periods of transboundary crisis this phenomenon is heightened, as reflected in our results, which show that during the years of the global crisis, municipalities implemented privatisation at a greater rate than in periods of economic stability. Our results suggest that after controlling for the fiscal stress measures, global financial crisis by itself has an independent impact.

Regarding the political variables, we find that these do not influence the decision to privatise the waste collection service.. Finally, with respect to socioeconomic factors, we found that increases in the number of inhabitants heighten the likelihood of privatisation taking place, while, to the contrary, the larger the number of population centres within the municipal area, the lower the likelihood.

Bibliography

- Allmendinger P (2002) Towards a post-positivist typology of planning theory. *Planning Theory* 1(1): 77–99.
- Altshuler A, Morrill W, Wolman H and Mitchell F (1999) *Governance and Opportunity in Metropolitan America*. Washington, DC: National Academy Press.
- Ashworth J, Geys B and Heyndels B (2005) Government weakness and local public debt development in Flemish municipalities. *International Tax and Public Finance* 12(4): 395–422.
- Bahl RW (1984) *Financing State and Local Government in the 1980's*. New York: Oxford University Press.
- Bel G and Costas A (2006) Do public sector reforms get rusty? Local privatization in Spain. *The Journal of Policy Reform* 9(1): 1–24.

- Bel G and Fageda X (2007) Why do local governments privatize public services? A survey of empirical studies. *Local Government Studies* 33(4): 517–534.
- Bel G and Fageda X (2010) Empirical analysis of solid management waste costs: some evidence from Galicia, Spain. *Resources, Conservation and Recycling* 54(3): 187–193.
- Bel G and Miralles A (2003) Factors influencing the privatisation of urban solid waste collection in Spain. *Urban Studies* 40(7): 1323–1334.
- Bel G and Mur M (2009) Intermunicipal cooperation, privatization and waste management costs: evidence from rural municipalities. *Waste Management* 29(10): 2772–2778.
- Bel G, Fageda X and Mur M (2010) ¿Por qué se privatizan servicios en los municipios (pequeños)? Evidencia empírica sobre residuos sólidos y agua. *Hacienda Pública Española/Revista de Economía Pública* 192: 33–58.
- Berne R (1992) *The relationships between financial reporting and the measurement of financial condition*. Government Accounting Standard Board (GASB). Research Report no.18. Norwalk, CT.
- Berry FS and Berry W (1999) Innovation and Diffusion Models in Policy Research. In: Sabatier PA (eds) *Theories of the Policy Process. Theoretical Lenses on Public Policy*. Oxford: Westview Press, pp.169–200.
- Berenyi E and Stevens B (1988) Does privatization work? A study of the delivery of eight local services. *State and Local Government Review* 20:11–21.
- Bhatti Y, Olsen AL and Pedersen LH (2011) Administrative professionals and the diffusion of innovations: the case of citizen service centres. *Public Administration* 89(2): 577–559.
- Boyne G (1998) Bureaucratic theory meets reality: public choice and service contracting in U.S. local government. *Public Administration Review* 58(6): 474–484.
- Bradbury KL (1982) Fiscal distress in large U.S. cities. *New England Economic Review* (November/December): 33–44.
- Campolieti M, Hebdon R, and Dachis B (2014) Collective Bargaining in the Canadian Public Sector, 1978–2008: The Consequences of Restraint and Structural Change, *British Journal of Industrial Relations*, DOI: 10.1111/bjir.12082
- Christoffersen H and Bo Larsen K (2007) Economies of scale in Danish municipalities: expenditure effects versus quality effects. *Local Government Studies* 33(1): 77–95.
- CICA, Canadian Institute of Chartered Accountants (1997) *Indicators of government financial condition*. Toronto.
- Clark TN and Ferguson LC (1983) *City Money: Political Processes, Fiscal Strain and Retrenchment*. New York: Columbia University Press.
- Dahl PS and Hansen KM (2006) Diffusion of standards: the importance of size, region and external pressures in diffusion processes. *Public Administration* 84(2):441–459.

