

What elements of financial stress affect contracting out and intermunicipal cooperation in the provision of local public services? The impact of the great recession

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ABSTRACT

The current financial crisis is one of the main factors underlying proposals made for change delivery form of municipal services. However, this situation is affected by a wide variety of financial indicators, and it is necessary to determine which of these indicators have greatest influence on decisions regarding outsourcing or long-term inter-municipal cooperation. Furthermore, the Great Recession could have modified these financial indicators, and so we must identify which of them impacted on public-service outsourcing and/or cooperation both before and during the crisis. This paper evaluates these factors with respect to a sample of Spanish municipalities, for the periods 2002-2007 and 2008-2010, via a discriminant analysis. The results obtained show that the financial indicators that affect outsourcing and cooperation are different, specifically, we find that the variables which are related to spending on transfers, budget sustainability and the flexibility of the entity, measured by its outstanding debt have the greatest impact on the outsourcing process, while the cooperation processes are influenced, in addition to the latter factors, by the short-term solvency of the entity. The elements of short term solvency, flexibility and sustainability led municipalities to outsource their public services in the pre-crisis period, while only debt and financial independence influenced the cooperation decisions during the crisis period.

KEYWORDS

Financial stress, contracting out, intermunicipal cooperation, great recession, local government.

1. Introduction

Fiscal stress is one of the explanatory factors most commonly referred to in studies of outsourcing and inter-municipal cooperation (Bel and Fageda, 2007). The reasoning used to relate the two concepts is based on the idea that municipalities in this situation are faced with falling revenues (transfers and/or taxes) and, not wishing to increase the local tax burden (Tiebout, 1956; Bel and Fageda, 2007), may choose to privatise public services that present a high degree of complexity and represent a significant cost to the local authority (Savas, 2000; Greene, 2002). Moreover, this situation has been aggravated by the current economic and financial crisis (Zafra-Gómez et al., 2009a, 2009b; Zullo, 2009). The effects of this crisis on public administration are reflected in a stricter control of budgets and deficits (López-Hernández et al., 2012) and this situation has prompted a search for solutions to fiscal stress, based primarily on recentralising the decision-making process and even on the use of new models of governance (Peters, 2011).

Among the options open to municipalities for alleviating situations of fiscal stress, one of the most common is to search for new forms of service delivery, such as privatisation (Moore, 1987; Hood, 1995). However, in recent years various alternatives to outsourcing – for example, inter-municipal cooperation – have arisen as a means of restructuring the delivery of public services (Mohr et al., 2010).

Nevertheless, empirical evidence is unclear as to whether situations of fiscal stress leading to outsourcing or inter-municipal cooperation are responsible for provoking changes in management attitudes (Levin and Tadelis, 2005; Bel and Fageda, 2007; Zullo, 2009). This may be due to the fact that most studies in this respect have been of a cross-sectional nature, aiming to evaluate the performance of municipalities over an extended period of time (Bel et al., 2010). Moreover, as observed by Boyne (1998), the measures used to assess whether the municipality is undergoing fiscal stress are very poor and may not reflect the true situation (Brudney et al., 2005).

The use of long periods of analysis means that the circumstances characterising these periods must be taken into account. We are currently experiencing a period of global financial crisis, known as the Great Recession (GR), which is having a major impact on economic activity in both the private and the public sectors. Accordingly, the fiscal stress/outsourcing (or inter-municipal cooperation) relationship may have changed during this period. Authors such as James and Wooten (2006) and Maitlis and Sonenshein (2010) have reported that when an international crisis occurs, the structure and development of

any organisation may be affected and undergo considerable change, and therefore action should be taken to overcome the problems faced (Christensen et al., 2011).

In view of this situation, it is necessary to identify the indicators that reflect the municipal financial situation, especially those with most impact on changes made in the provision of public services, and to determine whether these indicators are exerting the same influence during the GR.

Accordingly, the aim of this study is to establish whether the decisions taken by local public managers regarding outsourcing or inter-municipal cooperation are related to the presence of financial problems, specifically, when the municipality is undergoing a state of fiscal stress. This concept is distinguished from that of global financial crisis, known as the Great Recession (GR), which refers to the present global economic and financial crisis. The results obtained will clarify whether the financial variables were affected by the GR, thus impacting on how local public services are delivered, in terms of decisions to outsource or to enter into inter-municipal cooperation for this purpose. Furthermore, we consider a broad concept of fiscal stress, defining it in the framework of financial condition. In other words, we are not considering just the level of transfers or an indicator of local authority borrowing (Bel and Fageda, 2007), but also take into consideration variables related to transfers received, the fiscal capacity of the municipality, its cash position, level of debt and budget sustainability.

The rest of this paper is structured as follows. In the next section, the concept of financial condition is discussed, as a valuable element for measuring whether a municipality is undergoing financial stress. We then examine, from a theoretical standpoint, the relationship between fiscal stress and outsourcing or inter-municipal cooperation. Section four introduces the concept of crisis management to address the implications of the impact of the GR on the relationship being studied. In section five, we explain the methodology used, the data analysed and the results obtained, for a sample of Spanish municipalities for the period 2002-2010. In the final section, we discuss these results and draw appropriate conclusions.

