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BRAZILIAN JOURNAL OF PUBLIC ADMINISTRATION

Determinant socioeconomic variables for passive public transparency in Brazilian municipalities

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This article presents determinant socioeconomic variables for passive public transparency in Brazilian municipalities based on *Escala Brasil Transparente*, EBT (Brazilian transparency scale). Using a random sample of 1.133 municipalities, bivariate and multivariate analyses revealed a significant correlation between passive public transparency and the variables: population' education, per capita income and age. The variable age presented different result from what was expected, showing that the age of the population did not have an inverse relation with passive public transparency. The descriptive results revealed the low level of passive public transparency in Brazilian municipalities, which obtained a mean of only 1.93 (on a scale between 0 and 10). In addition to the statistical findings, the study contributes to show the differentiation between active and passive public transparency, showing the characteristics that are representative of each of them.

Keywords: public transparency; passive transparency; Brazil Transparency Scale.

Variáveis socioeconômicas determinantes para a transparência pública passiva nos municípios brasileiros

Este artigo apresenta variáveis socioeconômicas determinantes para a transparência pública passiva nos municípios brasileiros a partir da Escala Brasil Transparente (EBT). Por meio de amostra aleatória, formada por 1.133 municípios, as análises bivariadas e multivariadas revelaram correlação significativa entre a transparência pública passiva e as variáveis escolaridade da população, receita *per capita* e idade da população, e esta última apresentou resultado inverso ao esperado. Os resultados descritivos revelaram o baixo índice de transparência pública passiva nos municípios brasileiros que obtiveram uma média de nota de apenas 1,93 (em escala entre 0 e 10). Além dos achados estatísticos, o estudo contribui para expor a diferenciação entre transparência pública ativa e passiva, onde foram apresentadas as características representativas de cada tipo.

Palavras-chave: transparência pública; transparência passiva; Escala Brasil Transparente.

Variables socioeconómicas determinantes para la transparencia pública pasiva en los municipios brasileños

Este artículo presenta variables socioeconómicas como determinantes para la transparencia pública pasiva en los municipios brasileños, a través de la Escala Brasil Transparente (EBT). Por medio de una muestra aleatoria, formada por 1.133 municipios, los análisis bivariados y multivariados revelaron una correlación significativa entre la transparencia pública pasiva y las variables escolaridad, renta per cápita y edad de la población, y esta última presentó un resultado opuesto al esperado. Los resultados descriptivos mostraron un bajo índice de transparencia pública pasiva en los municipios brasileños, que recibieron una nota promedio de sólo 1,93 (en una escala de 0 a 10). Además de los resultados estadísticos, el estudio contribuye para mostrar la diferencia entre transparencia pública pasiva y activa, donde se presentaron las características representativas de cada tipo.

Palabras clave: Transparencia pública; Transparencia pasiva; Escala Brasil Transparente.

DOI: http://dx.doi.org/10.1590/0034-761220170383
ISSN: 1982-3134
Article received on December 13, 2017 and accepted on August 6, 2018.
[Translated version] Note: All quotes in English translated by this article's translator.

1. INTRODUCTION

Transparency of governmental acts is a decisive factor for social control and the exercise of democracy. The disclosure of reliable information is an essential aspect for the existence of citizen participation and is a necessary element for democracy (Vieira, 2012).

In Brazil, the right of access to public information was highlighted by the constituent, that included it within the fundamental rights and guarantees, in Art. 5, item XXXIII, of the Federal Constitution of 1988 (CF, 1988) and in other complementary articles, Art. 37, paragraph 3, subsection II, and Art. 216, paragraph 2. The publicity of the public acts was elevated to the category of principle of the public administration by the Art. 37 (1988). The Brazilian Constitution imposed obligatoriness and importance for the disclosure of public information to society and for the publicity of governmental actions. In addition, the editions of Complementary Law (LC) no. 131 (2009) and Law no. 12,527 (2011), which was popularly known as the Law on Access to Information (LAI), provided an operational rule to the dictates envisaged by the constituents.

Laws no. 12,527 (2011) and no. 131 (2009) established content and procedures for the access to information by initiative of the government (active transparency) or by demand from outside the administration (passive transparency), and are applicable to all levels of government. In general, active transparency refers to the information that the public manager himself makes available to the population, in person or, more commonly, through the Internet.[1] On the other hand, passive transparency goes further. It became the right of any interested party to have access to the public information they need, except for those of a confidential nature.