- Denhardt JV and Denhardt RB (2003) *The New Public Service: Serving not Steering*. Armonk, NY: M.E. Sharpe.
- Denhardt RB and Denhardt JV (2000) The New public management: serving rather than steering. *Public Administration Review* 60(6): 549–559.
- Dijkgraaf E, Gradus RHJM and Melenberg B (2003) Contracting out refuse collection. *Empirical Economics* 28(3): 553–570.
- DiMaggio PJ and Powell WW (1983) The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review* 48(2): 147–160.
- Donahue JD (1989) *The Privatization Decision: Public Ends, Private Means*. New York: Basic Books.
- Dubin J and Navarro P (1988) How markets for impure public goods organize: the case of household refuse collection. *Journal of Law, Economics and Organization* 4(2): 217–241.
- Esteve-Pérez S, Máñez-Castillejo JA and Sanchis-Llopis JA (2008) Does a “survival-by-exporting” effect for SMEs exist? *Empirica* 35(1): 81–104.
- Funkhouser M (2012) Outsourcing and the critical need for access to capital. *Public Administration Review* 72(6): 900–901.
- Guerrero LA, Maas G and Hogland W (2013) Solid waste management challenges for cities in developing countries. *Waste Management* 33(1): 220–232.
- Girard P, Mohr RD, Deller SC and Halstead JM (2009) Public–private partnerships and cooperative agreements in municipal service delivery. *International Journal of Public Administration* 32(5): 370–392.
- González-Gómez F and Guardiola J (2009) A duration model for the estimation of the contracting out of urban water management in southern Spain. *Urban Affairs Review* 44(6): 886–906.
- Gonzalez S and Oosterlynck S (2014) Crisis and resilience in a finance-led city: effects of the global financial crisis in Leeds. *Urban Studies* 51(15): 3164–3179.
- González-Gómez F, Picazo-Tadeo AJ and Guardiola J (2011) Why do local governments privatize the provision of water services? Empirical evidence from Spain. *Public Administration* 89(2): 471–492.
- Greenberg J and Hillier D (1995) Indicators of financial condition for governments. In: *5th Conference of Comparative International Governmental Accounting Research*. Paris-Amy, (No date).
- Groves M, Godsey W and Shulman M (2003) *Evaluating Financial Condition: A Handbook of Local Government*, Third Edition. Washington, DC: The International City/County Management Association.

- Hammer RB and Green GP (1996) Local growth promotion: policy adoption versus effort. *Economic Development Quarterly* 10(4): 331–341.
- Hart OD, Shleifer A and Vishny RW (1997) The proper scope of government: theory and application to prisons. *Quarterly Journal of Economics* 112: 1127–1161.
- Healey P (1996) The communicative turn in planning theory and its implications for spatial strategy formation. *Environment and Planning B: Planning and Design* 23(2): 217–234.
- Hefetz A and Warner ME (2007) Beyond the market versus planning dichotomy: understanding privatisation and its reverse in US cities. *Local Government Studies* 33(4): 555–572.
- Hendrick R (2004) Assessing and measuring the fiscal health of local governments: focus on Chicago suburban municipalities. *Urban Affairs Review* 40(1): 78–114.
- Hendrick RM (2011) *Managing the Fiscal Metropolis: The Financial Policies, Practices, and Health of Suburban Municipalities*. Washington, DC: Georgetown University Press.
- Honadle BW (2003) The states' role in U.S. local government fiscal crises: a theoretical model and results of a national survey. *International Journal of Public Administration* 26(13): 1431–1472.
- ICMA, International City/County Management Association (2003) *Evaluating Financial Condition: A Handbook for Local Government*, Fourth Edition. Washington, DC.
- Jenkins SF (2005) *Survival Analysis*. (Available at <https://www.iser.essex.ac.uk/files/teaching/stephenj/ec968/pdfs/ec968lnotesv6.pdf>). Institute for Social and Economic Research, University of Essex, Colchester: UK.
- Knoke D 1982 The Spread of municipal reform: temporal, spatial, and social dynamics. *American Journal of Sociology* 87(6): 1314–1339.
- Ladd HF and Yinger JM (1989) *America's Ailing Cities: Fiscal Health and the Design of Urban Policy*. Baltimore: Johns Hopkins University Press.
- León J, Dorta J and Pérez J (2010) Contraste de los modelos de asignación presupuestaria en el presupuesto social municipal. *Gestión y Política Pública* 19(2): 351–394.
- Levine CH (1978) Organizational decline and cutback management. *Public Administration Review* 38(4): 316–325.
- Lowery D (2000) A transactions costs model of metropolitan governance: allocation vs redistribution in urban America. *Journal of Public Administration Research and Theory* 10(1): 49–78.
- Máñez JA, Rochina ME and Sanchis JA (2008) Using survival models with individual data. In: Congregado E (eds) *Measuring Entrepreneurship: Building a Statistical System*. New York: Springer, pp.227–246.
- Mohr RD, Deller SC and Halstead JM (2010) Alternative methods of service delivery in small and rural municipalities. *Public Administration Review* 70(6): 894–905. Morgan DR and

