Determinants of fiscal transfers to municipal units: effects of malapportionment of Brazilian electoral districts

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The disproportionate representation of electoral districts has an effective influence on the distribution of public resources to the overrepresented regions, which shows that public spending is driven by political and institutional factors. Therefore, the objective of this article is to analyze the products of institutional factors, notably disproportionate non-legislative representation on the transfers to Brazilian municipalities. We used statistical econometric regression with panel data. Brazilian municipalities were analyzed considering the period from 2004 to 2014. The results indicate that the effect of malapportionment in the National Congress on discretionary federal and state expenditures is significant, which demonstrates that the representation structure guides political motivation and the actions of Brazilian public management.

Keywords: malapportionment; discretionary transfers; Brazilian municipalities.

Determinantes das transferências fiscais para as unidades municipais: efeitos da representação desproporcional dos distritos eleitorais brasileiros

A representação desproporcional dos distritos eleitorais tem efetiva influência sobre a distribuição de recursos públicos em benefício das regiões sobrerrepresentadas, o que evidencia que os gastos públicos são dirigidos por fatores políticos e institucionais. Diante disso, o objetivo deste artigo é analisar os efeitos de fatores institucionais, notadamente da representação desproporcional no Poder Legislativo, nas transferências em direção aos municípios brasileiros. Empregou-se a técnica estatística de regressão econométrica com dados em painel, tendo como unidade de análise os municípios brasileiros no período de estudo de 2004 a 2014. Os resultados apontam expressivo efeito da desproporcionalidade representativa no Congresso Nacional nas despesas discricionárias federais e estaduais, o que demonstra que a estrutura da representação orienta as motivações políticas e as ações dos gestores públicos brasileiros.

Palavras-chave: representação desproporcional; transferências discricionárias; municípios brasileiros

Determinantes de las transferencias fiscales para las unidades municipales: efectos de la representación desproporcionada de los distritos electorales brasileños

La representación desproporcionada de distritos electorales tiene una influencia efectiva en la distribución de recursos públicos en beneficio de las regiones sobrerrepresentadas, lo que pone de manifiesto que los gastos públicos están dirigidos por factores políticos e institucionales. El objetivo de este artículo es analizar los efectos de factores institucionales, notablemente de la representación desproporcionada en el Legislativo, sobre las transferencias hacia los municipios brasileños. Se empleó la técnica estadística de regresión econométrica con datos en panel. La unidad de análisis son los municipios brasileños y el período es de 2004 a 2014. Los resultados apuntan que el efecto de la desproporcionalidad representativa en el Congreso Nacional sobre los gastos discrecionales federales y estatales es expresivo, lo que demuestra que la estructura de la representación orienta las motivaciones políticas y las acciones gestoras públicas brasileñas.

Palabras clave: representación desproporcionada; transferencias discrecionales; municipios brasileños.

1. INTRODUCTION

The literature on intergovernmental relations in Brazilian federalism has highlighted a connection between political factors and transfers, especially discretionary ones. High-caliber studies address the subject, but typically focus on transfers to states and regions. Our investigation sheds light on the constraints of tax transfers of central and state governments towards their municipalities. This article aims to analyze the effects of institutional factors, focusing on disproportionate representation in the legislative branch, and fiscal transfers to Brazilian municipalities.

Intergovernmental fiscal transfers represent an important source of revenue for the federative entities, especially those of low-level capacity, unlike large districts, whose local taxes support most of their budgets. It is expected that distribution of resources among the electoral districts would be based on equity between the various regions of the country, favoring the poorest regions. However, there is a connection between political issues and allocation of public resources, characterizing the political nature of fiscal transfers.

Existing studies have attempted to identify this connection, for example Amorim and Simonassi (2013), Arretche and Rodden (2004), Gibson, Calvo and Falleti (2004), Soares and Neiva (2011), and Turgeon and Cavalcante (2014). Among the variables affecting direct intergovernmental transfer decisions, there is consensus among the authors cited that overrepresentation of electoral districts has a considerable effect on the distribution of public funds — that is, the states overrepresented in the legislation are those that receive the most benefit. They receive a greater proportion of constitutional and discretionary fiscal transfers, although these are not necessarily distributive.

Thus, it is important to analyze what influences the pattern of fiscal transfers between government spheres, both institutional and political, considering the disproportionate representation in legislative power. Economic aspects must also be considered, emphasizing variables that would signal a fiscal transfer's redistributive character.

Because it is widely accepted in the literature that distribution of discretionary resources is biased by political negotiations, the present study considers the hypothesis that these resources are an important governmental instrument to achieve political objectives.

To test the established hypothesis and achieve the proposed objective of the study, we used the statistical econometric regression technique, with data presented in a panel. This study covers the period between 2004 and 2014, and the sample includes all Brazilian municipalities that presented data for the analysis variables.

Following the introduction, this article is divided into five additional parts. First, we summarize the theoretical foundations of resource distribution and the disproportionate representation of electoral districts, as well as the institutional and political elements that influence the pattern of fiscal transfers from the central government to local governments. We then discuss the methodology used for empirical analysis, followed by results and analyses. Finally, we present the main conclusions of the study.

2. INTERGOVERNMENTAL FISCAL TRANSFER SYSTEM

With the decentralization process and fiscal federalism favored by the 1988 Constitution, the federal authorities gained greater autonomy and fiscal responsibility, as well as greater

accountability regarding provision of public goods and services. According to Arretche (2005), the fiscal decentralization fundamentally changed the foundations of the local government's authority, expanding local authority on fiscal resources and tax authority on taxes of significant importance.

Brazil is a country with differences between jurisdictions, resulting in strong territorial inequality. Given this, a number of federal resources in the country aim to maintain the federal balance (Souza, 2003). Among these resources are intergovernmental transfers, highlighted as a way to seek greater efficiency of the public sector in implementing policies and services and as a mechanism to balance public finances. They are relevant in federal regimes in which fiscal management looks to collect taxes and spend budgets equitably and efficiently, adjusting the distribution of resources.

Through intergovernmental fiscal transfers, the federal government supposedly takes the role of reducing interregional inequalities and inequal access to public services. In Brazil, where territorial inequality is significant,[1] the ability of various municipalities to provide public services would be fairly uneven without such transfers (Arretche, 2010).

Intergovernmental fiscal transfers may be classified into two major categories: compulsory and discretionary. They are determined constitutionally or legally, as well as in negotiations between central and subnational governments. Resources are provided to another federal entity as a form of financial cooperation, aid, or assistance.