The Ministry of Transparency, Supervision and Control (CGU) began to evaluate the passive transparency of federated entities through a metric[2] called Brazil Transparent Scale (*Escala Brasil Transparente* - EBT) with scores from 0 to 10. The disclosure of the municipalities' transparency scores showed a very heterogeneous scenario among the city councils evaluated and it is intended in this study to identify which variables influence the index of passive transparency in municipal units.

Previous studies have shown a correlation between variables and the phenomenon of public transparency, and this study contributes to the significant correlation between the specific type of passive public transparency and some socioeconomic factors, with data collected for the year 2015.

This is how the article is structured: after the introduction, the theoretical framework that addresses the concept of public transparency is presented, in addition to showing previous researches in which authors also sought to find explanatory factors for the theme. The methodological procedures verify the variables used in the research and the characteristics of the database. After that, the results are presented with descriptive, bivariate and multivariate analyzes. Lastly, in the final considerations, a summary of the work, the limitations and the invitation for new studies in this area of social science are presented.

[1] Law no. 131 (2009) provides municipalities with a population of less than 10 thousand inhabitants with the obligation to disseminate the minimum content on the Internet, keeping only the need for real-time disclosure of data on revenue and expenditure.
[2] The metric of Brazil Transparent Scale is available at *Controladoria-Geral da União* (2019).

2. THEORETICAL FRAMEWORK

With the purpose of establishing the theoretical framework, it was sought to present the concept of public transparency, as well as researches that studied the influence of social and economic variables on the phenomenon of transparency, thus designing the hypotheses of the work.

2.1 Public Transparency

Although apparently obvious the citizens' prerogative to obtain information of public nature, legislation guaranteeing the access is relatively new worldwide. A study by Mendel (2009) shows that, until 1990, only 13 countries had laws that determined the right of access to public information. This same study shows an evolution in this number, reporting that, in 2009, 70 countries already had laws of access to information. It is observed, thus, a search for transparency not only as a fad, but as an indispensable tool for the consolidation of modern democracies. In this sense, according to Kumar (2003), public transparency is a necessary means to guarantee and promote human rights. The importance given by Kumar (2003) to the subject it is noticed in the fact that, without information, the citizen does not obtain basic guarantees for its survival.

Another key point is the usefulness of the information provided. Given current information technology resources, public authorities prefer to use the Internet to make the mandatory information available through transparency portals. However, if the information is not useful to the citizen, then it is only rubbish; and it is equally useless to put up a web portal that does not work. Although there is a quantitative increase of transparency portals, the perception that the information does not reach its objective remains, as demonstrated in the studies by of Coelho, Silva, Cunha, and Teixeira (2018), and Raupp and Pinho (2016). These latter researchers warn for the fact that technological barriers are created to justify a lack of transparency and to undermine democracy: "*In other words, to prevent the achievement of democracy, technological constraints are created, being it easier to give explanations on technological limitations rather than on limitations on the exercise of democracy*" (Raupp & Pinho, 2016, p. 295).

The broader aspect of the word transparency, categorized in active and passive transparency, was reported by Araújo and Romero (2016, p. 329), who wrote:

> *This is a vast definition that encompasses both "active" disclosure activity, undertaken proactively by public organizations, and "passive" forms of transparency in which the same organizations respond reactively to external demands (e.g. through the right of information request*).

Box 1 shows the main features of the two types of public transparency at national level. Box 1 shows the legal coverage between the two categories. For active transparency, both Complementary Law no. 131 (2009), which amended the Fiscal Responsibility Law, and Law no. 12,527 (2011) apply. For passive transparency, only Law no. 12,527 (2011) applies. Box 1 also summarizes that for active transparency the initiative to disclose the information comes from the public manager, who can publish on the Internet only the minimum content provided by Law, while in passive transparency is the interested party who requests the information through the Citizen Information Service (CIS), and may request any type of

public information, as long as it is not protected by cases of secrecy. Lastly, Box 1 shows the characteristic disclosure time, in which the disclosure of active transparency needs to be in real time, while for passive transparency the public manager has 20 days to provide the information, extendable to up to 10 more, since it takes time to process the specific request of the interested party.

BOX 1 MAIN DISTINGUISHING CHARACTERISTICS BETWEEN ACTIVE AND PASSIVE TRANSPARENCY

Characteristic	Active Transparency	Passive Transparency
Legal scope	Complementary Law no. 131/2009 and Law no. 12,527 / 2011	Law no. 12,527 / 2011
Initiative of the information	Public manager	Anyone Interested
Means of access	Internet[3]	Citizen Information Service (CIS) which may be available on the Internet or in person
Information content	At the discretion of the public manager, as long as the minimum content provided for in Law is disclosed and confidentiality is protected, when applicable.	Any one requested by the interested party, safeguarding the secrecy of information, when applicable.
Time of disclosure	Real time	Immediately, when available, or at most within 20 days, extendable to up to 10 more days.

