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Searching for the optimal territorial structure: The case of Spanish provincial councils

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The case of Spanish provincial councils

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Abstract

Modern states are organized in multi-level governance structures with economic and political authorities dispersed across them. However, although there is relatively widespread consensus that this form of organization is preferable to a centralized authority, the same cannot be said about its jurisdictional design—that is, how to transfer authority from central states to both supranational and subnational levels. This lack of consensus also exists in contexts with explicit initiatives to strengthen political ties such as the European Union (EU), and even within EU member countries, a situation that is aggravated by the relative scarcity of contributions that measure the advantages and disadvantages of different territorial organizations. We explore these issues through a study of one EU country, Spain, whose provincial councils (diputaciones) are often the subject of debate and controversy due to their contribution to increasing public spending and their purported inefficiencies, corruption, and lack of transparency. Specifically, we combine a variety of activity analysis techniques to evaluate how they impact on local government performance. Results suggest that, in general, the presence of a provincial council has a positive impact on local government performance, but when their activity levels are too high the effect can become pernicious.

Searching for the optimal territorial structure: The case of Spanish provincial councils [*]

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Abstract

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Keywords: local government, multilevel analysis, panel data, performance, provincial council

JEL Classification: C14, H11, H70, R15

1. Introduction

In today's society, governance is dispersed across several levels of authority, the names of which vary from one country to another (regions, provinces, departments, jurisdictions, municipalities, etc.), and which ranges from very few to multiple levels. Although there is a broad consensus that this form of governance is preferable to a centralized authority (Hooghe and Marks, 2003), it is less clear how multi-level governance should be organized—that is, how power should be shared between central governments and their subnational units.

As a consequence, preferences across countries have leaned toward multiple-level types of governance to the detriment of centralized structures. This dispersion of authority below, above, and alongside central/national government has several implications in multiple directions. It is important to note that the global trend toward decentralization has been so fast that it has even outpaced that of democratization—which attracts more media and academic attention (Barter, 2018).

This trend toward enhanced decentralization has been documented in, for instance, Hooghe et al. (2016), who explored political devolution and administrative deconcentration in 52 countries, finding that the trend affected two-thirds of the sample (see also Asthana, 2013). Although the empirical evidence was overwhelming, it is less clear what lies behind the trend, since reasons vary from country to country. As Ayres et al. (2018) state, these motives might be multiple, and include, among others, the desire to mitigate economic differences (Martin et al., 2016), to deal with several regional cultures and identities simultaneously (Tang and Huhe, 2016), to relieve the political and bureaucratic burden associated with centralization (Organisation for Economic Co-operation and Development (OECD), 2015), or to change political views on the contribution of decentralization to achieving economic and social policies (Hambleton, 2015; Jessop, 2016).

In the case of Spain, the focus of our analysis, there have also been far-reaching devolutionary reforms since the Spanish Constitution was approved in 1978, and the country has one of the most devolved state structures in Europe. Lower levels of government deal with increasing shares of total public revenues and spending, whereas the tendency at the central level has taken the opposite direction. However, despite the rapid convergence in terms of decentralization with Spain's most decentralized European peers (such as Germany or Switzerland), the process has not been exempt from controversy, and ongoing parliamentary debate (in both Congress and Senate) has frequently addressed the transfer of powers from central to lower levels of government—or, in light of the pressures for independence in some parts of the

country, whether the process might even have gone "too far". This debate can be traced back to 1984, the first year of real decentralization (Molero, 2001),[1] and more recent issues such as the review of the regional funding model (*modelo de financiación autonómica*) are still high on central and regional government economic agendas.

The process of decentralization, apart from its usual association with issues alien to economics,[2] has had two particularities. First, it has mostly affected public expenditures, whereas revenues have largely remained in central government hands.[3] Second, the process has unevenly affected the different levels of subnational government in Spain: whereas regions (*comunidades autónomas*) have "won" in terms of volume of spending and relevance of powers transferred, local governments have "lost" in relative terms, as their share of public spending has increased only moderately compared to 1984 levels. Therefore, as indicated by Molero (2001), "we could say that local corporations are still waiting for a second decentralization process coming from the *comunidades autónomas*".

However, the way in which central governments share power with subnational units is determined not only by the volume of spending and relevance of powers transferred but also by the particular territorial structure in each country. In the case of Spain, the territory is divided politically not only into regions (*comunidades autónomas*) and municipalities, corresponding to levels NUTS2 and LAU2 in European terminology, respectively, but also into provinces, which correspond to the NUTS3 level.[4] But despite its geographical and historical importance (the territorial division of Spain into provinces was devised by Javier de Burgos in 1833), compared to regions and municipalities the provinces' powers and budgets are quite limited.

Therefore, any analysis of a devolutionary process is challenged both by the number of government levels, which differs from country to country, and also by the corresponding competencies—i.e., the public services, infrastructures and facilities that each of these subnational levels must provide. For instance, in some countries such as the USA or Belgium, to name just two (relevant) cases, early education (kindergarten and primary school) fall within the powers of local governments, whereas in other countries such as Spain these are regional

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[1] 1 1984 is the first year in which all the regional governments had a budget for the entire period.

[2] In this regard, the theory of fiscal federalism is one of the most significant theoretical landmarks offering guidelines on how to decentralize (Tiebout, 1956; Musgrave, 1989; Olson Jr, 1969; Oates, 1972). See also Prud'homme (1995). However, and as indicated by Molero (2001), in Spain decentralization has drawn very little from this theory.

[3] At least until 2001, when some regions began managing larger shares of their revenues. The trend has also varied among regions.

[4] NUTS stands for *Nomenclature des unités territoriales statistiques* (in French); LAU stands for Local Administrative Units, and refers to the classification of territorial units for statistics used in the European Union. LAU1 and LAU2 levels correspond to former NUTS4 and NUTS5 levels, respectively.

government competencies. Thus, evaluating the different levels of subnational government performance is a complex task for several reasons, not least because of the difficulties in accurately defining and measuring the mix of services, infrastructures and facilities that the various levels of government provide in each country.

In this scenario, Spanish local administration reforms have gained relevance over the last few years, partly due to the economic and financial crisis that has had a huge impact on the Spanish public sector. Some central issues relate to major changes at the local level in terms of goods and service provision, such as enhanced clarification of municipal powers, or the reinforced role of the provinces (*provincias*)—implemented via the *diputaciones*, *cabildos* and *consejos insulares* (provincial and island councils). However, although the need for a true (i.e., with enhanced powers) intermediate government level between regions and municipalities (the diputaciones provinciales) has been widely discussed for many years (Fundación ¿Hay Derecho?, 2016), the debate has gained momentum with the latest reforms to the local administration. Opinions range from those calling for their disappearance and the transfer of their powers to higher levels of government, to those advocating a stronger role and increasing their responsibility for managing resources (Fundación Democracia y Gobierno Local, 2016). However, the debate lacks quantitative support.

In this context, we attempt to evaluate the various activities undertaken by Spanish provincial councils (*diputaciones provinciales*) affect municipal performance. In doing so, we combine several methodologies within the context of data envelopment analysis (DEA, see Charnes et al., 1978; Cook and Seiford, 2009), a widely used activity analysis technique in public sector studies (Fox, 2001; Balaguer-Coll et al., 2007; Kalb, 2010). Specifically, we consider some innovative contributions in the field such as the temporal DEA frontiers introduced by Surroca et al. (2016) and applied to the public sector by Pérez-López et al. (2018)[5] together with the multilevel proposals of Battese et al. (2004). These methods can be used to compare the performance of different groups of municipalities classified according to several criteria: (i) population size and powers; (ii) presence of a *diputación* in the province; and (iii) degree of cooperation and activity of each *diputación* with the municipalities in its province. In this regard, whereas the number and relevance of studies in the specific field of local government efficiency and productivity has increased remarkably in the last twenty years,[6] few studies

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[5]See also Pérez-López et al. (2015).

[6]See, for instance, De Borger and Kerstens (1996a,b), Coffé and Geys (2005), Afonso and Fernandes (2006, 2008), Benito-López et al. (2010), Benito et al. (2010), Balaguer-Coll et al. (2007, 2010a,b, 2013), Balaguer-Coll and Prior (2009), De Witte and Geys (2011), Ashworth et al. (2014), Asatryan and De Witte (2015), Arcelus et al. (2015), Andrews and Boyne (2011), Andrews and Van de Walle (2013), Zafra-Gómez et al. (2013), Pérez-López et al. (2015),

have evaluated how the presence of an intermediate level of government,[7] and the activities it carries out, might affect the performance of other subnational levels of government, an issue that we approach using innovative techniques.

Our model is applied to a large sample of Spanish local governments with populations under 50,000 for the period 2008–2013. Results suggest that, on average, the presence of a *diputación* has a positive effect on the municipalities in its province, especially the smallest ones (with populations under 20,000). However, regarding the degree of cooperation and activity of the *diputaciones* with the municipalities located within the province, results are more intricate, since very active provincial councils might not have a positive effect on the efficiency with which municipal services and facilities are provided.

This study therefore contributes to the literature in three ways. First, from a theoretical point of view we propose a methodology to evaluate the contribution of subnational levels of government to the performance of other levels, taking into account how they interact. We consider this to be an interesting contribution, given the great disparities in the level of organization, political autonomy, political influence, and financial resources of subnational governments—not only across Europe (Hooghe and Marks, 1996) but also worldwide. Second, we combine our proposal with several innovative activity analysis techniques to evaluate, from a temporal point of view, how to measure the relevance of an *additional* level of government, which bears some similarities to proposals by Balaguer-Coll et al. (2010b). Finally, we find some relevant results in our application to Spain, a highly devolved country where some controversy surrounds the role of the subnational level of government represented by provincial councils.

The paper is organized as follows. After this introduction, Section 2 describes the institutional framework of Spanish municipalities and provincial councils, and Section 3 gives an overview of the methodologies used to determine cost efficiency and the multilevel analysis. Section 4 provides a detailed description of the data, and Section 5 presents and discusses the main results. Section 6 outlines the most important conclusions and avenues for future research.

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among others. This literature has been recently surveyed by Narbón-Perpiñá and De Witte (2018a,b). We do not extend the literature review to the performance of other public sector bodies for reasons of space.

[7]For instance, Seifert and Nieswand (2014) examine the case of France, although with different aims, methods and objectives to our study.