2. Using financial condition to measure fiscal stress in local government

The primary objective of financial information in the context of local government is to represent its economic and financial position, thus facilitating decision-taking by individuals, rating agencies, managers and the community in general, providing an instrument for effective action to be taken when financial circumstances are adverse, and a measure for determining rewards when circumstances are favourable. One of the main lines of research currently being addressed in the area of local government finance is the construction and development of indicators to measure how local authorities are managing their resources and their finances.

Studies related to the financial position of an entity have referred to the concept of financial position, i.e., the entity's ability to meet its obligations from the resources at its disposal (Lorig, 1941; Berne, 1992; Zafra-Gómez et al., 2009c). Measurement of this concept provides information about the entity's solvency or liquidity, that is, its ability to meet its obligations in the long term and the short term, respectively. Accordingly, the present financial analysis aims to determine the financial risks associated with local authorities' economic activities, by analysing their solvency.

Unlike financial position, the concept of financial condition addresses not only this facet of economic-financial information, but also others that influence the development of service delivery in municipalities, and which, even if they are not reflected in the analysis of financial position, have a tangible impact on the financial health of the local authority. However, the terms financial position and financial condition have sometimes been used in a confusing way, despite the Governmental Accounting Standards Board having clarified the broader nature of the concept of financial condition (paragraph 34 of Concept Statement 1), and different terms have been used to refer to the concept of financial condition, including fiscal crisis, fiscal stress, fiscal distress, fiscal emergency or financial condition (Honadle, 2003). Thus, the US State of Rhode Island uses the term "crisis", while Ohio speaks of "fiscal emergency", and Michigan and Pennsylvania, "fiscal distress".

In this context, the analysis of financial condition has been widely discussed (Hendrick, 1989; Greenberg and Hillier, 1995; Groves et al., 2003; Hendrick, 2004; Kloha et al., 2005a, 2005b; Wang et al., 2007; Zafra-Gómez et al., 2009a, 2009b, 2009c; Cohen et al., 2012) and the determinants of financial condition or fiscal distress have been studied from

various perspectives, with different systems being proposed for measuring and evaluating the financial health of local authorities.

Among the different possibilities offered to measure this concept, for the purposes of the present study, we start with two that seem most appropriate. On the one hand, the proposal made by Groves et al. (2003), who pointed out that financial condition can be measured in terms of four inter-related factors: cash solvency, budgetary solvency, long-term solvency and service-level solvency. These authors defined cash solvency as the entity's ability to generate sufficient liquidity to meet its short-term obligations; budgetary solvency is its ability to obtain sufficient budget revenues, without provoking a budget deficit; long-term solvency concerns the government's ability to meet all its long-term liabilities; and service-level solvency is its ability to provide the level and quality of services necessary for the welfare of the community in question.

The second contribution considered was that of Greenberg and Hillier (1995) and CICA (1997), for whom financial condition can be measured through various indicators related to sustainability, flexibility and vulnerability. Sustainability is viewed as the ability of the entity to maintain, foster and preserve the social welfare of its citizens using the resources at its disposal. Flexibility is the entity's capacity to respond to changing economic and financial circumstances within the limits of its fiscal capacity; and vulnerability is its level of dependence on external funding to enable public spending levels to be maintained.

In the present study, the concept of financial condition is used to determine whether a municipality is in a position of financial stress, and the financial condition is assumed to include the following aspects: cash solvency, defined as the organisation's ability to generate sufficient liquidity to pay its short-term debts (Groves et al., 2003); flexibility, the organisation's capability to respond to changes in the economy or in its financial circumstances, via modifications to public debt (Greenberg and Hillier, 1995; CICA, 1997); budgetary sustainability (or service-level solvency), the organisation's 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); 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 for this study. All of these measures are set out in Table 1 and are evaluated using the set of indicators derived from budgetary and balance sheet information.

Elements of the Financial Condition		Indicators	Definition
Short-run solvency		Cash Surplus Index (CSI)	Difference between net short-term receivables, liquidity and net short-term liabilities
		Liquidity Index (LI)	Liquidity divided by net short-term liabilities
Budgetary solvency	Flexibility	Net Savings Index (NSI)	Difference between the receivables from current budget resources and the budget obligations from non-financial current expenditures, reduced by annual amortisation payment –including interest and principal
		Taxable value divided by Financial Charge Index (TVFCI)	Taxable budgetary receivables divided by annual amortisation payment – interest and principal –
		Weight of Budgetary Receivables (TVCR)	Taxable budgetary receivables divided by annual current budgetary receivables
		Sustainability of Budgetary Receivables (CETV)	Current budgetary payables divided by taxable budgetary receivables
		Debt	Outstanding debt of the local authority and its autonomous organisations, consortia and associations
	Independence	Index of Financial Independence (ITRANSF)	Grants budgetary payables divided by total budgetary payables.
		Weight Payables/Transfers (TE/G)	Total budgetary payables divided by grants
	Sustainability	Non-Financial Budgetary Result Index (NFBRI)	Current budgetary payables, non-financial capital budgetary payables divided by non-financial current budgetary receivables, non-financial capital budgetary receivables.