Source: Elaborated by the authors.

It can be noticed that the division of the study of transparency into active and passive is not only didactic, but also procedural. Whereas in active transparency the information is made available in the interest of the public manager or by legal imposition of mandatory data, in the passive transparency it is necessary that the public entity be prepared to respond to any request of the population not subject to secrecy.

2.2. Social and economic variables that may affect public transparency

Several researches were carried out in the expectation of trying to explain the factors that influence a greater or lesser disclosure of the acts of public management, investigating socioeconomic variables that may be related to public transparency.

a) **Education:** It is required of those who will provide and use the information made available in public transparency an intellectual ability to obtain, work and apply the data. Ribeiro and Zuccolloto (2012), in a sample of 1,710 Brazilian municipalities, showed that there is a relationship between investment

[3] Law no. 12,527 (2011) establishes that municipalities with under 10 thousand inhabitants would be exempt from disclosing the minimum content on the Internet, although remaining the obligation to disclose, in real time, the budgetary and financial execution provided for in Complementary Law no. 101/2009. As budget and financial execution would, at first, be the most laborious information, it seems a little pointless to dispense the presentation of other simpler information, but that is how it is provided by law.

in education and level of public transparency, using two proxies for education indicators: Firjan Municipal Development Index - education category (qualitative factor) - and the expenditure on education per capita (quantitative factor), obtaining explanatory significance from both variables. Perez, Rodríguez and López (2014) also found a positive relationship between the educational level of the population and the availability of government information on the Internet. In their study they used the percentage of the population with university degree as proxy, also being, among the variables tested, the one that presented greater correlation with the transparency. According to Cinca, Tomás and Terragona (2008), the education level of a population, using the average of years in education as proxy, can influence the availability of public information, since more conscious citizens would have greater capacity to exert pressure for transparency.

b) **Financial capacity:** offering and requesting information made available in public transparency has a cost. Wright (2013) found a significant correlation between the income level of the population and the public transparency index, using the Gross Domestic Product (GDP) per capita of the population as proxy. In the same study, the author also confirmed the positive correlation between transparency and public entity income, using the proportion of tax revenue over total income as proxy. Cruz (2010) also found a significant positive relation between the level of economic power of the population and the municipality and the level of public transparency, using as explanatory variables GDP per capita for population wealth, and budget revenue to measure municipal wealth. Styles and Tennyson (2007), in a survey on US municipalities, concluded that the cities with the highest per capita income are those that disclosure financial information on the Internet the most. The hypothesis confirmed by the authors is that citizens with high levels of income carry out greater political monitoring, demanding more information from the public entity.

c) **Age:** some authors tried to construct hypotheses of correlation between public transparency and age, obtaining a diversity of results. Andrade, Alcântara and Linhares (2015, p. 355) relate the use of ICT to the young public: "The technological devices are increasingly immersed in the youth daily life being nowadays almost an extension of his body". In this line of reasoning, people of young age would have the advantage of using the tools of public transparency available online. Wright (2013) attempted to prove the hypothesis of inverse relationship between age and public transparency. The researcher also used the proxy mean age, but the research results pointed to a correlation with inverted signal, that is, public transparency would affect more the older public. Navarro Galera, Ortiz Rodríguez, Alcaraz Quiles and Zafra Gómez (2011) found out a positive relationship between users with age ranging from 18 to 65 and the level of public transparency. It can be observed, however, that the age range used by the authors seems to be too broad for an objective characterization between transparency and youth, adult or elder. The last census of the Brazilian Institute of Geography and Statistics (IBGE), for example, carried out in 2010, categorizes the age groups in every five years, considering youth those persons between the ages of 15 and 24 (*Instituto Brasileiro de Geografia e Estatística* [IBGE], 1999).

It is observed that, contrary to the relationships between financial capacity and education that, generally, point to positive interference, the age factor presents different results regarding its relation to transparency, indicating to the need for a greater study on the subject and an attention for the proxies used.

2.3. Research hypotheses

This study has as central question the assumption that the phenomenon of passive public transparency is influenced by social and economic variables. Given the theoretical reference presented, in which authors studied the interference of variables in public transparency, the following hypotheses are proposed.

Regarding passive public transparency versus education:

H1: population education (PE) has positive relation with passive public transparency (EBT); and
H2: municipal manager education (MME) has positive relation with passive public transparency (EBT).