2. Institutional framework and hypotheses development

The Spanish political and territorial organization, as set out in the 1978 Constitution, has three levels of government: (i) central; (ii) regional, comprising 17 autonomous communities or regions (NUTS2); and (iii) local, including 50 provinces (NUTS3) and 8,124 municipalities (LAU2, formerly NUTS5).[8]

The local level consists of municipalities which are characterised by their territorial diversity and heterogeneity. Data for 2017 show that 6,825 municipalities had populations below 5,000 inhabitants (84% of the total), representing only 13% of the total population. Despite their diversity, they play an important role in providing the most basic services, since as the lowest level of territorial organization they are in closest proximity to citizens (Narbón-Perpiñá et al., 2019). The 1978 Constitution grants municipalities a high degree of autonomy and self-government, as reflected in both their powers and their financial resources, which guarantee their right to manage public affairs that affect their interests and benefit their inhabitants.

The municipal financial structure is based on revenues derived from local taxes (both direct and indirect), fees and public prices from the provision of basic services and the use of public facilities or infrastructures, transfers received from higher levels of government, revenues from assets, and capital and financial revenues. Table 1 shows the revenue structure of municipal budgets for the years 2008–2013. As shown in the table, the most relevant resources are collected via direct taxes—mainly property taxes,[9] followed by current transfers received from central government. Note that despite the financial autonomy of municipalities, the share of self-generated revenues (resulting from the sum of current incomes and sale of fixed assets) amounts to just 54.07% of total revenues for the period 2008–2013, while current transfers received from other levels of government accounts for 27.29%.

As for municipal powers, the Spanish Law regulating the local government system (*Ley 7/1985 Reguladora de Bases de Régimen Local*) establishes the basic services and facilities that municipalities must provide. In 2013 the Spanish government approved the Law on rationalization and sustainability of the local administration (*Ley 27/2013, de 27 de diciembre, de Racionalización y Sostenibilidad de la Administración Local*), which adapted the basic regulations on local administration to the requirements derived from the application of the principles of

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[8]Note that municipalities and provinces are the two basic forms of territorial organization at the local level. However, other local-level institutions exist such as the local government bodies in the islands (*cabildos* and *consejos insulares*), territories smaller than municipalities (*aldeas*), associations or consortiums of neighboring municipalities (*mancomunidades*), districts (*comarcas*) and metropolitan areas.

[9]Such as the *IBI, Impuesto sobre Bienes Immuebles* or property tax.

budgetary stability, financial sustainability and efficiency in the use of public resources.[10] Table 2 summarizes the contents of Articles 25 to 28 of the Law regulating local government, reporting the services and facilities that Spanish municipalities are obliged by law to provide. Specifically, Article 26 lists the minimum services and facilities that each municipality must provide, according to the size of its population. Articles 25, 27 and 28 of the law consider the delegation of competencies from central or regional governments and the capacity of the municipalities to exercise complementary activities in certain fields.

Because of this open framework, disparities can arise in the provision of services, since the regulation does not prevent municipalities from going beyond the legal minimum (Balaguer-Coll et al., 2013). In addition, although the law establishes minimum compulsory services and facilities, the reality is that a large proportion of Spanish municipalities, especially the smallest ones, would be unable to manage even the most basic services without support from other levels of government. This support comes from the provincial councils (which represent the governing body of provinces) or regional governments in the case of single-province regions. Therefore, it is in this particular setting that, in pursuit of economies of scale and formulas of cooperation to achieve the objectives that go beyond the municipal possibilities, intermediate forms of local government acquire relevance and momentum.

The 1978 Spanish Constitution establishes the need for the province (NUTS3) as an intermediate local body between regional (NUTS2) and municipal (LAU2, formerly NUTS5) powers in multi-province regions and islands. The Constitution also recognizes the autonomy of the provincial council and, as a consequence, it is a *local* institution with its own legal personality and autonomy in the management of its interests. Although their importance declined following the introduction of the autonomous communities (*comunidades autónomas* or regions) in the devolution process during the Spanish transition to democracy, which absorbed part of their powers, the provinces still have an important function in the local government framework. Indeed, they receive one-third of the resources designated by central government to finance local governments (Cuenca, Alain, 2018). In addition, the latest reforms of the local system also placed considerable emphasis on strengthening their role as a local institution, assigning them responsibility to (i) ensure the adequate provision of municipal services and facilities throughout the provincial territory, and (ii) coordinate local institutions within the

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[10]Law 27/2013 on rationalization and sustainability of the local administration substantially modified some articles of Law 7/1985 regulating the local system with the aim of clarifying municipal powers. The new law also had an important effect on the competencies and the institutional role of the intermediate local governments, as we will see later on.

province, and with the regional and central levels of government.

Provincial organization is characterized by a high degree of heterogeneity across the Spanish territory and, as a consequence, the impact of the province as an intermediate local government varies across their corresponding autonomous communities. Some Spanish regions have just one province and constitute a single provincial regional government, in which the regional government replaces the provincial council and manages with its responsibilities/powers. The regions (provinces) in this specific category are Asturias, Cantabria, Madrid, Murcia, Navarra and La Rioja. In the remaining regions, the local administration landscape is completed with 41 provincial councils. They are differentiated between 38 *common* provincial councils (*Diputaciones de Régimen Común*) and three *chartered* councils (*Diputaciones de Régimen Foral*) in the Basque Country.[11] In addition, the structure of Spain's island regions (the Canary Islands and the Balearic Islands) differs in that each island or group of islands is governed by island councils (*Cabildos* and *Consejos Insulares*, respectively).[12] Figure 1 shows a map of the Spanish provinces according to the types of provincial organization.

The fact that not all provinces have a provincial council, together with the mandatory and necessary nature of their presence derived from the Constitution, motivates this study of the current position of provincial councils. To date, research analyzing efficiency in Spanish local governments has considered data for municipalities of varying population sizes to explore differences between sizes in terms of scale effects and the complexity of the public services offered (Prieto and Zofio, 2001; Giménez and Prior, 2007; Balaguer-Coll and Prior, 2009; Balaguer-Coll et al., 2007, 2010a,b, 2013, 2019; Benito et al., 2010; Bosch-Roca et al., 2012; Zafra-Gómez et al., 2010; Cuadrado-Ballesteros et al., 2013; Arcelus et al., 2015; Pérez-López et al., 2015; Narbón-Perpiñá et al., 2019). However, these studies do not consider the presence of provincial councils as intermediate local governments that collaborate in or assume the provision of municipal services and facilities in some municipalities (especially the smallest ones) and, as a consequence, affect the role played by municipalities as autonomous institutions for decision making. The above considerations reveal the need to extend our understanding of the managerial capacity in municipalities given the presence of a provincial council in a province, an issue that remains relatively unexplored in the literature.

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[11]*Chartered* provincial councils (*Diputaciones de Régimen Foral*) in the Basque Country are special provincial councils in which the provinces are constituted as "historical territories". They differ from the *common* provincial councils (*Diputaciones de Régimen Común*) in terms of both powers and financial resources.

[12]Island councils, known as *Cabildos* in the Canary Islands and *Consejos Insulares* in the Balearic Islands, are the governing bodies that assume the responsibilities of the common provincial councils (*Diputaciones de Régimen Común*) in the islands. In the case of the Canary Islands, the scope of the *Cabildos* does not coincide geographically with the provincial boundaries as each island has its own island Council.

Based on these ideas, below we propose the first set of hypotheses, which relate to the role of common provincial councils in the municipalities located in their province, taking population size into account:

Hypothesis 1a (H1a) *The presence of a provincial council in a province affects the performance of small municipalities.*

Hypothesis 1b (H1b) *The presence of a provincial council in a province affects the performance of medium-size municipalities.*

Hypothesis 1c (H1c) *The presence of a provincial council in a province affects the performance of large municipalities.*

The purpose of the provincial councils, as defined in the Spanish local government regulation (*Ley 7/1985 reguladora de Bases de Regimen Local*) is to ensure the comprehensive and adequate provision of municipal services.[13] Table 3 summarizes the content of Articles 26 and 36 of this law, which cover the services and support activities that Spanish provincial councils are legally bound to provide to the municipalities in the province. Specifically, Article 26 stipulates that provincial councils must coordinate the provision of certain basic services (such as waste collection or public street lighting, among many others) in municipalities with populations under 20,000. Article 36 establishes the obligation to provide certain specific municipal services in municipalities with populations under 5,000 (such as waste treatment services) or 20,000 (such as prevention and extinction of fires). They must also approve an annual provincial plan for cooperation on works on municipal facilities and infrastructures.

In addition, apart from the basic municipal services and facilities, article 36 also states the provision of support services to the municipalities. Specifically, they must provide legal, economic and technical assistance, especially to those municipalities with lower economic and managerial capacity. Moreover, they also provide support for electronic administration services, tax collection and financial management of municipalities with population under 20,000. Other technical support services also include urban planning, economic promotion and monitoring of both economic-financial plans and the effective costs of the services provided by the municipalities. According to this last issue, if provincial councils detect that the costs of the services provided by the municipalities are higher than those of the services coordinated

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[13]As stated before, the latest local regulation reforms had a particular impact on the provincial councils in the local government framework. The reforms aimed to clarify the tasks performed by the provincial councils and strengthen their responsibilities in terms of their cooperation with and coordination of municipal services, especially with the smallest municipalities.

or provided by the provincial councils, they should offer their collaboration for a more cost efficient management that allows reducing the costs. Finally, article 36 also considers that provincial councils' powers also depend on central or regional government legislation.

Apart from the basic municipal services and facilities, Article 36 also stipulates the provision of support services to the municipalities. Specifically, they must provide legal, economic and technical assistance, especially to those municipalities with lower economic and managerial capacity. They are also obliged to provide support for electronic administration services, tax collection and financial management of municipalities with populations under 20,000. Other technical support services include urban planning, economic promotion and monitoring of both economic-financial plans and the effective costs of the services provided by the municipalities. In relation to this last question, if provincial councils detect that the costs of the services provided by the municipalities are higher than those of the services coordinated or provided by the provincial councils, they should offer their collaboration through a more cost efficient management that would reduce the costs. Finally, Article 36 states that provincial council powers also depend on central or regional government legislation.

