Determinants of subnational budget/fiscal transparency: a review of empirical evidence

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Abstract

This paper provides a review of empirical research on the factors determining the budget/fiscal transparency of subnational governments. It focuses on academic online databases by conducting keyword searches that take in papers published in the period 2000-2017. Three important observations can be made: (1) there is a lack of a unique definition of budget/fiscal transparency; (2) the different definitions lead to disharmonised budget/fiscal transparency measurements; (3) there is a heterogeneity of the definition and measurement of some explanatory variables that can lead to apparent contradictions and inconsistencies in the results obtained. However, the paper provides a balanced account of core explanatory factors, emphasizing variables that, despite heterogeneity in definition and measurement, have a significant impact on the levels of subnational government budget/fiscal transparency. Since the review involves mainly online disclosure, future studies might want to extend the observation period, or implement systematic reviews and meta-analyses to gain additional insights on this topic.

Keywords: subnational governments, budget transparency, empirical review, main determinants

1 INTRODUCTION

It can be said that in the past two decades, and especially in the aftermath of the financial crisis, enormous pressure has been put on governments to improve their communication with citizens by being more open, transparent and accountable. In this sense, more and more attention is being paid to fiscal and budgetary issues. Some of the most prominent initiatives that advocate for these issues are the International Budget Partnership (IBP), the Global Initiative for Fiscal Transparency (GIFT) and the Open Government Partnership (OGP). Due to the OGP's strong advocacy, a total of 75 countries have endorsed the Open Government Declaration and announced their country action plans. More recently, OGP was opened to subnational governments. In 2016, a total of 15 subnational governments signed the declaration and submitted their action plans to be implemented throughout 2017, as part of a pilot program.

Thus, the discourse of budget transparency seems to be changing, giving ever more importance to subnational governments (SNGs). Accordingly, subnational budgets are becoming a ubiquitous topic in the field of public financial management. Their importance also stems from the fact that public goods and services are particularly tangible at the subnational and especially the local level. Therefore, citizens may have more interest in participating in local budget processes, where they can see their direct impact on local development. Furthermore, subnational budget transparency enables ordinary citizens and civil society organizations to evaluate government services and facilities and suggest possible changes and needs in the future.

The internet has provided an additional incentive for proactive publishing, enabling large-scale publication of budget data, as well as constantly improving gov-

ernment consultation processes. It can be said that the rise of the internet has furthered budget transparency by allowing rapid and inexpensive proactive disclosure (Darbishire, 2010). Consequently, SNGs have increasingly resorted to proactive budget disclosure, thus not only reducing demand-side pressures, but also changing their attitude and way of communicating with citizens. Despite the widespread availability and bidirectionality of the internet, SNG websites vary greatly in the amount of information available, comprehensiveness, timeliness and interactiveness (Caba-Pérez, Rodríguez Bolívar and López Hernández, 2008). While some SNGs run open budget policies, others oppose the practice and rarely use the low cost benefits of online proactive publishing.

The aim of this study is, hence, to review the development of research conducted previously in order to understand the factors that could influence SNG budget/fiscal disclosure. In other words, it aims to produce a balanced account of the set of variables that significantly affect SNG budget/fiscal transparency. Some previous studies reviewed the various types of public sector disclosure (Bakar and Saleh, 2015). However, this study explores studies published in the 2000-2017 period, focusing explicitly on budget or fiscal transparency. The paper is organized as follows. Section 2 provides the methodological framework. Section 3 presents different definitions and measurements of budget/fiscal transparency. Section 4 offers a balanced account of core determinants of SNG budget/fiscal disclosure. Section 5 concludes with recommendations for future research.

2 FRAMEWORK FOR ANALYSIS

This review focuses on identifying explicitly quantitative studies on the determinants of SNG budget/fiscal transparency. The decision for quantitative studies is because they allow for rapid analysis and replication, which increases reliability, validity and the greater probability of obtaining unambiguous results, which contributes to better decision-making. Subnational governments include all levels below the national government, i.e. local, regional, state and provincial. To identify eligible articles, this study used the Summon discovery service – a unified search for all electronic sources of academic publications, including search interfaces such as ProQuest, EBSCO Host, Web of Science and Scopus. In addition, Google Scholar and hand searches were also used. This review includes studies published from 2000-2017, thus the focus is inherently on online disclosure. Only studies in English are taken into consideration. Search terms used were "causes of budget/fiscal transparency", "subnational government transparency", "budget/fiscal transparency determinants", "local government transparency" or just "government transparency". Since only a few studies focused solely on budget or fiscal transparency, it should be noted that this review includes all studies that, in their transparency measure, have at least one dimension concerning the budget, i.e. revenues and expenditures. Although books were initially included in the search, no relevant sources were generated on the determinants of subnational budget/fiscal transparency. This is probably due to it being an insufficiently researched topic, which is why journals take the lead, while books are still outdated as sources of information.

However, the eligibility criteria were designed to ensure that high-quality relevant work is included, specifically referring to empirical quantitative studies that employ budget/fiscal transparency as the dependent variable. Finally, 20 studies are included in the review. All studies are peer-reviewed and published in journals, with the exception of Ma and Wu's (2011) paper which remained as part of the 1st Global Conference on Transparency Research held at Rutgers University.

Although it is unquestionable that every paper has made a contribution, this review highlights four papers on account of their narrow focus on budget/fiscal transparency, strong and credible evidence, and rigorous methodology used. The first is a paper by Alt, Lassen and Rose (2006), who used a unique panel data on the evolution of transparent budget procedures in the U.S. states over the past three decades. They used both case studies and quantitative analysis, presenting robust results. Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2009) used multivariate logistic regression, focusing exclusively on the availability of budget-related documents. Although their results showed different levels of robustness, they proved that size of the municipality, political will, and residents' income all affect budget disclosure. Similarly, Guillamón, Bastida and Benito (2011) examined the determinants of budget and financial transparency using both OLS and 2SLS regression analysis. After controlling for endogeneity, they confirmed the robustness of the model employed. Like them, Esteller-Moré and Polo Otero (2012) remained focused on budget information disclosures. They applied their analysis to a large sample of municipalities, using a logit regression analysis for panel data, covering a seven-year period. These four papers are emphasized on the basis of measurements of the dependent variables, and the credibility and quality of the evidence and method used for determining the factors of budget/fiscal transparency. With this in mind, all the papers included in the review are presented in the following chapters, first by measuring the dependent variables and then by the established budget/fiscal transparency factors.

3 BUDGET/FISCAL TRANSPARENCY – FROM DEFINITION TO MEASUREMENT

3.1 DEFINITION

In the literature, budget transparency and fiscal transparency are often used interchangeably, which may point to the equivalence of these two concepts. However, budget transparency is a narrower concept, focusing on the budget reports within the budget cycle. On the other hand, fiscal transparency also includes fiscal activities undertaken outside the budget sector, aiming at reducing off-budget transactions (IMF, 1997). It often includes information on all stocks as well as flows, which can hardly be found in the budget documents. Still, it is difficult to make a strict division between these two concepts, since they are intertwined and sometimes even used synonymously. Therefore, this paper will use both terms. One of the most comprehensive definitions of fiscal transparency was offered by Kopits and Craig (1998:1):

"Fiscal transparency implies an openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities – whether undertaken inside or outside the government sector – so that the electorate and financial markets can accurately assess the government's financial position and the true costs and benefits of government activities, including their present and future economic and social implications".

In accordance with this definition, Alt, Lassen and Skilling (2002) stressed that financial documents should be informative and comprehensive, but at the same time easily understandable, leaving the option of independent scrutiny. In order to facilitate this inspection and monitoring of economic policies by national authorities, financial markets and international institutions, the IMF has developed a Code of Good Practices on Fiscal Transparency (IMF, 1998). The Code consisted of four main principles:
1) clarity of roles and responsibilities;
2) public availability of information;
3) open budget preparation, execution, and reporting; and
4) independent assurances of integrity.

