

# ANALYZING THE TRANSPARENCY TRADITIONAL VARIABLES WITHIN THE SPANISH MUNICIPALITIES

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## Abstract

This paper analyzes the variables traditionally used to explain transparency in the empirical literature within the sphere of Spanish municipalities. The analysis has focused on 144 city councils with more than 50,000 inhabitants, covering 53% of the population of Spain.

It consists firstly of an analysis of their web pages in order to explain the levels of transparency through the use of the legal conditions that currently exist in Spain and the authors own transparency index, and secondly of the verification of an explicative hypothesis for each of the variables.

Our findings allow us to state that there are two explicative variables for municipal transparency, which are present in the majority of works previously consulted: 'size of population', and 'volume of investment'. In addition to the aforementioned variables, the research has also shown that the variable 'level of education' of the municipality's inhabitants is an explicative variable as regards the level of transparency, such that higher levels of education correspond to a greater degree of transparency.

**Keywords:** transparency, accountability, Spanish municipalities, local governments.

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## 1. Introduction

The Spanish public administration currently appears to have made the objective of transparency in public management a priority. This may be evidenced by the setting up of the State General Administration transparency portal in December 2014, following the publication of the Law on transparency, access to public information and good government in December 2013. This concept is, in addition to being a political formula, well documented in the relevant literature which, from the academic perspective, contains numerous studies that attempt to explain transparency by means of economic, political and institutional variables.

The objective of our research is to provide empirical evidence with which to explain the levels of transparency attained by Spanish municipalities through the use of independent variables that provide a certain predictive capacity as regards this attainment of transparency. More specifically, we aim to define an instrument with which to measure transparency through the use of the legal conditions that currently exist in Spain, i.e., the aforementioned Law no. 19/2013, of December 9. Previous studies have used either transparency indices based on the transparency perceived by the public or indicators constructed using the evaluation of practices that are or are not deemed to be appropriate for transparency from the research perspective. The objective of our research is therefore to objectivize this question to the full by creating our own index that is based exclusively on legal requirements.

This work is focused on attempting to verify whether the variables that the relevant literature has identified as being explicative of transparency have the same correlation when the index of transparency used is an indicator that has been created using the legal obligations of transparency and not other indicators with certain subjectivity.

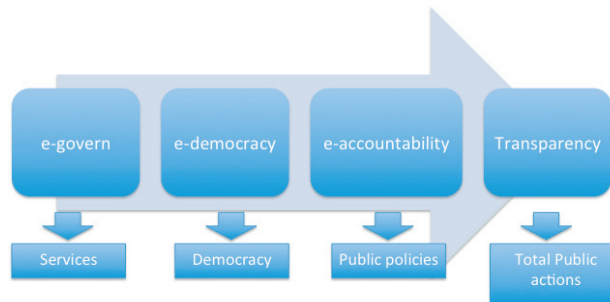
## 2. Conceptual framework for transparency

In accordance with the previously stated objectives, we shall begin by conceptually defining transparency through the use of pre-existing objective elements, i.e., the legal requirements contained in the Spanish legal framework. Therefore, article 105 of the Spanish Constitution establishes that: 'The law will regulate: (...) b) the public's access to archives and administrative registers (...)'. The culmination of regulations as regards transparency was attained in 2013 with the approval of Law no. 19/2013. This law drafts the fulfillment of the principle of transparency by means of the creation of active publicity obligations for all administrations. Since it is desired that the local autonomy that is guaranteed in the Constitution should form municipalities and provinces which are the territorial entities that are closest to the public, we agree with Bello (2014) in that it is in the local framework that the fulfillment of the paradigm of government should be ensured (in the sense of the ideal transparent management model).

In our opinion, transparency in public management could be defined as a management model that uses information technologies to provide the public with reasonably

up-to-date information regarding those areas that may be of interest to them. Since the doctrine appeared it is possible to find numerous works in literature that attempt to justify transparency as an essential characteristic of present-day public administration (Bertot, Jaeger and Grimes, 2010). Fernández-Pirla (2012) describes the current era as being that of information and technology owing to the abundant evidence of information and the use of new communication networks that, in his opinion, permit the use of ‘open’ governance models with an observance of all the variables implied. Barea (2004, p. 3), meanwhile, considers that the basis of budgetary credibility lies in transparency such that ‘transparency would be to public entities what the market is to businesses’, thus permitting the correct functioning of public administration. Cuciniello (2014) proposes a system of useful information rather than formal procedures of compliance and accountability.