Table 1. Elements of the financial condition

3. Cooperate or outsource in response to fiscal stress?

Outsourcing can be defined as a form of privatisation in which a private company obtains residual gains from service delivery (Vickers and Yarrow, 1988; Warner and Bel, 2008) and in this field it is the most important of the alternatives available (Pallesen, 2004). One of the economic factors promoting outsourcing is the impact of fiscal stress (tax burden, legal limitations on local tax levels and the size of transfers from central to local government) on local government. Bel and Fageda (2007) observed that one of the hypotheses most commonly analysed and empirically tested is that of the relationship between fiscal stress and outsourcing (Ferris, 1986; Miranda, 1994; Kodrzycki, 1998; Brown et al., 2008; Hebdon and Jalette, 2008) and various studies have concluded that local officials respond to fiscal problems by this means (Touche-Ross Company, 1987; Mouritzen and Nielsen, 1988; ICMA, 1989; Morgan and Hirlinger, 1991).

Outsourcing is most commonly resorted to by larger municipalities, because smaller ones will often not have access to providers of the services required (Kodrzycki, 1998; Warner and Hefetz, 2003). As an alternative, municipalities can choose to join forces, via inter-municipal cooperation, to provide services that would be too costly for each one alone. Inter-municipal cooperation can reduce public sector spending, as the services provided under this form of management are consolidated via a single entity, whereas there may previously have been a larger number of entities and a higher level of total expenditure (Parks and Oakerson, 1993). In other words, it is hypothesised that small local authorities could employ inter-municipal cooperation to exploit economies of scale (Warner and Hefetz, 2003; Dijkgraaf et al., 2003; Warner, 2006a; Zullo, 2009). In addition, they would retain control of the service provided, which is not the case with outsourcing (Warner, 2006b). For these reasons, assuming that greater cooperation leads to lower spending and thus reduces fiscal stress for local government, there is a high probability that municipalities faced with fiscal stress will opt for the service to be provided in the form of inter-municipal cooperation.

4. The effect of the great recession on the relationships between fiscal stress and outsourcing or inter-municipal cooperation

As discussed in Section 2, numerous concepts have been proposed for evaluating the financial condition of public entities. However, events of the last decade may have changed how these concepts are viewed. As a result of the globalisation of the economy, events in localised areas can affect economic activity worldwide. This situation has given rise to the concept of crisis management. This concept was first developed in the private sector but in the present context can be readily transferred to the public sector. Crisis management can be clearly differentiated from the concepts of fiscal crisis, fiscal distress and financial condition. These latter are all part of what may be considered the economic and financial problems of a single entity, but crisis management refers to factors and events that influence the business activity of production units and which can also provoke major changes in organisational life (James and Wooten, 2010). These changes may be substantial and structural, and require public managers to adopt strategic responses to adapt the entity to the new circumstances.

For such a crisis to be present, there must exist a set of elements clearly differentiating it from other types of problems. First, a severe threat must be detected (Hermann, 1963),

one that could significantly affect the aims of the organisation. The latter author noted that the concept of crisis also incorporates a certain element of surprise. But the entity must react appropriately both to the surprise and to the threat. This is what Hermann terms the short-term decision. Thus, a management crisis should present both these elements, although subsequently both the same author and Brady (1974) downplayed the importance of the element of surprise and of rapid decision taking. This concept of crisis could very well encompass the present Great Recession (GR). The GR has been characterised by its progressive appearance in different settings and the progressive decisions taken in response by different governments. The level of intensity of the crisis has varied among different countries, and the responses made by their governments have also differed. At present, and for the specific case of Europe, countries such as Portugal, Greece, Italy, Ireland and Spain are engaged in a whirlwind dismantling of the public sector, aimed at achieving total control of the public deficit.

This climate of change is also apparent at the local level, which is the object of most studies of financial condition, and thus any research in this field with an international focus, carried out since 2008, must take account of this situation characterising public sector finances in general and those of municipalities in particular. The first references to the situation of municipalities and their financial condition are the studies by López-Hernández et al. (2012) and Pérez-López et al. (2013), analysing the financial condition at the start of the period of crisis management. These studies have reported that the crisis affects different elements of the financial condition of local governments, to varying degrees. The element of financial condition that has undergone the most severe deterioration is that of budgetary sustainability, i.e., the control of the public deficit, which in turn has negatively impacted on budgetary stability. Secondly, the indicators of flexibility, that is, of government debt, have worsened. This latter element has been examined by the second group of authors (Pérez-López et al., 2013), who found that the variables which determine the level of debt, in the period from 2008 to 2011, presented certain differences from those identified in studies conducted during periods of economic stability.