Although this Code has helped practitioners in understanding basic concepts of fiscal transparency practices, it did not contain clear guidelines or standards that would facilitate the way and approach to measuring fiscal transparency. However, the Code was revised in 2007, pointing out that fiscal data (budget forecasts and updates, annual budget and final accounts, fiscal reports) should meet accepted data quality standards. Similarly, the OECD has developed best practices for budget transparency, although their definition of budget transparency refers to broader concept of fiscal matters: "full disclosure of all relevant fiscal information in a timely and systematic manner" (OECD, 2002:7). The best practices are divided into three parts – budget reports, specific disclosures, and integrity assurance (table 1). It is evident that only the first section corresponds to pure budget disclosure, while the other two represent wider fiscal matters. Still, the first section can be considered the first internationally recognized standard for budget reporting.

TABLE 1
The "three pillars" of the OECD's best budget transparency practices

Budget reports	Specific disclosures	Integrity, control and accountability
The budget	Economic assumptions	Accounting policies
Pre-budget report	Tax expenditures	Systems and responsibility
Monthly reports	Financial assets and liabilities	Audit
Mid-year report	Non-financial assets	Public and parliamentary scrutiny
Year-end report	Employee pension obligations	
Pre-election report	Contingent liabilities	
Long-term report		

Source: OECD (2002).

It could be said that a number of authors have defined budget/fiscal transparency not only as the availability of budget/fiscal information, but also in terms of openness and public accountability. This can best be seen in Kopits and Craig (1998) who argue that fiscal transparency does not only imply access to fiscal reports but, rather, the openness of fiscal policies and procedures. Similarly, Andreula, Chong and Guillén (2009) state that fiscal transparency, apart from open budget preparation and availability of fiscal information, also implies assurances of roles and responsibilities. In this sense, the IMF has indicated the difference between fiscal reporting and fiscal transparency. While the first refers to the production and availability of fiscal information, the second relates to the "clarity, reliability, frequency, timeliness and relevance of public fiscal reporting and the transparency of the government's fiscal policy-making process" (IMF, 2012:5).

One can conclude that there is no uniform definition of budget/fiscal transparency, which indicates a complex understanding of this topic. In other words, while there are certain standards and guidelines, different definitions and interpretations directly affect the approach and the way of measurement. Certainly, the methods and scope of measurement also depend on the context in which the research is carried out. Since this review is based on the causes rather than the effects of budget/fiscal transparency, the next section provides an empirical overview of different measurements in which the budget/fiscal transparency measure appears as a dependent variable.

3.2 VARIOUS APPROACHES TO MEASURING SUBNATIONAL BUDGET/FISCAL TRANSPARENCY

"Conceptually, a statistical measure of transparency is the precision of the information that is obtained, i.e. a function of its relevance and quality"

(Vishwanath and Kaufmann, 1999:4).

Given the specificities of different countries' laws, standards, procedures and contexts, one should be careful while summing, comparing and interpreting different definitions and measures of budget/fiscal transparency. In other words, subnational comparisons may be most important within, rather than across countries. Accordingly, this section seeks to present the first studies from Spain and USA – since most papers on this topic are focused on the SNGs of these two countries. Then, individual studies with samples from other countries were presented.

Spain

The largest body of research comes from Spanish local governments. Gandía and Archidona (2008) presented an extensive local government online disclosure index, which consists of five sub-indices, two of which provide comprehensive budget and financial information. The other three dimensions include general government information, web presentation and navigation, and relational web to address interactivity and functionality of the web. Unlike them, Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2009) explicitly explored budget and

financial disclosure which they measured by sending questionnaires to municipalities regarding their online publication of nine items (based on Spanish legislation regarding local government financial disclosure), including consolidated and unconsolidated budgets, budget and annual accounts of dependent entities. Like Gandía and Archidona (2008), Caba-Pérez, Rodríguez Bolívar and López Hernández (2008) have also offered an extensive web financial disclosure index, hoping to contribute to a more harmonized framework for the structure of budget and financial information in Spanish local governments. Although the numbers of items observed are different, the main sections of their disclosure indexes are quite the same, including budget and financial information and web navigability. The main difference is that Caba-Pérez, Rodríguez Bolívar and López Hernández (2008) included non-financial information, such as indicators of economy, efficiency and effectiveness and paid more attention to the characteristics of information such as timeliness, understandability or comparability rather than content of information provided. Several authors used the government transparency measure calculated by Transparency International (TI) Spain (Guillamón, Bastida and Benito, 2011; del Sol, 2013; De Araújo and Tejedo-Romero, 2016). This index consists of five government transparency areas: (a) information about the municipal corporation; (b) social transparency; (c) financial transparency; (d) services contracting transparency; (e) urban development and procurement transparency. Among these studies, Guillamón, Bastida and Benito (2011) have contributed most to the field of budget/fiscal transparency, by focusing explicitly on TI's financial transparency section. In other words, their dependent variable was based solely on financial transparency indicators, including accounting and budget, transparency on revenues and expenditures, and information on municipal debt. Their study inspired others to use the same transparency measure for Spanish municipalities (del Sol, 2013; De Araújo and Tejedo-Romero, 2016).

A significant study was presented by Esteller-Moré and Polo Otero (2012) who employed a panel analysis by using a large sample of Catalan municipalities in the period 2001-7. They constructed their fiscal transparency index by addressing the timeliness of the mandatory disclosure of municipalities that need to submit their budget information to the Public Audit Office for Catalonia. The budget information consisted of the following: budget approval, final budget, budget balances, closed settlement budgets, treasury statement, treasury surplus, net wealth statement, income statement and indebtedness. Similarly, Caamaño-Alegre et al. (2013) have investigated Galician municipalities. They based their budget transparency measure on the IMF's revised Code of Good Practices on Fiscal Transparency and sent the questionnaires to government officials by using a Likert-type survey on open budget process, public availability of information and assurance of integrity. However, unlike Esteller-Moré and Polo Otero (2012) who offered a large number of observations and time variation, this study remained limited in this sense.

A slightly different approach to measuring government transparency was provided by Gandía, Marrahí and Huguet (2016) who looked at the presence of Web 2.0 in

Spanish city councils. In this way, they wanted to examine the existence of participative and social web with the possibility of user-generated content. Accordingly, their disclosure index contained not only information disclosure, but also relational web. Similar to del Sol (2013), they observed the total index, as well as three sub-indices – ornamental index (general and citizen information), relational index, and information index, which includes budgetary and financial disclosure.

United States

Shortly after the OECD and the IMF implemented Codes of Best Practice for Fiscal Transparency, Alt, Lassen and Rose (2006) published one of the most prominent and influential studies on the causes of fiscal transparency. They examined the determinants of U.S. States both conceptually and empirically. A conceptual section included case studies of the states that managed to make significant progress towards higher transparency levels within a short time frame. On the other side, the transparency measure was not based on the availability of fiscal documents, but rather on transparency of state government budget procedures. Using the 1990s cross-sectional data from the National Association of State Budget Officers and the National Conference of State Legislatures, they extended the data to the beginnings of transparent budget procedures of US states, covering the period 1972-2002. This enabled them to use panel analysis which, to the best of my knowledge, was used for the first time in analyzing the causes of subnational fiscal transparency. Although this study offers a unique data set, comprising survey responses to a questionnaire sent to the budget officers of all fifty states, because of the period covered, it could not address e-government practices.

