

The efficiency of public policies and the autonomy cost in Brazilian municipalities



A eficiência das políticas públicas e o custo da autonomia dos municípios brasileiros

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ABSTRACT

Purpose: Brazilian federalism is complex. In a country with continental dimensions, with three levels of government (central, state, and local government) and 5,570 municipalities, a federative organization is expected to be complex. The fiscal sustainability of subnational governments is a fundamental pillar of any federative structure. This research aims to verify whether the revenue generated is sufficient to pay for the municipality's existence.

Originality/value: This is a gap in the specialized literature, which usually analyzes municipalities in terms of income or expenditures but not comparing the revenue obtained by economic activity and the cost of the municipality's existence, the main contribution of this research.

Design/methodology/approach: As such, we investigated the capacity of Brazilian municipalities to generate revenues to finance their autonomies by combining the income linked to the local economic activity with the cost of the existence of each municipality into an autonomy cost index (ACI).

Findings: Our analysis reveals that, of those municipalities who provided the data, one in each four does not generate enough revenues to pay for their existence. The results suggest that the ACI of Brazilian municipalities decreases with the population and business activity. Hence, our autonomy cost index performs worse in Brazil's North and Northeast regions. This context opens space for a crucial debate and further studies within the scope of Brazilian federalism.

Keywords: autonomy cost, fiscal federalism, municipalities, Brazilian federalism, public budget

RESUMO

Objetivo: O federalismo brasileiro é complexo. Em um país com dimensões continentais, com três níveis de governo (central, estadual e local) e 5.570 municípios, espera-se que uma organização federativa seja complexa. A sustentabilidade fiscal dos governos subnacionais é um pilar fundamental de qualquer estrutura federativa. O objetivo desta pesquisa é verificar se a receita gerada é suficiente para custear a existência do município.

Originalidade/valor: Essa é uma lacuna na literatura especializada, que costuma analisar os municípios em termos de receitas ou despesas, mas não comparando a receita obtida pela atividade econômica com o custo de existência do município, principal contribuição desta pesquisa.

Design/metodologia/abordagem: Assim, investigamos a capacidade dos municípios brasileiros de gerar receitas para financiar suas autonomias, combinando a receita vinculada à atividade econômica local com o custo de existência de cada município, em um índice de custo de autonomia (ICA).

Resultados: A análise revela que, entre os municípios que forneceram os dados, um em cada quatro não gera receitas suficientes para custear a própria existência. Os resultados sugerem que o custo de autonomia dos municípios brasileiros diminui com a população e a atividade empresarial, de forma que nosso ICA apresenta pior desempenho nas regiões Norte e Nordeste do Brasil. Esse contexto abre espaço para um importante debate e novos estudos no âmbito do federalismo brasileiro.

Palavras-chave: custo da autonomia, federalismo fiscal, municípios, federalismo brasileiro, orçamento público

INTRODUCTION

For the first time in Brazil's history, in 2015, the Federal Government sent a budget deficit law proposal to the National Congress. This proposal assumed that the expenditure for the following year would be higher than the revenue, which generated the perspective of many problems in the management of the Brazilian Federation. This same context was repeated in the Brazilian states and municipalities. It should be noted that Brazil is a country of continental dimensions, currently composed of 26 states plus the Federal District and 5,570 municipalities (IBGE, 2020a), each with its fiscal, administrative, and political autonomy. In all these units, the most different realities are verified regarding the area, population, population density, economic diversification, and other indicators.

Our purpose is to contribute to the fiscal decentralization debate by showing that not only are own-source revenues frequently insufficient to finance local public policies but that some municipalities do not even generate enough revenue to pay for their existence.

Given this context, this research aims to investigate Brazilian municipalities' capacity to generate revenues to finance their autonomies, as the fiscal sustainability of subnational governments is a crucial pillar of decentralized public policy formation. To measure this capacity, the budgets of Brazilian municipalities are analyzed and based on the budgetary structure, an indicator of the ability of each city to generate sufficient resources to pay for the cost of their existence, which we label the autonomy cost index (ACI), is proposed.

To assist during this investigation, the following section will present the main concepts and theories taken from the relevant economic literature and support the discussion. The third section addresses the calculation and analysis of the autonomy cost index, and the fourth section presents the main conclusions.

FISCAL FEDERALISM AS THE RELEVANT FRAMEWORK

The literature on fiscal federalism gives the main conceptual framework that supports the discussion carried out in this investigation. Before reviewing the conceptualization of fiscal federalism, it is important to gather some notes about decentralization and its relationship with federalism.