The latest reforms endeavored to define and justify the role of the provincial council. However, the constitutional framework remains ambiguous and incomplete, since it does not precisely define and guide provincial council involvement in municipal affairs. Both the scope of activity and the depth of participation of these intermediate local governments (in terms of quantity and quality of cooperation and coordination in the provision of municipal services, and support service activities) depend on a range of factors that can vary greatly among provinces. In addition, apart from the basic municipal services and facilities, provincial councils might also provide other types of non-compulsory municipal services (related to sports and cultural activities, social assistance services, for example) as well as services related to powers devolved from higher levels of government. Therefore, in light of the divergences in the amount and quality of the services and facilities provided by the provincial councils, the second set of hypotheses, also considering the population size, are formulated as follows:

Hypothesis 2a (H2a) *The degree of cooperation and activity of each provincial council with the municipalities in its province affects the performance of small municipalities.*

Hypothesis 2b (H2b) *The degree of cooperation and activity of each provincial council with the municipalities in its province affects the performance of medium-size municipalities.*

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Hypothesis 2c (H2c) *The degree of cooperation and activity of each provincial council with the municipalities in its province affects the performance of large municipalities.*

Figure 2 summarizes the relationships among the proposed hypotheses. The main objective of this paper is to contribute to the analysis of cost efficiency in Spanish municipalities by considering, first, the presence of a provincial council in a province and its effect according to municipality population size, and second, the degree of cooperation and activity of each provincial council with the municipalities in its province.

3. A panel data multilevel frontier proposal

To test the above hypotheses, we use a temporal activity analysis DEA (Data Envelopment Analysis) model from a multilevel perspective in order to analyze the role of provincial councils in municipal cost efficiency.[14]

3.1. Estimation of the frontier efficiency coefficients

DEA, initially developed by (Charnes et al., 1978) and adapted to cost measurement by Färe et al. (1994), is a non-parametric[15] methodology based on linear programming methods for measuring the relative performance of decision-making units or DMUs—in our case Spanish municipalities. The DEA model uses data on municipal inputs and outputs to estimate the efficiency for each municipality by measuring the distance between each observation and an empirical frontier defined by the efficient DMUs considered as "best-practice" units. However, the original DEA—and most of its latest proposals—use cross-sectional data to estimate performance; we consider this to represent a major limitation when dealing with a panel of data in a temporal context.

In this setting, Surroca et al. (2016) proposed an extension of the DEA model with which to estimate long-run efficiency analysis, taking into account the data panel structure (Pérez-López et al., 2018). Its main advantage, compared to the more widespread window analysis (Charnes et al., 1984) and intertemporal frontier analysis (Tulkens and Vanden Eeckaut,

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[14]Given that in public sector outputs are established externally (Balaguer-Coll and Prior, 2009) and goods and services are frequently unpriced due to their non-market nature (Kalb, 2012), we adopt a cost minimization approach, a strategy widely applied in previous studies on municipal efficiency.

[15]Non-parametric methods do not impose a particular functional form and allow for the simultaneous modeling of several inputs and outputs. See Fried et al. (2008) for further details on efficiency measurement.

1995),[16] is that it provides a single and representative coefficient of efficiency for each municipality for the entire period under analysis, considering the available data for each observation over time. In doing so, the reference technology considers the yearly outputs and inputs and the averaged values of the period for each observation. Therefore, the municipality that appears to be efficient in the panel data estimation is also efficient in each respective year because the underlying technology is not modified (Surroca et al., 2016).

The minimal cost efficiency (over the period) can be calculated by solving the following program for each municipality:

$$
\begin{aligned}
&min_{(\theta,\lambda)}\theta \\
&s.t. \quad -y_n + Y\lambda \geq 0 \\
&\quad\quad\ \theta x_n - X\lambda \geq 0 \\
&\quad\quad\ 1'\lambda = 1 \\
&\quad\quad\ \lambda \geq 0 \\
&\quad\quad\ n = 1, \ldots, N
\end{aligned}
\tag{1}
$$

where for N observations (municipalities), X is the input matrix and Y is the output matrix that includes the temporal information of inputs and outputs for all N municipalities and all T years ($t = 1, \ldots, T$). Similarly, x_n and y_n are the average level from the period from year 1 to year T of the observed inputs and outputs corresponding to municipality n under evaluation. The program tries to minimize the average cost of the assessed unit, by optimizing θ, relative to a complete specification of the technology (from year 1 to year T) for the entire sample. The last two constraints imply variable returns to scale, and the activity vector cannot be negative.

3.2. Decomposition of the multilevel frontier model

Given the characteristics of this study—in which municipalities are classified into groups according to their size and powers—we combine the application of temporal DEA frontiers with the concept of frontier separation or metafrontier models (Battese and Rao, 2002; Battese et al., 2004; O'Donnell et al., 2008), since they enable comparison of the efficiency of observations (municipalities) classified into different groups operating under different technologies. In this

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[16]These two methods have been widely applied in previous literature to estimate long-term efficiency scores (Drew and Dollery, 2015). They construct a frontier including all the DMUs during the period of study, which in the intertemporal analysis model is the entire period, whereas in the windows analysis it corresponds to shorter periods of time. However, in both methods each DMU in each year is regarded as a different observation, without considering any panel structure of the data. The result is that each observation is compared not only to other observations, but also to itself in different time periods.

setting, we estimate a <u>cost frontier</u> for each group (local frontiers, *LF*) as well as a joint frontier for all municipalities (overall metafrontier or global frontier, *GF*). Then the distance between the local frontiers (*LF*) and the global frontier (*GF*) determines the so-called <u>technology gap</u> (*TG*) (see Battese et al., 2004),[17] which represents the minimum potential costs for each unit under evaluation, given the observed outputs. Specifically, the technology gap for group *k* is defined as:

$$TG^k = \frac{GF}{LF^k} \tag{2}$$

where $k = 1, ..., n$ represents the different groups (which in our case are groups of municipalities according to their population size and the role played by the provincial council of their province) under different technologies. The technology gap ratio becomes closer to unity as the distance between the local frontier (represented by LF^k) and the global frontier (represented by *GF*) decreases. Following this procedure, new levels of decomposition can be added to the model, given that each local frontier can be decomposed again into subgroups operating under different technologies. In the present study, we define a total of four levels which are defined in the next subsection.

3.3. Quadripartite decomposition of overall efficiency

In order to disentangle the effect that *diputaciones* (provincial councils) have on the efficiency of the local governments' they support (i.e., those located in their province), we propose a quadripartite decomposition of overall efficiency—in a similar fashion to Kumar and Russell (2002), Henderson and Russell (2005) and Badunenko and Romero-Ávila (2013), among others. In the first level of decomposition, we consider two frontiers: the local frontier, specific to each group of municipalities according to their population size and powers, and the global frontier, which includes all municipalities without considering differences in population size and powers. The local frontiers corresponding to the groups according to population size and powers are composed of the most efficient municipalities within each group, while inefficient municipalities lie at varying distances from the local frontier. The distance separating the local and global frontiers reflects the municipal <u>population size/powers effect</u> (henceforth *SE*).

Figure 3 represents the multilevel decomposition of the influence of provincial councils on municipal cost efficiency for the case of total cost minimization and one output. Municipality

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[17]Given that an increase in the ratio has a negative correlation with the gap between the local frontier and the metafrontier, O'Donnell et al. (2008) referred to this measure as "metatechnology ratio" in order to avoid confusion.

m under analysis uses the input level represented by C_m, corresponding to output level Y_m. When comparing the performance of municipality m to the local frontier (i.e., input level C_1 corresponding to a specific municipality size group), we obtain the inefficiency of the municipality compared to other municipalities in the same group. Accordingly, the distance between C_1 and the overall frontier (C_G) determines the municipality population size effect ($SE = C_1/C_G$).

In a second level, we introduce the <u>presence of provincial council effect</u> ($PPCE$), since not all municipalities are located in provinces with such a council. In this stage, C_2 (see Figure 3) represents the minimum input level that municipality m can use while simultaneously taking into account the population size group and the presence of a provincial council. Therefore, it is possible to define a new effect, $PPCE = C_2/C_1$, which should be interpreted as how the presence (or absence) of a *diputación* contributes to the efficiency of local governments in the province. In graphical terms, as shown in Figure 3, it measures the distance between the level 2 local frontier C_2 (i.e., the frontier corresponding to municipalities located in provinces with a *diputación*) and the level 1 local frontier C_1 (i.e., the frontier corresponding to municipalities in the same population size/powers group).

In the third level we introduce the <u>provincial council activity effect</u> ($PCAE$). Note that this effect will only exist for municipalities in provinces with a *diputación*. Accordingly, in such provinces, the level of heterogeneity in municipalities' efficiency scores can be affected by how actively a provincial council cooperates with its municipalities. Accordingly, we define a new effect, $PCAE = C_3/C_2$ which should be interpreted as how the activities of a *diputación* contribute to the overall efficiency of its municipalities. Graphically, as shown in Figure 3, it measures the distance between the level 3 local frontier, C_3 (minimum input level for municipality m according to this frontier), and the level 2 local frontier, C_2.

The fourth component of overall efficiency corresponds to the <u>municipal manager efficiency effect</u> (MME), and reflects the contribution to overall efficiency of other factors not reflected by SE, $PPCE$ and $PCAE$. The cost efficiency scores for municipalities in different groups may be more or less distant from the last local frontier of the decomposition—level 3 where a *diputación* is present and level 2 otherwise. Graphically, municipality m under analysis is inefficient as long as we find more efficient municipalities in the same group (C_3), determined as a ratio in which the potential input is divided between the actual input ($MEE = C_m/C_3$). The distance to the local frontier represents the inefficiency of municipality m according to municipal manager performance since this municipality can achieve higher

levels of efficiency.

In summary, we propose a quadripartite decomposition in which overall (or global) efficiency can be decomposed into four effects reflecting the total distance of municipality *m* to the global frontier:

$$
\begin{aligned}
\text{Overall efficiency } (OE) = {} & \text{Municipality population size effect } (SE) \\
& \times \text{ Presence of provincial council effect } (PPCE) \\
& \times \text{ Provincial council activity effect } (PCAE) \\
& \times \text{ Municipal management efficiency effect } (MME)
\end{aligned}
\tag{3}
$$

However, as stated above, for those municipalities located in provinces without a *diputación* we cannot consider the provincial council activity effect ($PCAE$). In that case, since the overall efficiency can only be decomposed into three effects, the quadripartite decomposition should be redefined as a tripartite decomposition:

$$
\begin{aligned}
\text{Overall efficiency } (OE) = {} & \text{Municipality population size effect } (SE) \\
& \times \text{ Presence of provincial council effect } (PPCE) \\
& \times \text{ Municipal management efficiency effect } (MME)
\end{aligned}
\tag{4}
$$

4. Sample, variables and definition of the provincial groups

We use a panel dataset covering the period 2008–2013 for a sample of Spanish municipalities with fewer than 50,000 inhabitants (representing 31.40% of all Spanish municipalities). The final sample has a total of 2,547 municipalities for every year after removing all the municipalities with unavailable data on inputs and outputs for the 6-year period and having used an iterative process for outlier detection proposed by Prior and Surroca (2010).[18] In Table 4 we summarize the number of observations for each region in our sample.

