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Theoretical-empirical Article

Building a State Capacity Index for Municipal Governments of Minas Gerais

Construindo um Índice de Capacidade Estatal para os Governos Municipais de Minas Gerais



Gustavo Bastos Braga^{*1}
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ABSTRACT

Objective: state capacity constitutes the set of essential competences that government institutions have (or should have) in order to achieve public objectives. However, the multidimensional nature of the 'state capacity' construct implies a major research challenge for the scientific academy and a major management challenge for public managers. **Theoretical framework:** the creation of State Capacity Index (SCI) follows the same procedures as the Human Development Index (HDI). **Method:** the search for variables (proxies) that are pertinent to the Brazilian context and that empirically allow the measurement and operationalization of state capacity was carried out through extensive bibliographic research. Therefore, SCI allowed the general examination of the 'state capacity' construct. **Results:** the results are disparities in the municipal administrative structures of Minas Gerais. **Conclusion:** it is suggested the need for incentives and investments in the dimensions that cover the State Capacity Index, namely: administrative, political, and fiscal.

Keywords: state capacity; State Capacity Index; Minas Gerais administrative structures; performance measures.

RESUMO

Objetivo: a capacidade estatal constitui o conjunto de competências essenciais que as instituições governamentais possuem, ou devem possuir, para a consecução dos objetivos públicos. Entretanto, a natureza multidimensional do construto 'capacidade estatal' implica um grande desafio de pesquisa para a academia científica e um grande desafio de gerenciamento para os gestores públicos. Nosso objetivo consistiu na construção de uma medida de desempenho na expectativa de avançar empiricamente nos estudos sobre esse conceito. **Marco teórico:** a criação do Índice de Capacidade Estatal (SCI) seguiu os mesmos procedimentos do Índice de Desenvolvimento Humano (IDH). **Método:** a busca de variáveis (*proxies*) que estejam atinentes ao contexto brasileiro e que permitam, empiricamente, a mensuração e operacionalização da capacidade estatal se deu mediante extensa revisão de literatura. Logo, o SCI permitiu o exame geral do construto, 'capacidade estatal'. **Resultados:** os resultados ressaltaram disparidades nas estruturas administrativas municipais de Minas Gerais. **Conclusão:** sugere-se a necessidade de incentivos e investimentos nas dimensões que abrangeram o Índice de Capacidade Estatal, a saber: administrativa, política e fiscal.

Palavras-chave: capacidade estatal; Índice de Capacidade Estatal; estruturas administrativas de Minas Gerais; medidas de desempenho.

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INTRODUCTION

The extensive number of published studies on the topic of state capacity (SC) in different fields of knowledge attests the core role of this theme in scholarly research (Cingolani, 2013; Gomes, 2010; Lindvall & Teorell, 2016; Rosas Huerta, 2008; Wu et al., 2015). In the public administration sphere, SC studies have emerged, among other factors, as an outcome of the expansion of government's responsibility attributions and complexity (Gomide & Boschi, 2016).

Within the scope of public administration, the concept of state capacity refers to governmental actions and can be understood as a set of state competencies required for the attainment of public interests. In this regard, if, on the one hand, having an adequate state capacity can be characterized as a pre-condition for the efficiency of institutions (Evans, Huber, & Stephens, 2014; Howlett, 2015), on the other, the lack or insufficiency of state capacity is characterized as an obstacle to achieving state goals (Brassiolo & Sanguinetti, 2016).

The Brazilian state, due to its institutional structure, has a unique form of government (Franzese & Abrúcio, 2013): it highlights the consolidation of municipal entities as government structures, as they are endowed with political, administrative, and financial autonomy. In this arrangement, they need to have specific competencies (i.e., state capacity) in order to execute certain attributions — such as the construction of policies and the management and allocation of resources related to municipal collection — included in the 1988 Federative Pact.

Therefore, it is relevant to operationalize and understand the level of capacities of municipal public institutions, as this is an aspect that can contribute to the strengthening of municipal public management, through the generation of knowledge and expertise replicable throughout the Brazilian territory.

We argue here that the implementation of policies and programs by the federal government — such as the Decree No. 9,739/2019 (Decreto n. 9.739, de 28 de Março de 2019); the Public Management Modernization Project (Gespública); the Tax Administration Modernization Program (PMAT); and the National Support Program for Administrative and Fiscal Management of Brazilian Municipalities (PNAFM) — can facilitate the institutional strengthening of municipal governments, provided they are adequately supported by academic research and performance measures, specific to the state capacity domain. Thus, this study outlines a diagnosis of the state capacity of the municipal administrative structures of the state of Minas Gerais¹ by examining three aspects: fiscal, administrative, and political.

The purpose of this article is to build a measure of performance in an effort to advance empirically in the studies on SC. The delimitation of the administrative structures of

the municipalities as a unit of analysis was grounded on the possibility of examination, classification, and comparison of state capacity in the administrative, fiscal, and political dimensions of municipal governments at the organizational level, as previously proposed by Martins (2021).²

It is expected that this state capacity indicator becomes a mechanism to guide and provide subsidies to public managers at all levels of government, in addition to assisting in the design and implementation of sectoral policies that are more likely to produce more effective results.

This article is organized as follows. In addition to this introduction, section two presents a brief theoretical-conceptual discussion about the concept of state capacity and its relationship with quantitative and qualitative measurement systems. Section 3 describes the operationalization of the state capacity indicator. The results are discussed in the fourth section, and the last one concludes with the results and practical implications of this research.

PERFORMANCE MEASURES AND STATE CAPACITY

Through the consolidation and dissemination of the principles of New Public Management, performance measurement systems have gained relevance in the public sector. Gradually, public managers have focused their attention on the relationship with the stakeholders and on the achievement of institutions' desired objectives (Moore & Sanjeev, 2004). Given this context, performance measures have taken center stage in the public sector reform processes (Jarrar & Giovanni, 2007).

In the Brazilian scenario, the corollary of this finding is in the guidelines adopted by Decree No. 6,944/2009 (Decreto n. 6.944, de 21 de agosto de 2009) and in the public management modernization project (Gespública), since its objectives were focused on strengthening the SC of direct federal public administration, municipalities, and foundations, through the fortification of the capacity for planning and managing public policies; by modernizing organizational structures and administrative processes; through the reinforcement of mechanisms for administrative transparency; and by encouraging the management of indicators of efficiency, effectiveness, and results (Fernandes, 2016).

Although there is disagreement in the conceptualization of SC, which complexifies its empirical measurement (Hanson & Sigman, 2021), there has been an effort in the literature to measure SC in quantitative terms (Cingolani, 2013) and extensive use of it as an explanatory variable. In this work, articles that empirically measured SC were searched. The results of this investigation, which involved the last decade, are shown in Table 1.

Table 1. Authors who empirically operationalize the measurement of state capacity from 2009 to 2019.