Defining decentralization is not an easy assignment. Schneider (2003) stated that, back in 2003, decentralized government institutions were doing

more government work than ever before. Despite the increased research, much conceptual confusion persists since the definition of decentralization may be based on fiscal federalism, public administration, and political science theories. Each of these fields highlights a dimension of decentralization, as presented by Schneider (2003): fiscal, administrative, and political. Fiscal decentralization refers to how many central governments transfer the fiscal impact on the economy to subnational governments. Administrative decentralization refers to how much autonomy subnational governments possess relative to central control regarding policy responsibilities. Political decentralization refers to the degree to which central governments allow subnational governments to undertake the political functions of governance.

The first impression may be that federalism and decentralization are inseparable. But Arretche (2002, p. 27) alerts, citing the Brazilian case:

The historical simultaneity of the two processes has left the false impression that they are the same when they are not. Although originating from the same historical process in Brazil, federalism and decentralization do not imply twin political engineering.

In this case, the author refers mainly to the political reforms that took place in the 1980s (political federalism or political decentralization) and the decentralization of social policies that occurred in the 1990s (fiscal federalism or fiscal decentralization).

Arretche (2002) also states that the distinction between federative and unitary states concerns the forms of distribution of the political authority of national states. Riker (1987) states that decentralization involves the distribution of administrative functions between levels of government. This author demonstrated that the degree of centralization in the distribution of managerial competencies had varied a lot throughout the history of the federal countries, without this having substantially altered the essential characteristic of federalism, that is, the political autonomy of local governments.

Chandra (2012) states that the term “federalism” in fiscal federalism appears to create confusion to many scholars because it applies to “federal” and “unitary” political systems. The theory of fiscal federalism assumes that the distribution of tax and expenditure powers between vertical levels of government takes place, even if informally, in countries with systems of “unitary” form of government, differentiating fiscal federalism from political federalism. The theory also suggests that an “informal” distribution of power supplements the “formal” provision of federations so that “unitary” states may function as a federal system.

In this complex context, this research will focus on the literature on fiscal federalism (or fiscal decentralization) and its application to the Brazilian case.

The literature on fiscal federalism

The first generation of contributions to the theory of fiscal federalism offers a normative perspective on public decision-makers' behavior, with the seminal contributions belonging to Tiebout (1956), Musgrave (1959), and Oates (1972). The implicit assumption is that government officials act as guardians of the public interest, seeking the maximization of social welfare so that public intervention is needed when market failures occur. Musgrave's contribution (1959) envisioned a significant role for the central government in promoting macroeconomic stabilization and redistribution, while the responsibilities within the allocation function could be shared between central and lower government levels.

Tiebout (1956) consistently presents the hypothesis that economic efficiency will be improved in an economy with local public goods because of the competition across local jurisdictions. The argument is that if local jurisdictions offer a bundle of goods and collect certain taxes, people will move from one local community to another according to their valuations of those services and prices to maximize their utility.

With a complementary view, Oates' Decentralization Theorem (Oates, 1972) argues that, in the absence of economies of scale in the provision of goods and of interjurisdictional externalities, the decentralized provision of public goods is more efficient, leading to a superior outcome in comparison with a centrally determined uniform level of output across all jurisdictions. According to Oates (2005), the arguments are mainly two. First, local governments have a better knowledge of residents' preferences and other local conditions since even with immobile individuals – extending the scope of Tiebout's (1956)' model – systematic differences in preferences across jurisdictions are expected. Second, decentralization is more efficient if no political constraint prevents the central government from varying levels of public outputs across jurisdictions. This may happen when uniformity of provision is an important objective, for example, in an economic union.

Additionally, Boadway et al. (1994) emphasize the relevance of making local decision-makers more accountable to their citizens, given the transfer of decisions to governments closest to them.

However, it is impossible to set a level of government whose jurisdiction coincides exactly with the pattern of geographical benefits for each local

public good. And, even if there are inter-jurisdictional spillover benefits, there might still be social welfare gains from allowing decentralized provision, resorting to subsidies that will enable the internalization of such spillover benefits.

So, the following central question becomes how to finance local public provision.

The potential increase in efficiency induced by fiscal decentralization depends on the design of the tax system. The state of the art of the tax assignment problem – which taxation is best suited at the different levels of government – suggests that local governments should typically be limited to collecting, besides user fees, benefit taxes like property and vehicle taxes. The explanation is that these are easier to manage locally and to impose mainly on residents and do not raise problems of equity or competition among different jurisdictions (Bird, 2010). In particular, the tax base of property taxes is immobile, enabling the increase in rates without losing a significant portion of the tax base. Given the concern about the distortions that can result from the local taxation of highly mobile tax bases, certain taxes do not comply with the local collection, for example, those with progressive rates, which should be designed as a part of a broader program for the redistribution of income.

Moreover, central governments are usually reluctant to provide subnational governments with more tax power, as these cannot correctly manage macroeconomic stabilization and redistribution issues and the provision of goods with inter-jurisdictional spillovers. Since upper government levels have more resources and are assigned to a redistributive role, the most common solution is to combine the sharing of resources collected centrally through intergovernmental transfers with tax collection at the local level. Typically, local governments have become highly dependent (less autonomous) on intergovernmental transfers (including tax sharing) to finance their expenditure needs.