Regarding passive public transparency versus age:

H3: population age (PA) has an inverse relationship with passive public transparency (EBT) and, similarly
H4: municipal manager age (MMA) has an inverse relationship with passive public transparency (EBT), that is, the lower the age of the population and the manager, the greater the level of passive public transparency.

Regarding passive public transparency versus income:

H5: GDP per capita (GPC) has positive relation with passive transparency (EBT); and
H6: per capita income (PCI) has positive relation with passive transparency (EBT).

3. METHODOLOGICAL PROCEDURES

The variables used in this research are listed in Box 2. It is important to highlight that were used databases of information available until December 2016, the month in which the data collection phase of this research was completed, establishing, thus, a temporal cut. Once the dependent variable, EBT, in its second edition (*Controladoria-Geral da União*, 2015), was released in 2015, the databases with the closest information to that year were used, seeking a relationship of variables, whenever possible, within the same base year.

Descriptive, bivariate and multivariate analyzes were conducted. In the regression tests, the variables were categorized into two groups: internal and external. Internal are those hypotheses related to the internal management of the city council (city hall offers the information) and external are those hypotheses that are not related to the outside the internal management of the city council (population demands the information).

All the 5,569 Brazilian municipalities compose the research universe. EBT, in its second edition (Controladoria-Geral da União, 2015), evaluated 1,585 municipalities of which 1,133 municipalities were randomly selected and 452 were inserted in a non-random manner, and only the random sample will be used for the inferences, avoiding bias in the analyzes. Thus, there is a random sample (1,133 observations) that will be used for the inferences and a total sample (1,585 observations) that will be used for the descriptive evaluations or possible comparisons. The non-random sample of

452 municipalities refers to the non-random insertion in the EBT 2 of municipalities that had been assessed in the first edition of the EBT, or that requested a spontaneous assessment aiming at making a historical series and observe the evolution of the rating of the object under evaluation. It is noteworthy that, except for the capitals, which were compulsorily inserted, there is no standard profile for the municipality to be assesses in the EBT, no matter if it is large or small and of any Brazilian region.

BOX 2 RESEARCH VARIABLES OR PROXIES

Variable	Type	Proxy	Previous studies with the variable or proxy
Brazil Transparent Scale (EBT)	Dependent	Brazil Transparent Scale made available by CGU.	No previous work was found.
Population Education (PE)	Explanatory	Percentage of the population with secondary or higher education according to data from the 2010 IBGE census.	Perez et al. (2014) and Navarro Galera et al. (2011).
Population Age (PA)	Explanatory	Mean population age according to data from 2010 IBGE census.	Anjos and Bartoluzzio (2016) and Wright (2013).
GDP per capita (GPC)	Explanatory	GDP per capita with data from IBGE.	Wright (2013), Cruz (2010), and Styles and Tennyson (2007).
Municipal Manager Education (MME)	Explanatory	Education level informed by the candidate for mayor with data from the Superior Electoral Court (*Tribunal Superior Eleitoral* - TSE); higher education was used with the creation of a dummy variable.	No previous work was found.
Municipal Manager Age (MMA)	Explanatory	There was no need to use proxy, since the actual data of all mayors were available in the TSE.	No previous work was found.
Per capita income (PCI)	Explanatory	Per capita income with data from the National Secretary of the Treasury (Secretaria do Tesouro Nacional - STN)	Ribeiro and Zuccolloto (2012).

Source: Elaborated by the authors.

The treatment given to the missing values was to exclude the elements for the descriptive and inferential analyzes, a fact that does not impair the research, since the sample is sufficient for the intended analyzes. The exclusion of missing data is one of the solutions indicated by Corrar, Paulo and Dias Filho (2012) for the treatment of the database before performing the statistical tests.

Wright (2013), in addition to Ribeiro and Zuccolloto (2012), used the following formula [4] to calculate sample size:

[4] For the formula of the sample calculation, there are the following variables: n = sample calculated ; N = population; Z = standardized normal variable associated with the confidence level; p = true event probability; e = sampling error.

$$n = \frac{N.Z^2.p(1-p)}{Z^2.p.(1-p) + e^2.(N-1)}$$

For a 95% confidence interval and a maximum sample error of 5%, we would have as minimum sample the total of 360 observations for inferences at national level of the Brazilian municipalities. As the sample of this research is of 1,133 random observations, it is observed that it is sufficient even excluding the missing values.

The analysis of the variables histograms, combined with the Kolmogorov-Smirnov test, indicates a non-normal distribution of the data, except for the data of the variable Mean Age of the Population that presented a normal distribution. The data of the variables of this research present interval characteristics.