4.1. Inputs and outputs variables

On the input side, we construct a measure representing total local government costs of the municipal services provided (X_1). We include the following expenditures retrieved from the municipalities' yearly budgets: personnel expenses, expenditures on goods and services, current transfers, capital investments and capital transfers.

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[18]No information was available for the Basque Country, Navarre, Catalonia and Madrid regions, or for the provinces of Burgos, Huesca, Guadalajara and Huelva. In addition, in this study we do not include information for the Balearic Islands and Canary Islands which are governed by island *cabildos* (regional governments) and insular councils instead of provincial councils.

The variables used as outputs were obtained from the survey on local infrastructures and facilities (*Encuesta de Infraestructuras y Equipamientos Locales, EIEL*) conducted by the Spanish Ministry of the Treasury and Public Administrations (*Ministerio de Hacienda y Administraciones Públicas*). They are related to the specific compulsory services and facilities that each municipality must provide according to its size.[19] We selected ten output variables, which are consistent with previous literature (Balaguer-Coll et al., 2007, 2016; Narbón-Perpiñá et al., 2019; Narbón-Perpiñá and De Witte, 2018a).[20] Table 5 summarizes the minimum services that each local government is legally bound to provide, along with the different output indicators used to evaluate the services.

Finally, given the complexity of selecting the bundle of services and facilities (Balaguer-Coll et al., 2013) as well as the number of variables included in the efficiency analysis (which could lead to dimensionality problems[21]), we follow the proposal by Narbón-Perpiñá and De Witte (2018a) to consider alternative output models for assessing the robustness of our results. Specifically, we consider two different output models of which output <u>Model 1</u> includes all the minimum services compulsory for all governments, whereas output <u>Model 2</u> extends Model 1 by including additional services that must be provided by larger municipalities with populations in excess of 5,000 and of 20,000.

Table 6 shows the specific variables included in output Models 1 and 2 as well as the descriptive statistics for input and output variables for the period 2008–2013.

4.2. Defining the groups of municipalities according to provincial council activity

In order to analyze the role of the provincial councils in municipal efficiency, we classified municipalities into groups according to the degree of cooperation and activity carried out by the provincial councils in their province. In a first step, we identified the municipalities in provinces with and without a provincial council.[22] In a second step, we constructed a database for the provinces with a provincial council. This database compiles the information about the works carried out on municipal facilities, the municipal services provided, and the catalog of support services that each provincial council offers the municipalities in their province. Data

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[19]Listed in Article 26 of the Spanish local government law (*Ley reguladora de Bases de Régimen Local*).

[20]Spain differs from other European countries in the areas of education, care for elderly, and health services, which are not responsibilities at the municipal level.

[21]The "curse of dimensionality" implies that an increase in the number of variables, or a decrease in the sample under analysis entails higher efficiency scores (Daraio and Simar, 2007).

[22]Note that in Spanish territorial organization, all the provinces have a provincial council with the exception of single-province regions: Asturias, Cantabria, Madrid, Murcia, Navarra and La Rioja. Although the Basque Country is not a single-province region, the Basque provinces also have no provincial councils.

were taken from the provincial councils' websites, the NGO Transparency International Spain (TI-Spain)[23] and the official gazzete[24] of the provinces. Specifically, following the services that each provincial council is obliged to provide according to Articles 26 and 36 of the Spanish local government law (*Ley reguladora de Bases de Régimen Local*), we gathered information about the following provincial council activities:[25]

1. Cooperation on works carried out by provincial councils in municipal infrastructures and facilities. We classified the catalogs as "low" and "high" according to the average annual expenditures.

2. The activity of five support service catalogs containing: (i) tax management assistance; (ii) legal assistance; (iii) economic assistance; (iv) urban and technical assistance; and (v) computer assistance. We classified each catalog as "Basic", "Medium" and "Complete" according to the items it included.

3. Provision of the services of a municipal secretary-financial controller (*secretario-interventor*).

4. The coordination of two municipal services, namely, (i) the provision of waste collection and treatment of the waste collected; and (ii) the prevention and extinction of fires.

Finally, taking into account the information collected, we differentiated three groups of municipalities according to the degree of activity and cooperation of the provincial councils with the municipalities in their provinces: "very active", "active" and "less active". Provincial councils classified as "very active" are those which offer remarkably complete catalogs of support services to municipalities, that have cooperated closely on works carried out in the municipalities, and provide the services of a municipal secretary-financial controller, waste collection and treatment of the waste collected, and the prevention and extinction of fires. Similarly, "active" provincial councils were classified as those that meet the same requirements as the "very active" provincial councils but with less complete catalogs of support services and lower cooperation on works carried out in the municipalities. Finally, provincial councils classified as "less active" are those which offer basic catalogs of support services or that do not provide the service of waste collection and treatment of the waste collected or the prevention

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[23]Transparency International is a non-governmental organization dedicated to combating corruption at the national and international level. In Spain, it has compiled and published four Transparency Indexes in recent years, one of which concerns the transparency of provincial councils.

[24]A provincial council official gazette or bulletin publishes public and legal notices on a regular basis.

[25]We do not include data for training activities carried out for municipality staff or any other non-compulsory municipal services (sports and cultural activities or the provision of social services).

and extinction of fires. Table 7 contains the categories of municipalities grouped according to the provincial council activity in their province.

A supplementary appendix presents a description of the information on the items of the support service catalogs, the criteria followed to classify each catalog and the works carried out in qualitative categories, the summary of the activities offered by each provincial council and their classification, and the criteria followed to classify the groups of provincial councils according to their activity in support services and cooperation with municipalities in their province.

5. Results

Tables 8 and 9 report summary statistics for the decomposition of temporal local government cost efficiency for output Models 1 and 2, respectively. These tables show the decomposition of overall local government cost efficiency into different effects. Column 1 displays the specific groups of municipalities defined for each level of decomposition and effects measured—i.e., each efficiency component. The last row of each group represents the overall efficiency (in **bold**), which is the product of all the effects affecting the specific group. Columns 3–8 report the statistics for the results of the effects, including the mean and the standard deviation, as well as additional statistics that provide deeper insights into the results.

As explained in Section 3, we measured different cost frontiers for different groups of municipalities. Therefore, to evaluate the relative contributions to overall efficiency of the population size effect (*SE*), the presence of provincial council effect (*PPCE*), and the provincial council *activity* effect (*PCAE*), we estimate the technology gap ratio between each group-specific local frontier and the global frontier. When the values for these effects are closer to 1, they imply a shorter distance and the potential to achieve higher efficiency levels, while values below 1 represent a greater distance between these frontiers. The last effect, corresponding to municipal management efficiency (*MME*), shows the distance of the cost efficiency scores for each municipality to its respective local frontier. This effect is lower than 1 when the municipality is inefficient, and equal to 1 otherwise.

5.1. Population size effect (*SE*)

As indicated in Section 3.3, the first level of the decomposition (*SE*) considers the differences among municipalities according to population size and powers. Tables 8 and 9 report the

results in three horizontal panels, each of them corresponding to the three population size (powers) groups considered. The first row of these three panels reports results for this level of decomposition—labeled Level 1. As shown in Table 8 and Table 9, although some differences arise between the population size groups, the mean values for this effect are relatively high for all groups in both output models, that is, the local frontiers for all the groups of municipalities according to population size are close to the global frontier. Specifically, the mean values obtained are closer to unity for municipalities with populations under 5,000 (0.99 for output Model 1 in Table 8, and 0.98 for output Model 2 in Table 9), while the lowest mean values are found for municipalities with populations between 5,000 and 20,000 (0.95 for output Model 1 in Table 8 and 0.93 for output Model 2 in Table 9). These results would suggest that, according to our decomposition of overall efficiency, the inefficiency levels attributable to the population size effect (*SE*) are low, especially for the smallest municipalities, which present the highest average results.

Previous studies on Spanish municipalities conclude that the average efficiency results vary according to municipality population size, and more specifically, smaller municipalities generally perform worse than larger ones (Giménez and Prior, 2007; Balaguer-Coll and Prior, 2009; Balaguer-Coll et al., 2007, 2010a,b; Zafra-Gómez et al., 2010). Although our results may seem *a priori* to contradict those of previous studies, we consider this not to be the case. These studies carried out a global analysis considering municipalities of different population sizes, and then analyzed the distribution of the efficiency results according to the size of the municipalities, always taking into account scale effects. Following this approach, they obtained that smaller municipalities are relatively far from the global efficiency frontier, whereas most larger municipalities are efficient and closer to the frontier.

In our study we have measured the population size effect (*SE*) by comparing the most efficient municipalities of each population size group (i.e., the ones that determine the local frontiers) to the global frontier. Therefore, given that local frontiers for all population size groups are close to the global frontier, we conclude that the overall municipal inefficiency is slightly affected by the population size effect. However, many of the municipalities that form each population size group could present high inefficiency scores, since the inefficient units from each group could be far from their local frontier, as we will see in the results for the fourth effect (i.e., municipal management efficiency).

In sum, we show that municipal inefficiency is slightly affected by municipality population size, especially the smallest ones. This result does not imply that the average municipal

efficiency does not vary with population size, and that the most inefficient observations are found among the smallest size group. In addition, the impact of population size on municipal efficiency can be moderated by other effects that are more strongly connected with them, as we will see in the results for the second and third effects as explained below—i.e., presence of provincial council effect and the provincial council activity effect.[26]

5.2. Provincial council effect (*PPCE*)

The second level of decomposition to which we refer in Tables 8 and 9 as Level 2 introduces the presence of provincial council effect (*PPCE*). Results are reported in the first row of each group of municipalities defined according to whether they are located in a province *with* or *without* such a council—corresponding to rows five and two of each horizontal panel (based on population size groups), respectively.