Author	Variables used	Title of the article and year of publication
1. Hartley and Zhang	Communication levels; intra and interinstitutional consultation and coordination; finance and personnel levels; transparency; presence of the rule of law; access to information; adequate tax system to finance programs and projects.	Measuring policy capacity through governance indices (2018)
2. Gomide and Boschi	Efficient bureaucracies; refitting the production matrix; fostering development; adoption of social inclusion policies with distributive effects; expansion of democracy.	Capacidades estatais em países emergentes o Brasil em perspectiva comparada (2016)
3. Luciana Cingolani	Combination of the following state power dimensions: a) coercive (property rights); b) fiscal; c) administrative; d) transforming or industrializing; e) relational/territorial coverage; f) legal; g) policy.	The state of state capacity: A review of concepts, evidence and measures (2013)
4. Lindvall and Teorell	Fiscal capacity; specialized bureaucracy; information; coercion; incentives and advertising.	State capacity as power: A conceptual framework (2016)
5. Pires and Gomide	Bureaucracy specialization; dialogue between government and society; performance; analysis of results.	Governança e capacidades estatais: Uma análise comparativa de programas federais (2015)
6. Gomes	Fiscal (own tax revenue and resources from intergovernmental transfers); administrative (staff qualification, organizational structure, results of implementation); policy (accountability, transparency, communication channels, presence of regulatory bodies).	The multi-faceted debate on decentralization and collective welfare (2010)
7. Wu, Ramesh, and Howlett	Analytical; operational and political.	Policy capacity: A conceptual framework for understanding policy competences and capabilities (2015)
8. Rosas Huerta	Administrative capacity (rule of law, specialization of bureaucracy, structure and distribution of functions and responsibilities, availability of financial resources, relationship, coordination and intergovernmental collaboration); political capacity (channels of communication and political participation, transparency and accountability).	Una ruta metodológica para evaluar la capacidad institucional (2008)
9. Silva	Use of administrative, fiscal, and political indicators. Respectively: organizational structure of state governments, expenses paid in the social assistance function, and presence of public policy councils.	Os estados no SUAS: Uma análise da capacidade institucional (CI) dos governos estaduais (2015)
10. Addison	Coordination capacity (bureaucratic arrangements and their collaborative links with dominant civil society organizations), implementation capacity (service provision), and accountability capacity.	Is administrative capacity a useful concept? Review of the application, meaning and observation of administrative capacity in political science literature (2009)
11. Hanson and Sigman	Identification of three capacity factors: administrative, fiscal (extractive function), and coercive potential.	Leviathan's latent dimensions: Measuring state capacity for comparative political research (2021)

Note. Source: Own elaboration.

As shown in Table 1, the literature has a wide variety in the elaboration, decomposition, and operationalization of the SC concepts. While some researchers focus on the diagnosis of Brazilian states SC in social assistance (Silva, 2015), others hold a more comprehensive perception of the SC, taking into account the degrees of competence and the levels of resources used for the production of public policies, which are subdivided into twelve SC analysis dimensions (Howlett, 2015).

Some studies, such as Rosas Huerta's (2008) and Wu et al.'s (2015), provide a conceptual framework that allows the understanding of governments' SC in the diverse levels that circumscribe it. In light of this, three levels that refer to

the influence potential of the state's administrative structures should be highlighted.

First, there is the individual level (micro level), which alludes to the characteristics of the available human resources (the type of personnel, hiring, qualification, etc.). There is also the organizational level (meso level), which reflects the management capacity. That is to say, it focuses on organizational strengthening as an intervention area to build capacities (management systems, state arrangements, communication channels, etc.). Finally, there is the systemic level (macro level), which represents the last level of state capacity and refers to the institutions as well as to the

economic, political, and social environment within which the public sector is framed.

Consequently, the examination of the efficiency of municipal governments was based on the possibility of SC analysis and comparison considering the administrative, fiscal, and political dimensions of municipal governments at the organizational level. For this reason, the locus of this investigation is not restricted to a single characteristic or governmental action. Instead, it consists of measuring the whole set of dimensions that involve SC, taking into account the fact that municipalities have distinct trajectories and structural conditions that are capable of impacting SC.

Therefore, based on [Rosas Huerta's \(2008\)](#), [Gomes' \(2010\)](#), [Wu et al.'s \(2015\)](#), and [Martins' \(2021\)](#) theoretical contributions, this quantitative study will examine the administrative, fiscal, and political SC dimensions of the municipalities. The next section will present the methodological procedures that guided this work.

METHODOLOGY

This study has a quantitative approach with cross-sectional data delineation for the year 2015.³ Regarding the objectives, it is characterized as descriptive research, as it seeks to describe and analyze the set of characteristics that make up the state capacity construct of the administrative structures of municipalities in Minas Gerais. The subsequent sections will present the study area characterization, the methodological procedures, the dimensions, and the variables that account for each dimension.

Delimitation and collection of the sample

Minas Gerais is the state with the highest number of municipalities in Brazil, with 853 cities. It has also been verified that most municipalities in this state are of small size, with no more than 20 thousand inhabitants, which represents 79.13% of the total number of cities. On the other hand, only 29 municipalities (3.4%) have more than 100 thousand inhabitants. Consequently, the population density varies from 1.40 to 7,192.40 residents per km², evidencing differences also in the degree of urbanization, which varies from 18.56% up to 100%. In addition, it is worth noting that only 31.18% of the municipalities have levels of urbanization above 80% ([Instituto Brasileiro de Geografia e Estatística \[IBGE\], 2010](#)).

Given this information, this research sample comprised 733 emancipated cities, equivalent to 86% of the total amount of cities that make up the state of Minas Gerais. The omission of 120 cities was due to the absence of any data that constitutes the State Capacity Index.

A set of secondary data was used to analyze the state capacity of the municipalities of Minas Gerais and consisted of the following: (a) Brazilian Institute of Geography and Statistics (IBGE — Munic) — 2015; (b) Industry Federation of the State of Rio de Janeiro (Firjan); (c) João Pinheiro Foundation (IMRS). In addition, we clarify that the data were the last available up to the time of writing this article.

Dimensions of state capacity

In order to assess the state capacity of municipal structures, it is necessary to combine the components (dimensions) of this capacity. Therefore, the administrative, political, and fiscal dimensions allow us to consider the state as a political arena in which interests and ideologies (internal and external) are processed within the states' organizational structure.

The administrative dimension is the most mentioned in the literature on SC and is closely related to the concept of good governance ([Cingolani, 2013](#)). In turn, according to the [World Bank \(1991\)](#), the good governance concept is conceived as the exercise of political power for the management of public affairs. In this sense, [Corralo \(2012\)](#) relates the mechanisms of good municipal governance to administrative autonomy, which enables municipalities to elaborate public policies, through administrative activities of municipal competence, such as: public services; police function; and stimulation and intervention (direct or indirect). Therefore, the criteria adopted for the measurement of the administrative dimension included: level of socioeconomic development of municipalities, obtained by the Firjan Municipal Development Index (Índice Firjan de Desenvolvimento Municipal — IFDM); and maintenance of the Rule of Law — estimated from the management indicator and per capita expenditure with public security.

The political dimension is recognized in studies on SC — [Cingolani \(2013\)](#), [Gomes \(2010\)](#), and [Rosas Huerta \(2008\)](#) — as the one with a broader nature. In this study, we prioritized two aspects. The first aspect refers to the state's relational capacity (represented by municipal governments), which aims to observe the extent to which the state is related to society and capable of internalizing social interactions within state actions. The second refers to municipal governments' capacity for interstate, horizontal (municipality-municipality), and vertical (state-municipality, Union-state-municipality) articulation. Therefore, the second factor considers the importance of cooperation links and state arrangements as needed mechanisms to make the development of different public policies viable.