However, with the rapid adoption of the internet, more recent studies are mainly focused on online fiscal/budget transparency, usually examining transparency levels on governments' official websites. While Alt, Lassen and Rose (2006) offered a transparency measure with a considerable time variation, more recent studies looked at the budget/fiscal transparency at one point in time or with small time periods. Bernick et al. (2014) dropped to a lower level, exploring the fiscal transparency practices of U.S. counties in 2014. They measured the online availability of a comprehensive annual financial report (CAFR) and availability and comprehensiveness of budget information (no exact document or information is indicated). Similarly, Lowatcharin and Menifield (2015) investigated county website transparency in 2010. However, their county transparency measure (conducted by the Sunshine Review) included not only fiscal disclosure but a wider spectrum of government transparency such as permits and zoning, contracts, lobbying, etc. Relying on Groff and Pitman's (2004) description of internet financial reporting for the 100 largest U.S. municipalities, Styles and Tennyson (2007) extended the findings by examining the online availability and accessibility of CAFR data for a sample of U.S. municipalities of various sizes.

Other countries

When it comes to pioneers in dealing with voluntary internet financial reporting in subnational governments, the paper by Laswad, Fisher and Oyelere (2005) deserves highlighting. They observed New Zealand's district, city, and regional councils, by constructing the financial transparency measure as a dichotomous variable indicating whether or not the local authority publishes financial information on the web. However, their definition of what is considered published may be somewhat confusing, since they had four disclosure categories: financial highlights only, annual reports only, annual plan only, and combinations of annual reports, plans and financial highlights together. In other words, it is not clear whether there is any council that has published, for example, both annual plan and report, in which case the analysis could change considerably. García-Tabuyo, Sáez-Martín and Caba-Pérez (2016) investigated online proactive disclosure of the 40 largest municipalities in each of the five countries of Central America – El Salvador, Nicaragua, Panama, Guatemala and Honduras. This was a valuable study, since the same transparency measure was employed for local government transparency in different country contexts. However, their measure consists of five transparency areas, where economic and financial transparency (including enacted and executed consolidated and individual budget and budget amendments) accounts for 20% the total index.

On the other hand, some studies focused explicitly on fiscal transparency, either on a sample of Brazilian states (Zuccolotto and Teixeira, 2014) or Chinese provincial government (Ma and Wu, 2011). While Ma and Wu (2011) used the data collected from the first two years of the four-year survey by the Public Policy Research Center in Shanghai, Zuccolotto and Teixeira (2014) employed a fiscal transparency measure developed by Biderman and Pottomatti (2010)[1]. Tavares and da Cruz (2017) used TI Portugal's index of municipal transparency to assess a disclosure of Portuguese municipalities. The index is a comprehensive measure of local gov-ernemnt transparency, comprising seven dimensions one of which is economic and financial transparency. However, unlike other extensive measures, it only monitors the availability of a set of information items on a municipality's website, not taking into account accessibility, navigability, reliability or the quality of the information. A study presented by Gesuele, Metallo and Longobardi (2017) analyzed website disclosure of Italian and Spanish municipalities. Although their contribution is valuable (very few studies with an international context), they did not sufficiently address budget/fiscal transparency, except for financial statements and information about municipalities' assets, such as values, location and revenue.

3.3 THE CHALLENGE OF SUBNATIONAL BUDGET/FISCAL TRANSPARENCY MEASUREMENT

This review will outline several budget/fiscal transparency measurement challenges and opportunities. First, the use of the same transparency measure within a

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[1] A study available only in Portuguese.

country would allow for a comparison of the results of different studies, which could contribute to a greater understanding of inconsistent results and to the reduction or explanation of the ambiguity in the previous findings. The review shows that only a few studies used the same transparency index within a country, as with the TI Spain index used by De Araújo and Tejedo-Romero (2016), del Sol (2013), and Guillamón, Bastida and Benito (2011). Second, the transparency measure mainly involved one year of observation, and only a few studies have had a long dataset of the dependent variable, such as Alt, Lassen and Rose (2006) or Esteller-Moré and Polo Otero (2012). The longer time span of the dependent variable opens the door to many methodological approaches, enables a better quality analysis, and gives an opportunity to observe the progress of SNG budget/fiscal transparency. Third, in order to improve the observation of the causes of budget/fiscal transparency, it is necessary to have more studies focusing solely on budgetary and fiscal indicators.

Although strong efforts have been made to standardize fiscal transparency measures at the national level, this remains an empirical and contextual challenge at the local level. However, some studies have already examined cross-country analyses by introducing their own index on a sample of municipalities (García-Tabuyo, Sáez-Martín and Caba-Pérez, 2016; Gesuele, Metallo and Longobardi, 2017). Nonetheless, to facilitate these efforts, analogously to the IBP Open Budget Survey, one of the biggest challenges (given the diversity of the local self-government system) is to create a harmonized budget/fiscal transparency index capable of being applied to the subnational governments of various countries. Results of these studies could provide more comprehensive insights into the contextual sensitivity, but also generally in examining the causes of budget/fiscal transparency.

4 DETERMINANTS OF SUBNATIONAL BUDGET/FISCAL TRANSPARENCY – EMPIRICAL OVERVIEW

4.1 HETEROGENEITY OF DEFINITION AND MEASUREMENT OF VARIABLES

This review discusses the different definitions and measurements of some variables. While different measurements are not unexpected in different countries (bearing in mind different types of data), the main issue is when these arise within a single country, which can lead to confusion and "false" variability in the results. However, when concluding and interpreting results of previous studies, attention has to be paid to the definitions and the way of measuring variables, regardless of whether they are in-country or cross-country comparisons. According to the literature, some of the most frequently used variables that can cause confusion are leverage, debt, and political competition. Although the definition of leverage is quite unambiguous, several studies have used different measures. Laswad, Fisher and Oyelere (2005) have measured it in two ways, as a ratio of long-term liabilities in total assets, and in total public equity. On the other hand, some studies have used financial expenses per capita as a proxy for leverage (Gandía and Archidona, 2008; Gandía, Marrahí and Huguet, 2016). Gandía and Archidona (2008) have equated leverage with indebtedness, making it more confusing by stating that they have

used the cost of debt as a proxy of indebtedness, which is measured as municipal financial expenses per capita. At the same time, Caba-Pérez, Rodríguez Bolívar and López Hernández (2008) used funding costs of current year budget expenditure per capita as a proxy for the cost of debt, not assigning it to leverage, but rather to debt. Gesuele, Metallo and Longobardi (2017) have not even described their leverage measure. They defined it simply as a value of leverage per capita, while the measure was described just as natural logarithm, thus leaving it unexplained.

A unique measure for debt issuance was presented by Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2009), who used a dichotomic variable which assigns the value of 1 if the town hall has municipal bonds in circulation, denoting a debt issuance. On the other side, some debt measures are more straight-forward, such as debt level as a percentage of the total budget (del Sol, 2013) or the often-used municipal public debt per capita (Alt, Lassen and Rose, 2006; Styles and Tennyson, 2007; Guillamón, Bastida and Benito, 2011; Caamaño-Alegre et al., 2013).

While some authors argue that a government's decision to disclose or retain information is inherently political (Wehner and de Renzio, 2013), others claim that political competition is a major driver of transparency reforms (Berliner and Erlich, 2015). However, the mode of measurement of political competition imposes the greatest variability among political determinants. There are various measures introduced for this variable. Some studies observe it as a margin of victory, measured by the difference between the percentage of votes obtained by the parties coming in first and second place (De Araújo and Tejedo-Romero, 2016, 2017; Tavares and da Cruz, 2017). Others see it as a measure of dispersion, i.e. the standard deviation of the percentage of votes received by each political party (Caba-Pérez, Rodríguez Bolívar and López Hernández, 2008; Esteller-Moré and Polo Otero, 2012). Caamaño-Alegre et al. (2013) applied the measure developed by Laakso and Taagepera (1979) – an effective number of political parties, whose calculation also contains each party's proportion of all votes. Several studies focused explicitly on competition in the municipal council. Laswad, Fisher and Oyelere (2005), and Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2009) measured almost the same thing. While the first used the ratio of candidates to council positions available, the latter defined it as the ratio of candidates to councillors elected. However, despite the different definitions, it could be said that their measure is the same, since it seldom happens that available council positions are not filled.

By using different measures for one variable, results may vary within one study, let alone comparing different studies, contexts or subnational international comparisons. In this sense, one should be careful while summing and interpreting results because the measure always speaks more than the variable name.