They show that the average values obtained for this effect are equal to 1.00 for all groups of municipalities located in provinces with provincial councils (row five in each horizontal panel), which would indicate that inefficiency is not attributable to the presence of a *diputación* in a given province. This effect is robust across size groups as well as output models (Tables 8 and 9). In contrast, lower values correspond to the groups of municipalities located in provinces without a *diputación*, as shown in row two of each horizontal panel for both output models. Specifically, these values are further from the global frontier for municipalities with populations under 5,000 (0.55 for output Model 1 in Table 8, and 0.58 for output Model 2 in Table 9), while the highest mean values are found for municipalities with populations between 5,000 and 20,000 (0.80 for output Model 1 in Table 8, and 0.81 for output Model 2 in Table 9).

Therefore, these results suggest that, according to our decomposition of the overall efficiency, municipalities located in provinces with a provincial council could achieve higher efficiency levels than municipalities in provinces with no provincial council. Moreover, the inefficiency attributable to the absence of a provincial council is much higher for the smallest municipalities—first panel in Tables 8 and 9, with average efficiencies of 0.55 and 0.58, respectively. This descriptive analysis gives us an initial insight into the presence of provincial council effect (*PPCE*), providing a response to the first hypothesis concerning the existence of a *diputación* effect on small/medium/large municipality performance (H1a, H1b and H1c). Specifically, we find that, on average, the presence of a provincial council is positive for local government efficiency regardless of the population size group and the output model consid-

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[26]For other studies dealing with moderating effects see, for instance, Andrews et al. (2011).

ered. In contrast, the absence of a provincial council in a territory has a notable negative impact for smaller municipalities, and this finding is also robust across output models (Tables 8 and 9).

These hypotheses can be more formally tested to reveal if significant differences exist for the effect among the various groups of municipalities depending on whether a provincial council is present or not. To this end, we build on Kumar and Russell (2002), Balaguer-Coll et al. (2010a), Zafra-Gómez et al. (2010) and Narbón-Perpiñá et al. (2019), who follow Li (1996) and the variation proposed by Simar and Zelenyuk (2006) to investigate if there are significant differences between two given density functions, estimated via kernel smoothing.[27] Following this proposal, within the same population size group we compare the technology gap (effect) for municipalities with and without a *diputación*. We therefore consider, for the first three hypotheses H1a, H1b and H1c, the null hypothesis $H_0 : f$(without provincial council) = g(with provincial council), which means that the distribution of the technology gap is the same with and without the presence of a provincial council. Results are reported in Table 10. Should the hypothesis be rejected, it would imply that the presence of a provincial council is relevant to municipal performance.

The results of testing the hypotheses, presented in Table 10, reveal significant differences (either at the 1% or the 5% significance levels) for the effect of the presence of a provincial council on municipal efficiency but only for those municipalities with a population under 20,000. Therefore, regarding hypotheses H1a and H1b, these results lead us to reject the null hypothesis, thus confirming that the presence of a provincial council has a beneficial impact on performance in the smallest municipalities (up to 20,000 inhabitants). In contrast, the null hypothesis cannot be rejected for hypothesis H1c, indicating that the presence of a provincial council is not significant for municipalities with a population over 20,000. This last result is not robust across output specifications, since in the case of output Model 2 the effect is also significant at the 5% level.

Therefore, these results confirm the important role of provincial councils for small and medium-size municipal performance (i.e., municipalities located in a province with a *diputación* could obtain higher efficiency levels), whereas their role is not relevant for larger municipalities. These findings naturally complement results from previous studies (cited above) which suggested that municipal efficiency is influenced by population size, since we obtain that this effect is moderated by the presence (or absence) of a provincial council.

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[27]Simar and Zelenyuk (2006) adapted the Li (1996) test for efficiency applications using DEA and Free Disposal Hull (FDH) via bootstrapping techniques.

5.3. Degree of cooperation and activity of the provincial councils with their municipalities

The third level of decomposition introduces the degree of cooperation and activity of each *diputación* with the municipalities in its province (*PCAE*)—which obviously only affects the groups of municipalities with a provincial council. The results for this level, which we refer to as Level 3, are also reported in Tables 8 and 9 in the sixth, ninth and twelfth rows of each population size group. Results show that the average effect is inversely proportional to the intensity of the activities, and this result is robust across population size groups and output models (Tables 8 and 9). Specifically, the mean values are always higher for the municipalities located in provinces where the corresponding *diputación* is "less active" than in provinces where they are "active", which in turn are higher than the municipalities with "very active" provincial councils. This result is robust across population size groups and output models.

According to our decomposition of the overall efficiency and our classification for the provincial councils, these results suggest that higher provincial council activity has a negative effect on municipal performance. These descriptive results allow us to respond to the second hypothesis in Section 2 concerning the impact of the degree of cooperation and activity of a *diputación* on the performance of municipalities in its province. Specifically, the hypothesis was decomposed into three sub-hypotheses (H2a, H2b and H2c) for different sized municipalities (small/medium/large), and results showed that, on average, the "less active" provincial councils have a higher positive impact on municipal efficiency for all the population size groups. This would imply that municipalities whose provincial councils are less active will more likely obtain cost savings, and thus improve their efficiency levels.

Similarly to the procedure for the presence of provincial council effect (*PPCE*), we also consider Simar and Zelenyuk's (2006) test to evaluate whether differences across groups are significant in terms of the provincial council activity effect (*PCAE*). The test results for H2a, H2b and H2c are also reported in Table 10, where the specific hypotheses tested are H_0 : f(slightly active provincial council) = g(active provincial council), H_0 : f(slightly active provincial council) = g(very active provincial council) and H_0 : f(active provincial council) = g(very active provincial council).

Results reveal significant differences (either at the 1% or the 5% significance levels) for the effect of provincial council activity on municipal efficiency, but only for municipalities with populations under 20,000. Regarding hypotheses H2a and H2b, these results lead us to reject the null hypothesis, thus confirming that a lower degree of cooperation and activity of a provincial council with the municipalities in its province has a beneficial impact on the

performance of the smallest municipalities—up to 20,000 inhabitants. In contrast, the null hypothesis cannot be rejected for hypothesis H2c, which indicates that the degree of cooperation and activity of a provincial council is not significant for municipalities with a population over 20,000. Therefore, these results confirm that very active provincial councils might have a detrimental effect on the performance of small and medium-size municipalities, but the degree of activity is not significant for larger municipalities.

These findings may be due to the fact that some provincial councils classified as "very active" or "active" could be providing extensive *catalogs* of support services and activities to municipalities in their provinces, going beyond the mandatory basic services. As a consequence, the excess in the provision, which could be hiding issues related to corruption and extravagant use of public resources, might entail an increase in the costs of the municipal services and facilities in which they collaborate or provide, which directly affects municipal performance.

5.4. Municipal management efficiency effect

The last level of decomposition is the municipal management efficiency effect (*MME*), which represents the inefficiency attributable to municipal manager performance. The results for this level are reported in Tables 8 and 9 in the second row of each group of municipalities defined according to their location in a province without a provincial council or to the degree of cooperation and activity of the provincial council of the province in which they are located.

To ensure that the paper remains within reasonable length limits, we do not go into details about all the efficiency scores obtained. In general, our results show that the average cost efficiency values are relatively low for all the groups. Indeed, on average, the contribution of the municipal management efficiency effect to overall inefficiency is much higher than that from the other effects (i.e., it is the most important component). Moreover, as expected, the increase in the number of outputs from output Model 1 to Model 2 implies higher efficiency scores, since our estimator is known to suffer from the "curse of dimensionality" (Daraio and Simar, 2007).

Finally, it is important to note that although municipal efficiency according to size is not directly comparable because we are measuring different cost frontiers for different groups of municipalities, smaller municipalities are more inefficient within the same population group size (i.e., smaller inefficient municipalities are further from their local frontier), while larger municipalities present higher efficiency values (i.e., larger inefficient municipalities are closer

to their local frontier). Therefore, these findings corroborate the results from previous literature which concluded that population size has a positive impact on municipal performance. However, in the present analysis we have gone one step further by showing that this variation according to municipality population size is due to the poorer municipal management in smaller municipalities—probably related to the quality of public management, as outlined by Balaguer-Coll et al. (2007)—and not to size.

6. Conclusion

Today, national states are structured in several levels of government with a highly intertwined distribution of governmental authority between the central state and subnational units. In many countries, political channels (both formal and informal) for regional actors have multiplied, and a multilevel polity has developed, one of whose defining features is the predominance of shared authority between layers of government. However, there is no territorial uniformity in these operations, and intergovernmental relations work and are organized very differently from country to country. Whereas intergovernmental arrangements are highly institutionalized in Switzerland (Bolleyer, 2009), in the USA they are heavily fragmented, and in Canada the coordination between national and subnational authorities is relatively *ad hoc* (Cameron and Simeon, 2002).

This is also the case of Spain, the focus of our study, and a European Union member-state. In the specific context of the EU, the integration process has resulted in a multiplicity of extra-national channels for subnational political activities. However, there is little sign of either territorial convergence or even congruence in the notion of a "Europe of the Regions": whereas Austrian *Länder*, German *Länder*, Belgian regions, and Spanish *communidades autónomas* are heavily institutionalized, active at the European level, anchored within their respective states, and independently funded, in Greece, Ireland, Portugal, the Netherlands, and the Scandinavian countries regional governments are much weaker and virtually unheard of in the European arena. There are, therefore, large disparities in the level of financial resources, political influence, and political autonomy across subnational governments in Europe.

Although territorial organization and multi-level forms of governance vary a great deal from country to country in the EU, initiatives have been taken to compare them, such as the NUTS and LAU classifications. However, comparisons are always challenging, more so in particularly intricate contexts such as the Spanish case where, apart from the three levels of government with defined powers—central, regional and local—there is an additional level

whose powers are more vague and do not correspond to any level of government in the NUTS and LAU classifications. These are the provincial councils or *diputaciones provinciales* (or simply *diputaciones*), which not only have fewer and less clearly defined powers but, importantly, they have generated debate and controversy as a likely source of public sector inefficiency, lack of transparency, and even corruption. However, few contributions have explicitly measured whether such claims might be valid or not. We have attempted to fill this gap by evaluating quantitatively how both the presence and operations of *diputaciones* affect the performance of municipalities in their respective provinces.