Gasparini and Miranda (2006) note some reasons for establishing these transfers, such as balancing tax collection capacity and public spending needs. This must be done with consideration for distribution between government spheres, reduction of regional differences throughout the national territory, and better management of public resources in each sphere of government: the union, states, and municipalities.

Soares and Neiva (2011) observe that federal discretionary transfers are important revenue sources in Brazilian state budgets. They account for approximately 3% of taxes and 9% of constitutional transfers. However, the importance of these transfers differs by state according to regional economic disparities—for example, in the state of Sergipe, discretionary fiscal transfers account for almost 70% of the taxes collected, whereas in São Paulo, they account for less than 0.2%. This is because transfers are made to correct regional disparities, seeking to improve and increase the provision of public goods and guaranteeing the budget balance of the less-favored federal entities with lower tax collection capacity.

Nevertheless, the redistributive aspect of federal transfers is controversial, particularly with respect to compulsory transfers, as shown by some existing literature.

The redistributive aspect of nondiscretionary transfers is supported by the investigations of Soares and Neiva (2011), who found that the three states of São Paulo, Minas Gerais, and Rio de Janeiro together, which together collect over 50% of the total taxes collected by the other states, are

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[1] Souza (2003) demonstrates inequality indicators in the Brazilian municipalities, highlighting that inequalities are found not only among the five regions of the country, but also within a single region or similar state. These differences may be found according to the distribution of the population of the municipalities; the greatest differences are found in the northeast, where the number of small municipalities (population between 10,000 and 20,000 inhabitants) is quite high compared to other regions.

also those that receive less than 30% of constitutional transfers. The states in the northeast, which collect approximately 14% of the overall taxes, receive more than 30% of the total constitutional transfers. Arretche and Rodden (2004) came to a similar conclusion when investigating constitutional transfers; Gibson, Calvo, and Falleti (2004) found a moderately positive relationship between nondiscretionary spending and poverty variables, and a negative relationship between such expenses and per capita income.

Soares and Neiva (2011) state that the regions of less economic development (north, northeast, and central-west, respectively) receive a higher percentage of discretionary transfers; however, Gibson et al. (2004) did not find a significant relationship between discretionary spending and poverty, nor among these expenditures and per capita income. According to Arretche and Rodden (2004), the distribution of discretionary transfers does not benefit the poorest states, and thus "it is not determined by needs criteria." In this light, Amorim and Simonassi (2013) and Turgeon and Cavalcante (2014) identify a tendency to maintain interregional inequalities. The transfer of resources to the states seems to be driven more by political factors than the socioeconomic characteristics of the subnational units or criteria to reduce interregional inequalities.

The economic and political impacts of the two major transfer categories (compulsory and discretionary) differ. Compulsory transfers function as methods to redistribute resources, whereas discretionary transfers play a supplementary, emergency-adjustment role. For these transfers, the political factor appears to be more relevant. "The orientation to reduce disparities or equalize revenue distribution is an additional attribute that redistributive transfers may or may not take" (Prado, 2001, p. 4).

The following section focuses on discretionary transfers, in which the effects of disproportionate electoral district representation can be seen.

3. TRANSFERS AND DISPROPORTIONATE ELECTORAL DISTRICT REPRESENTATION

Disproportionate representation of the electoral districts has a decisive influence on the distribution of resources to them; empirical studies have shown that a greater volume of transfers are sent to overrepresented subnational units, which are less populous and economically developed.

This disproportionality is viewed as a discrepancy between the proportion of the legislative seats occupied by the district and its population in the country. In Brazil and other countries, less-populated units are overrepresented in the national legislation because they occupy proportionally more seats than the most populous units (Kauchakje, 2017; Samuels & Snyder, 2001).

In the Brazilian National Congress, districts territorially coincide with the states. In the two houses of the federal legislature, the Chamber of Deputies and the Senate, electoral district representation is disproportionate — that is, for each of the country's 27 districts, the proportion of the population does not correspond with the proportion of seats occupied.

In the Chamber of Deputies, regulations allow each district a minimum of eight and a maximum of 70 representatives; in the Senate, each district may elect three senators. The Legislative Assembly, representatives of the state legislature, has a number of members corresponding to three times the state's representation in the Chamber of Deputies. When this number reaches 36, the number of federal members exceeding 12 is added to it.

According to Samuels and Snyder (2001), the democratic principle of "one person, one vote" is normally violated, especially in federations with bicameral organization. For example, a district that accounts for 20% of the country's votes does not always occupy 20% of the seats in the legislature; this means that the votes may not translate to political representation (Turgeon & Cavalcante, 2014).

The subnational units are found to have disproportionate representation—that is, some are underrepresented and others overrepresented. In the more populous states, the proportion of seats versus population is much smaller than in the less-populated states. The large states are underrepresented, and the smaller states are overrepresented, illustrating what is known as *malapportionment* in the English-language literature.

When legislative representation is distributed among electoral districts, it is common that electoral rules lead to a degree of disproportionate representation in relation to the size of the population, even disregarding demographic changes over the years; some districts gain more representation than they would with proportionate representation of true population. Thus, the value of one vote in overrepresented states is greater than in underrepresented states, since a smaller number of votes is needed to elect a representative in such states (Turgeon & Cavalcante, 2014). When Samuels and Snyder (2001) investigated district representation in 78 countries, they found that most countries exhibit disproportionality, especially those in Latin America.[2]

National and international studies, such as those performed by Amorim and Simonassi (2013), Ansolabehere, Gerber and Snyder (2002), Arretche and Rodden (2004), Gibson et al. (2004), Kauchakje (2017), Lee (1998), and Turgeon and Cavalcante (2014), have presented extensive evidence of tax imbalances favoring overrepresented units.

Ansolabehere et al. (2002), Lee (1998), Gibson et al. (2004), and Turgeon and Cavalcante (2014) examined federal government allocation of resources to subnational units and found that overrepresented subnational entities tend to receive more federal resources per capita compared to those who are underrepresented—that is, the number of legislative seats in relation to the population determines the allocation of government resources.

Amorim and Simonassi (2013) hypothesized that intergovernmental transfers are an important mechanism used by the federal executive branch to achieve political objectives, highlighting that these objectives prevail over socioeconomic equity criteria; higher levels of per capita transfers are associated with the political composition of government coalitions.