These first studies in the Spanish context corroborate the need to consider the effects of crisis management in evaluating the financial condition of public bodies, particularly at the local level, and its relationship with the emergence of phenomena such as outsourcing and inter-municipal cooperation. The current economic and financial crisis may have altered the elements comprising financial condition and have pushed municipalities into

outsourcing services or entering into processes of inter-municipal cooperation. Therefore, we propose the following hypotheses:

H₁: The elements of the financial condition affecting the outsourcing of public services differ between the pre-crisis period and during the Great Recession.

H₂: The elements of the financial condition affecting processes of inter-municipal cooperation for the provision of public services differ between the pre-crisis period and during the Great Recession.

5. A study of local governments in Spain

5.1. Methodology and data

In view of the characteristics of the data and the particular aims of this study, we decided to conduct a stepwise discriminant analysis (Sánchez-Fernández and Luque-Martínez, 2012). This analysis technique was applied for the following reasons:

- First, because the fundamental purpose of the study was to determine the relationship between behaviour (assessed by a dichotomous variable) and a set of financial indicators (expressed in terms of ten measurement metrics), under the assumption that these indicators may influence the behaviour. This configuration of variables makes the technique especially suitable and also enables us to evaluate the relative weight or importance of each value in characterising the behaviour.
- Second, having ten independent metrics makes it especially necessary to reduce the dimension of the problem and to develop a model containing the fewest possible independent variables. In this respect, the stepwise procedure for estimating discriminant functions allows us to obtain a model comprised exclusively of the independent variables that offer the greatest discrimination and prediction capacity, while removing potential redundancies among them.

The study sample was constituted of 1,572 local authorities in Spain, each with over 1,000 inhabitants, of the total of 3,106 such Spanish local authorities, for the period 2002-2010. Fiscal stress and economic, financial and budgetary data were obtained from the Directorate General for Financial Coordination with Regional and Local Authorities (DGCFCAEL). The number of inter-municipal cooperation processes was ascertained by consulting the general database of local entities, maintained by DGCFCAEL. Finally, a

purpose-built database was constructed by incorporating the announcements published by local authorities in Spanish official provincial gazettes regarding the outsourcing of certain services. Information about the descriptive statistics is given in Table 2.

	N	Minimum	Maximum	Mean	Std. Deviation
NSI	14148	-3.104772859	0.89351469	0.07	0.16
TVCR	14148	0.042473713	0.964158577	0.58	0.15
NFBRI	14148	0.310360754	3.495602817	1.02	0.17
TE/G	14148	0.069991998	2.765167007	0.57	0.21
CSI	14148	-192.8107649	6564.840583	3.71	59.35
LI	14148	-90.87335352	6555.557724	2.34	58.91
TVFCI	14148	0.206163572	51853.79258	33.43	615.93
CETV	14148	0.090599958	5.330711451	0.69	0.27
Debt	14148	0.00E+00	6776856000	12798263.92	155579214.09
ITRANSF	14148	0.044581194	0.947001888	0.46	0.16

Table 2. Descriptive variables

5.2. Results

The first variable under analysis was outsourcing, and note was taken of the differences between the two groups defined by the dependent variable in relation to the measures for the ten values considered. However, not all the differences observed between the two groups were statistically significant. Thus, the last column in Table 3 shows that only 5 of the 10 variables revealed significant differences between the two groups.

Variable	Non-outsourcers: mean value	Outsourcers: mean value	Total	Sign.	Wilks' Lambda	F	Sig.
NSI	0.07	0.07	0.07	0.440	1	0.596	0.440
TVCR	0.57	0.63	0.58	0.000	0.984	222.734	0.000
NFBRI	1.02	1.02	1.02	0.861	1	0.03	0.861
TE/G	0.56	0.65	0.57	0.000	0.98	295.409	0.000
CSI	3.73	3.56	3.71	0.914	1	0.012	0.914
LI	2.36	2.16	2.34	0.896	1	0.017	0.896
TVFCI	35.40	17.19	33.43	0.274	1	1.198	0.274
CETV	0.68	0.74	0.69	0.000	0.995	72.808	0.000
Debt	5433871.57	73266829.19	12798263.92	0.000	0.982	265.151	0.000
ITRANSF	0.47	0.37	0.46	0.000	0.971	427.854	0.000

Table 3. Equality of the means

More specifically, it was found that the non-outsourcing group presents values that are higher and very different from those of the group that does outsource, with respect to the TVCFI variables and the short-term solvency ratios (CSI and LI). Moreover, the mean debt level of municipalities that outsource far exceeds that of the non-outsourcers, which corroborates the findings reported by Pérez-López et al. (2013).

In general, the existence of these significant differences between the two groups regarding these variables suggests it may be possible to develop an explanatory model to predict membership of these groups from the individual valuations for these variables.

Since the dependent variable divides the sample into two groups (non-outsourcing vs. outsourcing), discriminant analysis provides a single discriminant function that forms the basis for classification and prediction.