Two variables were implemented to measure the political dimension: number of active municipal councils and degree of participation in consortiums. According to [Lubambo and Coutinho \(2004\)](#), due to their proximity to municipal governments and to the ease of perception and absorption of social demands, municipal councils are a feature of the political-state profile of municipalities and their performance is one of the determining factors for the good performance of municipal management. [Mello \(2001\)](#) states that the interstate articulations are contracts made between Public Law people of political capacity, that is, between the Union, states, Federal District, and municipalities, in light of the execution of public activities of common interest, also reflecting the municipalities' degree of administrative performance.

The fiscal dimension reflects the state's collection capacity, mainly in the form of taxes. In practical terms, it expresses fiscal revenues and intergovernmental transfer resources, the government spending efficiency, the ability to comply with the directives imposed by the state, and the degree of fiscal autonomy ([Gomes, 2010](#)).

With this information in mind, Firjan Fiscal Management Index (Índice Firjan de Gestão Fiscal — IFGF) was the variable chosen to compose the fiscal dimension. The IFGF seeks to portray municipal management challenges in the allocation of resources, given the budgetary constraints faced by Brazilian city halls.

Construction of the state capacity indicator

An index is characterized as a dimensionless number, which has (or does not have) a predefined amplitude for the measurement of a construct or variable. Thus, the indices are a relevant performance measure evaluation that serves as a basis for decision-making ([United Nations, 2002](#)). From this perspective, this study does not aim to create an econometric forecast model, with a cause-and-effect relationship between exogenous and endogenous variables. Instead, it attempts to generate, through a mathematical model, an empirical proxy-index measure for state capacity.

A globally accepted indexing methodology was developed by economists Mahbub ul Haq and Amartya Sen in 1990, the Human Development Index (HDI). Since then, the United Nations (UN) has adopted this

methodology to gauge countries' degree of development beyond the economic factors. At the national level, there are some examples: BNDES' Social Development Index (IDS-BNDES, in Portuguese); the Sustainable Development Index of the Brazilian Institute of Geography and Statistics (IBGE, 2017); and Firjan Municipal Development Index, created by the Federation of Industries of the State of Rio de Janeiro ([Federação da Indústria do Estado do Rio De Janeiro \[Firjan\], 2016](#)). In this perspective, the indexes developed by some researchers can also be highlighted, such as: the Municipal Development Index (IDM, in Portuguese) ([Soares et al., 1999](#)) and the Index of Characterization of Rural and Urban Ways of Life ([Braga, 2015](#)).

All the above indexes are characterized by being multivariable, which means that they cover multiple dimensions and are inspired by the methodology followed by the UN. Therefore, in light of the robustness and empirical consolidation of the Human Development Index (HDI), we decided to adopt, in this work, the same steps used to create the HDI.

The first procedure consisted of the calculation of the sub-index, which resulted from the variables that embody the state capacity dimensions (administrative, political, and fiscal). All variables were select based on the reviewed literature, following the conceptions proposed by authors such as [Rosas Huerta \(2008\)](#), [Wu et al. \(2015\)](#), [Hanson and Sigman \(2021\)](#), and [Martins \(2021\)](#). In order to calculate the values assigned to each dimension, goalposts values (minimum and maximum) were set. These values correspond to the smallest and the highest unit value of each variable that makes up a given dimension.

Therefore, the unit with the lowest value receives zero, while the one with the highest value receives one. The sub-index was calculated through the relation of the observed value per analyzed unit, with the minimum and maximum value of the variable, allowing the creation of a scale ranging from zero to one.⁴

The goalpost values for the calculation of the sub-indexes that constituted the State Capacity Index (SCI) are highlighted in Table 2 in order to facilitate information visualization. The lower (minimum) and upper (maximum) limits were obtained from the calculation of the sub-indexes from each SC dimension.

Table 2. Sub-index goalposts.

Index value	Minimum value	Maximum value
Administrative dimension	0.38175	0.8532
Political dimension	0.041	1.0
Fiscal dimension	0.1303	0.7925

Note. Own elaboration.

Based on the methodology proposed by the UN, the State Capacity Index of municipal administrative structures of

the state of Minas Gerais resulted from the arithmetic mean of the three calculated sub-indexes, being expressed by the formula:

$$SCI_i = \frac{Administrative_{subindex_i} + Political_{subindex_i} + Fiscal_{subindex_i}}{3}$$

where subscript i is the identification of each unit.

It is important to stress that the constructs that include the State Capacity Index reliably reflect the investigated phenomenon, since the Cronbach's alpha value — which takes as reference the average behavior of the joint variability of the constructs that were considered in this study — was 71.5%, which is considered a satisfactory value (Hair et al., 2009).

However, two reservations must be expressed. First, there is the fact that the proxies that were used (IFDM and IFGF) are subject to questioning, especially concerning the clarity of the methodologies used in the validation and theoretical basis of the constructs. The second refers to the existence of criticisms regarding the methodology used in

the calculation of HDI (Bilbao-Ubillos, 2012; Barbosa, 2017). Aware of these limitations, the calculation method for all the sub-indexes necessary for the construction of the State Capacity Index will be presented below.

RESULTS AND DISCUSSIONS

Calculation of the sub-index: Administrative dimension

For the calculation of the administrative dimension, we considered the IFDM variables and per capita expenditure with public security:

$$Administrativesubindex_i = \left[\frac{3 \times IFMD_i + \left(\frac{\log \log(secutityexpenditure_i) - \log \log(secutityexpenditure_{min})}{\log \log(secutityexpenditure_{max}) - \log \log(secutityexpenditure_{min})} \right)}{4} \right]$$

where i represents the identification of each unit.

The IFDM variable consists of the following indicators: job and income, education, and health. The reading of the index results varies from zero to one and, in this case, the closer to one, the greater the development of the locality. However, for the variable calculation (per capita expenditure on public security), it was necessary to resort to logarithmic transformation since the goal was to analyze the percentage change in per capita expenditure on security and not the nominal variation. In this way, the dynamics of these expenditures between cities could be analyzed in a more coherent way, regardless of their investment potential, given the context of the disparities among the cities of Minas Gerais (Sabioni et al., 2016).

It is also important to note that all the administrative sub-index indicators were considered with equal weights. Thus, the sub-index that composes the administrative dimension (Figure 1) corroborates the scenario of disparities among the municipalities of Minas Gerais in terms of administrative capacity.

In light of this information, it is observed that the mesoregions of north of Minas, Jequitinhonha, and Vale do Mucuri presented the worst indicators for the administrative dimension, in comparison with the other regions of the

state, specifically the following mesoregions: Triângulo Mineiro and Alto Paranaíba; west, south, and metropolitan regions of Minas Gerais.

This implies that, despite the recent and innovative nature of this study, the inequalities highlighted by the administrative dimension presented patterns that are similar to those verified in different studies on the degree of efficiency of municipal management in Minas Gerais. Therefore, in agreement with the studies of Lopes and Toyoshima (2008) and Reis et al. (2013) — which examined the efficiency structures of municipal management in the areas of health and social security, respectively —, it was observed that the mesoregions of the northern group of Minas Gerais — Jequitinhonha and Vale do Mucuri, the poorest regions of the state — stood out with the worst administrative dimension scores of the State Capacity Index of Minas Gerais municipal administrative structures.

