

Favorable Environments for the Promotion of Public Transparency: Constructing and Index from Municipalities of Minas Gerais

Ambientes Favoráveis à Promoção da Transparência: A Construção de um Índice a partir de Municípios Mineiros

Suélem Viana Macedo¹

Universidade Federal de Viçosa – UFV
suelem.viana@ufv.br

Josiel Lopes Valadares¹

Universidade Federal de Viçosa – UFV
josiel.valadares@ufv.br

James Rocha Rodrigues de Melo¹

Universidade Federal de Viçosa – UFV
rochajames93@gmail.com

Wanderson de Almeida Mendes¹

Universidade Federal de Viçosa – UFV
wanderson.mendes@ufv.br

Abstract: This article has as general objective to identify the conditions that contribute to the creation of an environment favorable to the promotion of transparency, having as object of study the municipalities of the state of Minas Gerais. Therefore, explanatory factors from the literature were used to order them concerning their propensity to transparency. Through the factor analysis it was possible to point out three factors related to transparency in the analyzed municipalities: demographic and socioeconomic, financial, and social participation conditions. From these, an index was constructed that made it possible to rank municipalities in terms of greater or lesser propensity for transparency. The results indicated the need to work better the socioeconomic, financial, and social participation conditions of the municipalities. Thus, federal and state programs that aim to encourage the promotion of transparency still need to give more attention to

¹ Universidade Federal de Viçosa – Campus Universitário – CEP 36570-900 – Viçosa (MG) – Brasil

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municipalities and mesoregions in less favorable situations, seeking to strengthen actions to create environments that provide greater transparency of public administration.

Keywords – Transparency; Determinant Factors; Municipal Conditions.

Resumo: Este artigo teve como objetivo geral identificar as condições que contribuem para a criação de ambientes favoráveis à promoção da transparência, tendo como objeto de estudo os municípios do estado de Minas Gerais. Para tanto, foram utilizados fatores explicativos oriundos da literatura para ordená-los quanto à propensão dos municípios à transparência. Por meio da análise fatorial foi possível apontar três fatores relacionados à transparência nos municípios analisados: condições demográficas e socioeconômicas, financeiras e de participação social. A partir dessas informações foi construído um índice que permitiu classificar os municípios em termos de maior ou menor propensão à transparência. Os resultados indicaram a necessidade de melhorar as condições socioeconômicas, financeiras e de participação social dos municípios. Assim, programas federais e estaduais que visam incentivar a promoção da transparência ainda precisam dar mais atenção aos municípios e mesorregiões em situações menos favoráveis, buscando fortalecer ações para criar ambientes que proporcionem maior transparência da administração pública.

Palavras-chave – Transparência; Fatores Determinantes; Condições Municipais.

Introduction

Transparency in the disclosure of public accounts, since its incorporation into the government agenda, has been improved by the Brazilian public administration through legislative changes that have made it mandatory to make certain information available and regulate access to that information. The constant presence of corruption in the public sector, however, has evidenced the need to further improve mechanisms to promote more transparent management. In conceptual terms, transparency is related to the reduction of informational asymmetries between citizens and state agents, allowing society to exercise greater control over acts practiced in the public sector (Fung & Weil, 2010).

In this context, having access to information that is collected, produced, and stored by public entities is fundamental so that citizens can know and follow the actions practiced by public management. According to Filho (2005), for the implementation of a policy of transparency there must be a

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willingness of the public administration to open and, therefore, reduce the traditional culture of secrecy. This process, for the author, must involve increasing the state's permeability through mechanisms that ensure that society's demands can influence public activity (Filho, 2005). In addition, the promotion of transparency depends on internal political decisions and / or external factors (Zuccolotto & Teixeira, 2014; Alcaide Muñoz; Rodríguez Bolívar, & López Hernández, 2016; Baldissera & Dall'Asta, 2020), as well as a commitment of the rulers (Bellver & Kaufmann, 2005; Michener & Bersch, 2013).

However, although transparency is considered one of the pillars of democracy (Abrucio & Loureiro, 2004), and an obstacle to the practice of corruption (Kim & Lee, 2012), its promotion still finds obstacles in the Brazilian public management, especially, in the municipal scope. According to Michener (2016), the fact that transparency is weakened locally by lack of political will, lack of administrative capacity or the vulnerability of being transparent, as more open governments become more susceptible to political scrutiny and criticism, are paradoxes that surround the transparency of municipal government. Municipalities, however, are responsible for offering public goods and services directly, thus being closer to citizens, facilitating their inspection and monitoring.

According to Ribeiro and Zuccolotto (2014), the transparency of public administration is associated with better indicators of socioeconomic and fiscal development such as health, education, work and income, and budget revenue. However, Brazil is a country characterized by large disparities, such as income distribution, territorial dimensions, politics, structure, and financial resources. The state of Minas Gerais, in fact, is an example of the presence of this territorial inequality, since it is formed by numerous municipalities with different financial and socioeconomic conditions (Costa, Ferreira, Braga, & Abrantes, 2012). In this context, it becomes relevant to understand to what extent the municipal environments of the state of Minas Gerais favor or not the transparency of public management.

Thus, the present study intends to contribute to the field of public administration seeking to answer the following question: How different characteristics of the municipal environments of the state of Minas Gerais, Brazil, can favor the promotion of transparency of public management? As a general objective, therefore, it is sought to identify the conditions that favor public transparency in municipal

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spaces in Minas Gerais, to understand what characteristics may contribute to the formation of a more transparent environment. For that, a set of aggregated variables was used in an index that allows to know the factors that provide environments more favorable to the municipal transparency, allowing the hierarchy of spaces in terms of greater or lesser propensity to transparency. Therefore, explanatory factors from the literature were used to order them concerning their propensity to transparency.

To reach the proposed objective, an analytical cut was made taking as the territorial space of analysis the 853 (eight hundred and fifty-three) municipalities of the state of Minas Gerais. The choice of this state is due to its territorial diversity, since it is the state with the highest number of municipalities in Brazil and the second most populous in the country. It should be emphasized, moreover, that the municipal level was chosen because of its territorial organization, when compared to other federal entities, to allow a closer approximation between the activities developed by the executive and their impact on the life of the population.