Similarly, Kauchakje (2017) showed that the legislative bargaining model is used to explain the favoring of overrepresented states in distribution of public resources. This is conditioned by the participation of congressmen from these states in legislative coalitions.

Arretche and Rodden (2004) studied the influence of electoral and legislative policies on distribution of Brazilian intergovernmental transfers and found that Brazilian presidents exercise

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[2] In the ranking of disproportionate Senate representation among the 78 sample countries, Argentina, Brazil, and Bolivia take the first, second, and third place, respectively. In the ranking of disproportionate representation in Congress, Brazil takes 17th place (Samuels & Snyder, 2001, 2004).

great authority on tax transfers and incentives to exchange federal spending for legislative votes. Thus, the distribution of intergovernmental transfers is an important tool for obtaining parliamentary support.

Intergovernmental transfers are a financial aid mechanism to mitigate budgetary constraints in federative entities with low capacity for tax collection. The overrepresented units generally collect the smallest figures in local taxes. However, large districts have higher collection capacity, as their local taxes support the majority of their budget resources.

Both discretionary and compulsory transfers are vital in supplementing the budgets and implementing policies in subnational governments with less fiscal capacity and low economic development.

Kauchakje (2017) found a correspondence between overrepresentation, underrepresentation, and development level. In overrepresented states with low development indicators, the correspondence is 36.8% in Congress (68.4% of the Senate, 31.6% of the Chamber of Deputies); all the states in this group are from the north, northeast, and central-west regions.

Because the overrepresented units perform less in economic development, a greater volume of resources directed to these locations is justified in pursuit of territorial equity (Kauchakje, 2017). Soares and Neiva (2011) show that in Brazil, the regions that receive a greater percentage of transfers are the less-developed ones (the north, northeast, and center-west, respectively).

The disproportionate representation of electoral districts has an effective influence on distribution of public resources to the benefit of overrepresented regions. Overrepresented states benefit most from discretionary transfers. This suggests that public spending is driven by political and institutional factors (such as disproportional representation). Therefore, it does not necessarily reflect the characteristics of the subnational units.

3.1 STANDARDS FOR FEDERAL AND STATE TRANSFERS TO MUNICIPALITIES: INSTITUTIONAL AND POLITICAL ELEMENTS

It is expected that institutional mechanisms for balancing public finances, such as tax transfers, are operated to support equity between the various regions of the country, and thus favor the poorest regions. However, there is a connection between political issues and allocation of public resources, characterizing the nature of fiscal transfers as political.

According to Amorim and Simonassi (2013), it is preferable to direct transfers to locations that are more politically relevant rather than those that require the resources most. According to Gibson et al. (2004), when resources are transferred to serve political interests, to the detriment of the economic needs of subnational entities, federalism is reallocative rather than proportional.

The political factors directing tax transfers relate to the budgetary process. The rules for presenting amendments to the budget limit the ability of each congressperson to influence the distribution of resources according to his or her geographical and electoral preferences (Kauchakje, 2017). Even investment spending, which comprises a smaller share of the budget, is determined by the executive power (Figueiredo & Limongi, 2008).

The Brazilian executive branch, however, plays a central role in the budgetary process, as it is authorized to veto the approved budget and executes with a discretionary margin. For discretionary

transfers, this margin is normally unrestricted with respect to the amount and purpose of the transfer (Limongi & Figueiredo, 2005; Soares & Neiva, 2011).

The central government's strategy to transfer more resources to the overrepresented states may be linked to obtaining parliamentary support to form political coalitions. Because resource allocation to improve infrastructure in the subnational entities generates impacts only in the long term, it holds weakened incentive for the central government (Amorim & Simonassi, 2013).

Political actors are urged to exchange spending for legislative support, aiming to win political office, remain in power, or integrate majority legislative coalitions. Thus, the distribution of intergovernmental transfers is a valuable tool to achieve these political objectives (Arretche & Rodden, 2004).

As previously mentioned, because most studies focus on transfers to states and regions, we intend to extend the previous contributions with this study, taking the Brazilian municipalities as a unit of analysis. The effects of institutional, political, and economic variables will be examined with respect to transfers from the central and state governments to municipalities.

4. METHODOLOGY

To test the established hypothesis and achieve the aim proposed in this study, we used the statistical econometric regression technique, with data presented in a panel. A spatial analysis of clusters was performed to supplement the study. The study period is from 2004 to 2014, and the sample, composed of the Brazilian municipalities, was defined according to the availability of data at the municipal level. After selecting the variables, models were developed to measure the effect of independent or explanatory variables on the variable to be explained.

4.1 DATA

Data were collected for the period from 1988 (implementation of the Federal Constitution) to 2014. However, for statistical estimates, the study period began in 2004, the year in which it became possible to distinguish compulsory from discretionary transfers.

When working with several observation units over a long period of time, as in this study, data for important variables may not be available in certain years. In the present case, constraining the sample to those municipalities with data for all variables during the analysis period would result in a very small number of observations, hindering the heterogeneity desired in a longitudinal study. Thus, the sample size was increased by using statistical tests with an unbalanced panel, meaning that for each municipality of the sample, different numbers of temporal data are found.

The samples used for each year of the analysis period were as follows: in 2004, 4608 municipalities; in 2005, 4548 municipalities; in 2006, 4990 municipalities; in 2007, 4831 municipalities; in 2008, 4908 municipalities; in 2009, 4881 municipalities; in 2010, 4915 municipalities; in 2011, 4613 municipalities; in 2012, 4567 municipalities; in 2013, 4757 municipalities; and in 2014, 4542 municipalities. Ultimately, it was possible to work with an average of 4741 municipalities.[3] The municipalities emancipated during the study period were excluded from the sample.

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[3] The loss of municipalities is due to the absence of data, but this does not harm the results: the sample adopted in this study maintains the regional diversity that characterizes Brazil.

Furthermore, we excluded large municipalities with a population above 300,000 inhabitants from the sample because they are considered discrepant and may cause statistical model estimation problems.[4]

Data for the study were obtained from the Brazilian Finance Report by the National Treasury Secretariat (FINBRA), the Brazilian Institute of Geography and Statistics (IBGE), the database of the Institute of Applied Economic Research (Ipeadata), and the Superior Electoral Court (TSE).

4.2 STATISTICAL TECHNIQUE

Econometric regression models were estimated with unbalanced panel data. The models adopted had fixed effects,[5] and calculations were conducted using the Stata 13 software.