This fact may expose the tendency of poorer regions to have the worst management efficiency scores in relation to other regions. According to Silva (2009), the existence of cities with low economic activity and high numbers of residents living in poverty contributed to the widening disparities in quality of life and social well-being. In this sense, public sector actions are required to extinguish this system.

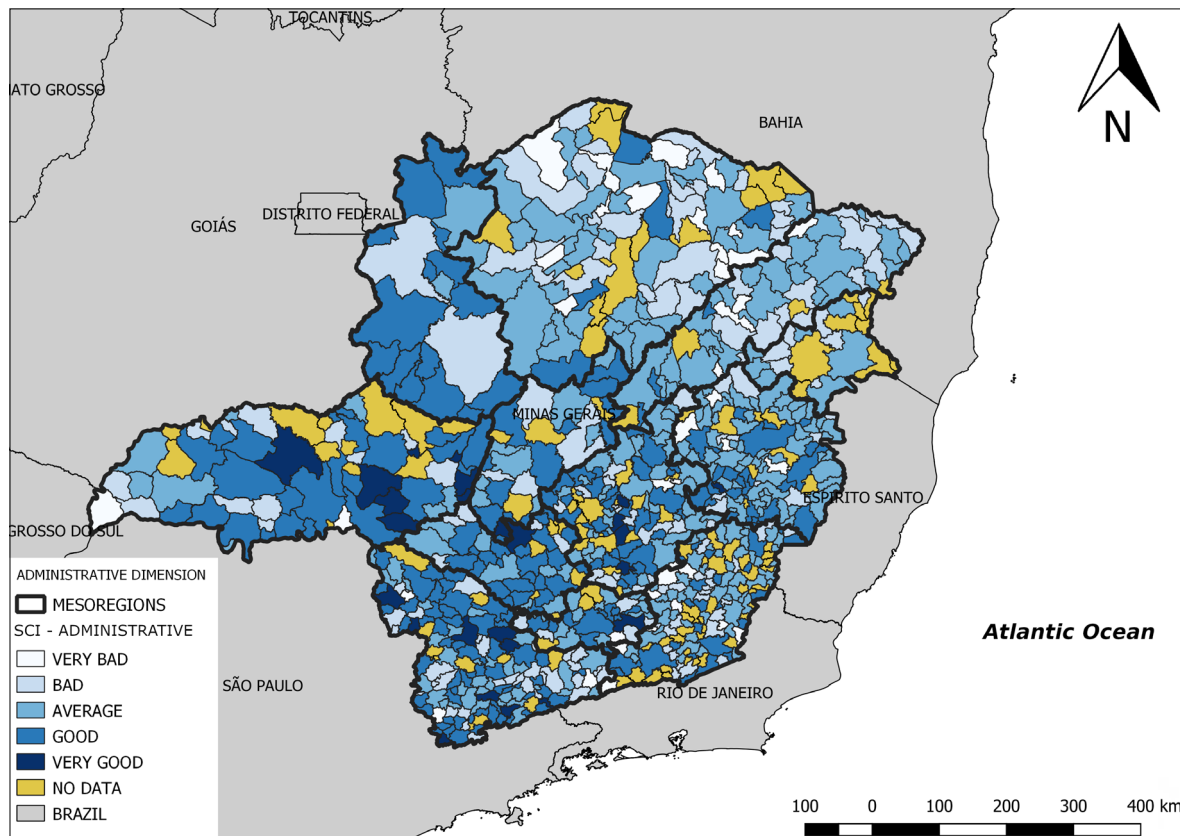


Figure 1. Administrative dimension.

Source: Own elaboration.

Calculation of the sub-index: Political dimension

The calculation of the political dimension considered the variables: social participation and the interstate articulation capacity of municipal administrative structures.

Accordingly, the indicators ‘number of active municipal councils’ (council sub-index) and ‘degree of participation consortia’ (sub-index consortium) were constructed with the objective of composing the political dimension variables, expressed by the formulas:

$$\text{subindex consortium}_i = \left[\frac{\text{Cedu}_i + \text{Chealth}_i + \text{Ccult}_i + \text{Chabitação}_i + \text{Cambiente}_i + \text{Ctransp}_i + \text{Cdesenvolvimento}_i + \text{Csaneamento}_i + \text{Câguas}_i + \text{Csólidos}_i + \text{Csólidos}_i + \text{Cassistência}_i}{12} \right]$$

$$\text{Sunindex council}_i = \left[\frac{2 \times \text{Ccriançaadolescente}_i + 2 \times \text{Ceducação}_i + 2 \times \text{saúde}_i + \text{Ccultura}_i + \text{Cesporte}_i + \text{Cpatrimôniocult}_i}{9} \right]$$

Before going into the description of the political sub-index, it is necessary to emphasize that the selection of indicators is a delicate task since there is no formal theory that can guide it with strict objectivity (Jannuzzi, 2002). On this account, in the calculation of the indicator ‘number of active municipal councils’, the councils ‘child and adolescent and health and education’ obtained a higher weight (weight two), owing to the fact that, according to the Constitutional Text, their creation is mandatory

(Buvnich, 2014). The other councils, having no creation requirement provided by Law, obtained weight one⁵. The calculation of the indicator ‘participation in consortia degree’ gained the same weight.

The calculation of the political sub-index was made according to the administrative sub-index calculation model. However, a significant difference was observed in the overall results of the political sub-index averages (Figure 2).