More recent studies related to transparency seek to develop models for assessing the levels of transparency of governments and entities (Cucciniello, Porumbescu, & Grimmelikhuijsen, 2017; Lyrio, Lunkes, & Taliani, 2018), without seeking a deeper understanding of what effectively makes certain public entities become more or less transparent. As Cucciniello, Porumbescu and Grimmelikhuijsen (2017) point out, the systematic identification of contextual factors and conditions that affect the results of transparency in the public sector is one of the relevant topics to be addressed in future studies of the transparency phenomenon in the public sector. Lyrio, Lunkes and Taliani (2018), in the same sense, suggest among the themes for future research, the analysis of factors that influence transparency in the public sector. This study aims exactly to contribute to the filling of this gap by presenting an analysis of the potential for transparency, which can be cross-checked with data on the level of transparency achieved by the municipalities, making it possible to verify whether their performance is consistent with their potential. In addition, it proposes a methodology different from those that has been used to assess transparency.

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It is hoped that the construction of the index will serve as a basis for possible improvements to public programs aimed at promoting transparency and may help the municipal sphere to build spaces that really promote transparency. It is also believed that knowing the characteristics that contribute to the promotion of transparency can allow the indication of areas that should be prioritized in public management not only to reduce information asymmetries, but also in the promotion of measures that seek to strengthen the involvement of citizens in public affairs.

The article is organized into five sections, starting with this introduction. The literature review, contained in the second section, discusses transparency in public management and its determining factors. Then, in the third section, the adopted methodological procedures are pointed out. In the fourth section, the results are analyzed and discussed, highlighting the municipal conditions that favor transparency and the Transparency Favoring Potential Index (IPFT). Finally, in the fifth section, the final considerations are presented.

Bibliographic Review

Transparency in Public Administration

When one speaks of transparency in Brazilian public administration, one can say that for several years the culture of secrecy has persisted. The most consistent legislative changes related to publicity occurred after the Federal Constitution of 1988, which with its proposal of re-democratization of the country extended the internal and external controls of public management, as well as made publicity more positive as a constitutional principle, instituting the right to access information (Bernardes, Santos, & Rover, 2015). However, there was a greater advance with the publication of Law No. 12,527/11, known as the Access to Information Law (LAI). In addition to establishing rules, deadlines and procedures for the provision and access to public information, this norm reinforced transparency legal requirements of acts performed in public administration, already provided for in the text of the Fiscal

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Responsibility Law, and its subsequent amendment (Complementary Law No. 131/2009), which determined the availability, in real time, of information on budgetary and financial execution.

In general, transparency can be said to have gained greater social expression in the last decade of the twentieth century, when it became part of the international and national governmental policy agenda (Heald, 2003). For Figueiredo and Santos (2014) public managers and scholars see transparency as a facilitator of good governance, because it enables better performance and reduces corruption in the public sphere, while increasing the relationship between State and society. Thus, transparency can be understood as the management of public affairs for the public, the opposite of opaque policies, where one does not have access to decisions, what they represent, how they are taken and what is gained or lost with them (Birkinshaw, 2006; Cunha Filho, 2018).

The promotion of transparency in this sense is considered as one of the factors that consolidate accountability, since in addition to facilitating social control and strengthening the relationship between the State and society, it contributes to the guarantee of better public policy results (Vasconcellos, Lunkes, & Taliani, 2018; Michener, 2019; Cunha & Antunes, 2021). Moreover, reduction corruption in the public sphere, as well as stimulates compliance with the decisions adopted by the rulers (Grimmelikhuijsen & Welch, 2012; Herzog, 2017).

Thus, simple information by itself is not enough for transparency to be effective, it is necessary, likewise, that they are easily accessed and understood, allowing society to use them for the purposes intended. About this point, the authors Platt Neto, Cruz, Ensslin and Ensslin, (2007, p. 77) understand that “more than ensuring compliance with legal norms, transparency initiatives in public administration constitute a policy of responsible management that favors the exercise of citizenship by the population”.

In this context, transparent public management must go beyond the dissemination of public information, and extend the conditions of accountability, to enable citizens to monitor and participate effectively in public administration acts (Cruz, Ferreira, Silva, & Macedo, 2012; Coelho, Silva, Cunha, & Teixeira, 2018). It is considered, therefore, that from the available and clear information about the public entity, the citizen can better follow the acts practiced by the public administration.

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Determining Factors of Public Management Transparency

Several characteristics are used by the literature to explain transparency in public management. (Baldissera & Dall'Asta, 2020). In general, given the work already done, the factors that determine transparency can arise both from external (mainly economic and fiscal) and internal (political will, qualified technical staff) causes. In this sense, Bakar and Saleh (2011) were able to identify twenty-seven types of variables that were used to study the determinants of voluntary disclosure of information by public sector entities that, in general, were related to social, demographic, economic or political factors. Tejedo-Romero and Araujo (2018) when analyzing Spanish municipalities verified that transparency is associated with economic and political factors. Zuccolotto and Teixeira (2014), in a study carried out in Brazil, also have found that fiscal and socioeconomic variables explain the level of transparency of Brazilian states.

The results of the research by Cruz et al. (2012) and Coelho et al. (2018), likewise, demonstrated the existence of a relationship between the socioeconomic conditions of the municipalities and the transparency in the availability of information on public management in the electronic portals of the municipalities surveyed. Likewise, Leite Filho, Colares and Andrade (2015), when analyzing the electronic portals of the most populous municipalities of Minas Gerais, concluded that the level of transparency of municipal public fiscal management was related to the population size and the level of development socioeconomic status of municipalities. Sicakava-Beblava, Kollorik and Sloboda (2016) focused on investigating the main trends in transparency of the 100 largest Slovak municipalities between 2010 and 2014. The authors found that population size is a factor that drives transparency.

Laswad, Fisher and Oyelere (2001) sought to compare the financial information voluntarily provided by cities, regions, and districts of New Zealand, since theoretically the cities would have in their councils a greater number of representatives of a metropolitan area. In this context, they verified that urbanization affects the availability of financial information. Likewise, Cassel and Mullaly (2012) stated that citizens in urban areas are generally able to make greater use of government Web sites, given the existence of greater connectivity.