After these contributions of the classical normative theory of fiscal federalism, new contributions based on the public choice theory and the market-preserving federalism theory emerged. This new perspective opened the debate on the possibility that the decisions may not be to guarantee the efficient use of resources or to establish an equitable distribution of income, as in the classical view, but to ensure the specific interests of one or more groups that often diverge from the maximization of social welfare.

To better understand the issue of political decision-making, it is helpful to use the theory of market-preserving federalism. Riker (1964), in his seminal

work on the political theory of federalism, defines a political system as federal if it has two characteristics: a hierarchy of governments so that at least two levels of government rule the same people and territory, and the autonomy of each government is institutionalized so that federalism's restrictions are self-enforcing. Weingast (1995, p. 4) adds three more characteristics to describe a market-preserving federal system:

[...] subnational governments have primary regulatory responsibility over the economy; a common market is ensured, preventing the lower governments from using their regulatory authority to erect trade barriers against the goods and services from other political units; and the lower governments face a hard budget constraint.

According to Mittal and Weingast (2013), many of the significant results of the first generation of contributions implicitly assumed most or all of those conditions, corroborating the idea that the classical theory and the public choice theory are not rivals but complementary.

In particular, the requirement that lower government levels face a hard budget constraint emphasizes the danger of subnational governments relying too much on intergovernmental transfers or debt issues to finance their budgets. According to this strand of the literature, that dependency may create incentives for decentralized governments to extend public provision beyond efficient levels. As such, the sustainability of fiscal decentralization requires that local governments do not have the ability to print money nor have unlimited access to credit so that lower government levels cannot be bailed out by the central government when facing fiscal difficulties. This is of the utmost importance for the present research – assessing whether local governments have enough resources to finance the public policies for which they are responsible.

Fiscal federalism in Brazil

This section describes fiscal federalism in Brazil to minimally understand the Brazilian organizational structure and operation. The first topic discusses the Brazilian federative pact to clarify the fiscal, administrative, and political aspects that shape the federal spheres. The following subsection discusses some concepts related to the public budget. The last topic is dedicated to the characterization of municipalities, the level of analysis on which our empirical research is based.

The Brazilian federative pact

Affonso (1994) indicates that the term “federation” corresponds to the idea of union, pact, or articulation of parts (states) with the whole (nation) through the central or federal government. The Constitution of the Federative Republic of Brazil (BRASIL, 1988), in article 18, establishes that the political-administrative organization of the federation comprises the Union, the states, the Federal District, and the municipalities, all autonomous, under the terms of this Constitution.

Accordingly, in the Brazilian case, the federative pact involves three government levels, the central government or the Union, the state governments or states (including the federal district, which despite being a district, in many situations is similar to a state), and, finally, municipal governments or municipalities.

The Federal Constitution defines the rights and duties of each of these three spheres within the organization of the federation. A historical analysis of the country’s formation can help those interested in deepening their understanding of how the duties of each of these entities and their competencies have changed over time, following the transformations that have taken place in Brazilian society and the world.

Leite (2016) states that the Brazilian federation has some distortions, among which is the lack of synchrony between the revenue-sharing system of the federal entities and the attribution system. According to 2019 data (IBGE, 2019), considering the tax revenue collected in the country, the Union alone gets 58% of the total collected, followed by the states and the federal district, which compose 34% of the total, and the municipalities with only 8% of the total tax revenues.

Despite having a lower revenue collection, states and municipalities have a range of attributions that they rarely are fully able to manage with their own resources, requiring a redistribution of tax revenue from the central government in order to enable the provision of services to the population. This necessity of revenue redistribution calls into question the genuine financial autonomy of states and municipalities.

Mendes and Branco (2016) argue that in a Federal State, there is more than one legal order covering the same territory and the same people, so it is necessary to adopt a mechanism that favors the effectiveness of public action, avoiding conflicts and waste of efforts and resources. The division of powers between the spheres of federalism is the instrument designed for this purpose. It consists of the attribution, by the Federal Constitution, to each government level of a subject that is its own.

The Federal Constitution also provides for an income distribution, which enlivens the autonomy of the members of the federation and enables them to perform their duties. To guarantee the members' autonomy, the Brazilian Constitution regulates, in the chapter on the national tax system, the tax capacity of each government level and describes a revenue-sharing model among them.

To better understand the reason for this form of organization in the Brazilian federation, it is important to address issues related to decentralization and autonomy, topics that will be discussed in the next section through the analysis of the Brazilian public budget.