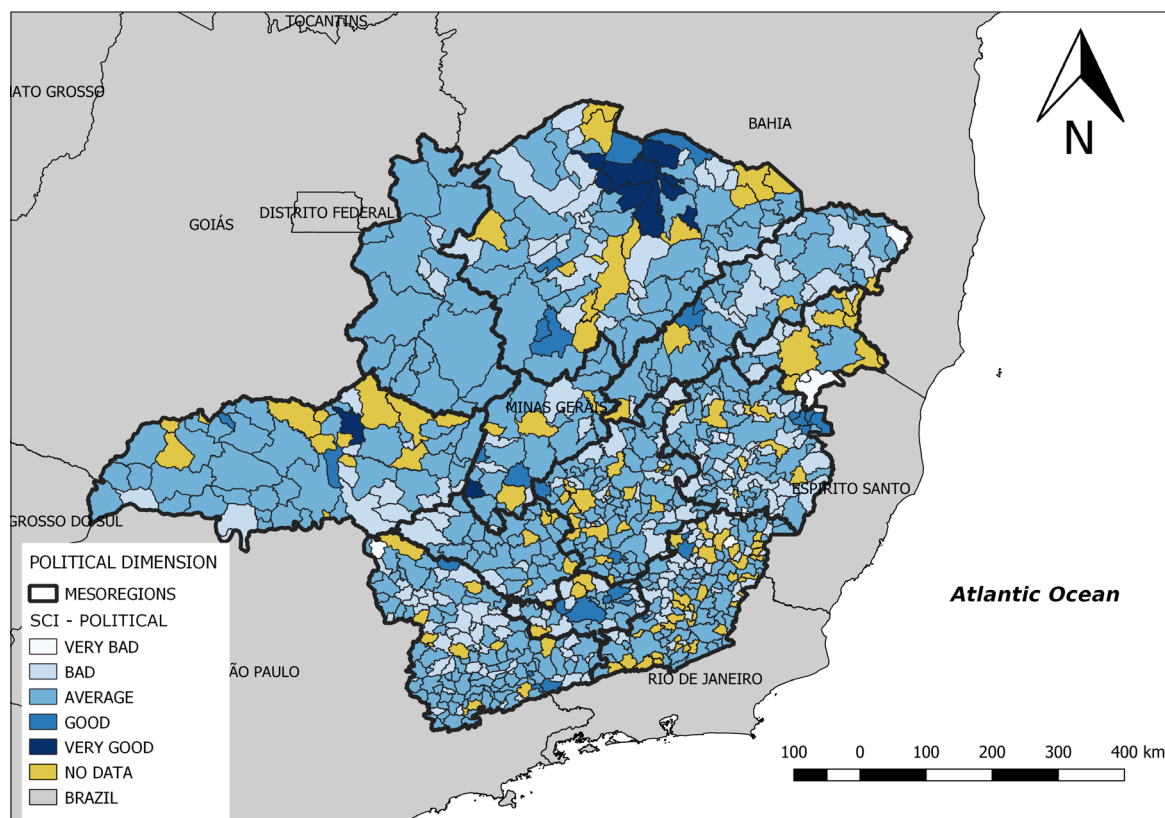


Figure 2. Political dimension.

Source: Own elaboration.

Subsequently, it is possible to observe that the sub-index 'political dimension' presents larger and more homogeneous general values than the sub-index related to the 'administrative dimension'. This situation is considered positive, since, according to Gohn (2001), as a consequence of the proximity to municipal governments and the ease to perceive and absorb social demands, the municipal councils were constituted as an important mechanism of foment for participation and social control. 'Public consortiums', on the other hand, are considered a tool used for regional public policies planning that provide local governments with scale economy gains (Cruz, 2001).

However, it has been noticed that the 'political dimension' sub-index values are concentrated in the moderate and good stratum, indicating the need for governments' investments in the creation, monitoring, and diffusion of information about participation channels and social control, such as municipal councils, as well as in state arrangements.

Another important aspect worthy of note refers to the excellent results obtained by certain municipalities in the north of Minas Gerais, specifically the municipalities of Jaíba, Gameleiras, Verdelândia, Itacarambi, and Pai Pedro, which stood out as an 'island of efficiency' in the middle of a region with scores ranging from bad to moderate in the

other dimensions that make up the State Capacity Index (SCI). It is also relevant to mention that the population size of these 'islands of efficiency' varies little, that is, except for Janaúba (70 thousand residents); the other cities have less than 50 thousand inhabitants. Therefore, these indicators deserve a detailed study on the factors that enabled these high efficiency scores.

Calculation of the sub-index: Fiscal dimension

The fiscal dimension was composed of the Firjan Fiscal Management Index (IFGF), represented schematically by Figure 3. The use of the proxy IFGF sought to elucidate the fiscal aspect of the analyzed municipalities from a structural bias or, more precisely, with a view to improving municipalities' fiscal management through mechanisms of good administrative management, fiscal responsibility, and stimulus to social control.

The other variables that make up the IFGF can be briefly explained as follows: the variable 'cost of debt' considers the fact that, for the great majority of Brazilian municipalities, long-term indebtedness is not used as a form of financing; accordingly, the weighing of the long-term debt cost is lower (10%) than the other variables that compose the index (22.5%), as calculated by Firjan.

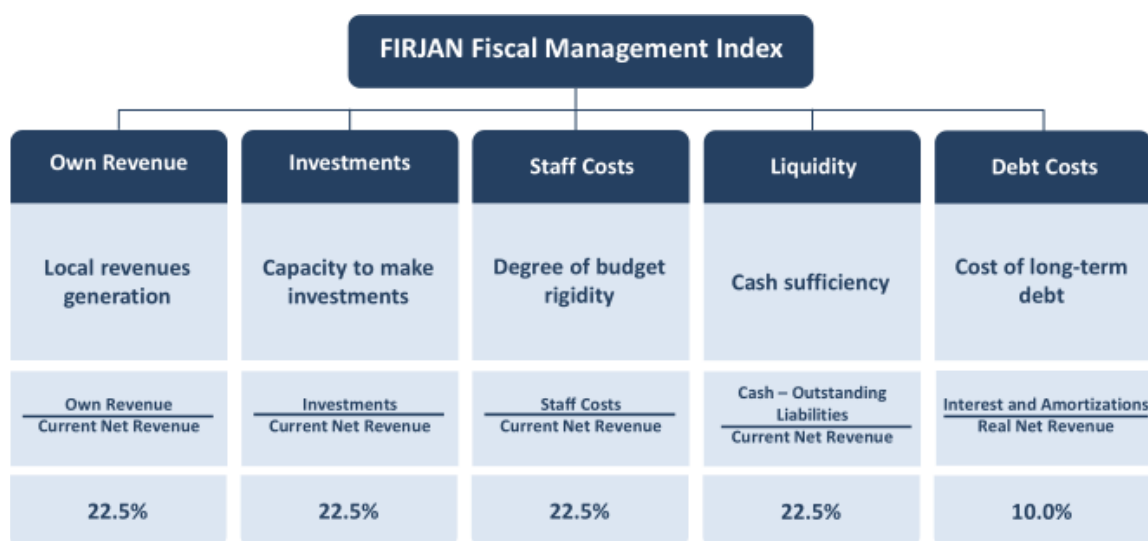


Figure 3. IFGF structure.

Source: Based on Federação da Indústria do Estado do Rio de Janeiro. (2016). IFGS 2016 – Índice FIRJAN de Gestão Fiscal: Ano-Base 2015. Firjan. <https://www.firjan.com.br/data/files/DE/F0/65/91/B34265107778C955F8A809C2/IFGF-2016-versao-completa.pdf>

The variable ‘own revenue’ aims to verify the autonomy degree of municipal revenues in relation to constitutional and voluntary transfers. The variable ‘investments’ intends to measure the share of investments in municipal budgets, considering Gobetti and Klering’s (2007) proposal that the budget process is ‘myopic’ and attributes excessive weight to the current cost of a project, regardless of its future benefits, causing restraints on long-term investments at the expense of short-term projects. The variable ‘personnel expenses’ seeks to evaluate the revenue commitment to personnel expenses, considering that the lower the commitment of the budget to the municipal civil service payroll, the greater the room for maneuvers for the execution of public policies. The variable ‘liquidity’ considers the remaining payments. Therefore, if the municipality registers more remnants to pay than cash resources for the year in question, it will have a worse evaluation (Firjan, 2018).

Accordant with the considerations provided, the results referring to the ‘fiscal dimension’ sub-index also emphasized the scenario of disparities in the ‘administrative’ sub-index, but to a lesser extent. The mesoregions north of Minas, northwest of Minas, and Vale do Jequitinhonha presented the worst results of State Capacity Index, in comparison to the other mesoregions of Minas Gerais (Figure 4).

Thus, the disparities observed in the ‘fiscal’ sub-index corroborate Arretche’s (2010) propositions that different regional contexts may lead to different municipal tax collection capacities, influencing the fiscal result of

municipal entities and, consequently, the State Capacity Index of municipal administrative structures. As a result, the regional fiscal disparities, evaluated by the IFGF, interfere with the public entities’ revenues composition, impacting on the conditions for goods and services provision, as pointed out by Rezende (1999) and Magalhães, Mattos and Wakim (2019).