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In addition to these characteristics, Piotrowski and Van Ryzin (2007) pointed out that education is also one of the potential factors that must be studied as a determinant of the demands of greater public transparency. For the authors, the higher the education level of the population, the greater its capacity to require government actions and, consequently, the greater the government transparency. Cassell and Mullaly (2012), when studying the municipalities of the USA, also found evidence that the more educated and urban the population, the greater the possibility of the existence of a Web site. The results of Brocco et al. (2018) also suggest that citizens with better health conditions, education and good employability are better able to exercise social control over municipal management. Tavares and Cruz (2020) also pointed out that the unemployment rate and the average age of the municipal population are negatively associated with transparency.

In the same vein, Cinca, Tomás and Terragona (2008) studied whether the environment influences the voluntary disclosure of financial information in 92 Spanish municipalities and pointed out that the localities in which the population has more years of studies tend to present Web sites with more information. Bernardo, Reis and Sediya (2017), in turn, have stated that municipalities with greater availability of financial resources and literacy rates tend to be more transparent.

Hameed (2005) sought to study the reality of fiscal transparency in 57 countries, noting that nations with higher per capita revenue were generally more transparent. Piotrowski and Van Ryzin (2007) also pointed out that, relative to USA local governments, revenue is related to a greater demand for transparency. The Styles and Tennyson study (2007) also showed that the cities with the highest per capita revenue are the ones that provide the most financial reports. Cinca, Tomás and Terragona (2008) and Lowatcharin and Menifield (2015) stated, in the same sense, that the higher the revenue and education level of the citizen, the greater the socio-political commitment, and the greater the influence of transparency. Silva and Bruni (2019) found that the variables years of schooling and the per capita revenue of the population have a significant relationship with the passive public transparency of Brazilian municipalities.

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The studies also show a positive relationship between political competition and public information disclosure (Laswad, Fisher, & Oyelere, 2001), where, in addition to the citizens, there is a search for fiscal information from the politicians who oppose management (Wehner & Renzio, 2013). In the same scenario, Ingram (1984) considered that a greater political competition leads to greater monitoring and, therefore, the greater the information collection.

The literature also ponders that participation is positively associated with transparency (Alt, Lassen, & Shanna, 2006; Welch, 2012; Sanchez, Aceituno, & Domínguez, 2013; Cucciniello, Porumbescu, & Grimmelikhuijsen, 2017). The author also points out that organizations that are strongly influenced by external actors report higher levels of participation. In this sense, Grimmelikhuijsen and Welch (2012) emphasize that the level of transparency is associated with media attention, external group pressure, political influence, and organizational capacity.

From these studies it is possible to verify that different factors can influence the level of transparency of public management. Given the importance of this theme, to analyze how social, demographic, economic, political, and financial characteristics of municipal environments can favor the promotion of transparency in the state of Minas Gerais, the methodology used to achieve this objective is presented below.

Methodological Procedures

The present study presents a quantitative approach with cross-sectional data design in the period of 2010. This is the year of the last demographic census conducted in Brazil, so it concentrates the largest amount of information on Brazilian municipalities. Regarding the objectives, it is characterized as descriptive research, since it seeks to describe and analyze a set of characteristics of the municipal environments that can favor the promotion the transparency of public management in Minas Gerais. The following are the methodological procedures, the variables used, the characterization of the study area, as well as the source and form of data treatment.

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Factor Analysis

To identify the factors that explain the possible differences in the municipal environments of the State of Minas Gerais in relation to transparency, as many variables will be used, the Factor Analysis (FA) method was used because the technique of multivariate analysis is appropriate for this purpose. This model is a set of statistical techniques that seeks to explain the correlation between observable variables, simplifying the data by reducing the number of variables necessary to describe them (Pestana & Gageiro, 2008).

The use of the factor analysis' technique aims to find a relationship between the variables capable of reducing them in a smaller set of statistical variables (factors) with the least loss of information (Maroco, 2006). The factor represents the portion of the total variation of the data that can be explained jointly for all the variables that compose it. Thus, the variations in a variable can be explained from a set of factors, whose analytical model presented by Corrar, Paulo and Dias Filho (2007, p. 79) is as follows:

$$X_i = \alpha_{i1}F_1 + \alpha_{i2}F_2 + \alpha_{i3}F_3 \dots + \alpha_{ij}F_j + e_i \quad (1)$$

Where α_i are the factor loads; F_j are the unrelated common factors; and e_i is an error that represents the portion of variation of the variable i that is unique to it and cannot be explained by a factor nor by another variable of the analyzed set. The term X_i represents the standard variables employed in FA to construct the factors. To obtain the factors F_j , a linear combination of the original variables is represented by:

$$F_j = \omega_{j1}x_1 + \omega_{j2}x_2 + \omega_{j3}x_3 \dots + \omega_{ji}x_i \quad (2)$$

Where ω_{ji} are the coefficients of the factor scores and X_i are the original variables involved in the study. It is worth noting that when there is more than one factor, the factor score represents the coordinates of the variable in relation to the axes, which are the factors (Corrar et al., 2007, p. 79). The factor, therefore, is the result of the linear relationship between the variables and that can explain a portion of variation of the original variables.

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As for the extraction of factors, the main components method was chosen, since it did not require information or assumptions about the normal multivariate distribution of the data (Corrar et al., 2007). The Varimax orthogonal method was used for the rotation of the main components, which consists of obtaining a factor structure in which one and only one of the original variables is strongly associated with a single factor, and little associated with the rest of the factors (Maroco, 2006). Factor scores were used to construct an index, as explained below.

Construction of the Index of Potential to Favor Transparency (IPFT)

As weighted in the previous subsection, we applied the factor analysis to obtain the factors and factor scores that were used to construct the Index of Potential to Favor Transparency (IPTF). The procedures adopted by Sabioni, Ferreira, Braga and Almeida (2016) and Lemos (2001) were taken as reference for estimation and elaboration of the IPFT. The IPFT is a proxy that represents the ability of a municipal environment to favor municipal transparency. In this way, this index has the function to determine, through the hierarchy, the municipalities more or less favorable to the transparency. For the constitution of the IPFT, the factors were aggregated according to the equation:

$$IPFT_i = \sum_{j=1}^p \frac{\lambda_j}{\Sigma \lambda_j} F_{ji} \quad (3)$$

In that the IPFT is the index of the i -th municipality, j is the j -th characteristic root, p is the number of factors extracted in the analysis, F_{ji} is the j -th factor score of the i -th municipality and $\Sigma \lambda_j$ the sum of the characteristic roots of the p extracted factors. The relative participation of the factor j in the explanation of the total variance captured by the p extracted factors is indicated by $\frac{\lambda_j}{\Sigma \lambda_j}$.