The Brazilian public budget

The Ministry of Planning, Budget, and Management (BRASIL, 2020a) defines the public budget as a government planning instrument that includes public administration expenditure for one year, in balance with the collection of the expected revenue. It is the document in which the government gathers the forecasts for all the revenues to be collected and programs for what will be done with these resources.

This concept reinforces the originality of the fact that it occurred in 2015 and was described in the introduction of this investigation when a deficit budget proposal was sent to the National Congress for the first time, with the estimated expenditure being more significant than the revenue to collect. Theoretically, the above concept indicates the need to balance spending and revenue.

However, the most practical question concerning the budget, which is of interest to this research, is its structure. In addition to the mandatory expenditure, such as the resources that should be compulsorily allocated to education and health, there is a whole set of regulations that establish several guidelines for the budget, which substantially limit the resources that the public manager can freely use.

Leite (2016) claims that the notion of the budget has changed in recent decades. In the past, there was a classic concept of the budget as a simple piece that included the forecast of revenue and the fixing of expenditure. Thus, it had only an accounting and financial aspect, which mainly ensured the balance between revenue and spending, regardless of the investments and the potential growth that eventual budgetary imbalances could bring.

Nowadays, the budget is regulated by a complex legal system and may be the result of pressure from various interest groups, requiring increasingly

mandatory spending and allowing less and less discretion (power of choice) to public decision-makers, often leading to questions about the practical administrative and financial autonomy of the federation's entities, namely the municipalities. In this context, the following section deals with the characterization of cities from the perspective of the Brazilian federation.

The Brazilian municipality

The municipality is the lower government level in Brazilian federalism. Nowadays, Brazil has 5,570 municipalities. In this group of cities, there are different realities concerning territorial extension, population, demographic density, or the diversification of economic activity. Just as an example of this diversity, the municipality of Borá, in the state of São Paulo, had 837 inhabitants in 2019, and the city of São Paulo, in the state with the same name, had more than 12,252 million inhabitants (IBGE, 2020b, 2020c). It should also be noted that Brazil is a country of continental dimensions, with more than 8.5 million km² of area, according to IBGE (2020a). Within its territory is the Amazon Forest in the North region, where practically isolated municipalities can only be accessed by river. On the other hand, in the Northeast region, there are semi-desert regions, while in the South and Southeast, the rate of urbanization and industrialization is high.

Despite the different realities of each Brazilian municipality, they are regulated by federal rules. Although they use indicators to segregate the cities into groups (usually by the number of inhabitants), they do not consider issues like location, activity, or the main economic competencies, among others. Thus, there is a gap in the regulation of municipalities since the rules admit the creation of new cities based mostly on population indicators but do not provide an objective, quantitative basis for municipalities' extinction or verify if this existence is justified. This is especially true in the budgetary aspects that this investigation intends to explore. The question is whether Brazilian municipalities are financially autonomous enough in conducting the public policies they are responsible for so that administrative decentralization follows adequately fiscal decentralization.

Efficiency requires that local governments finance a significant share of public expenditure from their own revenue sources and locally provided goods that primarily benefit residents. As mentioned previously, 2019 data reveals that the percentage of subnational (state and municipal) taxes in Brazil amounted to 42% (IBGE, 2019). The fact that Brazil has state govern-

ments certainly helps to explain this result since municipalities are responsible for only 8% of the tax collection.

As such, local governments are typically highly dependent on intergovernmental transfers (including tax sharing) to finance their expenditure needs. In particular, according to data provided by IBGE (2019), the share of taxes and social contributions in Brazilian municipalities' revenues was 30% in 2019. In contrast, intergovernmental grants and donations represented 57% of total revenues (the remaining revenues, including interests received, amounted to 13% of total revenue). This data clearly indicates that Brazilian municipalities depend significantly on intergovernmental grants.

A recent strand of the literature discusses the relevant dimensions for local governments to generate enough resources to manage public policies properly. Marenco et al. (2017) focus on the local state capacities to assess whether Brazilian municipalities with professional bureaucrats are better able to benefit from political and administrative decentralization, increasing their ability to tax and conduct public policies. The authors adopt a narrow view of the state capacity by selecting the share of bureaucrats with tertiary education and conclude that the higher that proportion, the more municipalities can tax real estate. Following the same line of research, Grin et al. (2018) adopt a broader view of the state capacities, covering administrative, technical (the one tested by Marenco et al., 2017), institutional and political dimensions and conclude that the positive effect of political capacities of Brazilian municipalities on fiscal performance is robust. As for the other types of capacities, the impact is not so strong, suggesting that there is room to enhance the qualification of Brazilian municipalities. Melo et al. (2015) also emphasize the multidimensional view of state capacities – besides political factors, institutional and administrative (including technical) elements are determinants of good governance at the local level. Silva and Silva (2018) stress the importance, especially for small municipalities, of increasing the own resources of Brazilian local governments and reducing the dependence on intergovernmental grants, fighting mayors' reluctance to tax due to electoral motivations. According to the authors, the local capacity to tax is shaped by organizational, technical, institutional, and political factors and conditions for the quality of public provision.

