Factors influencing the transparency in Portuguese Local Government: an empirical study

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Abstract. Citizens is demanding access to public information as a way to have more control over governments. Been more transparent in the conduct of their activities and political responsibilities, has been the response from governments to such pressures. A response which aim to improve good governance.

Transparency is about government decisions, increasing the effectiveness of government management and look for standards of ethics (Backstrand & Saward, 2004). It about the availability of information concerning government organizations that allows citizens and other external actors to monitor and assess internal work and performance of public organizations (Meijer, 2013; Grimmelikhuijsen & Welch, 2012). It is a mechanism used to improve good governance in public services (Piotrowski, 2007; Bauhr & Grimes, 2014) and increase the public’s ability to access government information (Roberts, 2006).

Literature about transparency is largely based on the explanations of the agency theory (Zimmerman, 1977) and the legitimacy theory (Patten, 1992). Based on the postulates of both theories, the purpose of this paper is to analyses the main features that are affecting transparency in Portuguese municipalities. It aims to answer the following research questions: What has been the evolution in the level of transparency in Portuguese municipalities? What factors influenced Local Government transparency?

Recent literature about local governments transparency claims that the disclosure of information may be conditioned by certain socioeconomic and political characteristics (Araujo & Tejedo-Romero, 2016; Cuadrado-Ballesteros, 2014). Since transparency problems are more frequent at local level, the construction of a transparency index for municipalities by a non-governmental Portuguese agency, the Transparency and Integrity Civic Association (TIAC), open the opportunity to test which factors influence municipal transparency.

This paper contributes to the literature on transparency by empirically testing a theoretical framework that explains the factors influencing Local Government transparency in Portuguese municipalities. It examines empirical evidence from Portuguese municipalities for two reasons: first, (1) to analyse the evolution of the Transparency in Portuguese municipalities, (2) to analyse the factors which influenced municipal transparency. Few studies have been produced for the Portuguese case and this is a contribution to understand municipalities answers to the increasing demands for transparency from Portuguese civil society. The empirical framework focuses on the factors, which influences transparency, using panel data and hypothesizes two explanations for it: socioeconomic and political factors. Data is collected for all the Portuguese municipalities from official sources.
1. Introduction

Access to information open public organizations to citizen’s scrutiny and improve their confidence concerning organization activities and actions (Archel et al., 2009). Demand for transparency grew rapidly since the Transparency International global movement, and more recently the Open Government Partnership initiative. Several countries engaged on initiative to promote transparency in public organizations (Ball, 2009). Transparency and the openness of government operations is considered a condition to improve government outcomes and managerial effectiveness, a key feature of good governance (Backstrand & Saward, 2004; Piotrowski, 2007). The challenge to provide information to citizens go further than passively provide information only on request of citizens and at discretion of governments. Governments are engaged in more active information disclosure with public organizations providing understandable information to external stakeholders.

Portugal is an interesting case study because access to public information is a constitutional right since 1989. The constitution gives to citizens the right to access public information, a right which was regulated by law in 1993. The law established the conditions to access administrative information defining a ‘passive’ form of transparency, where public organizations respond reactively to information requests from citizens. There was no obligation from government bodies or public entities to inform citizens about their activities.

The implementation in 2013 of a municipal transparency index by the non-governmental agency TIAC-Transparência e Integridade, Associação Cívica (Transparency and Integrity, Civic Association), a Portuguese representative of Transparency International, and the approval of the transparency law in 2016, changed the conditions to access to administrative information. There was a move from a ‘passive’ form of transparency toward an ‘active’ one. The law established that information about the operations and control of administrative activities shall be disseminated on a regular basis in an open and readable format. Information should be disclosed in public organizations websites in a free and open access.

This study focuses on municipal transparency because since 2013 TIAC has published four editions of the municipal transparency index. Among municipalities there is a growing interest in the index because it has been used as a benchmarking of good governance. Since Portuguese municipalities are all subject to the same legislation and have similar policy instruments differences on the transparency index are the result of the actions of municipalities and their political characteristics. On the other hand, it is at municipal level that interactions between citizens and government are crucial for local representative democracy. This increasing interactive role in citizens’ well-being can be reinforced by initiatives to promote transparency.

This paper contributes to the literature on transparency by empirically testing a theoretical framework that explains the factors influencing Local Government transparency in Portuguese municipalities. It examines empirical evidence from Portuguese
municipalities for two reasons: first, (1) to analyse the evolution of transparency in Portuguese municipalities, (2) to analyse the factors which influenced municipal transparency. It is a longitudinal study that covers a period of 4 years covering the period between 2013 and 2016, using panel data methodology, which has not been used to analyse municipal transparency in Portugal. Panel data analysis improves the efficiency of econometric estimates by capturing unobservable heterogeneity (Baltagi, 2014; Wooldridge, 2010).