4.2 MAIN DETERMINANTS

In order to provide the centrality of each variable in the literature, table 2 presents the most frequently used explanatory variables. It shows how many studies that

are included in the review used a particular independent variable. The complete classification and measurements of variables can be seen in the appendix.

TABLE 2

Most frequently used explanatory variables

Financial	%
Debt	40
Government's wealth	35
Budget (im)balance	35
Leverage	20
Intergovernmental transfers	15
Municipal size	10
Political	
Political competition	55
Political ideology	55
Voter turnout	45
Executive features	35
Governance type	20
E-government achievements	15
Citizens and the media	
Population size/density	60
Citizens' characteristics (education, age, gender)	45
Citizens' wealth	35
Internet access	30
Unemployment	25
Media use and visibility	25

Source: Author.

However, this overview aims to analyze the most frequently used variables that have shown a significant influence, with particular emphasis on those that, despite heterogeneity in definition and measurement, show a significant effect. In this way, the review strives to produce a balanced account of core variables that greatly affect the level of subnational fiscal/budget transparency (table 3). To produce this account, the rule is that only variables that were used in at least two papers and which show a significant result in more than 50% of cases were included. Accordingly, three basic variable categories are distinguished: financial, political, and citizens and the media. The following section reveals these variables and focuses on the explanation of the results obtained, based on some underpinnings in previous studies.

4.2.1 FINANCIAL VARIABLES

Financial leverage and debt levels are the most important financial factors determining subnational budget/fiscal transparency. Leverage refers to the use of borrowed funds to finance public activities. In this sense, it can represent the amount of debt of the government, showing the close relation of these two terms. According to Zimmerman (1977), governments want to reduce the cost of debt by increas-

ing resources available for other activities that are more efficient in increasing government's welfare than the payment of high interest rates. Accordingly, politicians are encouraged to publish government information, which in turn facilitates monitoring by creditors. This can be achieved easily and at low-cost by online proactive reporting, which is confirmed in several studies, even if they have different leverage measurements (Laswad, Fisher and Oyelere, 2005; Gandía, Marrahí and Huguet, 2016; Gesuele, Metallo and Longobardi, 2017).

TABLE 3

Main determinants of subnational budget/fiscal transparency

Category	Variable	Different measurements
Financial	Leverage	Ratio of long-term liabilities to total assets
		Ratio of long-term liabilities to total public equity
		Total executed expenses per capita
	Debt	Percentage of debt in total budget
		Public debt per capita
		Funding costs of the current year budget expenditure per capita
Political	Political competition	Divided government; gubernatorial competition; legislative competition
		1 if city council is governed by one of the majority political parties in the country
		Measure of dispersion, i.e. the standard deviation of the percentage of votes received by each political party
		Effective number of political parties
		Margin of victory, measured by the difference between the percentage of votes obtained by the parties coming in first and second place
	Executive features	Mayor's gender
		Number of incumbent's consecutive terms (tenure)
	Governance type	1 if district councils, 0 regional or city councils
		1 if provincial capitals
		Form of government (1 if council-manager, 0 commission and council-elected executive)
Citizens and the media	Population	Number of inhabitants
		Population density
	Internet access	Percentage of households with home internet access
		Fixed internet access connections over 200 kilobits per second in at least one direction per 1,000 households
		Internet penetration
	Unemployment	Unemployment rate
	Media	Intensity of use of social media, measured by the number of tweets
		Press visibility
		Internet visibility

Source: Author.

Moreover, politicians are incentivized to reduce debt levels because it allows for lower property taxes that will increase their probability of re-election (Gore, Sachs and Trzcinka, 2004). In this way, incumbents are encouraged to use internet reporting and disclose more information as this helps lenders to regularly monitor governments activities (Debreceny, Gray and Rahman, 2002). In other words, the greater the dependence on external funding sources the greater the disclosure (Ingram, 1984). Severel studies have confirmed this, finding a positive relationship between debt levels and budget/fiscal reporting (Styles and Tennyson, 2007; Caba-Pérez, Rodríguez Bolívar and López Hernández, 2008; Caamaño-Alegre et al., 2013; De Araújo and Tejedo-Romero, 2017). However, Alt, Lassen and Rose (2006) found a negative association, concluding that higher debt reduces fiscal transparency. But it should be pointed out that they employed debt variable only as a control variable. Finally, given the different leverage and debt measures used, the significance of these variables in determining fiscal/budgetary transparency is even greater.

4.2.2 POLITICAL VARIABLES
Political competition
When it comes to political determinants, there are three variables that contribute to explaining different levels of subnational budget/fiscal transparency – political competition, different executive features, and type of government. Stronger political competition encourages incumbents to bear higher monitoring costs, because if they do not keep pre-election promises, they are exposed to the long-term costs of re-election failure (Evans and Patton, 1987). Esteller-Moré and Polo Otero (2012) stressed the importance of political competition in times in which an incumbent's re-election is uncertain. With a strong competition, agents use fiscal disclosure as their strategic instrument to have a greater chance of being re-elected. However, when it comes to the degree of fiscal information they wish to provide, agents face a trade-off. According to Ferejohn (1986) higher levels of fiscal transparency allow politicians to have higher wages, since principals are now ready to pay more taxes. At the same time, greater information disclosure diverts agents from rent extraction. Accordingly, in the cases of strong competition, higher transparency becomes agents' instrument only if a trade-off is solved in favour of higher salaries. In cases of low competition, transparency becomes less important for politicians, as they in this case have high expectations of staying in power (Piotrowski and Bertelli, 2010).

It is argued that parties in power have greater benefits from divulging information in both a low and a high political competition environment. In the case of high competition, they have the incentive to show their current actions and good management (Caba Pérez, Rodríguez Bolívar and López Hernández, 2014), while low competition makes them more confident of their position in power and so willing to reveal more information (Grimmelikhuijsen and Welch, 2012). By contrast, other competing parties in a high competition environment abstain from the risk of disclosure, as this may reduce their ability to control their message (Caba Pérez, Rodríguez Bolívar and López Hernández, 2014).

In this context, the empirical results on political competition are mixed. While several authors proved that competition fosters subnational fiscal transparency (Caamaño-Alegre et al., 2013; Gandía and Archidona, 2008; Tavares and da Cruz, 2017), others disputed this, showing a negative correlation (Alt, Lassen and Rose, 2006; De Araújo and Tejedo-Romero, 2016; Gandía, Marrahí and Huguet, 2016). Generally, it is hard to report the true effect of political competition, since the context, data used, and different country characteristics may greatly affect this variability in the results. However, even with wide range of measurements used, political competition proved to be a significant predictor of subnational fiscal transparency.

Executive features

Different incumbent characteristics and features also affect government's decision on divulging or withholding fiscal information. The mayor's gender is the first of those features, showing a significant influence on subnational transparency levels. Many studies have investigated the differences between women and men officials, mostly favouring women's leadership style and its effect on decision-making in the public sector. It is argued that female mayors are more likely than their male counterparts to actively engage citizens in the decision-making, thus fostering participation, communication and different inputs (Fox and Schuhmann, 1999). Some studies are concerned with gender and ethics, suggesting that women are less likely to behave unethically in the workplace in order to achieve greater financial rewards (Bernardi and Arnold, 1997; Krishnan and Parsons, 2008). In addition, female mayors may be less likely to experience the principal-agent dilemma, since they are more ethically minded than men (Khazanchi, 1995). Some authors stress that the critical representation of women in governance structures can affect the way of government functioning, making it more socially responsive and transparent (Rodríguez-Garcia, 2015). Several authors have empirically confirmed these underpinnings, finding a positive relationship between a female mayor and budget transparency (De Araújo and Tejedo-Romero, 2017; Tavares and da Cruz, 2017). However, Gesuele, Metallo and Longobardi (2017) proved the opposite, but showing the significance in only one of the three models presented.