Those studies showed that municipal fiscal disparities arose mainly due to two reasons: one of them concerns the asymmetries in the resources distribution among municipalities during the decentralization process in Brazil, which created difficulties to reconcile fiscal decentralization with regional inequalities; the other results from the incentive to the creation of new municipalities, from the rule of emancipation of old districts by the 1988 Federal Constitution, accentuating the existing inequalities. Therefore, it is proposed that the dysfunctions, which originated from the decentralization process, contributed to the disparities in the municipalities’ state capacity, as will be shown by the results presented below.

State Capacity Index statistics

With a view to advancing empirically in state capacity studies, this research aimed at characterizing the municipal administrative structures of the state of Minas Gerais on a scale ranging from zero (insufficient SC level) to one (highly satisfactory SC level).

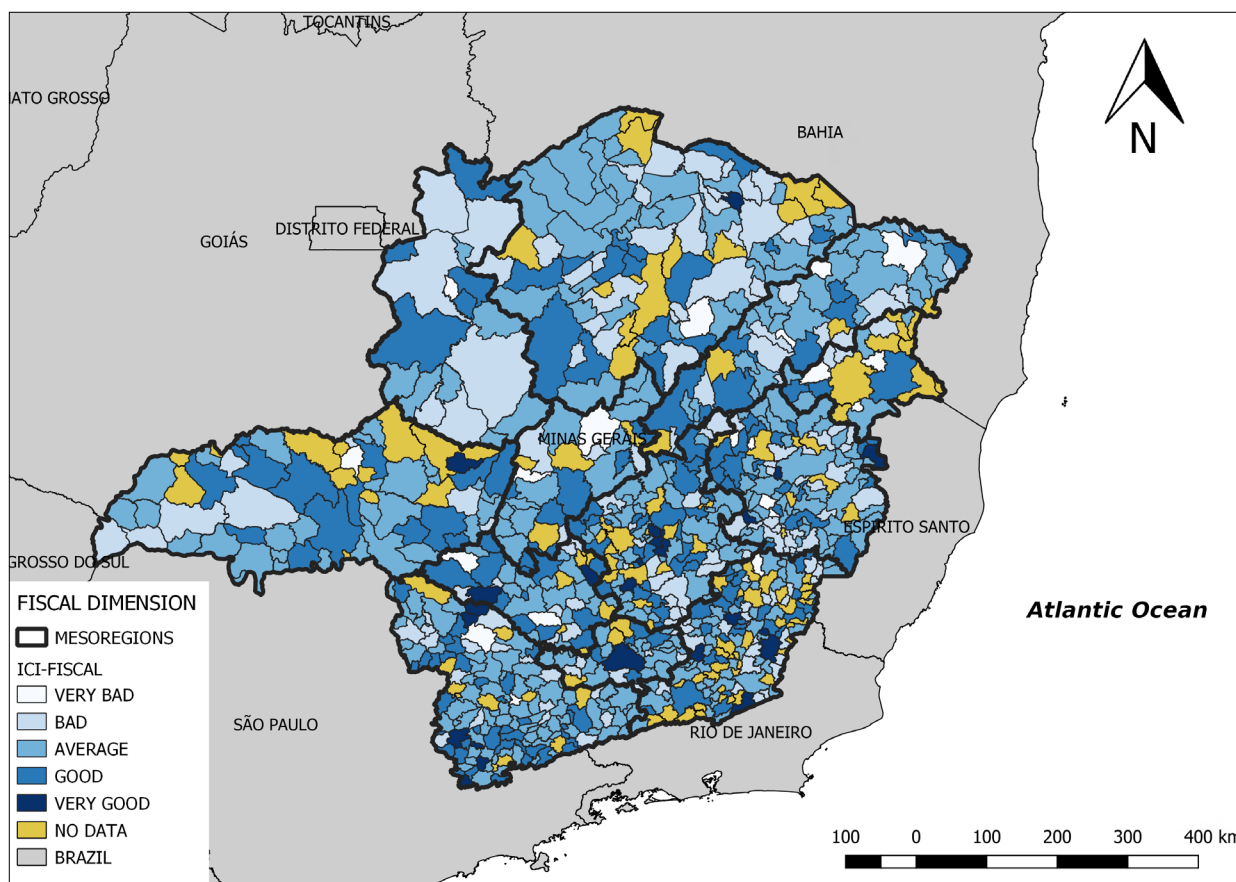


Figure 4. Fiscal dimension.

Source: Own elaboration.

When considering the administrative, political, and fiscal dimensions in an index, it was possible to classify and hierarchize Minas Gerais municipalities in terms of their state capacity degree. Thus, the State Capacity Index differed from other performance measures obtained in SC studies for the following reasons: the methodology used in its construction; because it brings together, in its analytical structure, the different dimensions that circumscribe the SC theme and its interrelationships (Rosas Huerta, 2008; Wu et al., 2015); and for not being limited to a specific SC function; instead, it allowed the generalization of the results for the analyzed level, namely, the organizational level.

Taking as a starting point the goal of examining the existence of different realities in the municipal administrative structures of the state of Minas Gerais, a descriptive analysis of the SCI data was carried out in order to know the municipalities' characteristics concerning the State Capacity Index.

Based on the descriptive statistical analysis (AED — *Análise Estatística Descritiva*, in Portuguese), it was verified that the SCI results mean was 0.516, which revealed that

most municipalities analyzed had a moderate SCI value, confirming the need to improve their administrative structures' state capacity in order to achieve greater management efficiency and achieve public objectives. We also observed the homogeneity of the standard deviation data, which was 0.067. However, the amplitude analysis revealed the existence of disparities in the state capacity level since the municipality with the minimum SCI value (insufficient) presented the value of 0.313 and the municipality with a very satisfactory SCI presented the maximum value of 0.735. This is an attribute that expresses the need for investments, from municipal, state, and federal entities, both in inspection and in incentives for good management.

The kurtosis coefficient demonstrated that the distribution is leptokurtic, being slightly more elongated in relation to the normal distribution. It was also verified, through the normality KS test (KS (Kolmogorov–Smirnov test), that the hypothesis that the State Capacity Index follows a normal distribution (99% confidence) cannot be rejected (Table 3).

Table 3. State Capacity Index AED.

Amplitude	Minimum	Maximum	Mean	Standard Deviation	Variance	Asymmetry	Kurtosis
0.423	0.313	0.735	0.516	0.067	0.04	0.17	0.255

Note. Source: Own elaboration.

The results show that some municipalities have the proper state capacities and competencies to undertake actions and, consequently, achieve the desired public objectives. On the other hand, there are municipalities with a large state capacity deficit, which deserve immediate attention of the public authorities.