Few studies have been produced for the Portuguese case and this is a contribution to understand municipalities’ answers to the increasing demands for transparency from Portuguese civil society. The empirical framework focuses on the factors, which influences transparency, using panel data and hypothesizes two explanations for it: socioeconomic and political factors. Data is collected for all the Portuguese municipalities from official sources.

The structure of the paper is organized as follows: in the next section, we review the literature on transparency and hypothesis development, and then develop the research methodology, in fourth section the results and discussion of main findings, and the main conclusions in the fifth section.

2. Theoretical Background and Hypotheses Development

2.1. Transparency literature review

Transparency is about the availability and access to information concerning government organizations (Roberts, 2006). It concerns the access to information by citizens and other stakeholders and its usability (demand side of transparency) and the availability of information (supply side of transparency). The literature claims (Hirsch and Osborne, 2000; Bauhr & Grimes, 2014) that the disclosure of information about policy, administrative and managerial effectiveness can improve good governance (Backstrand & Saward, 2004; Piotrowski, 2007). Information disclosure allows citizens and other stakeholders to monitor and assess the performance of public organizations (Meijer, 2013; Grimmelikhuijsen & Welch, 2012).

The way information is available and transparency works vary among administrative systems. In some countries information is disclosed proactively with public organizations been ‘active’ in providing understandable information to external stakeholders. In other countries information is available by request from citizens. This is a ‘passive’ form of transparency where public organizations respond reactively to external demands (Araujo & Tejedo-Romero, 2016). Regardless of the way information is available, Hood (2006) points out that information should be understandable to citizens and other stakeholders.

In our study transparency is related to information disclosed proactively (supply side of transparency), been municipalities ‘active’ in providing understandable information to citizens and other external stakeholders (Bauhr & Grimes, 2014).
Studies about transparency are based on the agency theory (Eisenhardt, 1989) and the legitimacy theory (Shapiro, 2005) to explain the incentives behind governments’ decisions to be ‘active’ in providing understandable information, been more transparent. Agency theory claims that there is information asymmetry in the relation between government and citizens (Lane, 2005; Zimmerman, 1977). To hold elected officials accountable for their actions and acting according to their responsibilities citizens should have access to information that allows monitoring the actions of elected officials (Laswad, Fisher & Oyelere, 2005). Transparency as voluntary or compulsory disclosure of information has been a way to reduce information asymmetries and increase the degree of confidence and public trust in political actors (Fung 2013). On the other hand, the legitimacy theory claims that the disclosure of information may be used to improve the confidence of citizens concerning organization activities and actions (Archel et al., 2009; Patten, 1992), enhancing the legitimacy of elected public officials. According to De Fine Licht et al. (2011), the legitimacy of representative decision-making can be improved by transparency. Information diffusion and transparency enhance the citizens’ sense of control producing a positive effect on public perceptions of political decisions and decision makers. It may be used to change citizen’s perceptions of government to regain the confidence of citizens to secure legitimacy and enhance municipalities’ reputation (Pina, Torres & Royo, 2010).

2.2. Transparency in Portuguese Municipalities

Portugal is a unitary state with 278 municipalities in the mainland and 30 in the two Atlantic archipelagos. The Portuguese Constitution established a three levels of Government: administrative regions, municipalities and parishes (freguesias). Administrative regions have not yet been implemented in the mainland Portugal. The only two autonomous regions are the Atlantic archipelagos: Azores and Madeira. Local government include the municipalities and the parishes. Each municipality including several parishes. Parishes are the lowest administrative unit which have a very limited scope of competences and resources and make the link between the municipality and the population needs.

Municipalities are responsible for delivering local public services to the population. They are governed by a Municipal Assembly (the deliberative branch) and a City Council (the executive branch) who are elected for a mandate of four years. The members of the deliberative and executive branches are elected directly by citizens, being the Mayor the first candidate of the party’s list for the City Council.

2.2.1. Transparency Regulatory Context

Portugal is one of the European countries pioneer in regulating the access to public information. Since 1989 the Portuguese Constitution established the principle of ‘Open Administration’ (Article 268.2) given to citizens the right to access administrative files and records, except for those issues concerning internal and external security or relating to personal data of citizens. This constitutional principle was regulated by Law No.
65/1993 which established the conditions to access to administrative information. However, the law did not oblige government bodies or public entities to inform citizens about their activities.

In 2007 the socialist government revoke the 1993 legislation and approve the Law n. 46/2007, of 24 August which establish “the right of access to the administrative documents, which includes the rights of consultation, reproduction and information on their existence and content” (Article 5º). The law allowed citizens to access public information when requested, but it does not oblige government bodies or public entities to inform citizens about their activities. The centre right parties refused the proposal from the socialists to introduce in the law the obligatoriness for all public entities to disclosure information through the internet in a complete, organized and with a language easy to understand.