Although normality tests point to a non-normal data distribution, this feature can be relaxed when the large number theory and the central limit theorem are observed, as discussed by Brooks (2008). Similar observation is made by Field (2009, p. 113) regarding the normality tests:

> However, they have limitations because with large samples it is very easy to obtain significant values from small deviations from normality and, thus, a significant result does not necessarily inform us if the deviation from normality is sufficient to impair the statistical procedures that will be applied to the data.

Gujarati and Poter (2011) indicate that a small sample, where normality would play a fundamental role, would be the one with less than 100 observations. Field (2009) considers a small sample the one with less than 200 observations. Although the size of a sample considered small may differ among authors, since the random sample of this research is composed of 1,133 observations, it is possible to relax the assumption of normality. Combining the characteristic of the interval data of the variables with the relaxation of the normality assumption, it was opted to perform parametric tests.

Regarding the limitations of the study, it should be emphasized that the approach is restricted to the explanatory variables identified in the theoretical framework and tested in statistical procedures that, of course, are not capable of explaining the whole social phenomenon of transparency. Variables such as the performance of inspection agencies, social control, participation of society, among others, may interfere with public transparency, but they are not always easy to measure through proxies. In this line, Loureiro, Teixeira, and Prado (2008) suggest that the commitment of the party or the head of the executive has more interference in the phenomenon of transparency than socioeconomic variables. However, in their study, there is no inferential evidence of this assumption or a proxy that represents behavioral measurement, such as commitment. The limitation, however, does not detract from the importance of this research since there is no pretension to create a model that explains in an absolute way the phenomenon of transparency, but to offer a scientific contribution with tests of variables that have reliability and are available in Brazilian databases, a fact characteristic of quantitative research.

4. RESULTS PRESENTATION

In the expectation of identifying determining variables for passive public transparency in Brazilian municipalities and their characteristics, it was initially opted to perform a descriptive analysis of the dependent variable that represents the passive public transparency proxy. After that, bivariate tests were carried out to identify the existence or not of the relationship between the explanatory variables and the dependent variable. Lastly, a multivariate analysis was performed aiming at evaluating the hypotheses of this study and verifying which statistical model best explains the passive public transparency.

4.1 Descriptive analysis of the dependent variable Brazil Transparent Scale

The dependent variable on this work is represented by the Brazil Transparent Scale, which is an assessment performed by the CGU on the level of passive public transparency, and is performed by means of a metric that assigns a score from 0 to 10 for the public entity evaluated. The analysis of the statistical indicators shown in Table 1 points to the low passive public transparency index in the Brazilian municipalities, having mean of only 1.93. The median 0.56 indicates that half of the evaluated municipalities did not even reach a minimum valid score of the 10 possible ones.

TABLE 1 STATISTICAL INDICATORS FOR THE VARIABLE EBT

Indicators	Value
Valid	1585
Missing value	0
Mean	1.9320
Median	.5600
Mode	.00
Standard deviation	2.6977
Minimum	.00
Maximum	10.00

Source: Elaborated by the authors.

It draws attention the fact that mode has score zero in 789 observations, indicating that 49.8% of the municipalities evaluated did not have any passive public transparency tool, and it is not possible for the citizen to send requests for information due to the inexistence of a CIS, in addition to the lack of regulations for access to information requests. The alarming number indicates the non-compliance with Law no. 12,527 (2011), pointing to the need for greater attention from public entities aiming at guaranteeing the right to passive public transparency.

Although having low mean, continuous assessment by EBT can stimulate the promotion of public transparency. The first edition of the EBT assessed 492 municipalities in May 2015 and obtained a mean of 1.35, with 62% of the scores being zero. In the second edition of the EBT, object of this study, carried out in November 2015, mean of 1.93 and a reduction of the percentage of zeros to 49.8% was observed, indicating a discrete but better situation in the results.

The municipalities assessed by the EBT are drawn, representing the random sample, or are inserted in a non-random way in the assessment, either by spontaneous request, or because they had already been assessed in the previous edition. Table 2 presents the analysis of indicators of these groups separately, indicating that the mean of the non-random group, consisting of 452 municipalities, is 2.49. This is higher than the average of the randomly selected group, represented by 1,133 municipalities, which drops to 1.70, pointing out that the expectation and experience in having already been assessed can produce better indicators of passive public transparency, being one more evidence of a potential benefit of a systematic assessment.