- England RE (1988) The two faces of privatization. *Public Administration Review* 48(6): 979–987.
- Morgan DR and Hirlinger MW (1991) Intergovernmental service contracts: a multivariate explanation. *Urban Affairs Quarterly* 27(1): 128–144.
- Niskanen WJr (1971) *Bureaucracy and Representative Government*. Chicago: Aldine Publishing Company.
- Parks RB and Oakerson RL (1993) Comparative metropolitan organization: Service production and governance structure in St. Louis (MO) and Allegheny County (PA). *Publius* 23(1): 19–40.
- Plata-Díaz, AM, Zafra-Gómez, JL, Pérez-López, G., López-Hernández, AM (2014) Alternative management structures for municipal waste collection services: The influence of economic and political factors, *Waste Management* ^[1] ^[SEP] volume 34, issue 11, pp. 1967 – 1976, doi:10.1016/j.wasman.2014.07.003
- Pérez-López, G, Plata-Díaz, AM, Zafra-Gómez, JL and López- Hernández, AM (2013) Deuda viva municipal en un contexto de crisis económica: Análisis de los factores determinantes y de las formas de gestión. *Revista de Contabilidad-Spanish Accounting Review* 16:83–93, <http://dx.doi.org/10.1016/j.rcsar.2012.12.001>
- Prentice RL and Gloeckler LA (1978) Regression analysis of grouped survival data with application to the breast cancer data. *Biometrics* 34(1): 57–67.
- Prieto AM, Zofío JL and Álvarez I (2009) Economías de escala, densidad y alcance en la provisión pública de infraestructura básica municipal. *Hacienda Pública Española/Revista de Economía Pública* 190(3): 59–94.
- Rodrigues M, Tavares AF and Araujo JF (2012) Municipal service delivery: the role of transaction cost in the choice between alternative governance mechanisms. *Local Government Studies* 38(5): 615–638.
- Rose R and Page E (1982) *Fiscal Stress in Cities*. Cambridge, UK: Cambridge University Press.
- Sager T (1998) Meaningful collective choice? Public planning and Arrow's theorem. *Progress in Planning* 50(2): 75–140.
- Savas ES (1987) *Privatization: The Key to Better Government*. Chatham, NJ: Chatham House.
- Stiglitz JE (2000) *Economics of the Public Sector*. Third Edition. New York: W.W. Norton & Company, Inc.
- Thomas P and Palfrey C (1996) Evaluation: stakeholder-focused criteria. *Social Policy and Administration* 30(2): 125–142.
- Tiebout CM (1956) A pure theory of local expenditures. *Journal of Political Economy* 64(5): 416–424.
- Warner ME (2012) Privatization and urban governance: The continuing challenges of efficiency, voice and integration. *Cities* 29(S2): S38–S43.