Our purpose is to contribute to this debate by suggesting that not only are own-source revenues frequently insufficient to finance local public policies but that some municipalities do not even generate enough revenue to pay for their existence.

THE AUTONOMY COST INDEX

The previous section highlighted the theoretical aspects of fiscal federalism and described the Brazilian federative structure. In Brazil, all federative units (central government, states, and municipalities) have their own budget and revenue collection powers (administrative autonomy), autonomy to make decisions on matters within their competence, safeguarding the powers established in the Federal Constitution (fiscal autonomy) and executive and legislative representatives elected by the vote (political autonomy). The purpose of this research is to deepen the investigation on whether political and fiscal decentralization (the transfer of the political representativeness and the fiscal impact on the economy to subnational governments) has been properly accompanied, at the municipality level, by administrative decentralization (how much autonomy subnational governments possess relative to central control in terms of policy responsibilities) or if municipalities fiscal policy relies too much on intergovernmental grants and other financing sources than own municipal resources.

To assess the appropriateness of the administrative autonomy of the Brazilian municipalities, after analyzing the structure of the municipalities' budgets, we conceptually designed an index to evaluate whether Brazilian municipalities generate sufficient resources to cover their costs of existence. The indicator, which we named autonomy cost index, verifies the relationship between 1. the revenue generated in the municipality and 2. the costs of autonomies:

1. From the perspective of revenue, the first concept refers to revenue linked to the municipality's economic activity. The Brazilian Federal Constitution defines which are the collection competencies of each level of government, and the taxes that fall to cities are those related to services, vehicle ownership, properties ownership, a part of taxes associated with the movement of goods (collected by the corresponding state) and an amount related to the industrialization of products (managed by the central government).
2. From the perspective of expenditure, to find the cost of autonomies, we considered the cost of maintaining the legislature, the judiciary, and the organizational structure of the executive power. Expenditures related to activities such as health, education, and urban life, which are directly related to the provision of essential services to the population, are not considered because it is expected that this expenditure will exist regardless of whether there is a municipality.

It is essential to highlight that the Federation of Industries of Rio de Janeiro (Firjan) annually publishes the Firjan Index of Fiscal Management (IFGF). The purpose of this indicator is to assess the Brazilian municipalities' fiscal management through four groups of indicators: autonomy, personnel expenses, liquidity, and investment. ACIS's purpose, however, is to present a measure of the cost of independence in municipalities. An additional difference concerning the database. Although all the data come from Siconfi, the Finbra database used to calculate the ACI has its own methodology and treatment, which can generate differences in the results. And finally, the results are displayed differently regarding relativization and standardization. Nevertheless, despite the different purposes of this research, part of the group's indicators referring to autonomy is close to those that make up the expenses analyzed for calculating the ACI¹.

The database used to calculate the ACI was Finbra. According to the Brazilian Ministry of Economy (BRASIL, 2020b), Finbra is the database that gathers the information on the statements received by the National Treasury by determination of Complementary Law no. 101/2000, the Fiscal Responsibility Law (LRF). This database contains a set of accounting and tax information sent by the Federation entities on their budget and financial execution.

Data on expenditure by function was extracted from Annex I-E to calculate the index, and data on revenue was taken from Annex I-C. The data used were those for 2019, the most recently available period (moreover, using 2020 data would introduce an undesirable disturbance caused by the Covid-19 pandemic). The technical budget manual includes municipal revenue accounts (BRASIL, 2019, p. 133).

The database was treated for the revenue, considering the sum of the following accounts:

- Taxes, fees, and improvement contributions.
- Equity revenue (excluding *securities* and *exploitation of natural resources*).
- Agricultural revenue (includes revenue stemming from activities of orderly exploitation of natural plant resources in a natural and protected environment).
- Industrial revenue (includes extraction and processing of raw materials, as well as the production and marketing of goods related to the mechanics, chemistry, and transformation in general).

¹ More information about the IFGF calculated by Firjan can be obtained at the website <https://www.firjan.com.br/ifgf/metodologia/>.

- Services revenue (includes the revenue stemming from the provision of services in the various areas of the economic activity).
- Rural territorial property tax (consists of the income arising from transfers of the tax on the rural territorial property).
- Financial transfer of tax on the circulation of goods and services – exemption (records the total amount of the resources of transfers from the Union to the States, Federal District, and municipalities, meeting the limits, criteria, deadlines, and other conditions set out in the annex to Complementary Law no. 87 from 09/13/96, based on the proceeds of collection of the tax on the movement of goods and services).
- Tax on the movement of goods and services (municipality share).
- Motor vehicle property tax (municipality share).
- Tax on industrialized products (municipality share).