Transparency can therefore be conceptually justified as the logical evolution of a management model whose forerunners can be found in the *New Public Management* in which *e-government* is extended as a means to provide the public with more efficient services by taking advantage of the possibilities offered by the development of ICTs. The expansion of this model would lead to the so-called *e-democracy* which would culminate in *e-governance*. Ruano de la Fuente (2014) has studied the impact of the ICTs in Spanish local governments concluding that the impact on the reform policies has been unequal.



**Figure 1:** Causes and evolution of the concept of transparency. Forerunners to and evolution of transparency

**Source:** The authors

Nevertheless, the definition of the term ‘transparency’ is more ambiguous, and it is defined as a broad concept whose outlines are at times rather vague. In this respect, Merino (2009) defines transparency as a system of networks in which everyone controls everyone else, and everyone is required to be and is responsible to everyone else. In other words, it is a system in which there is a combination of horizontal and vertical accountability: on the one hand we find the top-down hierarchies that control and demand clear accountability from their subordinates, and on the other, the public, organizations and companies at the bottom who wish to be informed about what the government (at the top) is doing (O’Donnell, 1998a).

Labeaga and Ramiro (2013) define transparency in the specific sphere of the public sector as the concept that is internationally alluded to as the openness and clarity of

governments' and institutions' activities for scrutiny by society and interest groups. It is a democratic practice with which to facilitate public access to institutions' social, political and economic information, which are therefore accessible and reliable and which consequently facilitates greater social participation in decision making. With regard to the international sphere, Kopits (2000) similarly interprets transparency as easy and opportune access to reliable, complete comprehensible and comparable information. Armstrong (2005) relates the concepts of 'integrity', 'transparency' and 'accountability', indicating that they are the fundamental principles of public administration and depend on each other.

Budgetary-financial transparency when understood as accountability has been the object of academic reflection as regards: its meaning and objectives (Brandsma, 2007), its links to corruption (Goodspeed, 2011) and its social aspects (O'Donnell, 1998b; Peruzzotti and Smulovitz, 2002; Przeworski, 1998). Financial condition is one of the aspects most commonly addressed in studies in this field. It is considered a key factor in determining the level of disclosure of economic-financial information by public administration institutions (Alcaide-Muñoz, Rodríguez-Bolívar and Garde-Sánchez, 2014). It can particularly be broadly defined as the social practice of the relationship between public administration and society, such that public managers explain themselves to their electorate on the basis of documented information concerning accounting and budgetary matters and the management of their annual economic-financial activity.

Within the Spanish sphere, Zapico Goñi (2010) states that the transparency of public spending is oriented towards the fulfillment of traditional budgetary principles and fiscal discipline. Álvarez-García and Cantarero-Prieto (2004) meanwhile analyze transparency in public administrations' accounts by incorporating the Spanish scene of territorial decentralization, and the objective of budgetary discipline that has characterized public policies in recent years. Finally, and also within the Spanish sphere, it is worth mentioning the work of Melle-Hernández (2014) who rightly reflects on the subject of transparency using the proliferation of public-private collaboration models.

### **3. Review of empirical literature**

Alcaide-Muñoz, Rodríguez-Bolívar and Garde-Sánchez, (2014) and Rodríguez-Bolívar, Alcaide-Muñoz and López-Hernández (2012) deal with those academic studies that are related to transparency, public participation and e-government. This exhaustive compilation shows the preferably descriptive nature of the works, which are in general focused on analyzing observed cases or the evaluation of the results of these initiatives.

With regard to the existing works on transparency, it is worth differentiating between two types of empirical studies. On the one hand, we find those works that have been produced with the aim of evaluating the fulfillment of transparency by one or a group of administrations using indicators, indices or standards produced by international organisms or institutions (the International Monetary Fund – IMF – and International Transparency – IT) and, on the other hand, we find those academic

studies that attempt to explain the independent variable of 'transparency'. However, both types of studies coincide in their definitions of degrees of transparency, which are based on the public's (perceived transparency) or the administration's own investigators' evaluation of particular characteristics or behavior of that administration.