It is also argued that longer tenure in office reduces pressure on the officials to disclose information. Tavares and da Cruz (2017) found that the number of an incumbent's consecutive terms in office is one of the factors most detrimental to transparency. This is consistent with the findings by Berliner (2014), who claimed that turnover in executive office fosters the adoption of freedom of information laws, which are associated with increased transparency. By contrast, Ma and Wu (2011) showed a positive correlation, stressing that governments need more time to achieve the support needed for the implementation of administrative reforms so as to foster transparency and openness. It could also be argued, however, that much more research is needed, as only few studies have employed this variable, thus limiting a better insight into the true effects of this variable.

Governance type

There has been a tendency for researchers to include a dummy variable that addresses the type or form of the government, thus pointing to the governance structure. This could be an important argument, especially in the context of implementation of the new public management (NPM). Namely, within this approach, citizens are viewed as customers and public servants as public managers, while transparency and accountability are perceived as fundamental elements of good governance (Caba Pérez, Rodríguez Bolívar and López Hernández, 2008). Laswad, Fisher and Oyelere (2005) were among the first to use the variable "form of local authority" by distinguishing between district, city and regional councils. They found that regional and city councils are more transparent than district councils. However, it is not clear why they have not used a nominal variable, rather than a dichotomous, to address all three council types separately. It should be noted, though, that the governance type may vary greatly among countries, thus depending on the setting of the public administration of a country. In some cases, the central government has administration delegations across the country, which are assigned to the several subnational units. In Spain, for example, these are provincial capitals where the central government holds offices to provide efficiently and effectively some additional services to citizens. These political capitals proved to be less transparent than other Spanish cities (del Sol, 2013). Since this is a specific country context, it would be difficult to find theoretical underpinnings that support this evidence. In spite of that, the author indicated that the reason for low transparency could be the capitals' privileged treatment by the central government. Lowatcharin and Menifield (2015) on a sample of US counties found that council-manager governments tend to be more transparent than their mayor-council counterparts. It could be argued, however, that council-managers are more prone to the adoption of web technologies and e-government solutions, rather than mere transparency (Moon, 2002). In other words, higher transparency in these governments is not a goal by itself, but comes as a result of their propensity for web technology implementations.

4.2.3 CITIZENS AND THE MEDIA
Population

One of the variables most often used in explaining SNG fiscal transparency is the number of inhabitants. It is widely discussed that larger SNGs have the extra resources and capacities to adopt technical and managerial innovations faster (Smith and Taebel, 1985; Norris and Kraemer, 1996). This is explained by the greater pressure they face in finding different ways for a better supply of public services. In addition, they may have a better trained stuff, a larger budget, and an established IT department, which helps them to embrace e-government practices (Moon and Norris, 2005). These underpinnings were strongly confirmed by several authors (del Sol, 2013; Guillamón, Bastida and Benito, 2011; Lowatcharin and Menifield, 2015; Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona, 2009). However, a study presented by Esteller-Moré and Polo Otero (2012) has revealed new insights into the population variable. Given the heterogeneity of the sample

with a wide range of population size, they split the sample into a large and small population. They found a negative relationship in the small sample, but a positive in the larger sample (for the very big municipalities), pointing to a non-linear relationship between the number of inhabitants and fiscal transparency. They stressed that unlike small municipalities, very large units have greater capacity to fulfil their legal obligations, which could more than compensate for their potential propensity to be less transparent.

Internet access

According to Debreceny, Gray and Rahman (2002), the rise in the use of the internet has brought different views to fiscal transparency. From the user's perspective, it is recognized as a facilitator in the demand for fiscal transparency, while from the supplier's perspective it is perceived as a tool for more effective dissemination of information. Internet take-up has affected the behaviour of governments, which are now divulging additional information and services online. Thus, its rise has brought about an improved transparency and financial accountability, reducing the costs of dissemination (Pina, Torres and Royo, 2010). Several studies that investigated online (mainly website) transparency reported that greater and better internet access in the SNGs positively affects their fiscal transparency (Caba-Pérez, Rodríguez Bolívar and López Hernández, 2008; Gandía and Archidona, 2008; De Araújo and Tejedo-Romero, 2017). García-Tabuyo, Sáez-Martín and Caba-Pérez (2016) found a positive association with mandatory disclosure, but surprisingly, the relationship with voluntary reporting proved to be negative. Although the argument may be somewhat shallow, they explained this by saying that voluntary information disclosure could be larger in municipalities with higher internet penetration and political commitment because by increasing the transparency levels, politicians aim to attract the votes of inactive citizens.

Unemployment

It has been argued that lower economic development and associated higher unemployment rates are damaging to civic engagement, i.e. the demand for greater opportunities to participate in the decision-making is lessened. Some studies used unemployment as a proxy for SNG economic status and found that higher economic status (lower unemployment) positively affects transparency in public administration (Piotrowski and van Ryzin, 2007). In accordance with these underpinnings, the results largely indicate that higher unemployment rates are detrimental to fiscal transparency (Caamaño-Alegre et al., 2013; De Araújo and Tejedo-Romero, 2016; del Sol, 2013; Tavares and da Cruz, 2017).

Media

Various authors have stressed the importance of public media visibility in a government's divulging of information (Zimmerman, 1977; Ingram, 1984; Laswad, Fisher and Oyelere, 2005). It is argued that greater visibility and frequency of press reporting on a government's activities and work contributes to resolving the principal-agent dilemma by reducing information asymmetries between citizens and author-

ities. However, it should be noted that the media, citizens and politicians often have different interests. In this context, public media may be more interested in publishing exclusive information, such as corruption scandals. This, in turn, affects the government's behavior, for it will limit the disclosure of information so as to avoid them being "misused" in the media (Laswad, Fisher and Oyelere, 2005; García and García-García, 2010; Cuadrado-Ballesteros et al., 2017). Nevertheless, studies have found that press and public media visibility as well as frequency of social media usage by SNGs have a positive impact on their fiscal transparency (Laswad, Fisher and Oyelere, 2005; Gandía and Archidona, 2008; Gandía, Marrahí and Huguet, 2016; Gesuele, Metallo and Longobardi, 2017).

5 DISCUSSION AND CONCLUSION

This paper has provided a review of empirical studies on the determinants of subnational government's budget/fiscal transparency in the period 2000-2017. Several important observations should be emphasized. First, in order to determine the factors involved, it is necessary to have a clear definition of budget/fiscal transparency. However, there is no consensus about this. Moreover, different definitions are interwoven, leading to budgetary and fiscal transparency being used interchangeably. The lack of a clear definition conduces to an inadequate measurement of budget transparency, which can significantly affect the credibility of the results of such research. Thus, instead of having effective transparency, this lack of clarity leads to opaque, fuzzy, or zombie transparency (Fox, 2007; Michener, 2015), where there is a lack of disaggregation or better descriptive details. Without parameters, as Michener (2015) stressed, the quality and comparability of transparency is compromised. Secondly, different approaches to measuring budget transparency, especially within the same country, reduce the effective comparison potential and lead to ambiguity. Thirdly, heterogeneity of the definition and measurement of explanatory variables can lead to apparent contradiction and inconsistency of the obtained results.

In this paper three basic categories that determine subnational government budget/fiscal transparency are established: (1) financial (leverage and debt), (2) political (political competition, executive features and governance type), and (3) citizens and the media (population, internet access, unemployment, and the media). This conclusion is based on the review of 20 selected papers, following the above-mentioned methodology. Looking at the wider literature, some of the findings can be related to findings at the national level, where the main factors of fiscal transparency are political, namely political (electoral) competition, and the level of governmental democracy (Hollyer, Rosendorff and Vreeland, 2011; Wehner and de Renzio, 2013). Although citizens and the media, and financial factors determine SNG fiscal transparency, at the national level its effect seems negligible. This may be due to the reduced participation opportunities and pressures of citizens on the national government, or different structures and sources of funding of national and SNGs. Moreover, Wehner and de Renzio (2013) have concluded that external initiatives might not play a great role in strenghtening fiscal accountabil-

ity at the national level when the internal demand (citizens, media) is weak. However, when it comes to a wider literature on other types of public sector transparency, all findings are highly correlated (Bakar and Saleh, 2015), including all three established categories.