The mathematical expression for the model may be represented as a linear equation in the form:

$$Y_{it} = \beta_0 + \delta_0 D_{1t}\beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \alpha_i + u_{it} \qquad i = 1,...,x;^6\ t = 2004,...,2014$$

where i represents the i-th unit of the cross-sectional cut and t the t-th period of time; Y is the variable dependent on the independent (explanatory) variables represented by X; β_0 is the model constant; D is a dummy variable; β_1, β_2, and β_3 are parameters determined from the observed data, and δ is used to emphasize the interpretation of the parameters that multiply dummy variables; variable αi captures all factors that were not observed, constant in time, that affect Y_{it}; Y_{it} determines that the model is of fixed effects, since αi is fixed over time; and finally, u_{it} is the temporal variation error, as it represents non-observed factors that change over time and affect Y_{it}.

4.3 DEFINITION OF VARIABLES AND THE ECONOMETRIC MODEL

The variables to be explained were established based on the classification of transfers as compulsory or discretionary.[7] According to Brazilian official agencies, transfers imposed in the Federal Constitution may be considered compulsory,[8] which are those imposed by the Federal Constitution; provided for by law; or discretionary, which are further classified as specific,[9] by delegation,[10] or voluntary.

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[4] In the exploratory analysis of the data, the results for the large municipalities present a substantial discrepancy among the others. This could cause distortions in the inferential analysis. To define the cutoff number of inhabitants for large municipalities, the National Treasury classification criteria were adopted. The following population groupings are proposed: a) population below 50,000 inhabitants; b) population between 50,000 and 300,000 inhabitants; d) population between 300,000 and 1,000,000 inhabitants; e) population above 1,000,000 inhabitants.

[5] The procedures for adopting the most appropriate model are described in detail in section 4.3, which defines the statistical variables and models.

[6] For each year of the temporal cut, there is a different number of observations due to the unbalanced nature of the panel. The number of municipalities used in each annual sample is described in section 4.1.

[7] The transfer values were established in accordance with the competence criterion, with pledged values without accrued liability.

[8] Examples of compulsory transfers: Municipal Share Fund (FPM); Rural Property Territorial Tax (RPTT); Industrialized Products Tax (IPT); Intervention on Economic Domain Contribution; Education Salary Contribution; Tax on Operations with Credit, Exchange, and Insurance or Operations Related to Bonds or Securities on Gold; Financial Compensation Transfers due to Exploitation of Natural Resources; Resource Transfers from the Education Development National Fund (EDNF); Financial Transfers from ICMS — Reduction of tax burden — Supplementary Law no. 87/1996; etc.

[9] Examples of specific transfers: Unified Health System (UHS) transfers; Social Welfare National Fund Resources (SWNFR); etc.

[10] Examples of transfers by delegation: Transfers to public consortia; transfers of covenants related to the Unified Health System (UHS); transfers of covenants from the Union to Social Welfare Programs; etc.

The dependent variable was separated in this study to establish a clear division between the granting of transfers, facilitating analysis of resource transfers with legal and constitutional determinations and the granting of transfers upon which the executive branch has discretionary power.

Analysis focuses on voluntary transfers of resources provided as cooperation, financial aid, or assistance. They are not constitutionally or legally determined, nor are they resources intended for the Unified Health System.[11] It is in discretionary transfers that the effect of overrepresentation on legislative bargaining each year is observable. According to Arretche and Rodden (2004), the federal executive branch has a substantial degree of discretion with respect to this type of transfer, deciding where the resources are intended to go and when the transfers will be executed. Other types of transfers may also be affected by overrepresentation, but this effect is applied differently and at different times.

The main independent variable used in the model was to test the hypothesis that the municipalities of overrepresented states are those that receive a greater amount of transferred resources.

The variable was built using the relative representation index (RRI) of the states in Congress, which would be related to the amount of tax transfers to states and their municipalities. The index formula will be presented further below.

The empirical research data presented by the existing literature support the use of RRI_states as a relevant measure for the analysis proposed here. The state governments, especially those administrations with low economic performance and overrepresentation, count on transfers received from the central government when composing their budgets to carry out municipal public policies (Soares & Neiva, 2011). As for legislative behavior, a portion (albeit small, compared to the total of the budget) of the voluntary resources for the states is also derived from individual parliamentary amendments and addressed to specific municipalities (Arretche & Rodden, 2004; Figueiredo & Limongi 2008). This means that congresspeople at the federal level act upon both national and state matters that may be of interest to local populations. The endeavor to bring tangible resources to their states and specific municipalities is regarded as part of the representatives' strategy in seeking votes, and it thus guides their parliamentary activity. Each (Cheibub, Figueiredo, & Limongi, 2009; Lee, 2007; Shepsle, 2010) congressperson's career is subject to party pressure, the national government, and the government of his or her home state. The demands of their consolidated electoral circle, or the circle they wish to expand by winning new voters, are also influences.

The disproportionality of the Brazilian states in the National Congress was observed using the Relative Representation Index (RRI) defined by Ansolabehere et al. (2002), whose formula for calculation is:

$$RRI = \frac{PCseats_{electoral\ district}}{PCseats_{country}}$$

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[11] We chose not to address specific and delegated transfers. For many municipalities, this variable was not reported in the FINBRA database. This would result in many missing values in the sample, damaging statistical estimations. Moreover, these transfers represent a very small value compared to the total value of discretionary transfers.

where:

$$PCseats = \frac{seats_{electoral\ district}}{population_{electoral\ district}}$$

$$PCseats_{country} = \frac{legislative\ seats_{country}}{population_{country}}$$

According to Ansolabehere et al. (2002), there is proportional representation when RRI = 1.0.

A dummy variable was built from RRI, assigning a value of 1 to municipalities of states overrepresented in the Chamber of Deputies, the Legislative Assembly, and the Senate, and value of 0 otherwise.

The differences in legislative representation among the Brazilian states will be detailed in the results section. However, it must be noted that in the Senate, overrepresentation is higher, the number of seats is smaller, and the election system is different. The Senate uses a majority electoral system, in contrast to the proportion electoral system used in the Chamber of Deputies. One or two senators are elected in each election, so the dispute over candidates is smaller. Senators may receive votes from the entire state, whereas deputies run with a range of 7 to 69 votes (as in the state of São Paulo). In these cases, one possible electoral strategy is to form electoral pipelines to guarantee votes according to a specific voter profile (Kinzo, Martins, & Borin, 2004).