This first group of studies is, in part, formed of those works published by the IMF (2007a; 2007b) and the OECD (2002) using indices created on the basis of the answers to a long list of questions on subjects related to the aggregate level of spending, formal budgetary processes, the incorporation of non-financial information at an operative level, etc.

With regard to the second group of studies, according to Vila i Vila (2013) two relevant works stand out in the sphere of Spanish local administration, both of which deal with budgetary-financial transparency: those of Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2008) and Cárcaba and García (2008). The former attempts to explain the financial information published on the Internet using the following six variables: size of municipality, emission of debt bonds, fiscal characteristics, level of income, level of education and political commitment (measured using the percentage of participation in the last municipal elections). Cárcaba and García (2008), meanwhile, work in order to attempt to explain the same independent variable. The explicative factors chosen in this case are: size of population, volume of investment, political competence, how well the municipality is known, measured according to the number of hits that each municipality has obtained with Google search, and debts. All the variables, with the exception of level of debt, were able to explain at least part of the municipality's level of coverage on the Internet as regards budgetary-financial information. Another study taken into consideration is Guillamón López, Ríos Martínez and Vicente Oliva (2011) covering the 100 largest Spanish municipalities.

Within the sphere of local administration in Spain it is also worth highlighting the works of Guillamón, Bastida Albaladejo and Benito (2011), Albalate (2012) and Frias-Aceituno, García-Sánchez and Rodríguez-Domínguez (2014). Albalate (2012) used the following seven variables: capital of province, population, ideology (whether the governing body was right or left-wing), rate of unemployment, tourism activities, debts and percentage of public participation in the last elections. Fernández-Santos, Gutiérrez-López and Fernández-Fernández (2011) carried out an empirical study in order to evaluate the websites of the municipalities in the province of León.

Within the international sphere it is worth highlighting the study carried out by Laswad, Fisher and Oyerele (2005) in which the authors studied the impact of a set of variables such as political competence, the size of the entity, debts, the type of entity, deficit or surplus and media pressure to explain the coverage of financial information on the Internet as regards local corporations in New Zealand.

Bonsón *et.al* (2012) carried out their analysis in the sphere of local European governments and concluded that in the majority of cases the use of the Internet helps to improve transparency, although it is insufficient for the full development of public participation or the management of proceedings with companies (Bonsón *et.al*, 2012).

Alcaide Muñoz, Rodríguez Bolívar and López Hernández (2013), conducted a meta-analysis to accumulate statistical information on the results published by independent studies. The results suggest there is a significant degree of statistical association between the financial situation of the public administration institution and its level of information disclosure.

#### 4. Methodology

As explained previously, the principal objective of this work is to empirically contrast the explicative capacity as regards the degree of transparency obtained by a municipality of those variables that have been employed as predictors of transparency in previous studies (Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona, 2008; Cárcaba and García, 2008; Guillamón, Bastida Albaladejo and Benito, 2011; Laswad, Fisher and Oyerele, 2005; Albalate, 2012; and Martín-Martínez and García-Muiña, 2011). Unlike previous studies, the aim of our work is to objectivize the concept of transparency by producing a quantitative index through the use of a questionnaire that will measure the fulfillment of the transparency requirements contained in Law no. 19/2013 of December 9, 2013, which concerns transparency, access to public information and good government. The contribution of our research resides in the fact that transparency is quantified using a legal and objective measurement, unlike the aforementioned works which base their analyses on perceived indicators of transparency or the evaluation of practices that have been conceptually considered to be transparent. Our research has therefore been divided into the following phases:

1. The identification of the explicative variables of municipal transparency used in previous studies;
2. The creation of our own transparency index;
3. The verification of an explicative hypothesis for each of the aforementioned variables, or failing that, of the null hypothesis;
4. The creation of a matrix of variables;
5. The sample under analysis is focused on Spanish municipalities with more than 50,000 inhabitants, consisting of 144 city councils covering 53% of the population of Spain. This sample was basically chosen for two reasons:
  - a) In order to attain greater efficiency, since upon analyzing only 144 municipalities from a total of 8,116 (less than 2%), it will be possible to evaluate the degree of transparency of those administrations that provide 53% of the country's population with services.
  - b) In order to focus the analysis of the problem on the areas of most interest. In this respect it is worth stressing that the largest administrations may be those that are most distanced from their inhabitants, thus requiring greater rigor as regards their degree of transparency and participation. In municipalities with very small populations, the relationship between the local council and the public may be so close that any other channel of communication is replaced with direct contact between those involved.