The *securities and exploitation of natural resources* accounts were deducted from the *equity revenue* account. *Securities* are derived from financial operations and are not directly related to local economic activity and the *exploitation of natural resources*. According to article 20 of the Constitution of the Federative Republic of Brazil (BRASIL, 1988), it is not a municipality competence but a central government property. To correct this distortion, the values were excluded from the final sum.

According to Finbra's data, *taxes, fees, and improvement contributions* represent more than half of own local revenue, ranging from 37% in the North to 56% in the Southeast. The second most crucial contribution is the municipal share of the *tax on the movement of goods and services*: 36% of own local revenue, with a maximum of 54% in the North and a minimum of 32% in the Southeast region. The municipal share of the *motor vehicle property tax* completes the top three sources of own local revenue, with similar weight in all areas (7%). Overall, the North region shows the composition of its own revenue that mainly differs from the national average.

The technical budget manual edited by the Ministry of Economy allows for a better understanding of the Brazilian budget structure by detailing all the income and expenditure accounts used in the budget (BRASIL, 2019).

Regarding the expenditure, data extracted are classified by budgetary function. It is a classification aggregating expenditure data according to the corresponding user. The budget functions selected to portray the cost of the existence of each municipality were the *legislative, judicial, essential to justice and administrative*.

Data regarding committed expenditure were collected because, in Law no. 4,320 (BRASIL, 1964), it is foreseen that the commitment to expenditure

is the act edited by the competent authority, which creates an obligation to pay for the State. Therefore, even if it does not materialize in actual expenditure, it indicates the intention and commitment of the manager to realize such expense (article 58).

From the calculation of the revenue as described above, we obtained the generated revenue indicator, and for the expenditure, we calculated the cost of autonomy indicator. All values respect 2019 and are expressed in the Brazilian currency, the Real. The ACI was obtained by dividing the cost of autonomy indicator by the generated revenue indicator.

As already mentioned, Brazil is composed of 5,570 municipalities, and all are required to submit the data regarding budget and financial execution to the National Treasury Secretariat, the body responsible for analyzing the data. Managers of municipalities that do not deliver the information are subject by Brazilian law to various penalties, which may result in the loss of the management position.

Even though the legislation determines sanctions, it is not uncommon for a municipality to withhold the data. In addition, there is another common situation which is the delivery of incorrect information. Despite the computerized system, it is common to fill in the records with only aggregated information (which prevents analyses such as the one that this research proposes to perform). In this context, it was possible to extract from the Finbra database the 2019 data on generated revenue and cost of autonomy indicators for 4,877 municipalities, representing 87.6% of the total Brazilian municipalities.

The first step to start analyzing the data is grouping the municipalities according to the Brazilian regions, as presented in Figure 1. This analysis by the group is necessary to make data analysis feasible due to a large number of municipalities with available data.

Figure 1
Brazilian regions and states



Source: Souza (n.d).

Note. The Federal District is located in the Midwest region, as indicated on the map.

The five regions in Brazil are:

1. North, composed of the states of *Acre*, *Amapá*, *Amazonas*, *Pará*, *Rondônia*, *Roraima*, and *Tocantins*.
2. Midwest, composed of the states of *Goiás*, *Mato Grosso*, and *Mato Grosso do Sul*; the Federal District is also included in this region.
3. Northeast, composed of the states of *Alagoas*, *Bahia*, *Ceará*, *Maranhão*, *Paraíba*, *Pernambuco*, *Piauí*, *Rio Grande do Norte*, and *Sergipe*.
4. Southeast, composed of the states of *Espírito Santo*, *Minas Gerais*, *Rio de Janeiro*, and *São Paulo*.
5. South comprises *Paraná*, *Rio Grande do Sul*, and *Santa Catarina*.

The division by regions is used in this research to facilitate the data analysis by avoiding naming each municipality with available data. Given this condition, the first relevant information concerns the number of cities for which no data was available for analysis, as presented in Table 1.

Table 1
Number of municipalities with missing data by region

Region	Number of municipalities with missing data	% total	Number of municipalities
Midwest	55	11.8	467
Northeast	317	17.7	1,794
North	103	22.9	450
Southeast	161	9.7	1,668
South	57	4.8	1,191
Total	693	12.4	5,570

Source: Elaborated by the authors.

This is important information because it reveals that the missing information is primarily concentrated in the North region, with 22.9% of the municipalities having no data available, despite the number of cities in the northern area being the smallest of all parts of the country. The Northeast region is the second in missing data, with 17.7% of the total municipalities. In opposition to the North region, the Northeast is the more extensive region of the country regarding the number of cities. This panorama shows that the Northern part has the most difficulty compiling budgetary data.

The ACI corresponds, for each municipality, to the ratio between the cost of autonomy indicator and the generated revenue indicator. The results were classified into two groups:

Group 1 – municipalities with an ACI below 1, indicating own sufficient revenue to pay for the costs of autonomy.