In this case, the discriminant function has a canonical correlation of 0.22, indicating that the function has an average association with the dependent variable that it is intended to predict. However, the analyses carried out clearly reveal significant differences in the mean discriminant scores for the two groups (Wilks' Lambda = 0.952, significance = 0.000), which shows that this function has a certain discriminant capacity between the groups defined by the dependent variable.

The stepwise inclusion procedure resulted in the inclusion in the discriminant function of only four of the ten independent variables. The following table shows the values of the standardised coefficients of these variables in the discriminant function.

Variable	Coefficient
NFBRI	-0.089
CETV	0.374
Debt	-0.574
ITRANSF	0.999

Table 4. Standardised coefficients of the discriminant function

From these values, we conclude that the four variables that make up the resulting model have unequal weights in shaping the discriminant function (between -0.089 and 0.999). Furthermore, these values allow us to anticipate that the discriminant function will clearly distinguish between municipalities with higher CETV, ITRANSF and NFBRI values. In other words, those with higher levels of current expenditure in relation to their tax

revenues, those with higher costs of transfers to other entities and those with higher budget deficits are all more likely to outsource public services. For the debt variable, we find a similar situation. Decreases in municipal debt increase the likelihood of outsourcing taking place. This may be due to the fact that municipalities which outsource public services do not need to incur higher levels of debt, as they have already reduced spending by outsourcing their services (Pérez-López et al., 2013, 2014).

Outsourcing	Function	Pre-crisis function	GR function
	1	1	1
0	0.079	0.077	0.097
1	-0.646	-0.739	-0.608

Nonstandardised canonical discriminant functions evaluated at the mean values for the groups

Table 5. Functions at the centroids of the groups

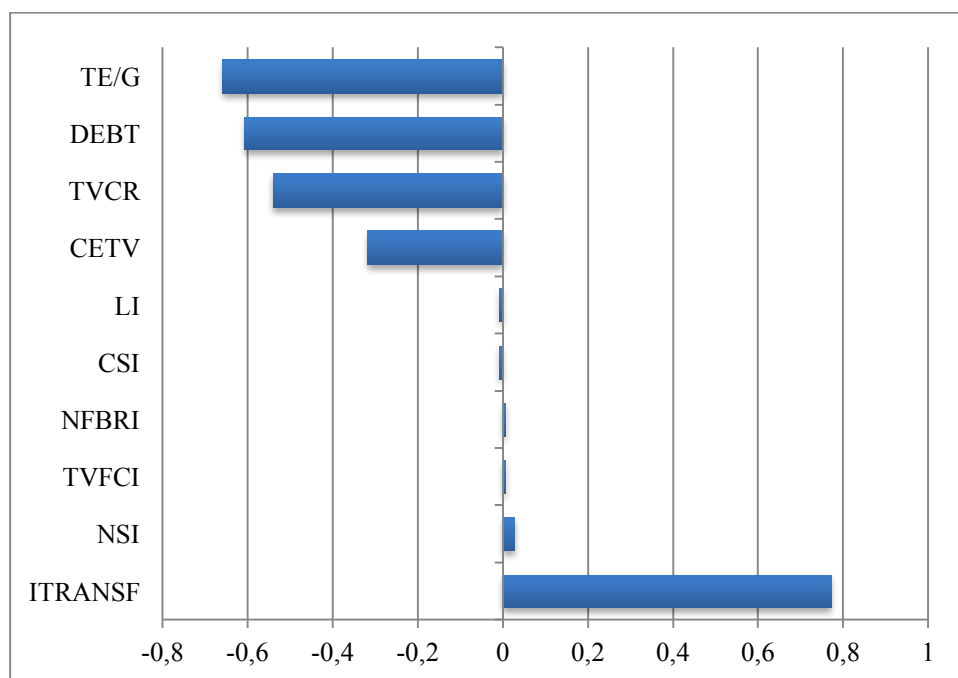


Figure 1. Correlations between the discriminant function and the independent variables (structure matrix)

Regarding the model's predictive capabilities, the results show that the discriminant function correctly predicts 64.2% of cases. In addition, for the non-outsourcing municipalities, this prediction rate is 64.2%, very similar to the outsourcing group (64.6%) (see Table 6). In general, however, this solution achieves a considerable

improvement in the classification of cases, with a hit ratio that is higher than the percentage of cases that could be classified correctly by chance (50%). Furthermore, Press's Q statistic corroborates the predictive ability of the model (Q = 1141).

		0	1	
Count	0	8091	4521	12612
	1	544	992	1536
%	0	64.2	35.8	100
	1	35.4	64.6	100

Table 6. Classification results

In view of the study aims, we were particularly interested in determining whether a similar explanation could be found for the behaviour of the dependent variable in the pre-crisis period (before 2008) in comparison to that for the GR (from 2008). Therefore, the discriminant analysis was repeated, obtaining the results discussed below.

With respect to the test for the equality of the means of the independent variables, the significant differences obtained previously were repeated in the same five variables as was the case for the combined sample group, for each of the two periods (see Table 7).