Specifically, considering activity analysis techniques, we propose a quadripartite decomposition of local government performance through which we can disentangle, apart from other relevant effects, not only the impact of provincial councils *per se*, but also whether carrying out activities with more intensity has any beneficial effect. Our results indicate that, on average, the presence of a *diputación* has a positive effect on performance in small and medium-size municipalities (up to 20,000 inhabitants), whereas its role is not relevant for larger municipalities. In addition, regarding the degree of cooperation and activity of the *diputaciones* with the municipalities located in the province, our results lead to the conclusion that higher provincial council activity is more detrimental to municipal performance.

The depth and variety of results can be assessed in different dimensions. From an empirical perspective, claims relative to the relevance or irrelevance of these institutions can now be robustly supported by the quantitative analysis conducted in the study. According to our findings, the conclusions on the inefficiencies that, allegedly, plague these institutions should not be generalized. Therefore, if possible, those provincial councils with a positive influence on the municipalities under their jurisdiction should be taken as benchmarks–on which the most inefficient combinations of municipalities and provincial councils should focus. In addition to this, our contributions should also be evaluated from a theoretical perspective, since we have demonstrated how to measure the likely influence, from an efficiency perspective, of an additional level of government. This evaluation, however, should be tailored to each specific country and context, which constitutes both a challenge but also an opportunity to identify relevant policy implications as well as research opportunities.

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Table 1: Structure of municipal revenues during the period 2008–2013 (%)

	Revenues[a](%)
Non-financial revenues	92.09
Current revenues	81.09
Direct taxes	32.23
Property tax[b]	21.32
Motor Vehicle tax[c]	4.48
Tax on the Increase in the Value of Urban Land[d]	2.77
Tax on Business Activities[e]	2.80
Other direct taxes	0.86
Indirect taxes	2.39
Tax on Construction, Installations and other Works[f]	1.60
Other indirect taxes	0.79
Fees and other revenues	16.14
Fees	10.35
Public prices	1.15
Other revenues	4.64
Current grants received	28.05
From central government	17.59
From regional government	6.79
From provincial council (*Diputaciones*)	2.91
Other grants	0.75
Property revenues	2.28
Capital revenues	11.00
Sale of fixed assets	1.03
Capital transfers	9.97
Financial revenues	7.91
Total revenues	100.00

Sources: Narbón-Perpiñá et al. (2019) and authors. Data from Ministry of the Treasury and Public Administrations (*Ministerio de Hacienda y Administraciones Públicas*)

[a] Share of total revenues averaged over the period 2008-2013.

[b] IBI, *Impuesto de Bienes Inmuebles*.

[c] IVTM, *Impuesto sobre Vehículos de Tracción Mecánica*.

[d] IIVTNU, *Impuesto sobre el Incremento de Valor de los Terrenos de Naturaleza Urbana*.

[e] IAE, *Impuesto de Actividades Económicas*.

[f] ICIO, *Impuesto sobre Construcciones, Instalaciones y Obras*.

Table 2: Municipal powers (*Ley 7/1985 Reguladora de Bases de Régimen Local, LRBRL)*

Article 26	Articles 25, 27 and 28

In all municipalities:
    Public street lighting
    Cemetery
    Waste collection
    Street cleaning
    Drinking water to households
    Sewage system
    Access to population centers
    Paving of public roads
    Regulation of food and drink
In municipalities with populations of over 5,000, in addition:
 	
    Public parks
    Public library
    Market
    Treatment of collected waste
In municipalities with populations of over 20,000, in addition:
 	
    Civil protection
    Provision of social services
    Fire prevention and extinction
    Public sports facilities
In municipalities with populations of over 50,000, in addition:
 	
    Urban passenger transport service
    Protection of the environment
	Powers exercised in the conditions defined by State and Regional laws:
	    Public safety
	    Traffic management
	    Civil protection, fire prevention and extinction
	    Management of parks and garden
	    Urban policies
	    Cultural heritage
	    Protection of the environment
	    Fairs and related activities
	    Protection of public health
	    Participation in the management of primary healthcare
	    Cemeteries and funeral services
	    Social services, promotion of social reinsertion
	    Local public networks (waste and water supply, public lighting)
	    Public transport
	    Cultural or sport activities and facilities
	    Tourism
	    Participation in the design of education programs and facilities
	Any delegated competence
	Complementary activities from other levels of government (related to education, culture, promotion of equality for women, housing, health and environmental protection).

Source: Narbón-Perpiñá et al. (2019).

Table 3: Provincial council powers (*Ley 7/1985 Reguladora de Bases de Régimen Local, LRBRL)*

Article 26	Articles 36
2. In municipalities with fewer than 20,000 inhabitants, the provincial council will coordinate the provision of the following services: (a) Waste collection and treatment of collected waste. (b) Drinking water to households and sewage system. (c) Street cleaning. (d) (d) Access to population centers. (e) Paving of public roads. (f) Public street lighting.	1. The provincial council has the following powers: (a) The coordination of the municipal services in order to ensure the adequate provision of municipal services throughout the provincial territory. (b) Legal, economic and technical assistance to the municipalities, especially to those with lower economic capacity and management. In any case, it will guarantee a municipal secretary-financial controller in municipalities with fewer than 1,000 inhabitants. (c) Provision of waste treatment services in municipalities with less than 5,000 inhabitants, and the service of prevention and extinction of fires in those with fewer than 20,000 inhabitants. (d) Economic promotion, social development and urban planning in the provincial territory. (e) Monitoring of economic-financial plans of the municipalities. (f) Assistance for the tax collection management services, and support for the financial management of municipalities with a population under 20,000 inhabitants. (g) Electronic administration services and centralized contracting of services in municipalities with population under 20,000 inhabitants. (h) Monitoring of the costs of the services provided by the municipalities of its province. (i) Coordination of the provision of maintenance and cleaning services for medical facilities in municipalities with population under 5,000 inhabitants.
To coordinate the aforementioned provision of services, the provincial council will propose the form of provision, consisting of direct provision by the provincial council or the implementation of shared management formulas.	2. For the provision of a), b) and c), the provincial council is responsible for: (a) Approving an annual provincial plan for cooperation with works on municipal facilities. (b) Ensuring access to all the minimum services of municipal powers and to the greater effectiveness and economy in their provision through any formulas of municipal assistance and cooperation. (c) Guaranteeing the necessary public functions in the municipalities and support in the selection and training of the staff. (d) Supporting the municipalities in the processing of administrative procedures and management activities.

Source: The authors.

Table 4: Distribution of the sample, municipalities by Spanish regions (*Comunidades Autónomas*)

Region	Number of municipalities
Andalusia	447
Aragon	202
Asturias	47
Cantabria	54
Castile and Leon	597
Castile La Manche	281
Extremadura	201
Galicia	218
Murcia	26
La Rioja	73
Valencian Community	401
TOTAL	**2,547**

Table 5: Minimum services provided and output variables

	Minimum services	Output indicators
In all municipalities:	Public street lighting	Number of lighting points
	Cemetery	Total population
	Waste collection	Waste collected
	Street cleaning	Street infrastructure surface area
	Supply of drinking water to households	Length of water distribution networks (m)
	Sewage system	Length of sewer networks (m)
	Access to population centers	Street infrastructure surface area
	Paving of public roads	Street infrastructure surface area
	Regulation of food and drink	Total population
In municipalities with populations of over 5,000, in addition:	Public parks	Surface area of public parks
	Public library	Surface area of public libraries
	Market	Surface area of markets
	Treatment of collected waste	Waste collected
In municipalities with populations of over 20,000, in addition:	Civil protection	Total population
	Provision of social services	Total population
	Fire prevention and extinction	Street infrastructure surface area
	Public sports facilities	Surface area of public sport facilities (m^2)

Source: Narbón-Perpiñá et al. (2019) and the authors.

Table 6: Variables included in output models and descriptive statistics for inputs and outputs (2008–2013)

	Output model 1[a]	Output model 2[b]	Mean	S.d.
Inputs[c]				
Total costs (X_1)	x	x	3,424,628.88	5,211,329.89
Outputs				
Total population (Y_1)	x	x	3772.56	5842.11
Street infrastructure surface area[d] (Y_2)	x	x	186,975.74	234,065.20
Number of lighting points (Y_3)	x	x	840.99	1,015.58
Tons of waste collected (Y_4)	x	x	1,701.04	2,947.32
Length of water distribution networks[d] (Y_5)	x	x	26,304.70	40,562.41
Length of sewer networks[d] (Y_6)	x	x	16,771.22	19,930.30
Public parks surface area[d] (Y_7)		x	37,479.40	141,772.44
Public library surface area[d] (Y_8)		x	176.44	696.28
Market surface area[d] (Y_9)		x	2,044.09	6,330.25
Sport facilities surface area[d] (Y_{10})		x	38,773.63	92,404.45

[a] This model includes minimum services compulsory for all governments.
[b] This model includes minimum services compulsory for all governments and additional services that must be provided by larger municipalities with populations of over 5,000 and 20,000.
[c] In thousands of euros.
[d] In square meters.

Table 7: Groups of municipalities according to the activity of their provincial council

Category		Provinces by provincial council groups
With provincial council	Provincial council highly active	Almería, Málaga, Cáceres, Jaén, Valencia, Sevilla, Córdoba, Cádiz, Soria
	Provincial council active	Segovia, Valladolid, Albacete, Zamora, Cuenca, Granada, Toledo, Salamanca, Badajoz, Alicante, Orense, Castellón
	Provincial council less active	Palencia, Pontevedra, Ciudad Real, Ávila, Zaragoza, León, Teruel, A Coruña, Lugo
Without provincial council		Asturias, Cantabria, Murcia, La Rioja

Notes: See the Supplementary Appendix for further information on the works carried out and the catalogs of support services of each provincial council, the criteria followed to classify each catalog and the definition of the groups of the provincial councils according to the degree of cooperation and activity with municipalities in their province.