#### 4.1. First phase: the identification of the explicative variables for municipal transparency used in previous studies

The studies previously considered provide variables of an economic-budgetary, political or social nature as predictors of the degree of transparency obtained by a municipality. The majority have employed contrast methodologies based on regression models. These works are summarized in the following tables, in which the variables are divided according to whether they were successful in determining the existence of a correlation with transparency or, in contrast and despite the fact that a relationship may have appeared to exist *a priori*, this correlation was not found to exist.

**Table 1:** Analysis of previous studies

Previous studies	Variables that DO explain transparency	Variables that DO NOT explain transparency
Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2008)	Size of municipality (v1) Level of income (v2)	Issuing of debt bonds (v3) Fiscal characteristics (v4) Level of education (v5) Political compromise (% of votes obtained in municipal elections) (v6)
Cárcaba and García (2008)	Size of population (v1) Volume of investment (v7) Political competence (v8) How well-known municipality is (number of hits on Google) (v9)	Debts (v3)
Guillamón <i>et al.</i> (2011)	Team's ideology (v10) Political strength (majority / no majority) (v8) Unemployment rate (v11)	Total spending per capita (v12) Transferences received per capita (v13)
Laswad, Fisher and Oyerele (2005)	Type of entity (v14) Budgetary deficit / surplus (v15) Pressure from the media (v9)	Political competence (v8) Size of entity (v1) Debts (v3)
Martín-Martínez and García-Muiña (2011)	Ideology (right or left-wing) (v10) Size (v1)	Mayor's nationalistic profile (yes/no) (v16) Governability (as a political strength) (v8)
Albalade (2012)	Population (v1) Ideology (right or left-wing) (v10) Capital of province (v14) Rate of unemployment (v11) Tourism activities (v17)	Debt Political compromise (% of votes obtained in municipal elections) (v6)

**Source:** The authors

#### 4.2. Second phase: the creation of our own transparency index

The transparency index was constructed using a questionnaire produced by the authors in which an attempt was made to measure the application of the Transparency Law by analyzing the four areas of information that it regulates and which should be published by councils via their respective websites: information regarding institution, organization and planning; legal information; information of an economic, budgetary and statistical nature, and requests to access information. The technique used to discover information about these areas was that of analyzing the contents of the councils' websites for the period between May and June 2014. The analysis of

websites is also confirmed by empirical literature and, according to Frias-Aceituno, García-Sánchez and Rodríguez-Domínguez, ‘in the current context of reforms in the public administration, in the search for greater effectiveness and efficiency, the development of electronic government stands out in particular’ (2014, p. 104). We have analyzed T1 ‘Information regarding institution, organisation and planning’, T2 ‘Legal information’, T3 ‘Information of an economic, budgetary and statistical nature’, T4 ‘Requests to access information’, with a weight being given to each block and resulting in the following:

$$\text{Transparency Index} = (T1*0,3) + (T2*0,1) + (T3*0,5) + (T4*0,1).$$

As it is said, the analysis of Transparency Law shows four main areas previously mentioned, each of them with clear objectives to cover. Based on the articles of the Law, the transparency objectives are as follow:

**Table 2:** Objectives by area in the Transparency Law versus Index

AREA	NUMBER	OBJETIVES OF PUBLICATION	SUPPORT
T1	O1	Organization chart, functions and composition of the mayor and councilors	Art. 6.1
	O2	Strategic plan	Art. 6.2
	O3	Strategic plan achievement	Art .6.2
T2	O4	Regulation	Art. 7
T3	O5	Public economic agreements	Art. 8.1.a
	O6	Covenants	Art. 8.1.b
	O7	Grants	Art. 8.1.c
	O8	Budgeting	Art. 8.1.d.e
	O9	Mayor and councillors remuneration and declaration of assets	Art. 8.f.g.
T4	O10	Request of access to information	Art. 17

**Source:** The authors

According to these 10 main objectives we propose the following percentage:

$$T1=3/10=30\%. T2=1/10=10\%. T3= 5/10=50\%. T4=1/10=10\%$$

### ***4.3. Third phase: the verification of an explicative hypothesis for each of the aforementioned variables, or failing that, of the null hypothesis***

We have attempted to verify hypotheses for all 17 variables found in literature. According to these hypotheses each of these variables will be capable of explaining, to a certain extent, the behavior as regards transparency of a sample of municipalities, or failing that, the null hypothesis will show the absence of a relationship between each variable and transparency. The 17 variables verified are shown in the following table along with the source of information used to assess them.