	Pre-crisis			GR		
	Wilks' Lambda	F	Sign.	Wilks' Lambda	F	Sign.
NSI	1	1.169	0.280	1	0.858	0.354
TVCR	0.985	142.315	0.000	0.979	101.542	0.000
NFBRI	1	1.252	0.263	1	0.283	0.595
TE/G	0.977	220.025	0.000	0.969	150.21	0.000
CSI	1	0.001	0.978	1	1.926	0.165
LI	1	0.001	0.979	1	1.71	0.191
TVFCI	1	0.899	0.343	1	0.288	0.591
CETV	0.994	54.068	0.000	0.991	42.136	0.000
Debt	0.979	205.033	0.000	0.985	69.406	0.000
ITRANSF	0.968	308.444	0.000	0.959	202.313	0.000

Table 7. Equality of the means

Similarly, the same four variables were obtained as in the general case for the pre-crisis and GR periods, with similar weights, and with the same sign.

Variable	Pre-crisis	GR
NFBRI	-0.128	-0.161
CETV	0.370	0.354
Debt	-0.591	-0.455
ITRANSF	0.984	1.073

Table 8. Standardised coefficients of the discriminant function

For the pre-crisis period, the discriminant function presents a canonical correlation of 0.232 (Wilks' Lambda = 0.946; significance = 0.000), whereas for the GR, it is 0.236 (Wilks' Lambda = 0.944, significance = 0.000). Therefore, the discriminant functions are significant and their explanatory power is practically identical. In addition, the coefficients of the discriminant function are similar, and identical for the pre-crisis period and for the GR. We conclude, therefore, that the indicators which determine the fiscal stress-outsourcing relationship were not modified by the onset of the GR. This finding is corroborated by the fact that the percentage of correctly classified cases is also very similar, with 66.1% for the pre-crisis period and 63.3% for the GR.

Table 9:

	Total		Pre-crisis		GR	
	0	1	0	1	0	1
0	8091	4521	5641	2902	2586	1483
1	544	992	294	595	235	412
0%	64.2	35.8	66.0	34.0	63.6	36.4
1%	35.4	64.6	33.1	66.9	36.3	63.7
Hit Ratio	64.2%		66.1		63.6	
Q	1141		979		347	

Table 9. Summary of case classifications

The second variable analysed was that of inter-municipal cooperation. This variable takes the value 1 when the local authority enters into cooperation with another or participates in a consortium, and the value 0 if it does not. The last column of Table 10 shows that for 8 of the 10 variables, there were significant differences between the two groups.

Variable	No cooperation group Mean value	Cooperation group Mean value	Total mean	Sign.	Wilks' Lambda	F	Sig.
NSI	0.073	0.078	0.074	0.272	1	1.207	0.272
TVCR	0.572	0.620	0.576	0.000	0.991	129.051	0.000
NFBRI	1.021	1.036	1.023	0.003	0.999	8.605	0.003
TE/G	0.560	0.636	0.567	0.000	0.989	154.691	0.000
CSI	2.966	11.117	3.714	0.000	0.998	22.282	0.000
LI	1.614	9.539	2.342	0.000	0.998	21.38	0.000
TVFCI	35.131	16.560	33.426	0.300	1	1.073	0.300
CETV	0.681	0.751	0.687	0.000	0.994	80.167	0.000
Debt	10862972.210	31941114.672	12798263.916	0.000	0.998	21.686	0.000
ITRANSF	0.461	0.400	0.455	0.000	0.988	166.894	0.000

Table 10. Equality of the means

The group of local authorities that entered into processes of inter-municipal cooperation presented different values from those obtained for the municipalities that outsourced public services. Our results show that the cooperating municipalities do not present worse levels of short-term solvency or of transfers and subsidies. On the other hand, they do have higher average levels of debt, although, as discussed below, this does not affect the value of the discriminant functions.

The discriminant function has a canonical correlation of 0.12, indicating that the function does not present a very high association with the dependent variable that it is intended to predict. However, the results of the analyses clearly reveal significant differences in the mean discriminant scores of the two groups (Wilks' Lambda = 0.985, significance = 0.000), which shows that the function does have a certain capacity to discriminate between the groups defined by the dependent variable.

The stepwise inclusion procedure resulted in the inclusion in the discriminant function of only four of the ten independent variables. The following table shows the values of the standardised coefficients of these variables in the discriminant function.

Variable	Coefficient
NFBRI	-0.185
CSI	-0.317
Debt	0.279
ITRANSF	0.867

Table 11. Standardised coefficients of the discriminant function

From these values, we conclude that the four variables that make up the resulting model have unequal weights in shaping the discriminant function (between -0.317 and 0.867). Furthermore, we anticipate that the discriminant function will clearly distinguish between municipalities with higher values for transfers to other entities (ITRANSF) and for level of debt, on the one hand, and those which present negative values for budget deficit and cash solvency, on the other. On comparing these results with those obtained for the case of outsourcing, we see they are very similar, except for the exit of the CETV variable and the entry of CSI (short-term cash solvency) in the discriminant function. This latter aspect means that increases in short-term cash solvency make the municipality less likely to cooperate with others.