In 2016 the socialist government approved the Law nº 26/2016 of 22 of August which introduced the active disclosure of information about the operations and control of activities to ensure the transparency of administrative activities. The law established that information should be disseminated on a regular basis, and updated by the respective bodies and entities, in an open format and on terms that allow access to the content in an unconditional way, making available in readable formats, which allow its further automated treatment (Article 10.3). Public entities should disclose information in their websites ensuring their comprehensibility, in a free and open access ensuring the interoperability, the quality, integrity and authenticity of data and their identification and location (Article 2).

To ensure that public organizations respond to citizens' requests for administrative information, a supervisory body has been established, the Commission for Access to Administrative Documents (CADA). It is an independent administrative entity, which works with the Assembly of the Republic and has the purpose of ensuring, in accordance with the law, the compliance with legal provisions regarding access to administrative information.

Access of public information contribute to reduce information asymmetry between government and the citizens, which is considered essential for good governance (Piotrowski, 2007; Roberts, 2006). Transparency and access to information are important for public scrutiny, participation and accountability, increasing citizens' confidence in government. In order to assess the degree of transparency, several international organizations have created indicators to measure the level of transparency. In the Portuguese case the level of transparency of local government is assessed, since 2013, by the TIAC, a national representative of Transparency International. The last edition of the transparency index was published in 2016.

The index measures the transparency of municipalities based on information about their composition, functioning and management, available in the portals of the City Councils. It includes 76 indicators about the information available in the municipality websites. Indicators are grouped in seven dimensions: A) Organizational information, social
composition, and operation of the municipality (18 indicators); B) Plans and planning (13 indicators); C) Local taxes, rates, service charges, and regulations (5 indicators); D) Relationship with citizens (8 indicators); E) Public procurement transparency (10 indicators); F) Economic and financial transparency (12 indicators); G) Transparency in Urban planning (10 indicators) (TIAC, 2013). The indicators are binary variables, that is, assume the value of 1 if the corresponding information is made available online or 0 (zero) if it is not. The transparency index analyses information about local governance available on municipalities’ websites creating universal criteria for measuring the levels of transparency. It measures the proactive disclosure of information by municipalities. Disclosure of municipal rankings pressure municipalities to improve communication with citizens through a more open and accountable way. Hence, to answer to the first research question we formulate the following hypothesis:

**H1:** Portuguese municipalities are becoming more transparent over the years.

### 2.3. Determinants of municipal transparency

In recent years internet has been used widely as an instrument for information disclosure. It is a good channel of communication which make easier the access to information for a great number of users and satisfying their need for information. According to Caba, Rodríguez and López (2014), the level of internet access is an important and determinant factor of transparency. Internet access increased citizens’ ability to access the municipality’s website and to demand an efficient, responsible and transparent government (Gandía & Archidona, 2008; Pina et al., 2010). It is expected that citizens using the internet will put greater pressure on municipal officials. Therefore, as a response, municipalities will try to be more transparent. Hence, we formulate the following hypothesis:

**H2:** There is a positive relationship between the level of transparency and the internet access by citizens.

Several studies show that wealthier municipalities with a more prosperous population are those with citizens more aware of transparency and accountability issues (Piotrowski & Van Ryzin, 2007; Giroux & McLelland, 2003). Citizens expect more information to confirm if their taxes are being spent effectively and will be more interested in the management of local finances. On the other hand, having a wealthier municipality is a sign of management quality which may be beneficial for local politicians (Laswad, et al., 2005). It can improve their reputation and the chances of re-election (Gandía & Archidona, 2008). It is expected this will increase information disclosure. Hence, we formulate the following hypothesis:

**H3:** There is a positive relationship between the level of transparency and wealthier municipalities.

Local revenues come from two kind of sources: from own source revenues and from intergovernmental transfers. As much as financial resources come from own-source
revenues, as higher is financial independence. It is expected that the higher is financial independence, the more accounting information municipalities have to disclosure and more transparency is required to account for the use of the taxes received. Financial independence plays an important role in transparency and information disclosure municipalities. According to Ingram and DeJong (1987), higher revenues received from taxes is an incentive to disclosure financial information to demonstrate the transparent management of resources received and that public managers have acted according to their responsibilities (Alcaide-Muñoz, Rodríguez-Bolívar, & López-Hernández 2016). According to Alcaide-Muñoz et al. (2016), the transparency of financial information on municipalities’ websites is higher when they receive larger financial resources from own-sources. We propose the following hypothesis:

**H4:** There is a positive relationship between the level of transparency and financial independence.

The capacity to finance public services and programs depends on the levels of municipal debt. The debt shows municipalities’ financial condition and its credibility vis-à-vis external agents (Caba et al., 2014) to finance the provision of public services and programs. In situations of indebtedness (the debt to income ratio) municipalities may use financial information disclosure to demonstrate their ability to meet financial obligations. Financial information disclosure improve transparency and show to creditors the financial situation and risk, which can influence the cost of funding from external sources. According to Albalate, (2013) and Gandía & Archidona, (2008) there are a relationship between the levels of debt and the level of transparency. We established the following hypothesis:

**H5:** There is a positive relationship between the level of transparency level and the debt to income ratio.

Citizens’ concern and involvement in politics is expressed by electoral turnout. Several studies show that citizens involvement and the growing interest in local government activities is influenced by the access to information (Hollyer, Rosendorff, & Vreeland 2011; Caamaño-Alegre et al., 2013). In the same way, it is expected that there will be a link between transparency and electoral turnout. Thus, the level of electoral turnout may indicate the interest in local government’s activities. In the same way, low levels of electoral turnout might indicate that citizens have little interest in local government’s activities. Increasing the levels of municipal transparency may boost citizens’ involvement in politics and interest in municipality’s activities, influencing the level of electoral turnout (Araujo & Tejedo-Romero, 2016). Hence, we formulate the following hypothesis:

**H6:** There is a negative relationship between the level of municipal transparency and electoral turnout.

Several studies (Piotrowski & Van Ryzin, 2007; Araujo & Tejedo-Romero, 2016) shows a relationship between political ideology and transparency. Municipalities ruled by left-wing political parties disclose more information and are more transparent than those
municipalities governed by right-wing political parties (Albalate, 2013; Guillamón, Bastida & Benito, 2011). Since left-wing parties tend to advocate greater state intervention, they disclose more information to justify their choices. We propose the following hypothesis:

**H7:** There is a positive relationship between the level of transparency and municipalities ruled by left-wing parties.

3. Research Methodology

This section presents the sample used and justifies the variables selected to test the hypotheses of the empirical study and the empirical model specification.

3.1. Sample

The sample employed to test hypotheses comprises the 308 Portuguese municipalities, in a period of 4 years, for which data has been published by Portuguese Transparency and Integrity, Civic Association (TIAC) – years of 2013, 2014, 2015 and 2016. The analysis is based on panel data methodology. This methodology is consistent with the approach adopted by Alt and Lassen (2006), Bauhr and Grimes (2014) and Cuadrado-Ballesteros (2014). Panel data permitted the control of unobserved individual and/or time-specific heterogeneity that is correlated with included explanatory variables (Baltagi, 2014). By combining time-series and cross-sectional data, unobservable individual-specific effects (possibly correlated with other explanatory variables) were controlled too (Hausman & Taylor, 1981). In general, a panel data set is defined as T observations (over time) of V variables (comprising the regression model) for N units of observation (individual municipalities in our case). After discarding observations with missing data, we end up with an unbalanced panel data of 1,098 observations (municipality-year) for 308 municipalities for 4 years.

3.2. Variables and data collection

**Dependent Variable.** The chosen dependent variable was the Portuguese municipalities transparency index (TI), published by TIAC. This index is a proxy to measure the level of transparency of the municipalities according to the information available in the portals of the municipal councils. The index takes values between 0 and 100. The information needed to create the dependent variable was taken from the website of the TIAC (see: https://transparencia.pt/indice-de-transparencia-municipal/).

**Independent Variables.** We selected the following variables that could contribute to increase of the level of transparency:

- **Internet access.** It is a numeric variable calculated as the total of residential access to broadband internet service divided by population density.
Wealthier municipalities. This is a numeric variable represented by the performance index as a proxy of wealthier municipalities. This variable is calculated based on indicators related to regional growth.

Financial Independence. It is a numerical variable that represents the ratio between own source revenue and the total of effective revenue. Own source revenue corresponds to the sum of tax revenue (direct taxes, indirect taxes, fees, fines and other penalties), revenue from sales of goods and services, income from property and sales of investment property. Total of effective revenue corresponds to total revenue less financial assets and liabilities.

Debt to Income Ratio. It is a numerical variable that represents the ratio of the total debt and the actual revenue. The total debt includes loans, leasing contracts and other debts to third parties resulting from budgetary operations. It is also considered the gross debt of local authority services, inter-municipal entities, municipal membership entities, municipal corporations and participated companies, when out of financial balance. Actual revenue corresponds to total revenue less financial assets and liabilities.

Electoral Turnout. This is a numerical variable that represents the percentage of participation in the last local elections in the municipality.

Political Ideology. It is a dummy variable given the value of 1 if the municipal ruling leader belongs to a left-wing party, and 0 otherwise.

Control variables. To avoid biased results, we want to control the effect of the electoral cycle that may influence the level of transparency of municipalities. According to Alt & Lassen (2006), Cuadrado-Ballesteros (2014) and Vicente, Benito and Bastida (2013) pre-electoral manipulation of spending or deficits can attenuate the levels of transparency in order to incumbent political parties increase their re-election changes.

PreElection. This is a dummy variable given the value of 1 in the previous year and 0 otherwise.

Election. This is a dummy variable given the value of 1 in the election year and 0 otherwise.

PostElection. It is a dummy variable taken the value of 1 in the year after election and 0 otherwise.

Data from independent and control variables were collected from the General Directorate of Local Authorities annual publication “Municipal Finances”, National Elections Commission, Portuguese National Statistics Institute and Marktest’s Sales Index database.