However, before aggregating the variables into the index, it is necessary to transform all factor scores into positive values and with variations between zero and one (Sabioni et al., 2016). According to Lemos (2001), this transformation is necessary to avoid that high negative factor scores raise the

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magnitude of the indexes associated to these municipalities. For this, the transformation was performed from the following formula:

$$F_{ij} = \frac{(F - F_{min})}{(F_{max} - F_{min})} \quad (4)$$

Where F_{ij} are the original factor scores estimated by means of the procedure of the main components, and F_{min} e F_{max} are the maximum and minimum values, observed in the factor scores associated to the municipalities of Minas Gerais.

Variables Used in the Study, Area of Study, Source and Treatment of Data

In this research the factor analysis was used to identify groups of variables that form constructs that represent the factors that favor transparency in a municipal environment. Thus, based on the reviewed literature, data availability and aiming to build a model with more explanatory power, twelve variables were selected with a positive theoretical expectation regarding transparency. Table 1 presents the variables and the theoretical basis according to the literature presented in the previous theoretical section.

Table 1.
Variables used in the factor analysis and theoretical basis.

Dimensions of Transparency	Variables	Data Source	Theoretical Basis
Socio-demographic	Urbanization rate	Minas Gerais Index of Social Responsibility	Laswad, Fisher and Oyelere (2001), Bakar and Saleh (2011), Cassel and Mullaly (2012)
Socio-economic	Rate of employment in the formal sector and per capita revenue literacy rate	Minas Gerais Index of Social Responsibility	Hameed (2005), Piotrowski and Van Ryzin (2007), Styles and Tennyson (2007), Cinca et al. (2008), Cassell and Mullaly (2012), Lowatcharin and Menifield (2015), Bernardo, Reis and Sediya (2017), Brocco et al. (2018), Tejedo-Romero and Araujo (2018) and Tavares and Cruz (2020)
	Percentage of the population with higher education	Atlas of Human Development in Brazil, of the United Nations Development Program in Brazil	
Financial	Budget revenue per capita	Finance of Brazil	Cruz et al. (2012), Ribeiro and Zuccolotto (2014), Zuccolotto and Teixeira (2014), Leite Filho (2015), Coelho et al. (2018) and Silva and Bruni (2019)
	Per capita expenditure with education and per capita expenditure with Health	Minas Gerais Index of Social Responsibility	

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Political-social	Percentage of Political Parties (PP) and percentage of affiliates to PP	Superior Electoral Court	Ingram (1984), Laswad, Fisher and Oyelere (2001), Alt, Lassen and Shanna (2006), Grimmelikhuijsen and Welch (2012), Welch (2012), Sanchez, Aceituno and Domínguez (2013), Wehner and Renzio (2013) and Cucciniello, Porumbescu and Grimmelikhuijsenm (2017)
	Proportion of private foundations and non-profit associations and percentage of members of religious entities	Brazilian Institute of Geography and Statistics	

Source: Prepared by the authors.

This study takes as a sample the 853 municipalities of Minas Gerais, to make feasible an analysis that addresses a state completely. For the treatment and the analysis of the collected data, the Excel spreadsheet, and the Statistical Package for Social Sciences (SPSS) software were used.

Presentation and Discussion of Results

Municipal Conditions that Favor Transparency

For the Factor Analysis, the Kaiser-Meyer-Olkin (KMO) and Bartlett sphericity tests were performed, which verify the quality of the correlations between the variables. The factoranalysis showed reliability for the KMO test whose result was 0.806 on a scale ranging from 0 to 1, which according to Pestana and Gageiro (2008) represents a good value. Bartlett's sphericity test, which tests the correlation matrix, indicated that the chosen variables were significant at less than 1%, that is, the null hypothesis that the correlation matrix is equal to an identity matrix is rejected. The application of the factor analysis with decomposition in main components resulted in the extraction of three factors, considering the Kaiser criterion, of characteristic roots (λ) greater than 1, as can be seen in Table 2.

Table 2.

Number of factors and percentage of variance explanation.

Factors	Roots Characteristic (λ)	Initial (%)	Rotating (%)
1	3.763	31.150	31.360
2	3.111	22.758	25.923
3	1.230	8.160	10.248
Total	-	67.531	67.531

Source: Search results.

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The communalities indicate the variables considered most representative in the construction of the components (Corrar et al., 2014). As can be seen in Table 3, the most representative variables in this study were per capita revenue, per capita budget revenue and percentage of members belonging to religious entities. According to the literature, the minimum acceptable value for the community is 0.50 (Pestana & Gageiro, 2008). In this sense, the variable relative to the proportion of the number of foundations and non-profit associations, which reached a value of 0.188, should be excluded from the model, and a new factor analysis was carried out. However, due to the importance of this variable about the social context, it was considered necessary to preserve it in the study. Table 3 shows the results of rotational factor loads and communalities:

Table 3.

Rotated factor loads and communalities.

Variables	Factor 1	Factor 2	Factor 3	Commonalities
Urbanization Rate	.760			.660
Employment Rate in the Formal Sector	.787			.673
Per Capita Revenue	.912			.833
Literacy Rate	.834			.723
Percentage of People Over 25 Years with Higher Education Complete	.841			.722
Percentage of Political Parties	.511			.563
Per Capita Budget Revenue		.916		.848
Per Capita Expenditure with Education		.872		.761
Per Capita Expenditure with Health		.836		.723
Percentage of Affiliated to Political Parties		.776		.629
Percentage of Religious Entity Members			.875	.781
Proportion of Number of Foundations and Non-profit Associations			.432	.188

Source: Search results.