The other explanatory variables were selected from the theoretical literature, including studies by Amorim and Simonassi (2013), Arretche and Rodden (2004), Gibson et al. (2004), and Soares and Neiva (2011).

Again, we would note that the studies cited focus on intergovernmental transfers from the Union to states/districts. This study, in contrast, focuses on transfers from the Union and states to municipalities.

In addition to overrepresentation, political and economic variables are shown in Box 1. We sought to test the strategic behavior of the president and the governor in sending transfers to municipalities. This was done by analyzing the effects according to objectives such as gaining popularity for the government administration and redistributing resources among the poorest regions, as well as the effects of increasing government support.

BOX 1   DESCRIPTION OF VARIABLES IN THE ECONOMETRIC MODELS

Variable	Description	Source
uobri	Compulsory transfers from the Union to municipalities (*per capita*)	FINBRA
uvol	Voluntary transfers from the Union to municipalities (*per capita*)	FINBRA

Continue

Variable	Description	Source
eobri	Compulsory transfers from states to municipalities (*per capita*)	FINBRA
evol	Voluntary transfers from states to municipalities (*per capita*)	FINBRA
pes	Personnel expenses (*per capita*)	FINBRA
inv	Investment expenses (*per capita*)	FINBRA
sobrecam	Dummy for municipalities of overrepresented states in the Chamber of Deputies (*1 for overrepresented, 0 otherwise*)	RRI
sobreal	Dummy for municipalities of overrepresented states in the Legislative Assembly (*1 for overrepresented, 0 otherwise*)	RRI
sobresen	Dummy for municipalities of overrepresented states in the Senate (*1 for overrepresented, 0 otherwise*)	RRI
elepres	Dummy for presidential election (*1 for years when presidential elections were held, 0 otherwise*)	TSE
elemun	Dummy for municipal election (*1 for years when municipal elections were held, 0 otherwise*)	TSE
income[12]	Gross domestic product divided by population	IBGE and Ipeadata

Source: Elaborated by the authors.

The models were adopted from the selected variables.

I. Determinants of fiscal transfers from the Union to municipalities:

$$\ln(uobri)_{it} = \beta_0 + \delta_0 sobrecam_{it} + \delta_0 sobresen_{it} + \delta_1 elepres_{it} + \delta_2 elemun_{it} + \beta_1 \ln(pes)_{it} + \beta_2 \ln(inv)_{it} + \beta_3 \ln(income)_{it} + \alpha_i + u_{it} \ (1)$$

$$\ln(uvol)_{it} = \beta_0 + \delta_0 sobrecam_{it} + \delta_0 sobresen_{it} + \delta1 elepres_{it} + \delta2 elemun_{it} + \beta_1 \ln(pes)_{it} + \beta_2 \ln(inv)_{it} + \beta3 \ln(income)_{it} + \alpha_i + u_{it} \ (2)$$

II. Determinants of fiscal transfers from states to municipalities:

$$\ln(eobri)_{it} = \beta_0 + \delta_0 sobreal_{it} + \delta_1 elepres_{it} + \delta_2 elemun_{it} + \beta_1 \ln(pes)_{it} + \beta_2 \ln(inv)_{it} + \beta_3 \ln(income)_{it} + \alpha_i + u_{it} \ (3)$$

$$\ln(evol)_{it} = \beta_0 + \delta_0 sobreal_{it} + \delta_1 elepres_{it} + \delta_2 elemun_{it} + \beta_1 \ln(pes)_{it} + \beta_2 \ln(inv)_{it} + \beta_3 \ln(income)_{it} + \alpha_i + u_{it} \ (4)$$

[12] To identify the effects of development from the municipalities, we considered using the Municipal Human Development Index (MHDI). However, benchmarking of the results including this variable could cause problems, since it is measured every 10 years. This would compromise the necessary variation required for a panel model with a 10-year temporal series.

The term $i = 1,...,x$ represents the cross-sectional cut (the Brazilian municipalities); the term $t = 2004,...,2014$ represents the period of time analyzed. The term of error is composed by the model presented, consisting of two elements: α_i, the element of the cross-sectional cut, and u_{it}, the combined element of the temporal series and the cross-sectional cut (Gujarati and Porter, 2011).

The notation *ln* indicates that the Napierian logarithm was applied to the dependent and continuous independent variables, obtaining log-line models.[13] This functional form seemed to be the most appropriate for the present study. The values of fiscal transfers, government expenditures, and gross domestic product tend to be asymmetric; logarithmic changes of this type of variable reduce both asymmetry and heteroscedasticity. According to Wooldridge (2005), variables that are strictly positive have heteroscedastic distributions; this problem may be mitigated, if not eliminated, by use of the Napierian logarithm. Furthermore, the use of *ln* "narrows the range of the values of variables, in some cases in considerable amounts. This makes estimates less sensitive to disparate observations on the dependent variable or independent variables" (Wooldridge, 2005, p. 181). Absolute values were corrected by the population and deflated; calculations were made in Brazilian reals per capita from 2014, and the General Price Index of the Getulio Vargas Foundation was used as a deflator.

The models were also estimated with the variables in their original form, and the MacKinnon-White-Davidson (MWD) test was conducted, as proposed by Gujarati (2011), to choose between linear and log-linear models. The null hypothesis of the MWD test takes the linear model as the most appropriate, and the alternative hypothesis the log-linear model. Since neither of the models were rejected, we chose the one that achieved better adjustment and parameters with expected signs, adjusted R^2, and improved statistical F. According to Wooldridge (2005), in the functional choice of the model, when none are rejected, R^2 can be used for selection.

The models were handled using three methods: Ordinary Least Squares (OLS) for stacked data (pooled data), in which cross-cuts are grouped over time (i.e., all data are stacked and the nature of the cross-sections and temporal series are not considered); fixed effects, in which the heterogeneity of each individual is considered, as each one has a dummy variable representing the intercept; and random effects, in which the differences between units are captured by the end of error. The fixed effects models were adopted for the analyses as they were the most adequate for this study.

5. RESULTS

This section analyzes the effects of political and economic variables, with a focus on overrepresentation in the Brazilian legislature and the granting of public resources, based on the premise that the municipalities of smaller states — those that are overrepresented — receive greater amounts of transfers from both the Union and the states.

The study considered both compulsory and discretionary transfers from the Union and states to municipalities. However, the focus of analysis was voluntary discretionary transfers originating from the Union. This is because transfers from the Union represent a significant proportion of the budgets of local governments.[14]

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[13] Interpretation of the log-linear coefficient models is in percentage variation.