For the year 2013 data was collected from the results occurred in November 2009 elections. For the years 2014, 2015 and 2016, data was extracted from the results occurred in November 2013 elections.
3.3. **Empirical model specification and estimation method**

We adopt the unbalanced panel data regression method and is empirically tested using the following econometric models:

\[
\text{Transparency}_{it} = \alpha + \beta_1 \text{Internet access}_{it} + \beta_2 \text{Wealthier municipalities}_{it} + \beta_3 \text{Financial Independence}_{it} + \beta_4 \text{Debt to Income Ratio}_{it} + \beta_5 \text{Electoral Turnout}_{it} + \beta_6 \text{Political Ideology}_{it} + \beta_7 \text{PreElection}_{it} + \beta_8 \text{Election}_{it} + \beta_9 \text{PostElection}_{it} + \mu_{it} \tag{1}
\]

where the Transparency depends on a linear combination of a number of explanatory variables (Internet access, Wealthier municipalities, Financial Independence, Debt to Income Ratio, Electoral Turnout and Political Ideology) and the control variable (PreElection, Election and PostElection); \( \alpha \) is an scalar; \( \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8 \) and \( \beta_9 \) are the estimable parameter vectors; \( i =1, \ldots ,308; \ t=2013, 2014, 2015 \) and 2016; \( \mu_{it} \) represents the disturbance term. Most panel data applications utilise a one-way error component model for the disturbance, with:

\[
\mu_{it} = \mu_i + \epsilon_{it} \tag{2}
\]

where \( \mu_i \) represents the unobservable municipality specific effect and is time-invariant such as the ability of municipality to be transparent. The remainder disturbance \( \epsilon_{it} \) varies with municipalities and years and can be thought of as the usual disturbance in the regression.

Three estimator panels were considered: Pooled Ordinary Least Squares (POLS), Fixed Effects (FE), and Random Effects (RE). The POLS estimator assumes that all \( \mu_i \) and \( \bar{\delta}_t \) are equal. By allowing \( \mu_i \) and \( \bar{\delta}_t \) to differ, but assuming they are fixed numbers, the FE panel was generated. The RE panel assumes that unobserved effects are random variables.

### 4. Results and Discussion

This section provides empirical results of our study by using descriptive, bivariate and multivariate analyses. To avoid the influence of outliers, we winsorized the continuous variables Internet access, Wealthier municipalities, Financial Independence and Debt to Income Ratio at the 5 percent top and bottom percentiles of its distribution.

#### 4.1. Descriptive Analysis

Table 1 reports descriptive statistics for our dependent variable – Transparency.

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<tbody>
<tr>
<td>Mean</td>
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<td>34.5</td>
<td>45.1</td>
<td>53.2</td>
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<tr>
<td>Max</td>
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<td>81.6</td>
<td>94.2</td>
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<td>Min</td>
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<td>3.02</td>
<td>7.97</td>
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</table>
The above table shows that over the years, there are high increases in the average value of TI by the municipalities under analysis. The average value of TI increase from 33.7 in 2013 to 53.2 in 2016, with an average value of the index of 41.6 in the period 2013-2016. The maximum value was reached in 2016, the year of transparency law approval. This suggests that the level of transparency in Portuguese municipalities is increasing in order to legitimize their actions to the citizens. This may be due to politicians who govern the municipalities being aware that citizens are demanding more accountable actions, with transparency being a way to recover citizens’ lost trust. This confirms our first hypothesis that there was an increased in the level of transparency over the years. Our results are aligned with those obtained in previous works about municipal transparency (Albalate, 2013; Araujo & Tejedo-Romero, 2016).

Table 2 reports descriptive statistics for the independent and control variables. Panel A concerns the continuous variables, whereas Panel B presents information on the dummies variables.

Table 2: Descriptive statistics for independent and control variables

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<td>Wealthier Municipalities</td>
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<td>9.15</td>
<td>8.97</td>
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<tr>
<td>Max</td>
<td>81.1</td>
<td>78.2</td>
<td>81.4</td>
<td>81.4</td>
<td>81.4</td>
</tr>
<tr>
<td>Min</td>
<td>38.9</td>
<td>37.8</td>
<td>37.8</td>
<td>37.8</td>
<td>37.8</td>
</tr>
</tbody>
</table>

Panel B: Dummies variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N (observations)</td>
<td>274</td>
<td>273</td>
<td>278</td>
<td>273</td>
<td>1098</td>
</tr>
</tbody>
</table>
Internet access and wealthier municipalities variables slightly changed over the years, a sign that the country is recovering slowly from the deep depression caused by the bailout in 2011. This is supported by the changes in financial variables which show improvements in municipalities financial situation. Financial Independence increased due to the reduction of transfer from central government to municipalities and Debt to Income Ratio increased until 2014, and then decreased. Concerning political variables, the decrease of electoral turnout seems to express the distrust from citizens due to the austerity measures of the previous years. This is reinforced by electoral results with the increase of municipalities ruled by left-wing parties. It is worth to point out that central government was ruled by right-wing parties during the implementation of the austerity program. It seems that municipal elections were an opportunity for citizens penalized the right-wing parties that ruled the country.