**Table 3:** Variables verified and their corresponding information source

Variable to be verified	Information Source
v1: size of population	SNIS (Spanish National Institute of Statistics)
v2: level of income	SIELOCAL Municipal financial information
v3: debts	SIELOCAL Municipal financial information
v4: fiscal characteristics	SIELOCAL Municipal financial information
v5: level of education*	EUROSTAT
v6: political compromise (% of votes)	Home Office
v7: volume of investment	SIELOCAL Municipal financial information
v8: political strength (majority – yes/no)	Council websites
v9: how well-known the municipality is	Google trend
v10: ideology (right/left-wing)	Council websites
v11: unemployment rate	SNIS INE
v12: total spending per capita	SIELOCAL Municipal financial information/population (SNIS)
v13: transfers received per capita	SIELOCAL Municipal financial information/population (SNIS)
v14: capital of province	--
v15: budgetary deficit/surplus	SIELOCAL Municipal financial information
v16: mayor's political profile (nationalist? – yes/no)	Council websites
v17: tourism activities	SNIS

\* Average number of pupils enrolled at secondary level.

**Source:** The authors

Previously to the analysis it has been obtained the following descriptive statistics:

**Table 4:** Descriptive Statistics

	N	Minimum	Maximum	Means		Standard Deviation
	Statistics	Statistics	Statistics	Statistics	Standard Error	Statistics
v1: size of population	144	50401	3207247	170376.96	25690.115	308281.383
v2: level of income	144	35.16	3366.23	624.8223	67.45611	809.47329
v3: debts	144	0	361	85.17	4.814	57.769
v4: fiscal characteristics	144	254.00	1116.17	559.0649	14.08345	169.00145
v5: level of education <sup>2</sup>	144	15.50	27.70	22.1243	.19407	2.32879
v6: political compromise. % vote	144	32.61	60.31	45.4397	.49637	5.95639
v7: volume of investment	144	.38	207.28	68.6132	4.05615	48.67384
v8: political strength (majority – yes/no)	144	0	1	.51	.042	.502
v9: how well-known the municipality is	144	0	78	52.49	1.489	17.863
v10: ideology (right/left-wing)	144	1	2	1.24	.036	.426
v11: unemployment rate	144	13.41	41.26	24.3748	.64062	7.68749
v12: total spending per capita	144	596.46	1570.52	959.6296	18.80833	225.69990
v13: transfers received per capita	144	86.30	767.26	289.1085	8.73804	104.85653
v14: capital of province	144	0	1	.35	.040	.478
v15: budgetary deficit/surplus	144	0	1	.76	.036	.426
v16: mayor's political profile (nationalist? – yes/no)	144	0	1	.12	.027	.324
v17: tourism activities	144	18.16	93.18	33.1126	1.45060	17.40718
T: Global Transparency	144	.22	4.38	2.6333	.07226	.86718
T1: Institutional Transparency	144	.00	4.55	2.3107	.09607	1.15287
T2: Legal Transparency	144	.00	5.00	4.7570	.07869	.94433
T3: Economic Transparency	144	.00	5.00	2.3194	.10029	1.20352
T4: Request of access to information	144	.00	5.00	3.0494	.09266	1.11194
N	144					

\* Average number of pupils enrolled at secondary level.

**Source:** The authors

As it can be observed some variables have a standard deviation which is not compatible with the normal distribution. The heterogeneity of the variables suggests not taking them into consideration in a correlation model. Assuming this limitation we have opted to analyze and contrast individually, due to the fact that these variables have been tested in previous researches.

Methodologically, the measure habitually used to study correlation is Pearson's lineal correlation coefficient. This coefficient measures the degree of lineal association between any two variables, and can be calculated by dividing the covariance of both between the product of the typical deviation of the two variables.