Group 2 – municipalities with an ACI above 1, demonstrating their insufficient income to pay for the expenses of autonomy.

Based on this classification, Group 1 includes 3,661 municipalities (75.1% of the total analyzed), while Group 2 comprises 1,216 municipalities (24.9% of the total analyzed). This information is shown in Table 2.

Table 2**Number of municipalities by region and ACI Group**

Region	Group 1 (ACI < 1)	% Total	Group 2 (ACI > 1)	% Total	Total
Midwest	377	91.5	35	8.5	412
Northeast	613	41.5	864	58.5	1,477
North	218	62.8	129	37.2	347
Southeast	1,356	90.0	151	10.0	1,507
South	1,097	96.7	37	3.3	1,134
Total	3,661	75.1%	1,216	24.9%	4,877

Source: Elaborated by the authors.

The data about ACI Group 2 is expressive and worrying. Almost one in every four Brazilian municipalities does not generate enough revenue to pay for the costs of their existence (autonomy). When these data are analyzed by region, the North and Northeast regions are the negative highlights. In the Northeast region, over half of the municipalities do not have enough revenue to pay for their autonomy, and in the North region, this occurs in more than a third of them. On the other hand, in the different areas (Midwest, Southeast, and South), there are less than 10% of municipalities in Group 2.

The economic activity and Brazilian territorial characteristics may explain this scenario. The Amazon rainforest mainly occupies the North region, so economic activity and occupation are limited. The Northeast region has a desert climate, which hinders economic development. On the other hand, the Midwest region is responsible for much of the Brazilian agricultural production, and the South and Southeast regions are the most industrialized regions of the country.

To deepen this analysis, Table 3 shows all the municipalities where the ACI was more significant than ten; that is, for each monetary unit collected, more than ten monetary units were spent on maintaining the municipality's autonomy. There are 65 municipalities on this list.

Table 3**Number of municipalities with an ACI above ten by region**

Region	ACI > 10	% Total
Midwest	49	75.4
Northeast	4	6.2
North	11	16.9
Southeast	1	1.5
South	0	0.00
Total	65	100.00

Source: Elaborated by the authors.

The data above highlights mostly the municipalities of the North and Midwest regions, especially the latter, which accounted for three-quarters of the total. On the other hand, other regions together represent less than ten percent of the municipalities in this list. However, it should be noted that a high ACI may be linked to a low absolute cost of autonomy.

Additionally, Table 4 shows all the municipalities where the ACI was less than 0.15; that is, for each monetary unit collected, less than 0.15 monetary units were spent on maintaining the municipality's autonomy. There are 62 municipalities on this list.

Table 4**Number of municipalities with an ACI above 0.15 by region**

Region	ACI < 0,15	% Total
Midwest	1	1.6
Northeast	1	1.6
North	1	1.6
Southeast	39	62.9
South	20	32.3
Total	62	100.00

Source: Elaborated by the authors.

The data above is consistent with the economic development situation in the Brazilian region. The Southeast and South regions have over 95% of

the municipalities with minor ACI scores. As for the cities of this selection coming from other areas, Campo Grande, the capital of the state of Mato Grosso do Sul, represents the Midwest region. This is the largest and most developed city in this state. The representative of the Northeast region is Cabedelo, in Paraíba state. This city is in the metropolitan area of the state capital, João Pessoa, and benefits from its geographical location on the Atlantic coast for its development. And finally, the representative of the Northern region is Gurupi, in the state of Tocantins, a large commercial warehouse located in a strategic place with a good infrastructure of transports, benefiting from the location and easy access to large centers, in addition to having developed livestock and agriculture activities.

Population size may help to explain the ACI performance, as shown in Table 5.

Table 5
Number of municipalities population and ACI group

Population	Group 1	% Total	Group 2	% Total	Total
<5,000	778	69.0	349	31.0	1,127
<10,000	754	72.9	280	27.1	1,034
<20,000	825	70.5	345	29.5	1,170
<50,000	741	78.3	206	21.8	947
>50,000	563	93.9	36	6.0	599
Total	3,661		1,216		4,877

Source: Elaborated by the authors.