Table 3 show the correlation matrix through Pearson coefficient and the variance inflation factor (VIF). We proceed to analyse the possible existence of linear relationships among dependent, independent and control variables.

Transparency is positively correlated at 1% level with Internet Access, Wealthier Municipalities, Financial Independent and with Pre-Election year. In addition, transparency is negatively correlated at 1% level with Electoral Turnout, Election Year and Pos-Election Year. However, it was not possible to confirm a significant pairwise correlation between transparency and Debt to Income Ratio and Political Ideology. Moreover, the values do not indicate collinearity. A collinearity problem is considered severe if a pairwise correlation coefficient is greater than 0.80 (Gujarati, 1995, p. 335). The mean VIF value was 1.71 (see the last column of Table 3), indicating that multicollinearity was not a problem in the regression models (a rule of thumb states that there is evidence of collinearity if VIF > 10).
### Table 3: Pearson correlation matrix

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Transparency</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Internet Access</td>
<td>0.0933***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.11</td>
</tr>
<tr>
<td>3.</td>
<td>Wealthier Municipalities</td>
<td>0.1646***</td>
<td>0.1205***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.22</td>
</tr>
<tr>
<td>4.</td>
<td>Financial Independence</td>
<td>0.2363***</td>
<td>0.0665**</td>
<td>0.7311**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.10</td>
</tr>
<tr>
<td>5.</td>
<td>Debt to Income Ratio</td>
<td>0.0218</td>
<td>-0.1084***</td>
<td>0.0489</td>
<td>0.1164***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.12</td>
</tr>
<tr>
<td>6.</td>
<td>Electoral Turnout</td>
<td>-0.2251***</td>
<td>-0.1697**</td>
<td>-0.5504***</td>
<td>-0.7042***</td>
<td>-0.025</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2.17</td>
</tr>
<tr>
<td>7.</td>
<td>Political Ideology</td>
<td>0.0284</td>
<td>0.1842**</td>
<td>0.0015</td>
<td>0.0072</td>
<td>0.0364</td>
<td>-0.04</td>
<td>1</td>
<td></td>
<td></td>
<td>1.03</td>
</tr>
<tr>
<td>8.</td>
<td>PreElection</td>
<td>0.3905***</td>
<td>0.0646**</td>
<td>0.0003</td>
<td>0.0596**</td>
<td>-0.0261</td>
<td>-0.0650***</td>
<td>0.0147</td>
<td>1</td>
<td></td>
<td>1.50</td>
</tr>
<tr>
<td>9.</td>
<td>Election</td>
<td>-0.2674***</td>
<td>-0.1122**</td>
<td>0.0038</td>
<td>-0.0788***</td>
<td>-0.2038***</td>
<td>0.2134***</td>
<td>-0.0568*</td>
<td>-0.3317***</td>
<td>1</td>
<td>1.65</td>
</tr>
<tr>
<td>10.</td>
<td>PostElection</td>
<td>-0.2421***</td>
<td>-0.0191</td>
<td>-0.0059</td>
<td>0.0147</td>
<td>0.1790***</td>
<td>-0.0808***</td>
<td>0.0233</td>
<td>-0.3309***</td>
<td>-0.3317***</td>
<td>1</td>
</tr>
</tbody>
</table>

**Mean VIF** 1.71

*** 1% significance, ** 5% significance, * 10% significance
Table 4 presents panel data regressions for the three estimators. To determine whether the correct estimator was used, we applied the Breusch-Pagan Lagrange Multiplier [LM] Test, the F-test for FE, and the Hausman Specification test (Wooldridge, 2010). The Breusch-Pagan LM Test ($p = 0.00$) confirmed that the RE model was more appropriate than the pooled OLS model. The F-test showed that the FE model was more appropriate than the POLS model ($p = 0.00$). To identify the most appropriate model (FE or RE), we checked the absence of correlation between the individual effects and the independent variables using the Hausman test. The FE model was the most suitable for our Model ($X^2_8 = 27.21$, Prob$>X^2_8 = 0.0007$).

The appropriateness of the FE model was investigated further by testing for autocorrelation, heteroskedasticity, and contemporaneous correlation. First, we applied Wooldridge’s (2002) test for serial correlation. The null hypothesis of no first-order autocorrelation was rejected ($F(1, 272) = 123.329$, $p = 0.0000$). Second, we applied a modified Wald test for groupwise heteroskedasticity in the residuals. This detected heteroskedasticity in the model ($X^2_{(278)} = 7.3e+31$, $p = 0.0000$). To deal with contemporaneous correlation, we applied the Pesaran test for cross-sectional independence in the residuals. There was contemporaneous correlation ($CD = 10.996$, $p = 0.000$). We corrected for cross-sectional dependence, groupwise heteroskedasticity, and AR(1) errors by estimating Prais–Winsten regressions with Panel-Corrected Standard Errors (PCSE), as suggested by Beck and Katz (1995) (see Table 4).