Inter-municipal Cooperation	Function	Pre-crisis function	GR function
	1	1	1
0	0.039	-0.042	-0.019
1	-0.384	0.319	0.447

Nonstandardised canonical discriminant functions evaluated at the mean values for the groups

Table 12. Functions at the centroids of the groups

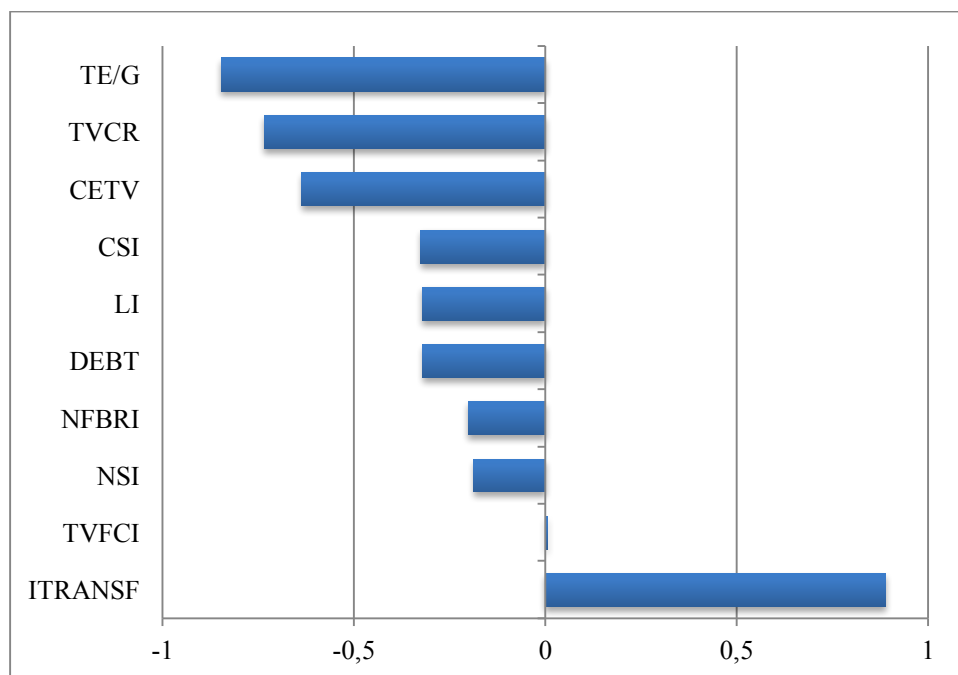


Figure 2. Correlations between the discriminant function and the independent variables (structure matrix)

Regarding the model's predictive capability, the results show that the discriminant function correctly predicts 57.9% of the cases. For the municipalities that do not

cooperate, this predictive capability was 57.7%, a similar value to that for the municipalities that do cooperate (59.7%). Nevertheless, in general, this model obtains some improvement in the classification of cases, since the hit ratio is higher than the percentage of cases that could be classified correctly by chance (50%). In addition, Press's Q statistic corroborates the predictive ability of the model ($Q = 356$).

		0	1	
Count	0	7420	5429	12849
	1	523	776	1299
%	0	57.7	42.3	100
	1	40.3	59.7	100

Table 13. Classification results

The corresponding cluster analysis (pre-crisis vs. GR) produced the results discussed below.

With respect to the test for the equality of the means of the independent variables (see Table 14), the significant differences were not the same for the two periods in question. Indeed, there were also some differences with respect to the overall sample. Specifically, while in the pre-crisis period there were differences for all the variables except NSI, NFBRI and TVFCI, in the GR the differences in CSI and LI also ceased to be significant.

	Pre-crisis			GR		
	Wilks' Lambda	F	Sign.	Wilks' Lambda	F	Sign.
NSI	1	0.666	0.415	1	0.133	0.715
TVCR	0.991	81.236	0.000	0.994	27.602	0.000
NFBRI	1	1.139	0.286	1	1.351	0.245
TE/G	0.993	70.422	0.000	0.994	30.16	0.000
CSI	0.998	15.977	0.000	1	0.012	0.913
LI	0.998	15.378	0.000	1	0.041	0.840
TVFCI	1	1.141	0.285	1	0.162	0.688
CETV	0.996	39.017	0.000	0.998	10.223	0.001
Debt	0.998	14.513	0.000	0.997	12.039	0.001
ITRANSF	0.991	83.192	0.000	0.994	28.589	0.000

Table 14. Equality of the means

The discriminant functions are significantly different in the two time periods, mainly because in the GR, only TE/G and Debt form part of the discriminant function, and NSI, TVCR and CSI cease to have explanatory power, which means that there was a significant change from the pre-crisis period to the GR in the indicators that determine whether municipalities cooperate with each other.