Table 8: Summary of the decomposition of temporal local government cost efficiency, output Model 1

Groups of municipalities			Overall efficiency (OE) and its components	Obs	Mean	Median	1Q	3Q	s.d.
Municipalities with populations under 5,000	All municipalities		Level 1 (SE)	1,976	0.99	1.00	1.00	1.00	0.04
		Without provincial council	Level 2 (PPCE)	134	0.55	0.55	0.47	0.62	0.10
			Municipal efficiency (MME)	134	0.50	0.51	0.36	0.63	0.19
			Overall efficiency (OE)	**134**	**0.27**	**0.26**	**0.17**	**0.35**	**0.12**
	With provincial council		Level 2 (PPCE)	1,842	1.00	1.00	1.00	1.00	0.00
		Less active	Level 3 (PCAE)	460	0.92	0.96	0.89	1.00	0.10
			Municipal efficiency (MME)	460	0.34	0.29	0.21	0.45	0.18
			Overall efficiency (OE)	**460**	**0.31**	**0.28**	**0.19**	**0.40**	**0.15**
		Active	Level 3 (PCAE)	911	0.81	0.80	0.77	0.84	0.06
			Municipal efficiency (MME)	911	0.40	0.39	0.31	0.49	0.14
			Overall efficiency (OE)	**911**	**0.32**	**0.32**	**0.25**	**0.39**	**0.12**
		Very active	Level 3 (PCAE)	471	0.69	0.69	0.59	0.79	0.13
			Municipal efficiency (MME)	471	0.41	0.38	0.31	0.50	0.14
			Overall efficiency (OE)	**471**	**0.27**	**0.27**	**0.20**	**0.34**	**0.10**
Municipalities with populations between 5,000 and 20,000	All municipalities		Level 1 (SE)	481	0.95	0.99	0.94	1.00	0.07
		Without provincial council	Level 2 (PPCE)	56	0.80	0.79	0.74	0.84	0.09
			Municipal efficiency (MME)	56	0.66	0.65	0.55	0.78	0.15
			Overall efficiency (OE)	**56**	**0.51**	**0.47**	**0.42**	**0.57**	**0.14**
	With provincial council		Level 2 (PPCE)	425	1.00	1.00	1.00	1.00	0.02
		Less active	Level 3 (PCAE)	108	0.98	1.00	0.99	1.00	0.07
			Municipal efficiency (MME)	108	0.61	0.60	0.51	0.72	0.15
			Overall efficiency (OE)	**108**	**0.57**	**0.56**	**0.46**	**0.66**	**0.14**
		Active	Level 3 (PCAE)	147	0.89	0.90	0.86	0.93	0.05
			Municipal efficiency (MME)	147	0.60	0.60	0.53	0.68	0.13
			Overall efficiency (OE)	**147**	**0.51**	**0.51**	**0.44**	**0.57**	**0.11**
		Very active	Level 3 (PCAE)	170	0.86	0.88	0.79	0.93	0.09
			Municipal efficiency (MME)	170	0.59	0.58	0.52	0.66	0.13
			Overall efficiency (OE)	**170**	**0.49**	**0.49**	**0.42**	**0.55**	**0.10**
Municipalities with populations over 20,000	All municipalities		Level 1 (SE)	90	0.97	0.98	0.95	1.00	0.04
		Without provincial council	Level 2 (PPCE)	10	0.74	0.77	0.68	0.79	0.09
			Municipal efficiency (MME)	10	0.80	0.83	0.72	0.85	0.10
			Overall efficiency (OE)	**10**	**0.57**	**0.56**	**0.54**	**0.63**	**0.10**
	With provincial council		Level 2 (PPCE)	80	1.00	1.00	1.00	1.00	0.00
		Less active	Level 3 (PCAE)	8	0.98	0.99	0.97	1.00	0.02
			Municipal efficiency (MME)	8	0.79	0.83	0.73	0.87	0.14
			Overall efficiency (OE)	**8**	**0.76**	**0.81**	**0.69**	**0.87**	**0.15**
		Active	Level 3 (PCAE)	25	0.94	0.95	0.93	0.97	0.05
			Municipal efficiency (MME)	25	0.73	0.76	0.63	0.82	0.14
			Overall efficiency (OE)	**25**	**0.67**	**0.64**	**0.58**	**0.79**	**0.13**
		Very active	Level 3 (PCAE)	47	0.88	0.90	0.83	0.95	0.09
			Municipal efficiency (MME)	47	0.71	0.72	0.64	0.82	0.12
			Overall efficiency (OE)	**47**	**0.71**	**0.72**	**0.64**	**0.82**	**0.12**

Notes:
Output model 1 includes 6 output variables which represent the minimum services compulsory for all governments.
Level 1 considers the effect of the local governments' population size (SE).
Level 2 considers the effect of the existence of provincial council in the municipalities of a province (PPCE).
Level 3 considers the effect of the degree of cooperation and activity of the provincial council with municipalities of its province (PCAE). Note that the groups of municipalities without a provincial council are not considered at this level of decomposition.
Municipal efficiency (MME) considers the municipal management efficiency score.
Overall efficiency (OE) = SE × PPCE × PCAE × MME

Table 9: Summary of the decomposition of temporal local government cost efficiency, output Model 2

Groups of municipalities			Overall efficiency (*OE*) and its components	Obs	Mean	Median	1Q	3Q	s.d.
Municipalities with populations under 5,000	All municipalities		Level 1 (*SE*)	1,976	0.98	1.00	1.00	1.00	0.05
		Without provincial council	Level 2 (*PPCE*)	134	0.58	0.57	0.48	0.64	0.13
			Municipal efficiency (*MME*)	134	0.54	0.53	0.37	0.70	0.21
			Overall efficiency (*OE*)	**134**	**0.31**	**0.29**	**0.17**	**0.38**	**0.15**
	With provincial council		Level 2 (*PPCE*)	1,842	1.00	1.00	1.00	1.00	0.01
		Less active	Level 3 (*PCAE*)	460	0.88	0.90	0.84	0.95	0.09
			Municipal efficiency (*MME*)	460	0.38	0.34	0.24	0.50	0.19
			Overall efficiency (*OE*)	**460**	**0.33**	**0.30**	**0.21**	**0.42**	**0.15**
		Active	Level 3 (*PCAE*)	911	0.83	0.82	0.79	0.86	0.06
			Municipal efficiency (*MME*)	911	0.42	0.40	0.32	0.51	0.15
			Overall efficiency (*OE*)	**911**	**0.34**	**0.33**	**0.26**	**0.41**	**0.12**
		Very active	Level 3 (*PCAE*)	471	0.69	0.70	0.59	0.80	0.14
			Municipal efficiency (*MME*)	471	0.44	0.41	0.33	0.53	0.15
			Overall efficiency (*OE*)	**471**	**0.29**	**0.28**	**0.21**	**0.36**	**0.11**
Municipalities with populations between 5,000 and 20,000	All municipalities		Level 1 (*SE*)	481	0.93	0.97	0.90	0.99	0.09
		Without provincial council	Level 2 (*PPCE*)	56	0.81	0.80	0.75	0.86	0.09
			Municipal efficiency (*MME*)	56	0.69	0.70	0.57	0.82	0.15
			Overall efficiency (*OE*)	**56**	**0.54**	**0.49**	**0.42**	**0.61**	**0.16**
	With provincial council		Level 2 (*PPCE*)	425	1.00	1.00	1.00	1.00	0.02
		Less active	Level 3 (*PCAE*)	108	0.93	0.97	0.93	0.99	0.11
			Municipal efficiency (*MME*)	108	0.68	0.69	0.59	0.80	0.15
			Overall efficiency (*OE*)	**108**	**0.58**	**0.58**	**0.50**	**0.67**	**0.13**
		Active	Level 3 (*PCAE*)	147	0.90	0.91	0.86	0.94	0.06
			Municipal efficiency (*MME*)	147	0.63	0.64	0.55	0.70	0.13
			Overall efficiency (*OE*)	**147**	**0.53**	**0.53**	**0.45**	**0.59**	**0.12**
		Very active	Level 3 (*PCAE*)	170	0.87	0.89	0.82	0.94	0.09
			Municipal efficiency (*MME*)	170	0.63	0.62	0.55	0.71	0.14
			Overall efficiency (*OE*)	**170**	**0.51**	**0.50**	**0.44**	**0.58**	**0.12**
Municipalities with populations over 20,000	All municipalities		Level 1 (*SE*)	90	0.97	0.98	0.95	1.00	0.04
		Without provincial council	Level 2 (*PPCE*)	10	0.73	0.72	0.65	0.79	0.10
			Municipal efficiency (*MME*)	10	0.83	0.85	0.74	0.88	0.11
			Overall efficiency (*OE*)	**10**	**0.58**	**0.58**	**0.54**	**0.65**	**0.11**
	With provincial council		Level 2 (*PPCE*)	80	1.00	1.00	1.00	1.00	0.00
		Less active	Level 3 (*PCAE*)	8	0.91	0.97	0.88	0.99	0.14
			Municipal efficiency (*MME*)	8	0.89	0.88	0.87	0.92	0.07
			Overall efficiency (*OE*)	**8**	**0.78**	**0.83**	**0.71**	**0.87**	**0.13**
		Active	Level 3 (*PCAE*)	25	0.80	0.81	0.68	0.90	0.13
			Municipal efficiency (*MME*)	25	0.93	0.95	0.92	0.98	0.07
			Overall efficiency (*OE*)	**25**	**0.73**	**0.75**	**0.61**	**0.81**	**0.14**
		Very active	Level 3 (*PCAE*)	47	0.75	0.77	0.66	0.85	0.13
			Municipal efficiency (*MME*)	47	0.90	0.91	0.87	0.96	0.08
			Overall efficiency (*OE*)	**47**	**0.75**	**0.77**	**0.66**	**0.85**	**0.13**

Notes:
 Output model 1 includes 6 output variables which represent the minimum services compulsory for all governments.
 Level 1 considers the effect of the local governments' population size (*SE*).
 Level 2 considers the effect of the presence of a provincial council in the municipalities of a province (*PPCE*).
 Level 3 considers the effect of the degree of cooperation and activity of the provincial council with municipalities of its province (*PCAE*). Note that the groups of municipalities without a provincial council are not considered at this level of decomposition.
 Municipal efficiency (*MME*) considers the municipal management efficiency score.
 Overall efficiency (*OE*) = $SE \times PPCE \times PCAE \times MME$

Table 10: Distribution tests (based on Simar and Zelenyuk, 2006)

Level 1[a]	Levels 2 and 3[b,c]		Test results, output Model 1	Test results, output Model 2
Population under 5,000	Provincial council effect, *PPCE* (*H1a*)	*p*-value[d]	0.0000	0.0000
	Provincial council activity effect, *PCAE* (*H2a*)	*p*-value[e]	0.0000	0.0000
		p-value[f]	0.0000	0.0000
		p-value[g]	0.0000	0.0000
Population between 5,000 and 20,000	Provincial council effect, *PPCE* (*H1b*)	*p*-value[d]	0.0000	0.0000
	Provincial council activity effect, *PCAE* (*H2b*)	*p*-value[e]	0.0000	0.0000
		p-value[f]	0.0000	0.0000
		p-value[g]	0.0000	0.0000
Population over 20,000	Provincial council effect, *PPCE* (*H1c*)	*p*-value[d]	0.0780	0.0210
	Provincial council activity effect, *PCAE* (*H2c*)	*p*-value[e]	0.0060	0.8690
		p-value[f]	0.4130	0.9800
		p-value[g]	0.0950	0.7790

[a] Level 1 considers local government population size (*SE*).
[b] Level 2 considers the presence of a provincial council in the municipalities of a province (*PPCE*).
[c] Level 3 considers the degree of cooperation and activity of the provincial council with municipalities of its province (*PCAE*).
[d] $H_0 : f$(without provincial council) = g(with provincial council).
[e] $H_0 : f$(less active provincial council) = g(active provincial council).
[f] $H_0 : f$(less active provincial council) = g(very active provincial council).
[g] $H_0 : f$(active provincial council) = g(very active provincial council).