[14] Giuberti (2005), for example, shows data from the dependence of the subnational governments compared to transfers from the Union. In 2002, 50% of the current revenue from the municipalities was originally derived from this fund.
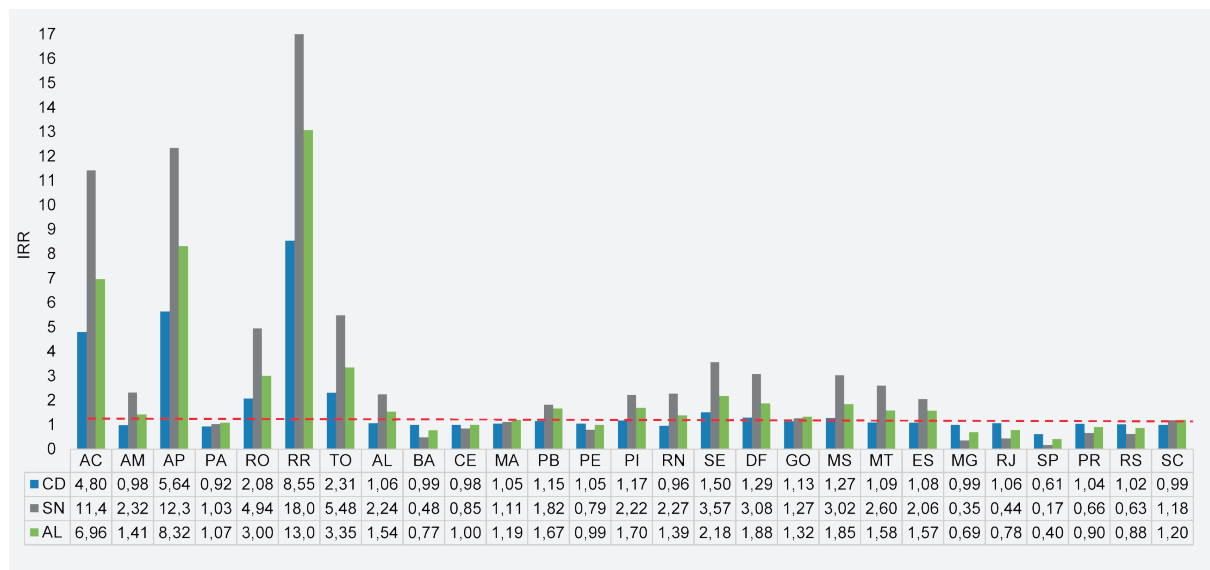
As shown below, the results confirm a tendency for the federal and state governments to direct discretionary transfer resources to municipalities according to political criteria. As political needs prevail over socioeconomic needs, this may be a factor in intensifying regional inequalities.

5.1 DISPROPORTIONALITY OF REPRESENTATION IN BRAZILIAN STATES

The Relative Representation Index (RRI) was calculated for the Chamber of Deputies, the Legislative Assembly, and the Senate for each year from 1988 to 2014. To analyze Graph 1, we adapted the classification of Ansolabehere et al. (2002), modifying the intervals to identify the proportional (RRI > 0.90 and < 1.2), overrepresented (RRI >= 1.2), and underrepresented states (RRI <= 0.90). This adaptation was useful to represent and describe the general characteristics of the Brazilian legislature with respect to disproportionality.

Graph 1 presents the average RRI for the 27 Brazilian states during the period from 1988 to 2014.

GRAPH 1   **AVERAGE RRI FOR THE CHAMBER OF DEPUTIES, LEGISLATIVE ASSEMBLY, AND SENATE FOR BRAZILIAN STATES DURING THE PERIOD FROM 1988 TO 2014**

	AC	AM	AP	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	DF	GO	MS	MT	ES	MG	RJ	SP	PR	RS	SC
CD	4,80	0,98	5,64	0,92	2,08	8,55	2,31	1,06	0,99	0,98	1,05	1,15	1,05	1,17	0,96	1,50	1,29	1,13	1,27	1,09	1,08	0,99	1,06	0,61	1,04	1,02	0,99
SN	11,4	2,32	12,3	1,03	4,94	18,0	5,48	2,24	0,48	0,85	1,11	1,82	0,79	2,22	2,27	3,57	3,08	1,27	3,02	2,60	2,06	0,35	0,44	0,17	0,66	0,63	1,18
AL	6,96	1,41	8,32	1,07	3,00	13,0	3,35	1,54	0,77	1,00	1,19	1,67	0,99	1,70	1,39	2,18	1,88	1,32	1,85	1,58	1,57	0,69	0,78	0,40	0,90	0,88	1,20

Source: Elaborated by the authors.
Note: CD = Chamber of Deputies; SN = Senate; AL = Legislative Assembly.

The five states with the highest representation indices in the Chamber of Deputies, the Legislative Assembly, and the Senate are located in the North Region: Acre, Amapá, Rondônia, Roraima, and Tocantins. In contrast, the state of São Paulo presents the smallest RRI values, and is the only one underrepresented in the Chamber of Deputies, the Legislative Assembly, and the Senate. The states of Pará, Maranhão, and Santa Catarina are considered proportional in the Chamber of Deputies, Legislative Assembly, and Senate.

It was further found that 67% of the states in the Chamber of Deputies have proportional state representation; most of these are from the Northeast, Southeast and South Regions. In the Senate and the Legislative Assembly, 11% and 19% of states have proportional representation, respectively.

In the Senate and the Legislative Assembly, 59% of states are overrepresented; most of these are in the North Region, followed by the Northeast and Center-West. In the Chamber of Deputies, 30% of states are overrepresented, and São Paulo is the only one underrepresented. No state from the South Region presents RRI > 1.2, and in the Southeast Region, only the state of Espírito Santo is overrepresented in the Senate and the Legislative Assembly. All others are underrepresented or proportional.