- Warner ME and Hefetz A (2002) Applying market solutions to public services: an assessment of efficiency, equity and voice. *Urban Affairs Review* 38(1): 70–89.
- Warner ME and Hebdon R (2001) Local government restructuring: privatization and its alternatives. *Journal of Policy Analysis and Management* 20(2): 315–336.
- Zafra-Gómez JL and Muñiz M (2010) Overcoming cost inefficiencies within small municipalities: improve financial condition or reduce the quality of public services? *Environment and Planning C: Government and Policy* 28(4): 609–629.
- Zafra-Gómez JL, López-Hernández AM and Hernández-Bastida A (2009a) Evaluating financial performance in local government. Maximising the benchmarking value. *International Review of Administrative Science* 75(1): 151–167.
- Zafra-Gómez JL, López-Hernández AM and Hernández-Bastida A (2009b) Developing a model to measure financial condition in local government. Evaluating service quality and minimizing the effects of the socioeconomic environment: an application to Spanish municipalities. *American Review of Public Administration* 39(4): 425–449.
- Zafra-Gómez JL, López-Hernández AM and Hernández-Bastida A (2009c) Developing an alert system for local governments in financial crisis. *Public Money and Management* 29(3): 175–181.
- Zafra-Gómez JL, Prior D, Plata-Díaz AM and López-Hernández AM (2013) Reducing costs in times of crisis: delivery forms in small and medium sized local governments' waste management services. *Public Administration* 91(1): 51–68.

ⁱ This hypothesis corresponds to an approach by which we seek to determine the fiscal stress-quality relationship and its influence prior to the privatisation decision.

ⁱⁱ This hypothesis finalises the analytic strategy followed in this paper, examining the fiscal stress-privatisation relationship in terms of a time dimension (pre-privatisation vs. post-privatisation). Specifically we consider the relationship post-privatisation/pre-privatisation, collective interest vs. individual interest. However, it should be clarified that the impact of privatisation on collective interests is measured by examining a proxy or by considering an indirect effect of this relationship (i.e., service quality), because it was not possible to obtain a measure of user satisfaction pre- and post-privatisation for each of the years that constitute the study period.

ⁱⁱⁱ We remind the reader that this hypothesis measures the specific effect of separating the analysis period into two sub-periods, namely pre-crisis (2000–2007) and during the onset of the crisis (2008–2010). Other influences during this period may also have affected this relationship; for example, there may have been more general knowledge about privatisation options, or more publicity given to the downsides of privatisation, among other possibilities.

^{iv} To measure the concept of fiscal stress, we use four indicators, obtained from budgetary and balance sheet information. However, despite local authorities' obligation to provide budgetary information to the Directorate General for Financial Coordination with Regional and Local Authorities (DGCFCAL, part of the Ministry of Finance and Public Administration), a number of local authorities do not comply with this requirement, and this further limits our sample size. The Index of Tourism was obtained from the Spanish Economic and Social Yearbook (*Anuario Económico y Social de España*) published by La Caixa, which provides information only for municipalities with over 1000 inhabitants. The Spanish Survey of Infrastructure and Equipment (EIEL) provides information about municipalities with fewer than 50,000 inhabitants but does not include the municipalities in the Spanish regions (in Spain, termed Autonomous Communities) of the Basque Country, Navarre and Madrid.

^v (<https://serviciostelematicos.sgcail.minhap.gob.es/bdgel.aspx/consultaInventario.aspx>).

^{vi} The baseline hazard was assumed to have a parametric specification (which could be monotonically increasing, decreasing, or constant). If the shape of the baseline hazard function were addressed using non-parametric techniques we would have to create a dummy variable for each privatisation time during the period, which would cause problems of multicollinearity with respect to the dummy variables and of possible convergence in estimating the frailty models (Jenkins, 2005; González-Gómez and Guardiola, 2009).

^{vii} To estimate the model including unobserved heterogeneity in Stata 11.2, we use the command `pgmhaz8` developed by Stephen Jenkins (<https://www.iser.essex.ac.uk/resources/survival-analysis-with-stata>).

^{viii} This variable was created as the \ln (survival time) and is included in the estimations to reflect whether the hazard rate is monotonically increasing, decreasing, or constant. Survival time is the variable that uniquely identifies each time period during which the privatisation of the waste collection service might take place in each municipality.

^{ix} It should be taken into account that the normal expectation of the journal is that the minimum standard level of statistical significance is 0.05 (ie 5%) or better. In this case, the minimum level of significance for this variable is minor than 0.1.

^x It should be taken into account that the normal expectation of the journal is that the minimum standard level of statistical significance is 0.05 (ie 5%) or better. In this case, the minimum level of significance for this variable is minor than 0.1.