It is worth mentioning that, in addition to the communalities, the factor loads of each variable should also be analyzed in relation to the extracted components. It is possible to notice that the criterion that the same variable should not contribute above 0.40 for the construction of the three factors was met. This limit is indicated to avoid problem of indetermination of the relationship between variables and factors. Because of this, it was possible to identify which variables relate to which factors.

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Thus, considering that the purpose of this study so far is to know the characteristics that provide favorable environments for municipal transparency, we tried to discuss each of the factors that were retained, considering the pattern of relationship identified and the literature consulted:

Factor 1 – Demographic and Socioeconomic Conditions: This factor has the largest variance, corresponding to 31.360 of the total accumulated. In this way, this is the factor that contributes most to the municipal environment being favorable to transparency. The variables that compose it refer, basically, to the characteristics of the population that resides in the municipalities and of the municipality itself, in the case of the rate of urbanization and percentage of political parties. Several authors, as we have seen in the theoretical section, affirm that factors related to urbanization, per capita revenue, education and political competition have a positive influence on transparency (Ingram, 1984; Laswad, Fisher, & Oyelere, 2001; Hameed, 2005; Piotrowski & Van Ryzin, 2007; Styles & Tennyson, 2007; Cinca et al., 2008; Bakar & Saleh, 2011; Cassel & Mullaly, 2012; Wehner & Renzio, 2013; Lowatcharin & Menifield, 2015; Bernardo, Reis, & Sediya, 2017; Brocco et al., 2018; Tejedo-Romero & Araujo, 2018; Tavares & Cruz, 2020).

As Cassel and Mullaly (2012) citizens in urban areas are generally able to make greater use of government Web sites, given the greater connectivity in urban areas. The literature also argues that the higher the level of income, employability, and education of citizens, the stronger the pressure on local authorities to disseminate information through the Internet, so that the level of disclosure will consequently increase (Cinca, Tomás, & Terragona, 2008; Lowatcharin & Menifield, 2015; Tavares & Cruz, 2020). In addition, in cities with competitive political environments, the local executive may feel the need to support transparency to increase credibility, address citizens' concerns, and involve the community in its proposals (Tavares & Cruz, 2020).

Factor 2 – Financial Conditions: The variables that make up this factor are related to municipal public finances. According to Cruz et al. (2012), municipalities with greater relative efficiency in the

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requirement of budget revenues (per capita budget revenue) disclose more information in an electronic public access medium, indicating that municipalities with greater power to generate resources also have greater capacity to maintain more efficient electronic information systems. In this sense, the positive relation between the value of the budget revenue and the level of transparency of a municipality indicates that the more resources the municipalities must carry out the activities, the more information will be made available to the population (Cruz et al., 2012; Ribeiro & Zuccolotto, 2014; Zuccolotto & Teixeira, 2014; Leite Filho, Colares, & Andrade, 2015, Coelho et al., 2018; Silva & Bruni, 2019).

Moreover, it is assumed that people with better educational opportunities and health conditions have greater possibilities to exercise social control, charging public managers to maintain them. Likewise, a government with good performance and management in these areas seeks to legitimize its good administration, making its acts public (Ribeiro & Zuccolotto, 2014; Brocco et al., 2018). As for the percentage variable of affiliated to political parties, it has been framed in the factor that aggregates basically financial data, it is believed that the fact that the municipality has more people related to politics can favor the sending of resources by politicians who have relation with the city, influencing in the budget revenue.

Factor 3 – Conditions of Social Participation: Although with a smaller contribution, conditions related to social participation also contribute to the promotion of transparency. According to Sabioni et al. (2016), the mobilization of members of religious entities and foundations and non-profit organizations can put pressure on municipal public administration for better results. Participation in this context is positively associated with transparency, so that organizations that are strongly influenced by external actors report higher levels of participation (Alt, Lassen, & Rose, 2006; Grimmelikhuijsen & Welch, 2012; Welch, 2012; Sanchez, Aceituno, & Domínguez, 2013; Cucciniello, Porumbescu, & Grimmelikhuijsen, 2017). It is understood, therefore, that conditions that encourage social participation contribute to the local society have greater possibilities to demand from its ruler's greater

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openness in public management (popular participation) and greater transparency in the dissemination of the acts practiced.

In addition to identifying and interpreting the factors, it is possible to measure how demographic, social, economic, political, and financial conditions favor public transparency through the establishment of the Index of Potential to Favor Transparency (IPFT), presented below. It is worth mentioning that the creation of the index followed the work of Sabioni et al. (2016). This study, through the identification of explanatory factors that contribute to citizen engagement in social control at the municipal level, measured the extent to which municipal spaces favor citizen participation in public administration in Minas Gerais.

Index of Potential to Favor Transparency (IPFT)

To rank municipalities in terms of environments favorable to transparency, the Index of Potential to Favor Transparency (IPFT) was created. By considering together the factors related to demographic and socioeconomic, financial, and social participation conditions in an index, it was possible to classify the municipalities of the state of Minas Gerais, revealing those that are more or less favorable to transparency.

The index calculated from the factors obtained with the factor analysis is a proxy, which represents the conditions of the municipal environments regarding favoring transparency. Through Table 4 it is possible to visualize the descriptive statistics of the IPFT in the state, and to facilitate the interpretation of the data, the resulting values were re-parameterized applying the ratio between the obtained index and the highest value reached.

Table 4.
Descriptive analysis of IPFT (%) in Minas Gerais.

	Extend	Min.	Max.	Mean	Median	Standard Deviation	Variation	Asymmetry	Kurtosis
IPFT	87.43	12.57	100.00	41.70	41.99	12.59	158.74	.60	1.18

Source: Search results.

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The breadth of data demonstrates the existing disparities in levels of transparency-friendly environments in Minas Gerais, which is a state of great territorial extension, characterized by modern and dynamic regions on one side and stagnant and backward regions on the other (Amaral, Lemos, & Chein, 2010). The municipality that provides the least conditions favorable to an environment aimed at promoting transparency presents a value of 12.57%, being the difference of this to the one that has a more favorable environment of 87.42%. It is possible to note, however, that the general mean of the state is well above the minimum found, since the difference is 29.13 percentage points. Likewise, the average is also far from the maximum value reached, with a difference of 58.3 percentage points. The kurtosis coefficient, which corresponds to 1.18, shows that the distribution is considered leptokurtic because it is elongated in relation to the normal distribution. Regarding asymmetry, the variable presents positive or right asymmetry.