Table 4: Panel regression model

<table>
<thead>
<tr>
<th>Hypothesis/predict sign</th>
<th>POLS</th>
<th>FE</th>
<th>RE</th>
<th>PCSE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Access</td>
<td>H2(+)</td>
<td>0.0061 (0.0058)</td>
<td>0.0767* (0.0407)</td>
<td>0.0069 (0.0086)</td>
</tr>
<tr>
<td>Wealthier Municipalities</td>
<td>H3(+)</td>
<td>0.0085 (0.0191)</td>
<td>0.1651 (0.2753)</td>
<td>0.012 (0.0278)</td>
</tr>
<tr>
<td>Financial Independence</td>
<td>H4(+)</td>
<td>0.0016*** (0.0005)</td>
<td>0.0011 (0.0012)</td>
<td>0.0014*** (0.0006)</td>
</tr>
<tr>
<td>Debt to Income Ratio</td>
<td>H5(+)</td>
<td>0.0000 (0.0001)</td>
<td>0.0003 (0.0002)</td>
<td>0.0001 (0.0001)</td>
</tr>
<tr>
<td>Electoral Turnout</td>
<td>H6(-)</td>
<td>-0.0011 (0.0007)</td>
<td>-0.002 (0.0023)</td>
<td>-0.0011 (0.0010)</td>
</tr>
<tr>
<td>Political Ideology</td>
<td>H7(+)</td>
<td>0.0032 (0.0091)</td>
<td>0.0380** (0.0185)</td>
<td>0.011 (0.0116)</td>
</tr>
<tr>
<td>PreElection</td>
<td>0.0786*** (0.0125)</td>
<td>0.0808*** (0.0098)</td>
<td>0.0788*** (0.0096)</td>
<td>0.0720*** (0.0063)</td>
</tr>
<tr>
<td>Election</td>
<td>-0.1027*** (0.0131)</td>
<td>-0.0635*** (0.0211)</td>
<td>-0.0987*** (0.0110)</td>
<td>-0.0647*** (0.0067)</td>
</tr>
<tr>
<td>PostElection</td>
<td>-0.1064*** (0.0125)</td>
<td>-0.0953*** (0.0112)</td>
<td>-0.1046*** (0.0096)</td>
<td>-0.1062*** (0.0063)</td>
</tr>
</tbody>
</table>

1 We run the regression and test the residuals using the user-developed command xtdc2, which is a modification of xtdc command.
We used the index of transparency on a scale of 0-1. The logarithm transformation is used for Internet Access variable. Figures in parentheses are standard errors. *** 1% significance, ** 5% significance, * 10% significance.

# Panel-specific AR(1).

<table>
<thead>
<tr>
<th>Hypothesis/predict sign</th>
<th>POLS</th>
<th>FE</th>
<th>RE</th>
<th>PCSE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>0.4654***</td>
<td>0.6682***</td>
<td>0.4667***</td>
<td>-0.0027</td>
</tr>
<tr>
<td></td>
<td>(0.0568)</td>
<td>(0.2357)</td>
<td>(0.0767)</td>
<td>(0.0026)</td>
</tr>
<tr>
<td>Observations</td>
<td>1.098</td>
<td>1.098</td>
<td>1.098</td>
<td>1.098</td>
</tr>
<tr>
<td>R²(overall)</td>
<td>26.82</td>
<td>16.84</td>
<td>26.73</td>
<td>47.47</td>
</tr>
<tr>
<td>F(9, 1088)/ F(9, 811)</td>
<td>44.31***</td>
<td>62.92***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wald chi²(9)</td>
<td></td>
<td></td>
<td>585.61***</td>
<td>3638.95***</td>
</tr>
</tbody>
</table>

The final results obtained (see six column) show that the Internet access variable has a positive and significant relationship for a significance level of 1% (β₁ = 0.0840). This confirms that internet access is an important factor of transparency increasing citizens’ ability to access the municipality’s website to access to information. Results are consistent with previous works of Caba et al. (2014) and Gandía and Archidona (2008). We accept the hypothesis H2.

Wealthier Municipalities and Financial Independence variables have not been significant (β₂ = 0.1125; β₃ = 0.1125, respectively). Hypothesis H3 and H4 are not confirmed.

In the case of Debt to Income Ratio variable, there is a positive and significant relationship for a significance level of 1% with transparency (β₄ = 0.0003). Disclosure of financial information and transparency about the municipalities’ financial condition and its credibility is regarded important to demonstrate toward external agents their ability to meet financial obligations. The cost of funding from external sources is influenced by municipalities financial situation and risk. Results are consistent with previous works of Albalate (2013), Gandía and Archidona (2008) and Caamaño-Alegre et al. (2013). We accept the hypothesis H5.