For any set of data, and once the coefficient of correlation between a pair of variables X and Y has been calculated, it is possible to carry out a simple hypothesis test based on the Student t distribution, in order to evaluate the significance of the coefficient of correlation and to confirm whether or not there is a statistically significant association between both characteristics. It is definitively possible to study the statistical significance of the coefficient of correlation by determining whether r is statistically different to zero. It is also possible to obtain an interval of confidence for the correlation coefficient in the population. However, while the value of Pearson's correlation coefficient can be calculated for any data set, the validity of the hypothesis test as regards the correlation between the variables requires at least one of them to have a normal distribution. Even under this supposition, the distribution of the correlation coefficient will not be normal, but it can be transformed to obtain a value z that has a normal distribution and which can be used to calculate its corresponding confidence interval.

The following tables show the values obtained for the Pearson's correlation coefficient, along with the ANOVA table containing the levels of significance obtained by said variables.

**Table 5:** Pearson analysis of the dependent variable 'global transparency' and the independent variables

PEARSON ANALYSIS		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Global transparency	Pearson Correlation	.276**	-.047	-.075	.137	.169*	.118	.210*	.091	.237**	-.075
	Sig. (bilateral)	.001	.578	.370	.102	.042	.160	.012	.276	.004	.372
	N	144	144	144	144	144	144	144	144	144	144

\* The correlation is significant to the level of 0.05 (bilateral).

\*\* The correlation is significant to the level of 0.01 (bilateral).

PEARSON ANALYSIS		V11	V12	V13	V14	V15	V16	V17
Global transparency	Pearson Correlation	-.312**	.195*	.087	.274**	-.007	.079	-.115
	Sig. (bilateral)	.000	.019	.302	.001	.937	.349	.169
	N	144	144	144	144	144	144	144

\* The correlation is significant to the level of 0.05 (bilateral).

\*\* The correlation is significant to the level of 0.01 (bilateral).

**Table 6:** Pearson Analysis of dependent variables T1, T2, T3 and T4 and independent variables

PEARSON ANALYSIS		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Institutional Transparency	Pearson Correlation	.167*	-.039	-.007	.006	.072	.072	.187*	.103	.197*	.008
	Sig. (bilateral)	.046	.646	.936	.943	.392	.394	.025	.218	.018	.928
	N	144	144	144	144	144	144	144	144	144	144
Legal Transparency	Pearson Correlation	.059	.062	-.164*	.080	.116	.040	.093	.093	.218**	-.088
	Sig. (bilateral)	.482	.463	.050	.342	.168	.635	.269	.266	.009	.294
	N	144	144	144	144	144	144	144	144	144	144
Economic Transparency	Pearson Correlation	.256**	-.050	-.032	.200*	.162	.119	.159	.061	.163	-.081
	Sig. (bilateral)	.002	.553	.707	.016	.053	.155	.057	.466	.051	.335
	N	144	144	144	144	144	144	144	144	144	144
Transparency re access to information	Pearson Correlation	.200*	-.049	-.250**	-.100	.124	.025	.157	-.019	.143	-.067
	Sig. (bilateral)	.016	.560	.002	.235	.139	.764	.061	.823	.087	.424
	N	144	144	144	144	144	144	144	144	144	144

\* The correlation is significant to the level of 0.05 (bilateral).

\*\* The correlation is significant to the level of 0.01 (bilateral).

PEARSON ANALYSIS PARTIAL TRANSPARENCY		V11	V12	V13	V14	V15	V16	V17
Institutional Transparency	Pearson Correlation	-.269**	.115	.179*	.322**	.025	.082	-.203*
	Sig. (bilateral)	.001	.169	.032	.000	.769	.330	.015
	N	144	144	144	144	144	144	144
Legal Transparency	Pearson Correlation	-.269**	.068	-.043	.111	.001	.094	.076
	Sig. (bilateral)	.001	.417	.611	.186	.989	.260	.364
	N	144	144	144	144	144	144	144
Economic Transparency	Pearson Correlation	-.201*	.205*	-.004	.160	-.036	.015	-.042
	Sig. (bilateral)	.016	.014	.959	.055	.669	.856	.619
	N	144	144	144	144	144	144	144
Transparency re access to information	Pearson Correlation	-.270**	-.027	.174*	.176*	.091	.126	-.102
	Sig. (bilateral)	.001	.745	.037	.035	.276	.133	.225
	N	144	144	144	144	144	144	144

\* The correlation is significant to the level of 0.05 (bilateral).

\*\* The correlation is significant to the level of 0.01 (bilateral).