It is worth mentioning that the municipalities with the lowest and highest rates, respectively, are Setubinha and Cachoeira Dourada, with the latter having in 2010 about 2,500 inhabitants. This result, by the way, is in line with the findings of Leite Filho, Colares and Andrade (2015) and Sicakava-Beblava, Kollorik and Sloboda (2016), which related the population size to higher levels of transparency. In the case of the municipality of Cachoeira Dourada despite the small population, the city has good financial and socio-economic indicators.

The municipality of Setubinha is in the Vale do Jequitinhonha, a region of the state with greater socioeconomic weaknesses, which may have influenced the result of lower potential. From the information obtained with the descriptive analysis of IPFT, Kolmogorov-Smirnov and Shapiro-Wilk tests of normality were performed, indicating that the index does not have a normal distribution. Thus, to facilitate the understanding of the different levels found, the index was divided into four strata from the quartiles, as can be seen from Table 5. In addition, to better understand the four groups formed, the mean of each of the variables used in each of the groups formed, as well as the population density of each municipality, were calculated.

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Table 5.
Characterization of IPFT strata in Minas Gerais.

Variables	Group 1 %	Group 2 %	Group 3 %	Group 4 %
IPFT Levels	0 – 31.88	31.89 – 41.98	41.99 - 49.36	49.37 - 100
Amount of Municipalities	213	213	213	214
Population Density	32.66	68.85	38.81	122.10
Urbanization Rate	53.52	64.19	74.62	79.28
Employment Rate in the Formal Sector	10.98	16.38	22.89	31.53
Per Capita Revenue	327.38	437.13	541.71	655.40
Literacy Rate	0.79	0.86	0.90	0.91
Percentage of the Population with Higher Education	4.00	4.98	6.13	7.99
Per Capita Budget Revenue	1396.68	1549.66	1664.20	2412.09
Per Capita Expenditure with Education	328.86	356.78	370.51	483.01
Per Capita Expenditure with Health	288.49	334.19	371.74	494.03
Percentage of Political Parties	0.43	0.42	0.42	0.47
Percentage of Affiliated to Political Parties	0.10	0.12	0.12	0.14
Proportion of Foundations and Non-profit Associations	0.19	0.20	0.21	0.23
Percentage of Members of Religious Entities	0.95	0.96	0.96	0.95

Source: Search results.

It is verified that more than 75% of the municipalities presented levels of potential to favor transparency below fifty percent. Of group 4, which has 214 municipalities, 199 have an index higher than 50%, of which only 60 reached a value greater than or equal to 60%. Thus, of the 853 municipalities of Minas Gerais, only 23.3% of the total reached an index higher than 50% and 50.1% and were above the general average, which was 41.70%. It is also possible to notice that, in general, the variables used presented increasing results from group 1 to group 4, except for the percentage of the number of members of religious entities.

Following the studies of Sabioni et al. (2016), we can call Group 1 as low potential; Group 2, as medium potential; Group 3, regular; and the fourth group with high potential for transparency. Regarding the population density of the municipalities belonging to each of the groups, there was not a growing result as occurred with the variables. Group 2, because it also has municipalities with a higher population density, has an average higher than Group 3.

Thus, there is a greater contrast between Groups 1 and 3 and Group 4, the first two being formed mostly by small cities, and the latter by cities with a higher level of population density. In Group 2 there

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are municipalities of all types. This fact shows that municipalities with higher population density are not always more likely to provide an environment favorable to transparency, as exposed by Leite Filho, Colares and Andrade (2015). To identify the spatial distribution of the IPFT, a map (Figure 1) was elaborated according to the four strata analyzed.

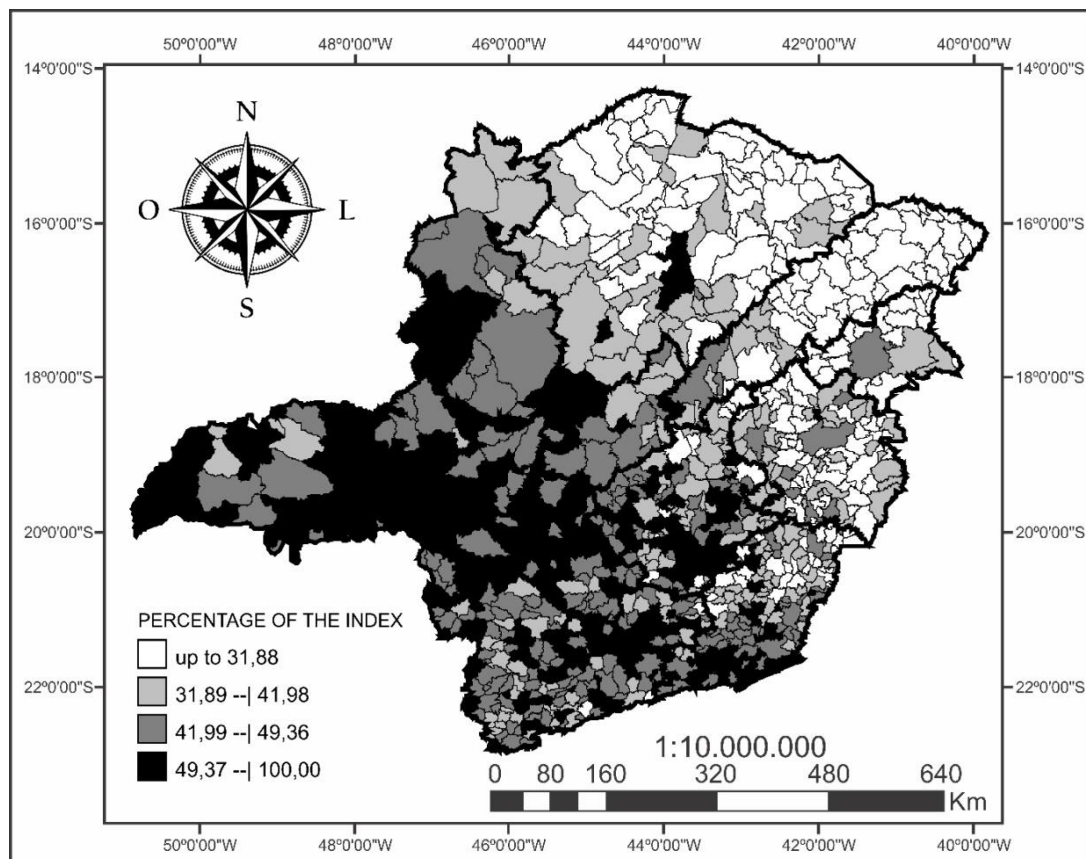


Figure 1. Map of the IPFT in the municipalities of Minas Gerais.