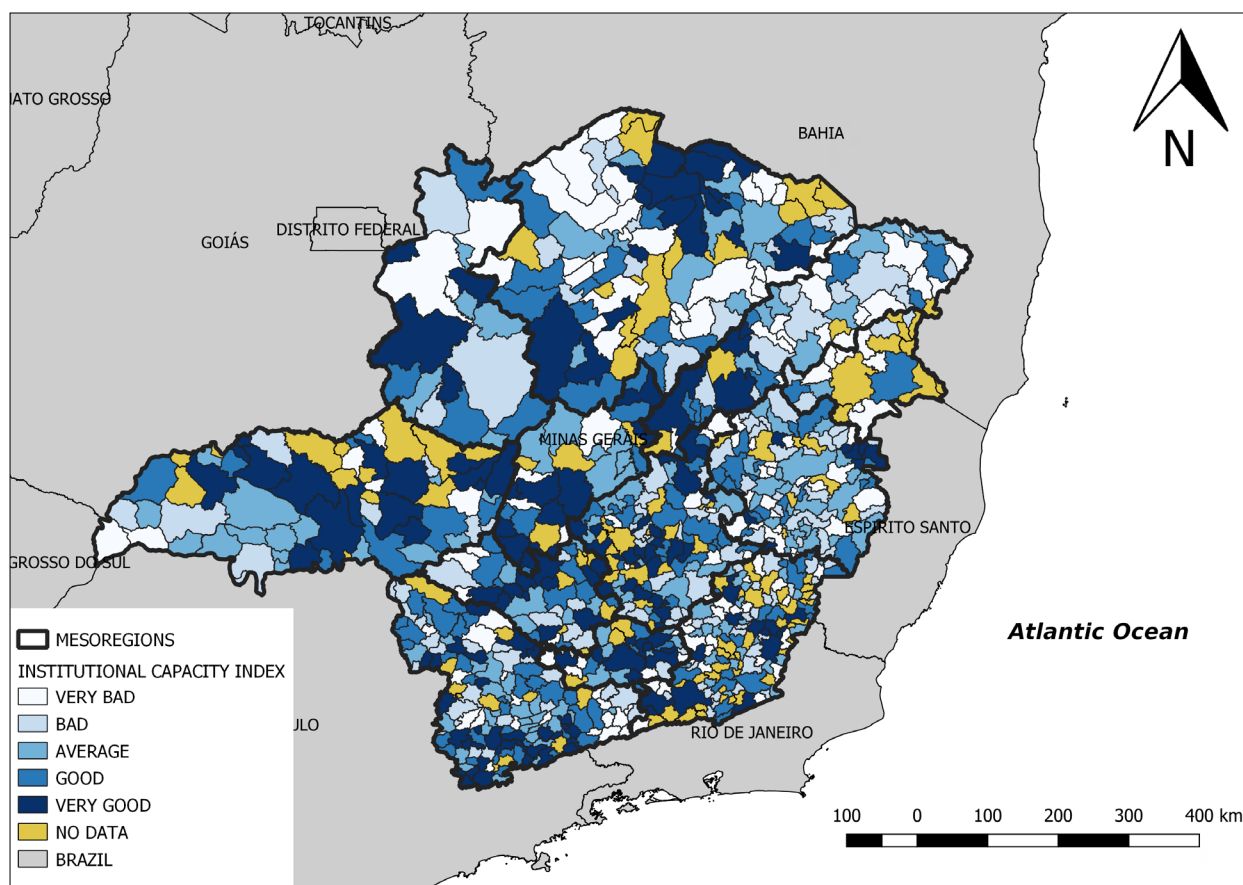
Application of the State Capacity Index in Minas Gerais

Before starting the analysis on the State Capacity Index, it is important to emphasize the exploratory nature of this study, since there is no evidence of another approach to SC studies that resemble this research proposal. Thus, we recognize the inherent limitations in the choice of proxies

related to the SC dimensions and the data collection with geographic aggregation limited to the state of Minas Gerais — considered a small sample compared to the universe of research it represents.

Despite these limitations, the State Capacity Index was built with the purpose of characterizing municipal administrative structures based on the state capacity degree in the different dimensions that circumscribe the SC. The results revealed the existence of diverse realities in the municipal administrative structures of Minas Gerais (Figure 5).

In general, the variables presented increasing results from Group 1 to Group 5, equally divided from the number of quantiles (Figure 6).⁶

**Figure 5.** Institutional Capacity Index implementation.

Source: Own elaboration.

Insufficient (1)	SCI score varying from 0.313 to 0.460
Bad (2)	SCI score varying from 0.460 to 0.502
Moderate (3)	SCI score varying from 0.502 to 0.534
Good (4)	SCI score varying from 0.534 to 0.571
Highly satisfactory (5)	SCI score varying from 0.571 to 0.736

Figure 6. SCI Classification caption.

Source: Own elaboration.

Based on the results, the contrast between the SCI scores of Groups 1 and 5 can be highlighted. However, regarding the influence of the urbanization degree of the municipalities on the results of the State Capacity Index, it was revealed that eight out of the ten ‘best’ SCI ranked cities are considered small cities, having up to 50,000 residents. The only exceptions are the cities São João del Rei and Santa Luzia, which are characterized as medium-sized municipalities (Spósito, 2007). It should be noted that the classification of municipalities in three large population groups — small, medium, and large — calls for studies that contemplate more precise stratifications (Alves et al., 2011).

However, this information contradicts the results of Costa et al.’s (2015) study, which shows that the larger the population size and the municipalities’ urban portion, the lower the per capita expenditures to achieve management efficiency, suggesting that scale economies, in terms of public management efficiency, have advantages over municipalities with smaller population sizes. This study verified that this assertion cannot be generalized to the entire state of Minas Gerais, since large cities such as Belo Horizonte, Uberlândia, Contagem, and Juiz de Fora, the largest cities in Minas Gerais, do not appear among the ones with the highest SCI.

From the analysis of the mesoregions, it was verified that the majority of them are present in the stratum (3), moderate. In the stratum (5), which expresses the best SCI degree, the mesoregions that stood out were: Campo das Vertentes; Central Mineira; and south and south-west of Minas. In the stratum (1), which shows the worst SC, the mesoregions found were: Jequitinhonha; Vale do Mucuri; and Vale do Rio Doce. This situation ratifies the results of previous studies: Salvato et al. (2006), Lopes and Toyoshima (2008), Silva (2009), and Reis et al. (2013), which emphasized the concentration of municipalities with poor socioeconomic structures in the north and northeast mesoregions of Minas Gerais, in comparison to the other mesoregions of the same state. In view of the verified patterns, based on the SCI visualization, we highlight the possibility of the spatial dependence effect. This concept expresses the tendency of a variable that is associated with a given location to resemble the value of its neighboring

samples more than that of the rest of the locations of the sample set (Bonat et al., 2009).

Another relevant remark concerns the SCI disparities of neighboring municipalities, specifically in the Vale do Mucuri and Vale do Rio Doce mesoregions (Figure 7).

It was noted that, despite being neighboring municipalities and having a small population size (both with less than twenty thousand inhabitants), Ataleia and Itabirinha have contrasting scores — insufficient and very satisfactory —, a condition that requires further detailed investigation.

This study revolved around the assumption that the state institutions’ performance quality depends largely on their resource management and the effectiveness of their actions (Alves et al., 2011). In this sense, federal state capacity strengthening programs should focus more on the regions identified with the worst results in the state capacity indicator.

Therefore, our research is adjacent to Rosas Huerta’s (2008) and Grin and Abrúcio’s (2019) conceptions, which emphasize that in order to analyze the state capacity of a municipal government, first, it must be recognized that although this capacity is expressed particularly in municipal governments, it is also associated with other government areas and Union powers. It thereby requires the joint and harmonious action of all the federated entities to best provide services and public goods.