Figure 1: Spanish provinces

Types of provincial organization
- Common provincial council
- Chartered provincial council
- Island council
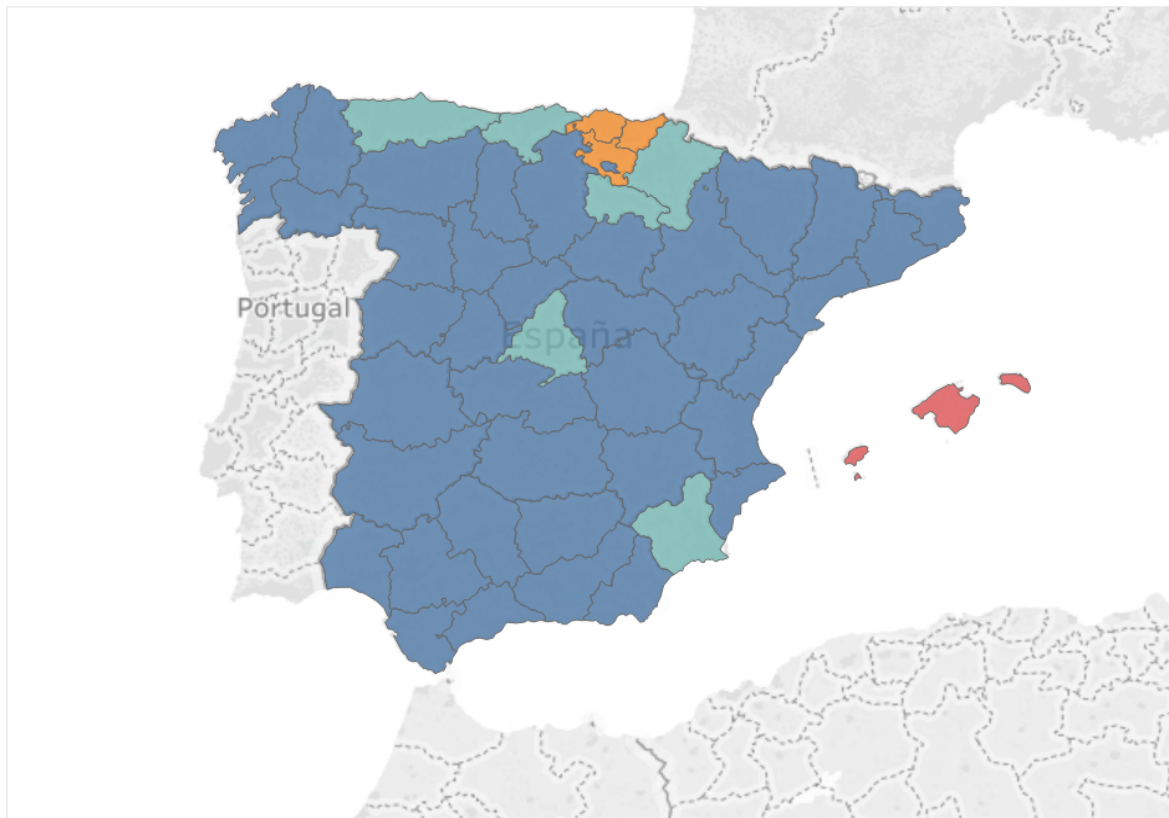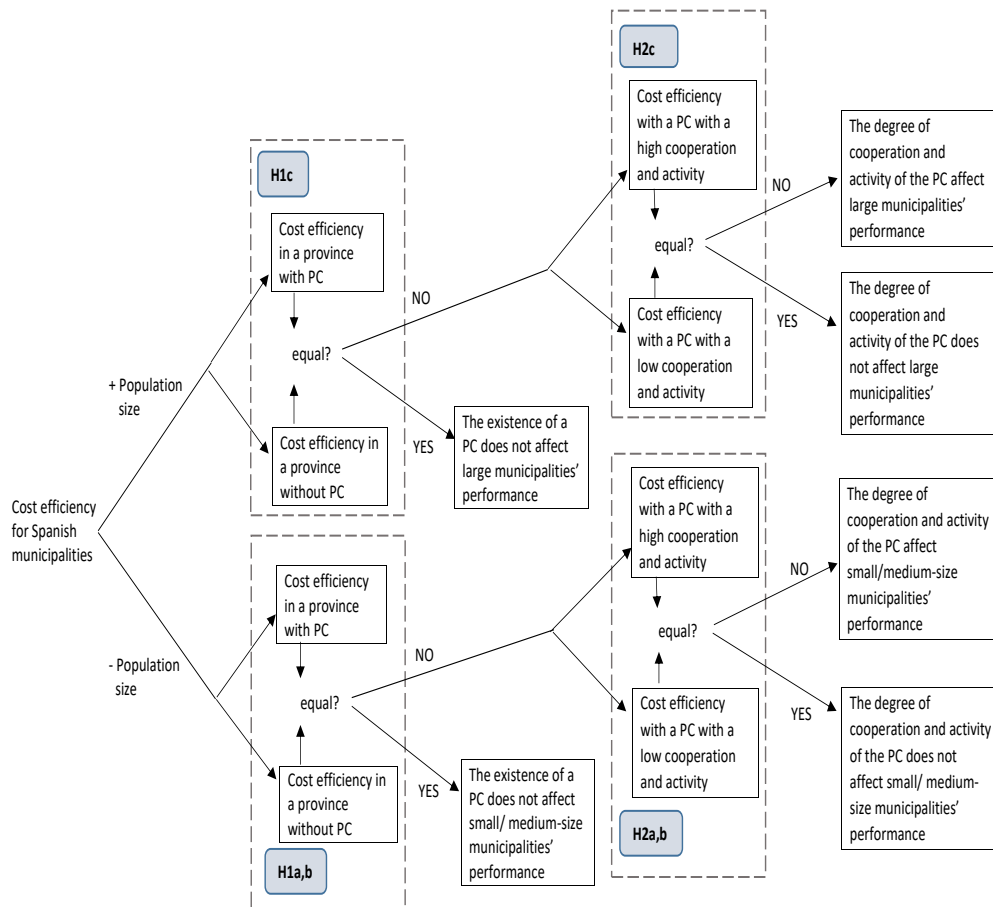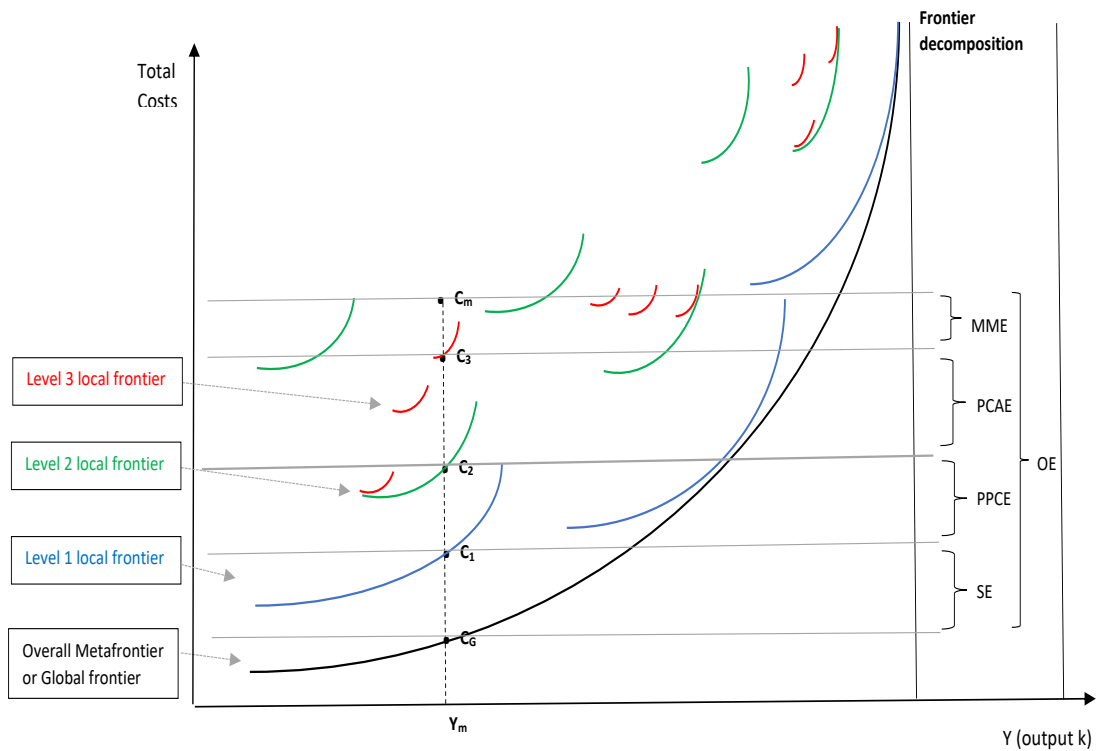- Without provincial council

Figure 2: Hypothesis for the role played by provincial councils (PC) on municipalities' cost efficiency

Source: Authors' own elaboration

Notes: For visual simplicity, we show together hypothesis H1a and H1b, and H2a and H2b.

Figure 3: Decomposition of municipal efficiency

Source: The authors.

Notes:
Municipal management efficiency effect (MME)
Level 1: Municipal population size effect (SE)
Leve2: Presence of provincial council effect (PPCE)
Level 3: Provincial council activity effect (PCAE)
Overall efficiency (OE)