A vast majority of studies tend to focus on local governments, thus neglecting other types of public sector organizations such as federal and state governments, or quasi-government bodies. Very few studies involved different countries in an investigation of subnational international comparisons. In this sense, the challenge would be to create a harmonized budget transparency measure that could be applied to subnational governments of different countries. Further such research could offer a more comprehensive insight into the factors implicated in budget/fiscal transparency, including different country characteristics and contexts. Furthermore, greater consistency in selecting proxy measures for certain variables could contribute to a clearer interpretation of results, while the greater time span of budget transparency data would allow for richer methodology solutions and observations.

Like any other studies, this study has a few limitations. It does not take into account research before 2000, as the focus is rather on online disclosure. Future studies may extend observation time. Furthermore, no meta-analytic studies were included. However, this paper can serve as the basis and motivation for implementing systematic reviews and meta-analyses on this topic. In spite of these limitations, it is believed that the study may provide rich insights for both interested researchers and practitioners.

Disclosure statement
The author does not have any conflict of interest.

APPENDIX

TABLE A1
Budget/fiscal transparency measurements

Author(s)	Sample	Dependent variable		Time period	Type of disclosure	Method for estimating determinants	Main results (determinants)
		Measurement					
		United States					
Alt et al. (2006)	50 States	Based on Alt, Lassen and Skilling (2002). They measured state government budget procedures by sending questionnaires to the budget officers of all 50 states on nine dichotomous items regarding budget procedure issues, based on the data from the National Association of State Budget Officers and the National Conference of State Legislatures.		1972-99	Survey responses	Panel data regression analysis	Political competition; Political polarization; Partisan composition of government; Debt; Budget imbalance
Styles and Tennyson (2007)	300 municipalities	They used only one indicator – a comprehensive annual financial report (CAFR). In addition, they developed an accessibility index to measure the ease of CAFR access, i.e. how many steps are required to locate the report.		n/a	Online mandatory	Logit Regression Analysis for provision model and OLS Regression Analysis for accessibility model	Population size; Income per capita; Accounting disclosure
Bernick et al. (2014)	400 counties	Like Styles and Tennyson (2007), they looked at a comprehensive annual financial report (CAFR) and availability and comprehensiveness of budget information (no exact document or information is indicated).		2014	Online mandatory	Ordered logit analysis	Counties with appointed county manager; size of county board; counties required to submit an audit to the federal government; Economic stress; Population age; Democratic and minority residents; Heterogeneity of the county

Author(s)	Sample	Dependent variable / Measurement	Time period	Type of disclosure	Method for estimating determinants	Main results (determinants)
Lowatcharin and Menifield (2015)	816 counties in twelve US Midwestern states	Categorical data, taking the numbers from 0 to 4 with regard to the release of the following 10 items: budget, meetings, elected officials, administrative officials, permits and zoning, audits, contracts, lobbying, public records, and local taxes.	2010	Online proactive	Ordered Logistic Regression Analysis	Governance type; Population density; Citizens' education; Total land area; Minority population (most extensive model results)
Spain						
Gandia and Archidona (2008)	130 municipalities with more than 50,000 inhabitants	Web disclosure index, consisting of 88 items grouped into five sections: general information, budget information, financial information, navigation and presentation, relational web.	2006	Online voluntary	Multivariate Regression Analysis	Political competition; Public media visibility; Internet access; Citizens' education
Serrano-Cinca et al. (2009)	92 local governments, including all provincial capitals and all town halls with over 70,000 inhabitants	Dependent variable based on web availability of nine documents: individual budget of the council, consolidated budget of the council, budget of dependent entities, budget disaggregated by economic, functional or organic classification, budget information regarding investment, borrowing or revenue and expenditure, individual annual accounts, consolidated annual accounts, annual accounts of dependent entities and audit report.	2006	Online voluntary	Multivariate Logistic Regression	Population size; Budget revenues; Political will (measured by councils' experience with e-democracy); Disposable family income per inhabitant
Caba-Pérez et al. (2008)	65 Spanish city councils, including large cities, provincial capitals, autonomous region capitals and municipalities with central offices of the autonomous regions' institutions.	Disclosure index divided into three sections: (1) content of information supplied, including budget and financial information; (2) characteristics of the information disclosed, i.e. completeness, timeliness, comparability, understandability, relevance and reliability; and (3) navigability, design and accessibility of public financial information on the web site.	2007	Online voluntary	Multivariable Linear Regression	Cost of debt; Internet access

Author(s)	Sample	Dependent variable		Time period	Type of disclosure	Method for estimating determinants	Main results (determinants)
			Measurement				
Guillamón et al. (2011)	100 largest Spanish municipalities		The financial transparency index based on the data of Transparency International (TI) Spain 2008 and partly from the questionnaire created by the authors. They observed three dimensions: accounting and budget, municipal revenues and expenditures, and municipal debt.	2008	Proactive, print and online	OLS and 2SLS regressions	Municipal wealth; Intergovernmental transfers; Political ideology; Population size
del Sol (2013)	110 local governments that participated in 2010 TI Spain survey		TI Spain disclosure index, including five transparency areas: fiscal (accounting and budget information, information on revenues and expenditures, information on debt), corporate, social, procurement and contracting.	2010	Online voluntary	OLS and censored regression models	Population size; Political ideology; Governance type (provincial capital); Tourist activity; Political ideology
De Araújo and Tejedo-Romero (2016)	109 municipalities		TI Spain disclosure index, including 80 indicators grouped into six transparency areas. Five areas used already by Albalate (2013) and additional category on urban development/public works transparency.	2012	Online voluntary	OLS and IV/2SLS regression analysis	Voter turnout; Political ideology; Political competition
Esteller-Moré and Polo Otero (2012)	691 Catalan municipalities		A dichotomous variable measuring budget/fiscal transparency by looking at the nine budget information: budget approval, final budget, budget balance, closed settlement budgets, treasury statement, treasury surplus, net wealth statement, income statement and indebtedness. These informations are part of annual accounts that Catalan local governments have to deliver to the Public Audit Office for Catalonia.	2001-2007	Mandatory	Logit regression analysis	Political competition; Population size (measuring the degree of decentralization)

Author(s)	Sample	Dependent variable Measurement	Time period	Type of disclosure	Method for estimating determinants	Main results (determinants)
Caamaño-Alegre et al. (2013)	33 Galician municipalities	Budget transparency index containing information on the open budget process, public availability of information and assurance of integrity. Questionnaires are sent to government officials by using a Likert-type survey questionnaire based on the IMF's revised Code of Good Practices on Fiscal Transparency.	n/a	Proactive	OLS regression analysis	Debt per capita; Budget (im)balance; Ratio of municipal public expenditure to GDP; Political competition; Political ideology; Coalition incumbent; Voter turnout; Unemployment rate
Gandia et al. (2016)	145 Spanish local governments with more than 50,000 inhabitants	Web 2.0 disclosure index, consisted of: (1) an ornamental disclosure index, which contains general and citizen information; (2) information disclosure index, including the information on public procurement, administrative agreements, government subsidies and aid, and staff, and budget and financial information; (3) relational disclosure index, which represents the presentation, navigability and interaction abilities of the web.	n/a	Online voluntary	Multivariate regression analysis	Leverage; Municipal wealth; Political competition; Political ideology; Citizens' education; Social media use; Press visibility; Internet visibility
De Araujo and Tejedo-Romero (2017)	100 largest Spanish municipalities	TI Spain disclosure index	2008-2010, 2012, 2014	Online voluntary	Balanced panel data regression analysis	Mayor's gender; Woman's representation in municipal council