Source: Prepared by the authors.

In addition to the map above, Table 6 also helps detect the differences between the regions of Minas Gerais. The mesoregions with the highest concentration of municipalities less favorable to transparency are Vale do Mucuri, Jequitinhonha, Norte de Minas (North of Minas) and Vale do Rio Doce. The Central Mineira, the Oeste of Minas (West of Minas) and the Triângulo Mineiro / Alto

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Paranaíba had no municipality in stratum 1, forming the mesoregions with lower concentration of municipalities with low potential for transparency. It is also worth noting that less than 1% of the municipalities of the Sul / Sudoeste de Minas (South / South-west of Minas) mesoregion are in Group 1.

With the exception of the Norte de Minas, which is not part of Group 3, all mesoregions are present in Groups 2 and 3, of medium and regular potential, to a greater and lesser extent. In Group 4, stratum with municipal environments more favorable to transparency, the mesoregions that presented the best results are: Triângulo Mineiro / Alto Paranaíba, Oeste de Minas, Central Mineira, Campo das Vertentes, Metropolitan Region of Belo Horizonte, and Sul / Sudoeste de Minas. These mesoregions, even, were those that presented the best average in the IPFT.

On the other hand, the mesoregion with the worst representations in this stratum were Jequitinhonha and Vale do Mucuri, which had no municipality present in Group 4, Norte de Minas and Vale do Rio Doce. Analyzing these results, it is possible to verify that the mesoregions from Minas Gerais with better socioeconomic and human development indexes are also the ones with the greatest potential to favor public transparency, corroborating the findings of Bakar and Saleh (2011), Cruz et al. (2012), Zuccolotto and Teixeira (2014), Coelho et al. (2018) and Tejedo-Romero and Araujo (2018).

Table 6.
Description of IPFT by mesoregion.

Mesoregions of Minas Gerais	G. 1 %	G. 2 %	G. 3 %	G. 4 %	IPFT Mean	Standard Deviation	Min.	Max.
Campo das Vertentes (36)	2.78	30.56	27.78	38.89	46.75	9.2	24.8	66.6
Central Mineira (30)	0.00	16.67	40.00	43.33	49.71	11.1	33.5	95.7
Jequitinhonha (51)	78.43	15.69	5.88	0.00	27.90	7.1	17.6	46.7
Metropolitana de Belo Horizonte (105)	13.33	31.43	22.86	32.38	46.33	14.0	18.4	96.1
Noroeste de Minas (19)	5.26	21.05	52.63	21.05	45.57	6.2	31.4	56.4
Norte de Minas (89)	64.04	33.71	0.00	2.25	29.80	6.8	12.9	53.7
Oeste de Minas (44)	0.00	4.55	47.73	47.73	49.76	6.6	40.9	74.5
Sul/Sudoeste de Minas (146)	0.68	22.60	45.89	30.82	47.20	7.6	31.0	72.8
Triângulo Mineiro/Alto Paranaíba (66)	0.00	7.58	25.76	66.67	54.67	11.5	35.4	100.0
Vale do Mucuri (23)	86.96	8.70	4.35	0.00	25.08	7.1	12.6	44.1
Vale do Rio Doce (102)	51.96	37.25	5.88	4.90	32.71	7.5	17.7	62.6
Zona da Mata (142)	18.31	29.58	29.58	22.54	42.17	10.2	20.2	71.0

Source: Prepared by the authors.

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In the Vale do Mucuri region, only two cities are part of Group 2, which are Carlos Chagas and Nanuque, and only the city of Teófilo Otoni occupies Group 3, which is the largest of its mesoregion. This municipality presented results above the average of the state only for the first factor score analyzed in this study, which refers to demographic and socioeconomic conditions. All other municipalities are part of Group 1.

The Jequitinhonha mesoregion also does not have any municipality in stratum 4 and only the cities of Diamantina, Presidente Kubitschek and São Gonçalo do Rio Preto are present in Group 3. Diamantina is the largest municipality of this mesoregion and presented values above the average in Factors 1 and 3. Regarding the Factor 2 that refers to the financial conditions, however, the factor was equal to zero. The municipalities of Presidente Kubitschek and São Gonçalo do Rio Preto, on the other hand, obtained above-average factor scores on social and financial participation conditions. Of the other municipalities, eight are in Group 2 and all others in stratum 1.

In the mesoregion of the Norte de Minas no municipality presented regular potential to favor transparency, however, two cities are Group 4, which are Montes Claros and Pirapora. The two municipalities presented factor scores above the state average only in relation to demographic and socioeconomic conditions. In the Vale do Rio Doce, six municipalities are present in Group 3 and five in Group 4, being Carmésia, Ipatinga, Jaguarçu, Marilac and Timóteo. Concerning these mesoregions that presented the lowest rates, the largest cities in terms of population and with better socioeconomic conditions outnumbered the smaller municipalities, corroborating, on this matter, the studies by Leite Filho, Colares and Andrade (2015) and Sicakava-Beblava, Kollorik and Sloboda (2016).

In the mesoregion of Campo das Vertentes, only the municipality of Senhora dos Remédios was part of the low potential group, the Factor 3 score being the only one with a result higher than the state average. Formoso was the municipality of Noroeste de Minas (Northwest of Minas) that was also allocated in Group 1, showing scores below the state average in all three factors. As for the mesoregion of the Sul / Sudeste of Minas Gerais, which is composed of a total of 146 municipalities, only the city of Virginia is present in Group 1. This municipality had an above average score only in relation to the

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conditions of social participation. In the mesoregion of the Oeste of Minas, which did not obtain any municipality in Group 1, only the cities of Candeias and São Francisco de Paulo are part of Group 2, as well as the municipalities of Centralina, Guimarânia, Gurinhatã, Ipiacu and Monte Alegre de Minas belonging to the Triângulo Mineiro/Alto Paranaíba.