TABLE 2 DESCRIPTIVE ANALYSIS OF EBT, CATEGORIZED BY RANDOM AND NON-RANDOM GROUPS

Choice	N	Amplitude	Minimum	Maximum	Mean	Standard deviation
Non-random	452	10.00	0.00	10.00	2.49	3.14
Random	1133	10.00	0.00	10.00	1.70	2.46

Source: Elaborated by the authors.

Analyzing statistical indicators categorizing the municipalities evaluated by the characteristic of being or not the capital of the state of the federation, a great difference in numbers is observed in Table 3. Municipalities that are capitals have EBT mean of 7.04, and the most frequently observed score is 10 indicating that, at least in the capitals, passive public transparency indicators are satisfactory. Five capitals had maximum scored in the EBT assessment: Rio Branco (AC), João Pessoa (PB), Recife (PE), São Paulo (SP) and Curitiba (PR). Only one capital, Porto Velho (RO), scored zero in the assessment. Given the demographic concentration observed in Brazilian capitals, Table 3 shows that the 26 municipalities that are capitals account for almost half of the population resident in the cities evaluated, indicating that a large part of the population, although in a very concentrated way, has access to requests for passive transparency information where they live. A different situation occurs with municipalities that are not capitals, where the mean EBT score is only 1.84, and about half of the municipalities got score zero, indicating that access to passive transparency information in cities in the countryside of Brazil is a distant reality.

TABLE 3 DESCRIPTIVE ANALYSIS OF THE VARIABLE EBT , CATEGORIZED BY CAPITAL AND NON-CAPITAL

Characteristic	Number of municipalities assessed	% of score zero	Score mode	Score mean	Absolute population assessed	% of the population assessed
Capital	26	3.8	10.0	7.04	45,420,301	49.24
Non capital	1,559	50.5	0.0	1.84	46,816,957	50.76

Source: Elaborated by the authors.

Therefore, it can be observed that the general mean of passive public transparency in Brazil, measured at 1.93 points out of 10, is very low, except in cities that are capitals, a fact that points to a difficulty for citizens to obtain access to information. In this case, EBT can be a stimulus for the improvement of this scenario by the manager expectation to improve his score for each edition of the assessment.

4.2 Correlation analysis between variables

In order to analyze the existence of a correlation between the explanatory variables and the Transparent Brazil Scale (EBT), which is the dependent variable representative of the passive public transparency of the study, a bivariate Pearson analysis was performed, [5]considering the interval characteristic of the data and the relaxation of the assumption of data normality.

Table 4 presents the results of Pearson test for both the original values collected from the variables and the standard values, using Z-scores and excluding those higher and lower than two, in the expectation of eliminating the outliers. Initially, it was observed that Pearson correlation does not change the significance and the meaning of the correlation, only discretely varying the correlation coefficient when using Z-scores, indicating that the presence of outliers does not interfere in a relevant way in the analysis.

Thus, it was opted, from this point on, to analyze the original data, understanding that the presence of outliers was not important.

[5] Although it is possible to relax the assumption of data normality, considering the large size of the sample, the non-parametric Sperman test was also performed, finding significant difference only in the dummy variables created for the manager education, a fact that did not interfere in the evaluation of the hypothesis of this study. PE - population education (r=0,198**, pvalue=0,000); PA - population age (r=0,199**, pvalue=0,000); GPC - gross domestic product per capita (r=0,295**, pvalue=0,000); DHEC - dummy higher education complete (r=0,045, pvalue=0,066); DEEC - dummy elementary education complete (r=0,058*, pvalue=0,026); DSEC - dummy secondary education complete (r=0,045, pvalue=0,063); MMA - municipal manager age (r=0,045, pvalue=0,066); PCI - per capita income (r=0,150**, pvalue=0,000).

TABLE 4 BIVARIATE ANALYSIS BETWEEN EBT AND EXPLANATORY VARIABLES

Variable	Frequency	Pearson Correlation		Pearson Correlation, using Z-score	
		Coefficient	Significance (*p-value*)	Coefficient	Significance (*p-value*)
PE	1,132	0.257**	0.000	0.147**	0.000
PA	1,132	0.189**	0.000	0.180**	0.000
GPC	1,133	0.165**	0.000	0.224**	0.000
DEEC	1,133	0.065**	0.014	-	-
DSEC	1,133	0.060**	0.021	-	-
DSPC	1,133	0.080**	0.003	-	-
MMA	1,133	0.037	0.109	0.028	0.213
IPC	996	0.126**	0.000	0.140**	0.000

Source: Elaborated by the authors.
Note: The correlation (unilateral) is significant at the level of 5% (*) or 1% (**).