Author(s)	Sample	Dependent variable Measurement	Time period	Type of disclosure	Method for estimating determinants	Main results (determinants)
Other countries						
Laswad et al. (2005)	86 local governments in New Zealand	A dichotomous variable, indicating whether or not the local authority publishes financial information on the web. It is considered that local authority delivers information if at least one of four documents that represent voluntary internet financial reporting was published. Four documents are: financial highlights, annual reports, annual plan, and combinations of annual reports, plans and financial highlights.	n/a	Online voluntary	Multivariate logit regression	Leverage; Municipal wealth; Press visibility; Type of council
García-Tabuyo et al. (2016)	40 largest municipalities in each of the five Central America countries – El Salvador, Nicaragua, Panama, Guatemala and Honduras	Index of mandatory and index of voluntary disclosure based on 94 items grouped into four transparency categories: municipal government, relations with citizens and society, economic-financial transparency and service-procurement transparency. The ratio of voluntary and legal items differs depending on the observed country.	Salvador (2010), Guatemala (2008), Honduras (2006), Nicaragua (2007), Panama (2002)	Online proactive	Tobit Regression Analysis	The maturity of the FOI law (mandatory disclosure); Internet access; Voter turnout (voluntary disclosure)
Zuccolotto and Teixeira (2014)	26 Brazilian states	State transparency index developed by Biderman and Pottomatti (2010), consisting of three parameters: content, time series and update frequency, and usability.	2010	Online proactive	Multiple linear regression analysis	Socioeconomic factors: education, employment and income, and health indicators; Fiscal factors

Author(s)	Sample	Dependent variable Measurement	Time period	Type of disclosure	Method for estimating determinants	Main results (determinants)
Ma and Wu (2011)	31 Chinese provinces	Disclosure index based on resposiveness and information completeness as two basic dimensions. It is measured by governments' responses to 113 open fiscal information requests of citizens, including 66 items for government accounts, 30 items for social security accounts and 17 items for state owned enterprises accounts.	2008-2009	Reactive	Seemingly Unrelated Regressions (SUR) model with random effects	Economic openness; Marketization; Budget (im)balance; Incumbent's tenure
Gesuele et al. (2017)	287 municipalities, 142 Italian and 145 Spanish municipalities	Two indexes: (a) e-disclosure website index, which measures interaction level among citizens and municipalities using official or mandatory disclosure channel by looking for the 13 items, including the publication of financial statements from the municipality and from the controlled company and municipalities' assets and revenues; (b) social media usage index, which measures the voluntary disclosure via social media such as Facebook and Twitter.	2013	Online proactive	Tobit regression (stepwise approach)	Leverage; Internet visibility; Citizens wealth (measured by economic activity per capita)
Tavares and da Cruz (2017)	278 Portuguese municipalities	TI Portugal disclosure index, consisting of 76 indicators, grouped into the seven dimensions: (1) Organizational information, social composition and operation of the municipality; (2) Plans and planning; (3) Local taxes, rates, service charges, and regulations; (4) Relationship with citizens; (5) Public procurement; (6) Economic and financial transparency; and (7) Urban planning and land use management.	2013	Online proactive	OLS regressions	Financial autonomy; Mayor's gender; Tenure; Political competition; Unemployment rate; Population age

Source: Author

TABLE A2
Financial variables

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Municipal size	Average total assets; average total revenues	–	–	Laswad et al., 2005
	Budget revenues	Serrano-Cinca et al., 2009	–	–
Leverage	Ratio of long-term liabilities to total assets; ratio of long-term liabilities to total public equity	Laswad et al., 2005	–	–
	Total executed expenses per capita	Gandía et al., 2016	–	Gandía and Archidona, 2008
	The level of leverage (not specified)	Gesuele et al., 2017	–	–
Government's wealth	Municipality's own revenue per capita	Gandía et al., 2016; Laswad et al., 2005	–	Gandía and Archidona, 2008
	Budget revenue per capita	–	–	Ma and Wu, 2011
	Tax revenues per capita	Guillamón et al., 2011	–	Caamaño-Alegre et al., 2013
	GDP per capita	–	–	Ma and Wu, 2011 (positive for completeness, but insignificant for provision of information)
Debt	Dichotomous variable (1 if the city hall has municipal bonds in circulation)	–	–	Serrano-Cinca et al., 2009
	Percentage of debt in total budget	–	–	del Sol, 2013
	Public debt per capita	Caamaño-Alegre et al., 2013; De Araújo and Tejedo-Romero, 2017; Styles and Tennyson, 2007	Alt et al., 2006	De Araújo and Tejedo-Romero, 2016; Guillamón et al., 2011
Intergovernmental transfers	Funding costs of the current year budget expenditure per capita	Caba-Pérez et al., 2008	–	–
	Ratio of total transfers to the total amount of non-financial revenues. They have also observed current and capital transfers separately		–	Esteller-Moré and Polo Otero, 2012
	Regional and central transfers per capita	Guillamón et al., 2011	–	–
	Total current and capital transfers	–	–	Caba-Pérez et al., 2008

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Budget im(balance)	Fiscal imbalance, i.e. higher surpluses and deficits	Alt et al., 2006	–	–
	Budget balance per capita (lowering deficit)	Caamaño-Alegre et al., 2013	–	–
	Budget deficit, natural logarithm	Ma and Wu, 2011	–	–
	Deficit per capita	–	–	Esteller-Moré and Polo Otero, 2012; Guillamón et al., 2011
	Deficit or surplus as a percentage of total budget	–	–	del Sol, 2013
	Investment pc; tax burden pc; ratio of the tax revenues to operating revenues; ratio of financial to total expenses; ratio of operating to total expenses	–	–	Serrano-Cinca et al., 2009
Other financial variables	Capital investment per capita	De Araújo and Tejedo-Romero, 2016	–	–
	Fiscal pressure, measured by per capita tax and non-tax revenue, and the sale of goods and services of the public administrations	–	–	Caba-Pérez et al., 2008
	Fiscal pressure, measured by total direct and indirect taxes per capita	De Araújo and Tejedo-Romero, 2017	–	–
	Index of financial autonomy (derived from taxes and fees)	Gesuele et al., 2017 (significant in one of three models)	–	–
	Financial position, measured by the ratio of primary government's unrestricted net assets to total expenses	Styles and Tennyson, 2007	–	–
	Financial autonomy (proportion of local taxes, fees and other charges)	Tavares and da Cruz, 2017	–	–
	Ratio of municipal public expenditure to GDP	Caamaño-Alegre et al., 2013	–	–
	Municipalities with a certificate of achievement for excellence in accounting reporting	Styles and Tennyson, 2007	–	–

Source: Author.

TABLE A3
Political variables

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
	(a) Divided government – dichotomous variable taking the value 1 if different parties control the executive and legislature, 0 otherwise; (b) Gubernatorial competition, measured by the share of Democratic votes in the gubernatorial election, capturing absolute deviatians from one half, (c) Legislative competition – Democratic seat shares in the upper and lower houses	–	Alt et al., 2006	–
	Ratio of candidates to council positions available	–	–	Laswad et al., 2005
	Number of political parties in the city council	–	–	Gandía and Archidona, 2008
Political competition	Dichotomic variable, 1 if city council is governed by one of the majority political parties in the country	Gandía and Archidona, 2008	Gandía et al., 2016	–
	Ratio of candidates to councillors elected	–	–	Serrano-Cinca et al., 2009
	Ratio of councillors elected for the party in power to the total number of elected councillors	–	–	Caba-Pérez et al., 2008
	Measure of dispersion, i.e. the standard deviation of the percentage of votes received by each political party (the greater the dispersion of votes among political parties, the smaller the electoral competition)	Esteller-Moré and Polo Otero, 2012 (non-significant for big municipalities)	–	Caba-Pérez et al., 2008
	Effective number of political parties, according to Laakso and Taagapera's (1979) calculation	Caamaño-Alegre et al., 2013	–	–
	Margin of victory, measured by the difference between the percentage of votes obtained by the parties coming in first and second place. The lower the difference the higher the electoral competition	Tavares and da Cruz, 2017	De Araújo and Tejedo-Romero, 2016	De Araújo and Tejedo-Romero, 2017