The dotted red line in Graph 1 represents RRI >= 1.2 to clearly show the states above this value (those that are overrepresented). The Senate was found to have the largest RRI values, as well as a much higher disproportionality of representation than the Chamber of Deputies. Therefore, it is possible that overrepresentation in the Brazilian Congress is driven by the Senate.
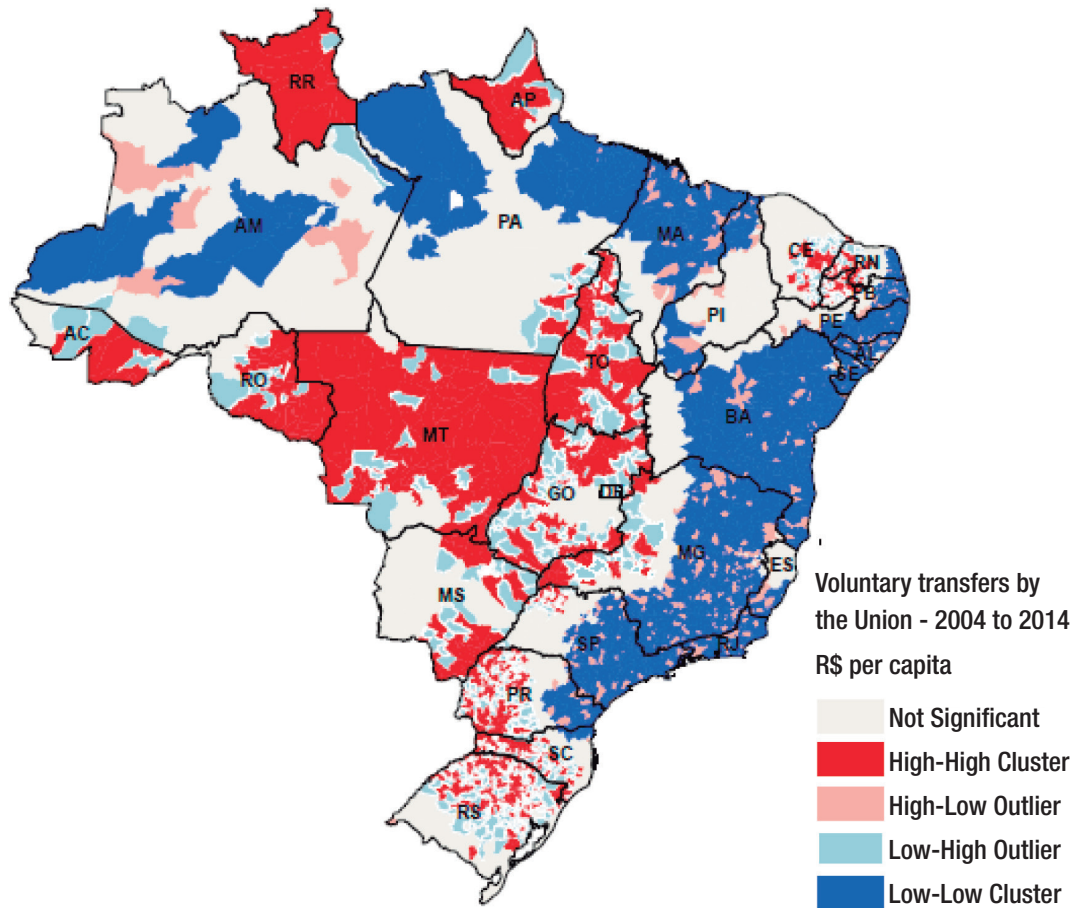
The mapping in Figure 1 was conducted using geoprocessing tools and spatial analysis, and it was designed to support statistical analysis. Voluntary transfers from the Union to municipalities were analyzed using the average from 2004 to 2014.[15] The objective was to identify if resource transfer is related to overrepresentation in the Brazilian legislature.

From the spatial self-correlation map, we observed the spatialization of different amounts of resources received by Brazilian municipalities. Moran's *I* enabled identification of clusters of nearby areas with high or low transfers received per capita. The municipalities in dark red and dark blue form statistically significant groupings, indicating the existence of value clusters. The light red and light blue colors indicate the presence of outliers. The clearest areas are those that did not present statistical significance in calculation of Moran's *I*.

Figure 1 shows that the municipalities of states with the largest RRI values (Acre, Amapá, Rondônia, Roraima, and Tocantins) generally receive the largest transfer amounts per capita. The clusters that present high, closely grouped values *(high-high clusters)* are concentrated in these municipalities. However, the municipalities that present clusters with lower values (*low-low clusters*) compose the majority of underrepresented states in the Chamber of Deputies, the Legislative Assembly, and the Senate, including Pará, Bahia, Maranhão, Pernambuco, Minas Gerais, Rio de Janeiro, and São Paulo.

[15] Maps and cluster spatial analyses were produced for each year of the period analyzed. However, because there were no significant changes in the data during this period, the data are presented using calculation of the average.

FIGURE 1   CLUSTER ANALYSIS OF VOLUNTARY TRANSFERS PER CAPITA FROM THE UNION TO MUNICIPALITIES (2004 TO 2014)

Voluntary transfers by
the Union - 2004 to 2014

R$ per capita

  Not Significant
  High-High Cluster
  High-Low Outlier
  Low-High Outlier
  Low-Low Cluster

Source: Elaborated by the authors based on FINBRA data.

The municipalities considered non-significant do not fit the groupings because their transfer revenue values and the values of the neighboring municipalities vary.

These results break from the existing literature on the subject, as they highlight the influence of overrepresentation in voluntary transfers. Other political factors, such as partisan relationships and coalitions between the federal and local government, may impact transfer of public resources, especially transfers that are discretionary. To better understand the dynamics of resource transfers, more studies focusing on these variables are needed.

The following section presents the estimations of the econometric models with the previously selected variables.

5.2 EFFECTS OF OVERREPRESENTATION ON FEDERAL AND STATE TRANSFERS TO BRAZILIAN MUNICIPALITIES

Some model specification tests were conducted to identify the most appropriate approach, to ensure that results were achieved satisfactorily.

First, the most appropriate model — stacked (pooled), fixed effects, or random effects — was identified; subsequently, the Wald test was used to detect the presence of heteroscedasticity.

Initially, the Chow test was used to determine whether the stacked or fixed effects model was most appropriate. In the stacked model, which uses the OLS form, all coefficients are constant over time and within individuals. In the fixed effects model, the angular coefficients are constant, but the intercept varies between units, remaining constant over time. The result of the Chow test is shown in the *F* statistics of the fixed effects model estimation, in which the null hypothesis takes the restricted (stacked) model as more appropriate, and the alternative hypothesis the unrestricted (fixed effects) model.

The statistical *F* of the fixed effects model rejected the null hypothesis that the stacked model is more appropriate. Thus, the alternative hypothesis, proposing that the fixed effects model is preferable to the stacked model in this study, was accepted.