Regarding the differences within each mesoregion, the Metropolitan Region of Belo Horizonte has the greatest dispersion around the data, indicating that there are large differences between municipalities, with percentages varying from 18.4 to 96.1 – a difference of 77.7 percentage points. The other mesoregions that showed greater diversity in the sequence were the Triângulo Mineiro/Alto Paranaíba, the Central Mineira and the Zona da Mata. However, the Noroeste, Oeste and Norte of Minas showed less variability, due to the low values of the standard deviation. The low variation of the Noroeste occurs since more than half of the municipalities are part of Group 3. In the Oeste de Minas, most of its municipalities are concentrated between Groups 3 and 4 of regular and high potential. On the other hand, in the Norte de Minas, most of the municipalities are present in Groups 1 and 2, with low and medium potential to favor transparency.

Among the 853 municipalities analyzed, the cities with the index above 90%, in order of importance, were: Cachoeira Dourada, which presented a maximum score, followed by Nova Lima, Serra da Saudade and Belo Horizonte. All these municipalities presented the three factor scores above the state average. Except for Belo Horizonte and Nova Lima, which are larger municipalities, in the cities of Cachoeira Dourada and Serra da Saudade have the lowest population. This result is consistent with the findings of Comin et al. (2016), which when analyzing the level of compliance with the Law on Access to Information by the municipalities of the state of Santa Catarina, identified that smaller cities have voluntarily disclosed a greater amount of information. An explanation for this fact is the greater closeness of these governments with their citizens, providing more effective control.

It is worth mentioning that the important thing in the public sector is the quality of spending, not quantity (Ribeiro & Zuccolotto, 2014). In the same sense, Bellver and Kaufmann (2005) also point out that the dissemination of information is not a matter of resources, but of commitment on the part of the

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government. Therefore, even if the municipality does not have the best financial and socioeconomic conditions, the government's willingness to inform and disseminate its information may be predominant for promoting transparency. Coelho et al. (2018) highlight, by the way, that the lack of infrastructure, technological systems and trained personnel may limit the transparency potential of governments. Subnational control in the form of institutions dedicated to regulating and complying with information management and disclosure practices is also one of the problems the country needs to face (Michener, Contreras, & Niskier, 2018). Thus, to study the in-depth peculiarities of these municipalities, which is not the scope of this study, may reveal important information regarding measures that may make the municipal environment more favorable to transparency.

In view of the table presented, it can be observed that the state of Minas Gerais presents strong inequalities when it comes to offering favorable conditions for the promotion of transparency. In this context, it can be verified that federal and state programs that aim to encourage the promotion of transparency in Brazil still need to give greater attention to municipalities and mesoregions in less favorable situations, seeking to strengthen actions for the formation of environments that really provide greater transparency of the local public administration.

Final Considerations

Unlike most studies about transparency, which use multiple linear regression to find the factors that determine transparency, this research has broadened the focus of the work already done, analyzing the contextual factors and conditions that affect transparency results in the public sector, as suggested by Cucciniello, Porumbescu and Grimmelihijsen (2017) and Lyrio, Lunkes and Taliani (2018). About the many works already done, the variables pointed to as important in the literature were used to propose a new way of understanding transparency at the municipal level.

The results obtained showed strong disparities in relation to the potential that the municipalities of Minas Gerais must promote transparency. Thus, for a municipal environment to become more favorable to the transparency of public management, the results indicate the need to work better the

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socioeconomic, financial, and social participation conditions of the municipalities. In addition, upgrading existing programs by focusing on the local level, which often remains the latter, can help identify areas that need to be prioritized. Contrary to what much of the literature points out, the larger cities tend to be more transparent (Styles & Tennyson, 2007; Cruz et al., 2012), the results showed that smaller municipalities also have equal capacity to promote spaces that promote transparency.

These findings contribute to the discussion that a municipality that reaches high levels of transparency may, however, be below its potential. While others, despite being at a lower level, do a good job in relation to their potential for transparency, considering the conditions they are. Hence the importance of considering the quality of public spending, as well as the government's willingness to be transparent and the population to collect information and use it in the public interest.

In addition to compliance with the laws that determine the duty to inform, the data provided by public entities must be understandable and useful, to facilitate social control. Thus, combined with transparency, governments must invest in tools that allow social participation. Transparency is not an end, an environment that really favors it should also offer effective accountability mechanisms.

As a contribution to the field of public administration, the present study proposes an index that allows to know the factors that provide environments more favorable to the municipal transparency, allowing the hierarchy of the municipalities in terms of more or less propensity to transparency. In addition, the analysis carried out can be cross-referenced with the data of the level of transparency achieved by the municipalities, making it possible to verify whether their performance is consistent with their potential. It also contributes to the debate about the need to devote greater attention to the municipal public administration, since, when compared to other federal entities, it allows a closer approximation between the activities developed by the executive branch and their impact on the life of the population.

Regarding the limitations of the study, the first one concerns the lack of more current data. As a large part of the variables referred to the year 2010, to have a standardization, it was decided to take this year as the base. In addition, the study was based on the use of a metric to measure how much the

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municipalities of Minas Gerais provide environments favorable to transparency. It is verified, therefore, that the situation presented in this study represents a static view of the scenario found in the municipalities of Minas Gerais in the year of 2010. Thus, if the situation of municipalities has changed in recent years, the percentage of the index obtained will no longer represent reality. Finally, transparency is a complex phenomenon, and there are explanatory factors addressed in the literature that were not included in this study.

Thus, considering the presented results and the limitations previously mentioned, for future research it is suggested to include new variables or more current data, seeking to know better the reality of the state, by means of comparative studies that approach in greater depth the municipalities or regions that differed from the others. Another suggestion is to increase the results of this study by verifying the relationship between the IPFT and existing municipal transparency indicators, such as the Transparent Brazil Scale (EBT) of the General Comptroller's Office, and to use qualitative techniques, as well as to extend this study to other states, regions or even to all municipalities in Brazil.

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