CONCLUSION

The State Capacity Index was designed to meet the empirical expectation of being a tool for monitoring, planning, and measuring the performance of the municipal administrative structures of Minas Gerais, as well as the theoretical perspective of advancing empirically in studies on state capacity. In such a manner, the SCI allowed the general examination of the state capacity construct, enabling the collection of a range of information that can aid decision-making.

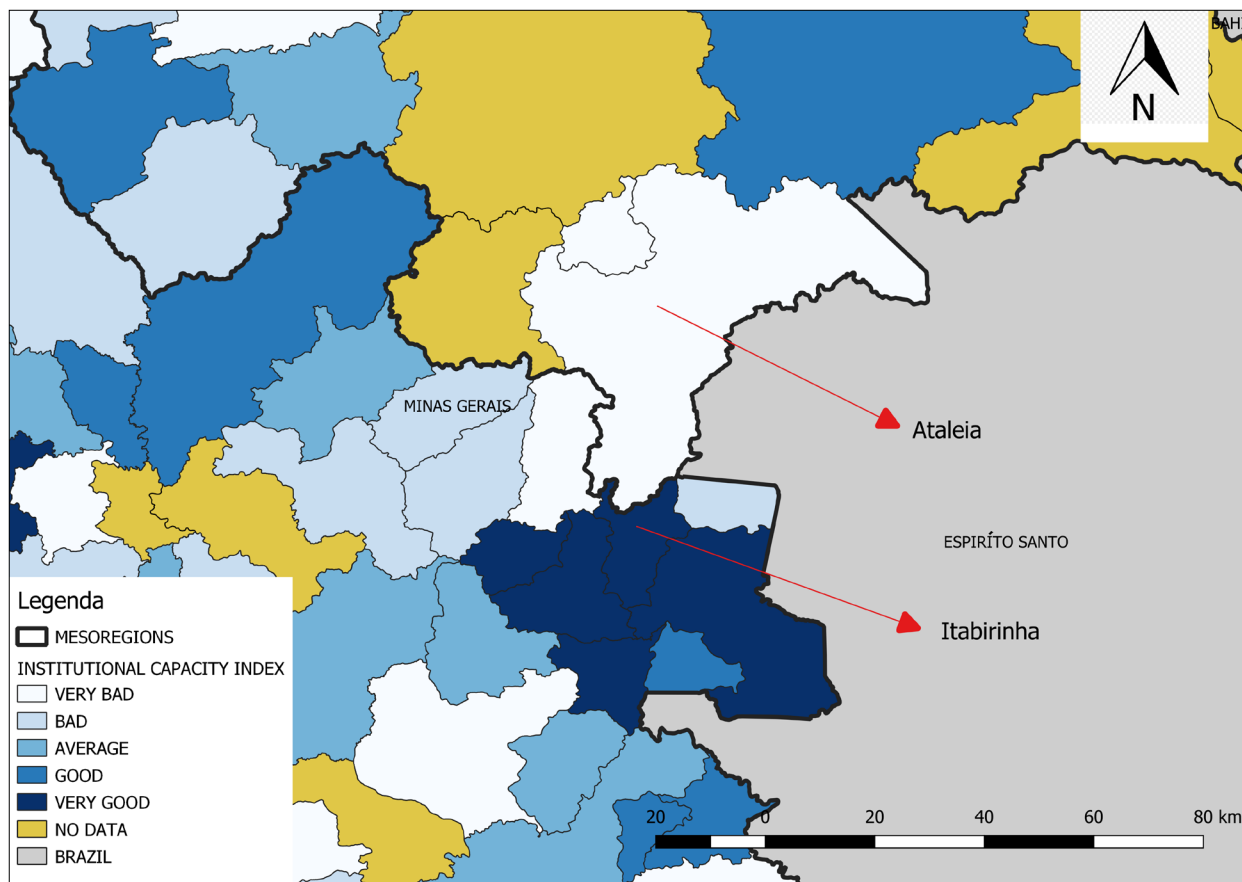


Figure 7. Neighboring disparities.

Source: Own elaboration.

The results stressed the disparities in the state capacity of Minas Gerais administrative structures, suggesting the need for incentives and investments in the administrative, political, and fiscal dimensions, with a view to increasing the municipal public administrations' SC. In face of the importance of municipalities as actors in the implementation of public policies, both the municipal management professionalization and the establishment of democratic or popular control of public action become indispensable.

As a result of the evidence verified in this study, plans and projects can be designed with the purpose to improve the state capacity of municipalities throughout Brazil, serving as an increment to the state capacity-building programs implemented by the federal government.

The disparities observed among Minas Gerais municipalities reveal the need to elaborate performance management systems directed toward the scope of state capacity. Therefore, state and federal management should provide support to municipalities that are in less favorable situations.

Among the limitations of this study, there are problems inherent to using the IFDM and IFGF proxies; there is a lack of comprehensive data and information due to the small number on municipalities' SC, turning it difficult to expand quantitative research on the subject.

As a suggestion for future studies, we propose a comparative analysis of the existing spatial patterns and discrepancies in the SCI levels of the state of Minas Gerais, using geospatial, benchmark, and anti-benchmarking techniques. In addition, we recommend expanding the SC analysis to the entire national territory.

NOTES

1. The choice of the state of Minas Gerais as the object of analysis was due to the fact that it is the Brazilian state with the largest number of municipalities. Its extensive territorial dimensions are analogous to countries such as France, Sweden, Spain, and Japan. Its economy is equivalent to countries like Israel, Ireland, Chile, and Czech Republic (Emmendoerfer & Soares, 2014).

2. In this study, it was observed that the concept of 'institutional capacity' (see [Martins, 2021](#); [Silva, 2015](#); and [Rosas Huerta, 2008](#)) is associated with the institutional context of public administration and is therefore related to the concept of 'state capacity.'
3. The year of 2015 was chosen due to the lack of more up-to-date secondary data. It should be noted that, because of the impacts of the COVID-19 pandemic, the 2020 census was postponed in Brazil.
4. See United Nations Methodology ([United Nations, 2002](#)).
5. It is important to point out that the aspect of local autonomy is very relevant, insofar as the willingness of

local governments to create local councils without the need for federal laws that impose the implementation of these forums in health and social assistance is considered. However, this discussion deserves a separate study.

6. In order to offer spatial visualization and a better understanding of the phenomenon, the results were divided into five categories: insufficient; bad; moderate; good; and highly satisfactory. To obtain the strata, the 20th, 40th, 60th, and 80th percentiles were calculated to use this statistical measure as a benchmark for the level of state capacity.

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Authors' Contributions

1st author: conceptualization (equal); data curation (equal); formal analysis (equal); validation (equal); writing – original draft (equal); writing – review & editing (equal).

2nd author: conceptualization (equal); data curation (equal); formal analysis (equal); investigation (equal); validation (equal); writing – original draft (equal); writing – review & editing (equal).

Conflict of Interests

The authors have stated that there is no conflict of interest.

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Data Availability

The authors claim that all data used in the research have been made publicly available through the Harvard Dataverse platform and can be accessed at:



Braga, Gustavo Bastos; Martins, Douglas Gomes, 2022, "Replication Data for: "Building a state capacity index for municipal governments of Minas Gerais" published by RAC-Revista de Administração Contemporânea", Harvard Dataverse, V1.

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