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Political ideology	Political orientation of the municipal majority and/or mayor	–	–	Esteller-Moré and Polo Otero, 2012; García-Tabuyo et al., 2016; Gesuele et al., 2017; Serrano-Cinca et al., 2009; Tavares and da Cruz, 2017
	1 if left-wing municipal majority	Gandía et al., 2016; Guillamón et al., 2011	–	–
	1 if left incumbent	Caamaño-Alegre et al., 2013; del Sol, 2013	De Araújo and Tejedo-Romero, 2016, 2017	–
	Mayor's gender (1 if female)	De Araújo and Tejedo-Romero, 2017; Tavares and da Cruz, 2017	Gesuele et al., 2017 (significant in one of three models)	De Araújo and Tejedo-Romero, 2016; Guillamón et al., 2011
Executive	1 in the case of coalition incumbents	–	Caamaño-Alegre et al., 2013	–
	Mayor's age and education	–	–	Tavares and da Cruz, 2017
	Number of incumbent's consecutive terms	Ma and Wu, 2011	Tavares and da Cruz, 2017	–
Governance type	1 district councils, 0 regional or city councils	–	Laswad et al., 2005	–
	1 provincial capitals	–	del Sol, 2013	–
	Form of government (1 council-manager, 0 commission and council-elected executive)	Lowatcharin and Menifield, 2015	–	–
	1 city-manager governance structure	–	–	Styles and Tennyson, 2007
Voter turnout	Percentage of citizen participation in local elections	Caamaño-Alegre et al., 2013; De Araújo and Tejedo-Romero, 2017 (simplified model)	García-Tabuyo et al., 2016 (voluntary disclosure); De Araújo and Tejedo-Romero, 2016; De Araújo and Tejedo-Romero, 2017 (extensive models)	García-Tabuyo et al., 2016 (mandatory disclosure); del Sol, 2013; Guillamón et al., 2011; Serrano-Cinca et al., 2009; Tavares and da Cruz, 2017

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Voter turnout	Voter abstention, representing the percentage of population who did not vote	–	Esteller-Moré and Polo Otero, 2012 (big municipalities)	Esteller-Moré and Polo Otero, 2012 (whole sample and small municipalities)
E-government achievements	Number of e-democracy actions implemented	Serrano-Cinca et al., 2009	–	–
	E-government development, measured by the score in open information, online business, user satisfaction, properties and design, and daily operation	–	–	–
	Institutional capacity variable, measured by Open Government Information (OGI)	–	–	Ma and Wu, 2011 (positive for fiscal completeness)
	Municipal IT capacity, measured by the number of IT employees	–	–	Tavares and da Cruz, 2017
	Counties with appointed county managers; size of county board; counties required to submit an audit to the federal government	Bernick et al., 2014	–	–
	Political polarization (for measurement see Hanssen, 2004)	Alt et al., 2006	–	–
Other political variables	Two-party and multi-party coalition in the city council	–	–	Serrano-Cinca et al., 2009
	Woman's representation in municipal council, measured as a percentage of female members in municipal council	De Araújo and Tejedo-Romero, 2017	–	–
	1 if incumbent's party does not hold a majority of seats in the council	–	–	Tavares and da Cruz, 2017
	The maturity of the FOI law, i.e. how long has it been in force; number of sanctions stipulated in the FOI law	–	García-Tabuyo et al., 2016 (mandatory disclosure)	–

Source: Author.

TABLE A4
Citizens and the media

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Population	Number of inhabitants	De Araújo and Tejedo-Romero, 2016; del Sol, 2013; Guillamón et al., 2011; Serrano-Cinca et al., 2009; Styles and Tennyson, 2007	Esteller-Moré and Polo Otero, 2012 (non-linear relationship)	Caamaño-Alegre et al., 2013; Caba-Pérez et al., 2008; Gandía and Archidona, 2008; García-Tabuyo et al., 2016; Tavares and da Cruz, 2017
	Population density, measured in persons per square mile	Lowatcharin and Menifield, 2015	–	–
	Percentage of households with home internet access	Gandía and Archidona, 2008 (budget disclosure); Caba-Pérez et al., 2008; De Araújo and Tejedo-Romero, 2017	–	Gandía and Archidona, 2008 (financial disclosure)
Internet access	Fixed internet access connections over 200 kilobits per second in at least one direction per 1,000 households	Lowatcharin and Menifield, 2015 (simplest model)	–	Lowatcharin and Menifield, 2015 (most extensive models)
	Internet penetration as a measure for the development of ICT infrastructure	García-Tabuyo et al., 2016 (mandatory disclosure)	García-Tabuyo et al., 2016 (voluntary disclosure)	–
	Percentage of netizens	–	–	Ma and Wu, 2011
Citizens' characteristics	Citizen education attainment	Gandía and Archidona, 2008 (budget disclosure); Gandía et al., 2016; Lowatcharin and Menifield, 2015	–	Gandía and Archidona, 2008 (financial disclosure); Caba-Pérez et al., 2008; De Araújo and Tejedo-Romero, 2017; Ma and Wu, 2011; Serrano-Cinca et al., 2009; Tavares and da Cruz, 2017
	Citizens' age, measured by the percentage of the population aged 65 and over	Esteller-Moré and Polo Otero, 2012 (whole sample and big municipalities); del Sol, 2013	–	Esteller-Moré and Polo Otero, 2012 (small municipalities); Ma and Wu, 2011

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Citizens' characteristics	Citizens' age, measured by the average age of the municipal population	–	Tavares and da Cruz, 2017	–
	Citizens' age, measured by the median age of population	–	–	Lowatcharin and Menifield, 2015
	Gender, measured by the percentage of men over the total local population	–	–	del Sol, 2013
Citizens' wealth	Disposable family income per inhabitant	Serrano-Cinca et al., 2009	–	–
	Personal income per capita	Lowatcharin and Menifield, 2015; Styles and Tennyson, 2007	–	Lowatcharin and Menifield, 2015 (after controlling for state effects); Guillamón et al., 2011
	Percentage of population below the poverty level	–	–	Lowatcharin and Menifield, 2015
	The value of economic activity per capita	Gesuele et al., 2017	–	del Sol, 2013
	Purchase power index	–	–	Tavares and da Cruz, 2017
Unemployment	Unemployment rate	De Araújo and Tejedo-Romero, 2017	Caamaño-Alegre et al., 2013; De Araújo and Tejedo-Romero, 2016; del Sol, 2013; Tavares and da Cruz, 2017	–
Media	Having Twitter and/or Facebook accounts	–	–	Gandía et al., 2016
	Intensity of use of social media, measured by the number of tweets	Gandía et al., 2016	–	–
	Intensity of use of social media, measured by the Facebook likes	–	–	Gandía et al., 2016

Variable name	Variable measurement	Correlation of determinants		
		Positive	Negative	Non-significant
Media	Press visibility	Gandía and Archidona, 2008; Gandía et al., 2016; Laswad et al., 2005	–	Gesuele et al., 2017
	Internet visibility	Gandía and Archidona, 2008; Gandía et al., 2016; Gesuele et al., 2017	–	Serrano-Cinca et al., 2009
	Degree of community involvement, measured by the number of civic associations divided by the number of inhabitans	–	–	Serrano-Cinca et al., 2009
Other variables	Total land area	Lowatcharin and Menifield, 2015 (most extensive model)	–	–
	Percentage of population change over the years	Lowatcharin and Menifield, 2015 (more simplified models)	–	–
	Minority, measured by the percentage of nonwhite population	Lowatcharin and Menifield, 2015	–	–
	Index of tourist activity per capita	–	del Sol, 2013	-

Source: Author.

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