In relation to Electoral Turnout variable, it is significant at the 1% level and negatively associated with our dependent variable (β₅ = -0.0029). Low Electoral Turnout is a sign of lower trust in municipal government. It is reasonable to assume that to increase citizens’ involvement and regain citizens’ confidence about municipalities’ functioning, they should provide relevant information on budgets, plans and activities. Hence, Electoral Turnout contributes to municipal transparency. These results are consistent with previous works of Fung (2013) and Araujo and Tejedo-Romero (2016). This result supports the hypothesis H6.

We observed that the Political Ideology is positively correlated with the transparency at 1 percent level (β₆ = -0.0373). So, municipalities governed by left-wing parties are more transparent than those municipalities ruled by right-wing parties. Our results are consistent with previous works (Albalate, 2013; Caamaño-Alegre et al., 2013; Guillamón et al., 2011) that identified a positive relationship with the index of transparency in municipalities governed by left-wing parties. This result supports the hypothesis H7.
In relation to the control variables, we analysed the influence of the electoral cycle on transparency. The results showed that the pre-election years were positively correlated with the Transparency at 1 percent level ($\beta_7 = 0.0720$). This means that municipalities tend to be more transparent in the year prior to elections to show their competence in managing the resources received (Cuadrado-Ballesteros, 2014), and that politicians have acted according to their responsibilities to influence elector’s decisions. On the other hand, the results showed that the years of elections and after elections were negatively correlated with the Transparency at 1 percent level ($\beta_8 = -0.0647$; $\beta_9 = -0.1062$, respectively). According to the political cycle, after elections the pressures the municipalities disclose information tend to reduce because a new political cycle begins.

5. Conclusions

The main objective of this article was to do an analysis of transparency in the Portuguese municipalities and to find which factors affected the level of transparency. The study used a time-series cross-sectional Prais–Winsten regression model with panel-corrected standard errors (PCSE), to take into account heteroskedasticity, cross-sectional correlation and a panel-specific AR(1) autocorrelation process (Beck and Katz 1995). The sample was composed of 308 municipalities, using data for four years from the municipal transparency index published by the TIAC.

Our results showed that in the period of time analysed, there was an increase in transparency in Portuguese municipalities which reached the maximum value in 2016. It suggested that transparency is increasing in Portuguese municipalities, perhaps influenced by the approval of the Transparency Law in 2016, and the pressure from citizens which demand more accountable actions from politicians. These results were consonant with the Agency Theory which considers the existence of pressure from citizens about municipalities decisions and activities reducing the asymmetry of information by increasing the level of transparency. According to the Theory of Legitimacy increasing the levels of transparency will legitimize the actions of political leaders toward citizens. The study suggested that electoral cycle influenced the level of transparency. In pre-election years the level of transparency increased, and decreased after the elections years, may be because the need to have citizens’ sympathy is lower.

We found empirical evidence regarding factors that influenced the level of transparency. When analysing the political factors, we observed that the variables considered (electoral turnout, ideology, and electoral cycle) had a significant effect on the level of municipal transparency. In those municipalities where electoral turnout was lower, there was more information disclosure. Perhaps this was a way to capture voters for the upcoming municipal elections. Disclosing information about municipalities’ decisions, processes and functioning increased public trust, reducing the agency conflicts (Laswad et al., 2005), and increasing their legitimacy (Roberts, 2006), working as a positive incentive for citizen’s support for future elections. Additionally, results show that Political Ideology influenced the level of transparency. Municipalities ruled by left-wing parties showed higher levels of transparency then those ruled by right-wing parties. It is worth to stress
that, in Portugal, left-wing parties are more receptive to issues of transparency than the right-wing parties.

Concerning socioeconomic factors (internet access and debt to income ratio) we observed that the variables considered had a significant effect on the level of transparency. Internet access increased citizens’ ability to access the municipality’s website to access to information. On the other hand, the dissemination of information about municipal decisions through social networks pressured municipalities to be more transparent. The higher the discussion on social networks about municipalities management, the more pressure have to inform the citizens about their decisions. Finally, the need to demonstrate toward external agents their ability to meet financial obligations to reduce the costs of funding influenced the decision to disclosure financial information. Hence, those municipalities with high debt to income ratio were more transparent.

This study is a contribution to the literature of transparency in order to understand transparency among the municipalities. It demonstrated the contributions provided by the agency and legitimacy theories about transparency. The principal lesson from this study is that transparency and the exchange of information between municipalities and citizens is partly influenced by political factors.

There are several limitations in this study. Firstly, the study focuses on the supply side of transparency. Transparency can also be done from the demand side of transparency. Secondly, the study does not analyse how citizens perceive the information, an issue which would increase our understanding of transparency. Finally, we do not take into account the problem of endogeneity caused by the possible existence of inverse causality between municipal transparency and other variables considered in the study.

6. Bibliography