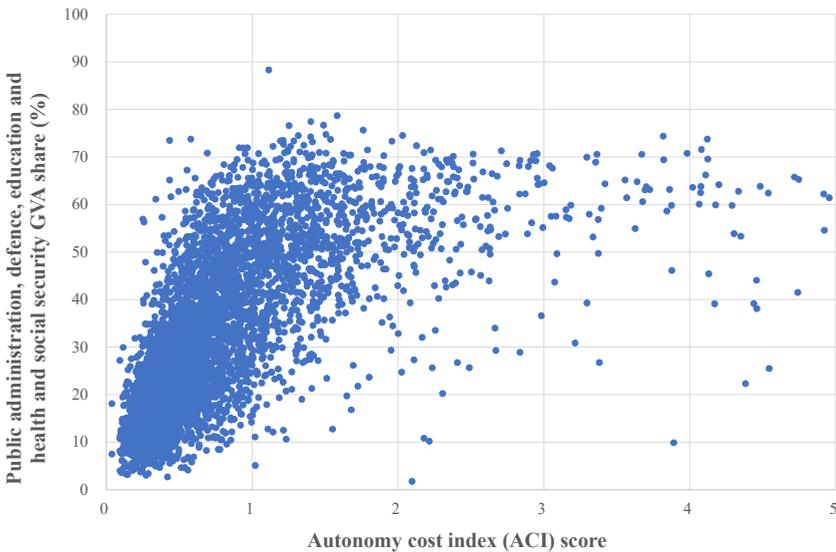
In general terms, it is possible to find a downward tendency of the number of municipalities in Group 2 with the increase in population: especially in cities with less than 20,000 inhabitants, almost 30% of them are part of Group 2 while the most populated municipalities, notably those with more than 50,000 inhabitants, have about 6% of their representatives in Group 2. This suggests that population size positively affects the autonomy cost index.

Nevertheless, the population variable does not show an influence as strong as the geographic region variable. To further expand our findings, we performed a correlation analysis between our index, both in level and in per capita terms, and a set of possible explanatory variables, ranging from geo-demographic variables (population, area, and population density) to economic variables like the per capita gross domestic product (GDP) and the gross value

added (GVA) sectoral shares. The most exciting but somewhat expected result is the positive correlation between the autonomy cost index and the *public administration, defense, education, and health and social security* GVA share, as shown in Figure 2. This suggests that the fiscal performance of municipalities is a negative function of the degree of public intervention and consequently positively depends on the dynamics of the business activity.

Figure 2

ACI score and public administration, defense, education, health, and social security GVA share



Source: Elaborated by the authors.

Note: The figure excludes the 100 municipalities with an ACI score above 5.

Overall, the results suggest that the autonomy cost of Brazilian municipalities decreases with the population and business activity. Hence, our autonomy cost index performs worse in Brazil’s North and Northeast regions.

CONCLUSIONS

The purpose of our research is to contribute to the fiscal decentralization debate by showing that not only are own-source revenues frequently

insufficient to finance local public policies run by Brazilian municipalities but that some municipalities do not even generate enough revenue to pay for their existence. Our argument is that some Brazilian municipalities are not financially autonomous in conducting their public policies and are too dependent on revenue sharing from other government levels.

As such, we investigated the capacity of Brazilian municipalities to generate revenues to finance their autonomy by comparing the revenue linked to the local economic activity (mainly local fees and taxes) with the cost of the existence of each municipality (given by the expenditure excluding the one that would happen whether there is a municipal government or not).

Our data reveals many difficulties for municipalities to finance their existence. The first difficulty is the data, as more than 10% of the Brazilian municipalities cannot even provide their budgetary and financial data. But the most alarming data is that, from the total number of municipalities that manage to present the data, one out of four does not generate enough revenue to face the cost of their existence. Moreover, the results suggest that the autonomy cost of Brazilian municipalities decreases with the population and business activity. Hence, our autonomy cost index performs worse in Brazil's North and Northeast regions.

This context opens space for a meaningful debate within the scope of Brazilian federalism: Is the Brazilian federation willing to allocate resources to guarantee the existence of these municipalities? Is it possible to maintain the level of public service provision for these places' citizens without a municipality?

The Brazilian federation encompasses several redistribution mechanisms. This redistribution system is complex due to the significant difference between Brazilian regions, mainly concerning climate, population, and economic activity. Although there are rules that consider regional differences, evidence was found that substantial distortions persist.

The ACI results may suggest the extinction of a third to a quarter of the total number of Brazilian municipalities. This would mean unprecedented federative reform in the country and worldwide. However, the issue cannot be analyzed only from the budgetary perspective. It must be remembered that a municipality is a group of people with specific characteristics and unique cultural identities. This statement is evident when analyzing the municipalities in the Northern region, which, with an area in the Amazon rainforest, preserves unique and completely distinct indigenous communities where geography plays a relevant role.

Given the issue's complexity, it is believed that the ACI can contribute to deepening the debate on the Brazilian federative structure. Studies on the

geographical, political, and economic characteristics of worse-performing municipalities can be carried out to seek other federative arrangements that enable a more efficient allocation of the available resources.

A suggestion for future research is to develop studies on the viability of converting municipalities with an ACI score above one into districts, an administrative instance with less autonomy and fewer maintenance costs, which may preserve the organization, cultural identity, and specific characteristics of these groups of people. Another possibility is to develop studies on the viability of merging neighboring municipalities.

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