Variable	Pre-crisis	GR
NSI	-0.291	
CETV	0.529	
TE/G	0.440	0.838
CSI	0.347	
Debt	0.315	0.502

Table 15. Standardised coefficients of the discriminant function

For the pre-crisis period, the discriminant function obtained has a canonical correlation of 0.115 (Wilks' Lambda = 0.987; significance = 0.000), while for the GR it is 0.092 (Wilks' Lambda = 0.992; significance = 0.000). Therefore, the discriminant functions are significant and their explanatory power is practically identical. However, it should be noted that when the evaluation period is separated into two sub-periods, the elements of the financial condition that affect the cooperation process change significantly, with the variable that measures the budget deficit (NFBRI) and the index of transfers to other authorities (ITRANSF) being eliminated from the model. Replacing these variables, the model for the pre-crisis period introduces a variable that reflects the flexibility and sustainability of the current budget (NSI). When NSI is negative, the municipality is more likely to cooperate with other local entities. Also introduced is the TE/G variable, which measures the dependence of the local authority on grants in order to meet its expenses; when this variable increase, there is an increased probability of cooperation with other bodies. The third aspect introduced is the variable that reflects the entity's short-term solvency, although in this period it is positively related with inter-municipal cooperation, and so part of the fiscal stress-intermunicipal cooperation relationship is not accounted for by this variable. Finally, the outstanding debt variable for the pre-crisis period is positively related with cooperation processes, which implies that when debt rises, there

is a greater likelihood of the municipality cooperating with others. This occurs because the local authority seeks to transfer debt to other instrumental entities, such as consortia or municipal associations, seeking to keep the debt value off the general account (Pérez-López et al., 2014). In other words, this mechanism is used as a means of debt avoidance¹. Regarding the GR period, it should be noted that the debt variable has a similar effect to that observed for the pre-crisis period, together with the TE/G variable, and so both indicators are associated with an increased likelihood of inter-municipal cooperation. Finally, the percentage of correctly classified cases was significantly higher for the GR period (63.6%) than for the pre-crisis period (55.7%).

	Total		Pre-crisis		GR	
	0	1	0	1	0	1
0	7420	5429	4588	3738	2885	1638
1	523	776	437	669	77	116
0%	57.7	42.3	55.1	44.9	63.8	36.2
1%	40.3	59.7	39.5	60.5	39.9	60.1
Hit Ratio	57.9		55.7		63.3	
Q	356		124		250	

Table 16. Case classification summary

6. Discussion and conclusions

Fiscal stress is one of the main variables included in models seeking to identify the factors that explain why municipalities outsource and enter into inter-municipal cooperation agreements for the provision of public services. However, no in-depth study has previously been made of this variable. According to several theories, the presence of a situation of fiscal stress may provoke changes in how municipal services are provided, in order to reduce costs and thus levels of fiscal stress. But what factors in the entity's financial condition induce it to carry out these changes? Previous studies have only considered the possibility of outsourcing, but there are others that municipalities could adopt in order to reduce the costs of their services. For this reason, we have broadened

¹Article 36 of Royal Decree 1463/2007 obliges local authorities to inform the Bank of Spain of their outstanding debt, including that of consortia and associations in which they participate.

the analysis, examining the impact of fiscal stress on management changes, not only regarding outsourcing to a private operator, but also addressing the question of inter-municipal cooperation. The results obtained show that when a set of financial indicators present values according to which municipalities are undergoing financial stress, these authorities will conduct operations to outsource public services and/or engage in cooperation with other municipalities. For both cases, the methodology applied in this study, that of discriminant analysis, obtained discriminant functions that were sufficiently precise to enable us to predict with a high degree of probability when a municipality will outsource services or enter into inter-municipal cooperation, in reaction to a state of fiscal stress. However, the elements that lead to these two outcomes vary slightly. While the variables that have the greatest impact on the outsourcing process are related to spending on transfers, budget sustainability and the flexibility of the entity, measured by its outstanding debt, cooperation processes are influenced, in addition to the latter factors, by the short-term solvency of the entity.

The division of the period of analysis into pre-crisis (2002-2007) and crisis (2008-2010) reveals differences in the behaviour pattern. While the GR did not alter the elements of the financial condition that lead municipalities to outsource services, there were significant changes with respect to processes of inter-municipal cooperation. On the other hand, in the pre-crisis period, questions of sustainability, flexibility and short-term solvency led municipalities to outsource their services, while during the GR, only debt and financial independence had a significant influence on cooperation decisions.

Another noteworthy finding is that the debt variable presented a different behaviour for the two responses: while it was negatively associated with outsourcing, the sign for cooperation was positive, because in the accounts item of outstanding debt municipalities are obliged to include the debt of the consortia or municipal associations in which they participate.

As a future line of research, we intend to analyse other forms of management open to local authorities in their aim to become more efficient and to overcome situations of fiscal stress. These forms include the creation of autonomous organisations and the provision of services by provincial councils. Finally, more complex analytic methods will be used, highlighting the strength and direction of relationships among the variables that may account for the level of outsourcing. To this end, and in view of the strong correlations between many of the financial indicators, we propose a preliminary factor analysis to

identify specific factors that, after explaining and justifying their possible relations in terms of the corresponding theory, will allow us to use structural equation models based on a path-analysis method to explain the level of outsourcing and other forms of management.

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