**Table 7:** ANOVA of a factor between the global transparency and the independent variables with a significant correlation in the Pearson analysis

ANOVA of a factor						
		Sum of squares	gl	Quadratic mean	F	Sig.
Population	Inter-group	1.289E+13	111	116161460964.227	5.337	.000
	Intra-group	6.964E+11	32	21763363538.828		
	Total	1.359E+13	143			
Education level	Inter-group	700.257	111	6.309	2.682	.001
	Intra-group	75.268	32	2.352		
	Total	775.525	143			
Volume of investment	Inter-group	290077.575	111	2613.311	1.717	.040
	Intra-group	48709.814	32	1522.182		
	Total	338787.389	143			
How well-known municipality is: Google trends	Inter-group	36882.972	111	332.279	1.216	.268
	Intra-group	8747.000	32	273.344		
	Total	45629.972	143			

ANOVA of a factor						
		Sum of squares	gl	Quadratic mean	F	Sig.
Unemployment rate	Inter-group	7008.769	111	63.142	1.401	.137
	Intra-group	1442.176	32	45.068		
	Total	8450.945	143			
Capital of province	Inter-group	26.472	111	.238	1.238	.248
	Intra-group	6.167	32	.193		
	Total	32.639	143			

**Table 8:** ANOVA of a factor between T1 and the independent variables of significant correlation in the Pearson analysis

ANOVA of a factor						
		Sum of squares	gl	Quadratic mean	F	Sig.
Tourism activity	Inter-group	5407.310	10	540.731	1.896	.051
	Intra-group	37923.107	133	285.136		
	Total	43330.418	143			
Population	Inter-group	2017485923409.074	10	201748592340.907	2.319	.015
	Intra-group	11572863876862.674	133	87014014111.749		
	Total	13590349800271.748	143			
Unemployment rate	Inter-group	1628.796	10	162.880	3.175	.001
	Intra-group	6822.149	133	51.294		
	Total	8450.945	143			
Capital of province	Inter-group	4.781	10	.478	2.283	.017
	Intra-group	27.858	133	.209		
	Total	32.639	143			
Volume of investment	Inter-group	25766.359	10	2576.636	1.095	.371
	Intra-group	313021.030	133	2353.542		
	Total	338787.389	143			
How well-known municipality is Google trends	Inter-group	4557.620	10	455.762	1.476	.155
	Intra-group	41072.352	133	308.815		
	Total	45629.972	143			
Transfers received per capita	Inter-group	139534.374	10	13953.437	1.295	.239
	Intra-group	1432735.218	133	10772.445		
	Total	1572269.592	143			

**Table 9:** ANOVA of a factor between T2 and the independent variables with a significant correlation in Pearson analysis

ANOVA of a factor						
		Sum of squares	gl	Quadratic mean	F	Sig.
Debt (%)	Inter-group	21301.487	3	7100.496	2.180	.093
	Intra-group	455926.513	140	3256.618		
	Total	477228.000	143			
How well-known the municipality is: Google trends	Inter-group	2323.367	3	774.456	2.504	.062
	Intra-group	43306.605	140	309.333		
	Total	45629.972	143			
Unemployment rate	Inter-group	647.440	3	215.813	3.872	.011
	Intra-group	7803.505	140	55.739		
	Total	8450.945	143			

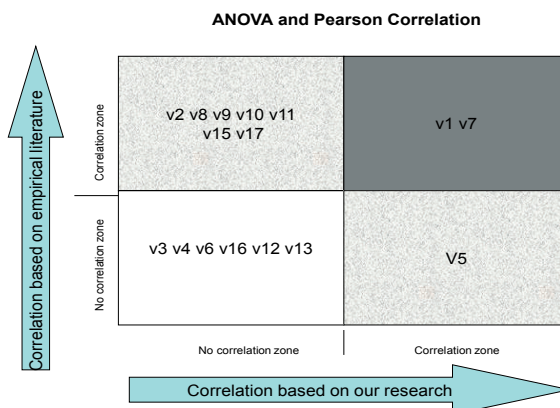
**Table 10:** ANOVA of a factor between T3 and the independent variables with a significant correlation in Pearson analysis

ANOVA of a factor						
		Sum of squares	gl	Quadratic mean	F	Sig.
Debts (%)	Inter-group	21301.487	3	7100.496	2.180	.093
	Intra-group	455926.513	140	3256.618		
	Total	477228.000	143			
How well-known municipality is Google trends	Inter-group	2323.367	3	774.456	2.504	.062
	Intra-group	43306.605	140	309.333		
	Total	45629.972	143			
Unemployment rate	Inter-group	647.440	3	215.813	3.872	.011
	Intra-group	7803.505	140	55.739		
	Total	8450.945	143			