Starting from the analysis of significance, it is observed that all explanatory variables have a significant relationship with the dependent variable (EBT), except for the variable Manager Age (MMA), which obtained a significance score of 0.109. According to Field (2009), when the significance value is less than 0.05, it can be concluded that there is a significant relationship between the variables. It is observed that the explanatory variables are all positively related to the dependent variable (EBT), there being no negative sign in any correlation coefficient, indicating that increases or decreases in a variable will cause increments in the same direction in the variable correlated.

Although only one variable presented a non-significant relationship, it was opted to evaluate the hypothesis of this study later, in conjunction with the multivariate analysis, aiming at a higher statistical safety.

4.3 Regression analysis

EBT is a scale that evaluates the passive transparency with a score from 0 to 10 and, in the sample, there were observations in the lower and upper limits. Due to the censored characteristic of the dependent variable, it was opted for the Tobit modeling. Gujarati and Porter (2011, p. 571) indicate Tobit model as suitable for a multivariate analysis with a limited dependent variable: "Therefore, Tobit model is also known as a censored regression model. Some authors call these models regression models with a limited dependent variable due to the restriction imposed on the values assumed by the regressors". Using the same model, Rios and Maçada (1984 as quoted in Rios and Maçada, 2006, p. 4) record that: "[…] the basis of Tobit model is similar to least-squares regression, but assumes a truncated or censored normal distribution and becomes an efficient method to estimate the relationship between a truncated or censored dependent variable and other explanatory variables", also mentioning eight more scientific papers that used Tobit model.

The assumption of homoscedasticity was met using in the estimation of the model the correction by robust standard error.

Regarding the verification of the existence or not of multicollinearity among the variables, the Variance Inflation Factor (VIF) diagnosis was used. According to Field (2009), the IVF diagnosis is significant for multicollinearity if its value exceeds 10, a fact not observed in any of the variables.

The model with all the explanatory variables is presented in Table 5, which confirms the significance of the variables population education (PE), population age (PA) and per capita income (PCI), also found in bivariate tests. Chi-square statistic has p-value of less than 0.001, demonstrating that the model is adequate for the data.

TABLE 5 RESULTS OF THE MULTIVARIATE TOBIT MODEL

Variable	Coefficient	Standard error	Z	Significance (*p*-value)
Const	-5.59808	1.49821	-3.737	0.0002 ***
PE	0.126120	0.0179069	7.043	1.88e-012 ***
PA	0.0926880	0.0460664	2.012	0.0442 **
GPC	5.12880e-06	9.35860e-06	0.5480	0.5837
DSPC	-0.0741328	0.297094	-0.2495	0.8030
MMA	-0.0113497	0.0149904	-0.7571	0.4490
IPC	0.000236821	0.000130425	1.816	0.0694 *
Chi-square(6)	95.73233	*p-value*		1.95e-18
Log of likelihood	-1757.148	Akaike criterion		3530.297
Schwarz criterion	3569.519	Hannan-Quinn criterion		3545.208
sigma = 4.11008	(0.139956)			
Left-censored observations: 485 (NOTEBT <= 0)				
Right-censored observations: 12 (NOTEBT >= 10)				

Source: Elaborated by the authors.

Thus, hypotheses **H1** and **H6** cannot be rejected, that is, significant and positive relationships between the variables education of the population (PE) and per capita income (PCI) with the variable EBT, that represents the passive public transparency in this work, were identified. However, hypotheses **H2** and **H5** are rejected because the significant relationship between the variables municipal manager education, represented by the dummy higher education complete (DHEC), and the variable GDP per capita (GPC) with the EBT was only found in the bivariate analysis, not being confirmed in the multivariate model. Hypothesis **H4** was rejected because there was no significant relationship between the municipal manager age (MMA) with the EBT in the bivariate analysis, nor in the multivariate

analysis. Hypothesis **H3** was also rejected because, even though a significant relationship between the population age, PA, and EBT was found, the positive sign found was not expected. It means that both Pearson test and Tobit model demonstrated that an older population has a significant relationship with passive public transparency, a finding divergent from the initial hypothesis, which advocated that younger people could interfere more significantly in the phenomenon.

Subsequently, the multivariate analysis was carried out by grouping the variables into three categories: external factors, internal factors and consolidated factors, with the intention of verifying whether the passive public transparency is more affected by factors originating from characteristics of the population, the municipality or all together, taking into consideration the comparison between similar proxies. The explanatory power of a model is derived from the coefficient of determination, R^2, and, in some models, a Pseudo R^2 is presented, which represents an approximate value. For Tobit model, Gretl software does not have this number, however Greene (2012, p. 534) suggests that "[…] for limited dependent variable and many loglinear models, some other measures that are related to a correlation between a prediction and the actual value would be more useable". Thus, as Wright (2013, p. 101) did, "[…] the square of the multiple linear correlation between the dependent variable and the adjusted value of the model was used as the coefficient of determination".