**Table 11:** ANOVA of a factor between T4 and the independent variables with a significant correlation in Pearson analysis

ANOVA of a factor						
		Sum of squares	gl	Quadratic mean	F	Sig.
Population	Inter-group	6581258613581.317	33	199432079199.434	3.130	.000
	Intra-group	7009091186690.432	110	63719010788.095		
	Total	13590349800271.750	143			
Fiscal pressure / inhab.	Inter-group	1380179.997	33	41823.636	1.701	.022
	Intra-group	2704113.084	110	24582.846		
	Total	4084293.081	143			
Unemployment rate	Inter-group	2263.474	33	68.590	1.219	.222
	Intra-group	6187,471	110	56,250		
	Total	8450,945	143			
Total spending per capita	Inter-group	1673639,286	33	50716,342	.994	.488
	Intra-group	5610844,424	110	51007,677		
	Total	7284483,710	143			

#### 4.4. Fourth phase: the creation of a matrix of variables



**Figure 2:** Matrix of correlation of variables Correlation with Pearson analysis and ANOVA analysis Non-correlation zone and Correlation verification zone

**Source:** The authors

## 5. Conclusions

The most significant finding of our research allows us to state that there are two explicative variables for municipal transparency, which are present in the majority of works previously consulted and which are valid as regards explaining transparency when the indexes employed to measure the latter are constructed using the legal requirements that are currently in force in accordance with the regulations recently approved in Spain. More specifically, we refer to the variables 'size of population (v1)' and 'volume of investment (v7)'. It is possible to establish a direct relationship in the case of both these variables, such that the greater the size of the population and the greater the volume of investment, the greater the transparency obtained. We therefore coincide with existing literature in giving the explicative value to these two socio-economic variables as regards transparency. It would appear to be coherent that those municipalities with larger populations in which the relationship between those in power and the public is much decreased must make a greater effort with their on-line accountability. Likewise, the volume of investment demonstrates better public resources.

In addition to the aforementioned variables, our research has also shown that the variable 'level of education (v5)' of the municipality's inhabitants is an explicative variable as regards the level of transparency, such that higher levels of education correspond with a greater degree of transparency. This variable is, in the majority of previous studies, presented as a non-explicative factor in transparency, unlike the results of our methodology, i.e., it is efficient when the dependent-transparency variable is constructed using an index based on Spanish legislation that is currently in force. We coincide with the previous studies in that certain variables which may *a priori* appear to be explicative of transparency are in fact not so. This is true in the case of debts, fiscal characteristics, political compromise measured as the percentage of votes obtained in the last municipal elections, total spending per capita, whether or not the governing team has a nationalistic profile and transfers received per capita.

Nevertheless, there is a large set containing variables that are different to those found in traditional indices not based on strictly legal criteria when verified using our transparency index. That is, these traditional indices do explain the transparency perceived by the public or by experts, but they do not explain transparency according to the criteria of Law no. 19/2013 of December 9, 2013. These are economic variables such as the municipality's income (v2), unemployment rate (v11) and tourism activities (v17); political variables such as the political strength of the governing team or majority governance (v8), the left or right-wing ideology of the party (v10); and budgetary factors, which refer to the deficit or surplus obtained by non-financial operations (v15). To these variables we can add how well the municipality is known on the Internet. The fact that they have not been verified in our research does not make their capacity to predict a certain degree of 'transparency' less relevant, but is rather a case of a measure of transparency that has been created with different criteria to those contained in the aforementioned law.

Given that our transparency index (T) has been created as the sum of four sub-indices (T1, T2, T3 and T4) that measure different perspectives of transparency in accordance with the articles of the law, it is possible to explore the explicative nature of the variables according to these facets in greater depth. We can therefore state that the variable that best explains transparency is size of population, since this is how economic transparency is explained by accessing institutional information (up to three different facets), while the other variables identified as being explicative do so as regards partial aspects of transparency. Our research also allows us to conclude that the aspect of transparency that can best be justified through the use of explicative independent variables is undoubtedly economic transparency (T3), i.e., that which permits the public to be informed about the results of municipal economic-financial activity.

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