For Tobit model, the coefficient of determination for the three models is presented in Table 6, which is obtained by the square of the correlation coefficient between the dependent variable EBT and the adjusted value of the models. In addition, Pseudo R^2 is presented in Table 6 by other model used for censored variables, the beta model, confirming the trend of the correlation coefficients found.

TABLE 6 CORRELATION COEFFICIENTS OF THE MODELS OF THE STUDY

Group	Explanatory variables	Test model	Coefficient of determination - Tobit model	Pseudo R^2 (beta model)
External factors	Population Education (PE) Population Age (PA) GDP per capita (GPC)	EBT = b0 + b1.PE + b2.PA + b3.GPC	0.089	0.080
Internal factors	Municipal Manager Education (MME) Municipal Manager Age (MMA) Per capita income (PCI)	EBT = b0 + b1.MME + b2.PA + b3.PCI	0.022	0.019
Consolidated Factors	All internal and external variables	EBT = b0 + b1.PE + b2.PA + b3. GPC + b4. MME + b5.MMA + b6. PCI	0.091	0.083

Source: Elaborated by the authors.

The figures in Table 6 show that both Tobit model and beta model point to a greater explanatory power of external variables than internal variables. The model with consolidated factors accounts for about 9.10% of passive public transparency, indicator that demonstrates that there are other variables that interfere in the phenomenon. This projects a vast field for future research on the subject.

5. FINAL CONSIDERATIONS

The research reached the proposed objectives, identifying variables that determine passive public transparency. It was verified that the variable population education (PE) and per capita income (PCI) have a significant relationship with the Transparent Brazilian Scale (EBT) variable, which is the proxy representing the passive public transparency in this work, both in the bivariate and multivariate analysis. Thus, it is not possible to reject hypotheses **H1** and **H6**. Regarding hypothesis **H3**, Population Age (PA), it was rejected because a significant relationship was found out, but with an opposite signal to the one initially expected, indicating that the older population has a greater relationship with passive public transparency. Hypotheses **H2** and **H5** were rejected because the significant relationship between the variable manager education, represented by the dummy higher education complete (DHEC), and GDP per capita (GPC) with EBT was only found in the bivariate analysis, not being confirmed in the multivariate model. The variable Manager Age, tested in hypothesis **H4**, did not show a significant relationship, in addition to presenting a signal that was also different from what was expected, and was also rejected.

Regarding the multivariate analysis, the model that used only factors that are external to the municipal administration to explain passive public transparency presented greater explanatory power than the model that used only internal factors, indicating that socioeconomic aspects of the population can exercise greater influence than factors related to the social and economic characteristics of the city council.

As an additional contribution, the study highlights that public transparency at national level has a distinct categorization of active and passive public transparency, where the representative attributes of each type have been exposed. Those characteristics may help in the correct understanding of the public transparency indicators, since, according to the metric used, the very same public entity can have different results according to the focus of the assessment on passive or active aspects, or on both.

In the descriptive aspect, there were low passive public transparency indexes, since the median presented value of 0.56. It indicates that half of the evaluated municipalities did not even reach a point of note among the 10 possible; 789 municipalities had score zero, that is, they did not present minimum conditions for citizens to exercise the right to request public information of their interest. In any case, there was a potential importance of the assessment performed by Brazil Transparent Scale (EBT), since the average of the scores of the first edition of May 2015 was 1.35, while in the second edition, object of this research, was 1.93 in November of the same year. This increase may be related to the perspective of the public manager in being assessed by a controlling agency. Contributing to this perception, when separating the descriptive analysis in random and non-random observations, it turned out that the non-random group, represented by those that had already been assessed in the first edition and those that requested a spontaneous assessment, obtained mean of 2.49, against 1.70 of the randomly selected group. It suggests that the systematic assessment may cause an increase in the index of passive public transparency, since public managers will be worried about presenting better scores to society.

The main limitations of the research are the restricted approach to the explanatory variables identified in the theoretical framework; and the difficulty in obtaining databases and proxies that can be used in the analysis. However, the restriction is at the same time an incentive for new studies with the specific subject of passive public transparency, since other tests are important to corroborate the hypotheses of this work, besides being relevant to identify other determinant variables of the phenomenon.

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