We then tested whether the fixed effects model was also preferable to the random effects model using the Hausman test. Under the null hypothesis of this test, the fixed effects and random effects models are both consistent, but the latter is the more efficient of the two. Under the alternative hypothesis, the random effects model provides inconsistent estimation of the parameters; thus, the difference between the two estimators must be different from zero.

The presuppositions that are made based on the likely correlation between the *X* regressors and the individual error component define the choice between the fixed or random effects models. If there is correlation, the fixed effects model is the most advisable; if not, the random effects model is (Gujarati, 2011). Thus, the fixed effects model is indicated when the null hypothesis (no correlation between errors) is rejected; in the absence of correlation, the random effects model is recommended.[16]

The Hausman test provides the estimates of the two models, fixed and random effects, and calculates the difference between their coefficients. According to the chi-square probability, it was possible to reject the null hypothesis, meaning that the random effects estimator is significantly different from the fixed effects estimator; the alternative hypothesis, indicating that the random effects model is inconsistent, was accepted. Thus, the fixed effects statistics provided by the Hausman test are the most appropriate.

We also applied the Wald test, which showed heteroscedasticity in the models, as is common in longitudinal data. The fixed effects models were thus estimated on robust standard errors, a procedure that aims to adjust the standard deviation of the variables to correct the absence of homoscedasticity of the regression residuals. The estimation results are presented below, based on the process and equations previously described.

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[16] The results of the Hausman tests are found in Tables 2 and 3.

Table 1 describes the results of estimations to explain the granting of transfers from the Union to municipalities. Model 1 takes compulsory transfers as a dependent variable, and model 2 explains the voluntary transfers.[17]

TABLE 1   ESTIMATES OF TRANSFER MODELS FROM THE UNION TO THE MUNICIPALITIES

Independent variables	uobri		uvol	
	Model 1		Model 2	
sobrecam	-0.032	[-8.6]***	0.144	[3.61]***
sobresen	0.004	[0.58]	0.127	[3.00]***
elepres	-0.031	[-23.52]***	0.055	[5.58]***
elemun	-0.015	[-9.63]***	-0.099	[-8.32]***
pes	0.413	[57.01]***	0.441	[17.88]***
inv	0.037	[29.48]***	0.481	[59.45]***
income	0.142	[17.05]***	0.068	[2.23]**
constant	2.433	[52.44]***	-2.256	[-11.04]***
Adjusted R^2	0.95		0.36	
Prob > F	0.000		0.000	
Chi² Hausman	2010.2		448.7	
Prob > chi²	0.000		0.000	
Chi² Wald	5.3		2.1	
Prob > chi²	0.000		0.000	
No. of municipalities	5.492		5.492	
Notes	57.841		57.030	

Source: Elaborated by the authors based on estimations using the Stata software.
Notes: Brackets indicate *t*-values.
*** significant at 1% ** significant at 5%.
Continuous variables in LN.

Overall, the regressions were found to be significant. Statistical *F*, which considers the overall significance of the model, indicates that the independent variables together explain the variance in the dependent variable. The *t*-values indicate the individual significance of the coefficients; all variables presented statistical significance at the 1% and 5% level except for overrepresentation in the Senate

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[17] It is noteworthy that in terms of functional estimation, the results were calculated with the continuous variables in their original form, as well as the log. As in Amorim and Simonassi (2013) and Arretche and Rodden (2004), the models were more robust.

(*sobresen*). Adjusted R^2[18] is 95% for model 1 and 36% for model 2. According to Gujarati and Porter (2011), interpretation of R^2 must be modest—that is, more significant coefficients and expected signs are more valuable than a high R^2. For data involving several observations, low R^2 values are common due to diversity in the cross-cut units and the temporal series. Nevertheless, with a significant *F*, regressors can be considered to influence regression, particularly if the regressors are also individually significant. In model 2, the parameters of the first two explanatory variables employed to verify the effects of overrepresentation in the Chamber of Deputies *(sobrecam)* and the Senate *(sobresen)* in the granting of transfers were significant at 1% and presented positive signs; this indicates that the municipalities of overrepresented states in the two legislative bodies benefit more from voluntary transfers from the Union compared to the municipalities of underrepresented states. More specifically, it is estimated that the municipalities of overrepresented states in the Chamber and Senate receive approximately 14% and 13% more in voluntary transfers per capita from the Union, respectively, than the municipalities of underrepresented states. In model 1, which has compulsory transfers as a dependent variable, the *sobresen* variable is not statistically significant, whereas the *sobrecam* variable coefficient suggests that the municipalities of overrepresented states in the Chamber receive a lower per capita amount of compulsory transfers (-3.2%) than the municipalities of underrepresented states.

The effects of overrepresentation on the granting of transfers provided for by law are opposite those of voluntary transfers. In compulsory transfers (model 1), overrepresentation causes reduction in resource granting, counter to the effect observed in voluntary transfers (model 2). It is therefore necessary to highlight that "the effect of overrepresentation is not merely an artifact of the rules governing constitutional transfers. It seems to emerge from the bargaining power of the smaller states" (Arretche & Rodden, 2004, p. 565).

This result was expected, since it aligns with the literature. As mentioned in the theoretical foundations, there is consensus that political leaders preferentially grant tax resources, especially discretionary resources, to the districts that will provide them with more legislative support. In other words, leaders exchange localized spending with electoral and legislative strategies in mind (Arretche & Rodden, 2004). Analysis of the *elepres* and *elemun* variables shows that in presidential election years, municipalities receive 6% more voluntary transfers per capita than in the other years, highlighting the existence of electoral cycles in politics. Again, the effects of these variables on compulsory transfers is opposite. Compulsory transfers to municipalities fall in presidential and municipal election years, along with the effects on transfers of voluntary resources in municipal elections.

The expenditure variable coefficients indicate positive elasticities—that is, increases in spending on personnel and investments[19] motivates greater transfers of resources, both compulsory and voluntary.

Interestingly, increased investments by municipality public management involve significantly greater amounts of voluntary transfer revenues than compulsory transfer revenues. This indicates that voluntary resource transfers stimulate expenditures in this category.

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[18] Adjusted R^2 is preferable to R^2 because the latter does not decrease when new independent variables are added to a model. The adjusted R^2 formula considers degrees of freedom. Thus, adjusted R^2 will be smaller than R^2, but more appropriate (Wooldridge, 2005).

[19] The models were estimated without the personnel and investment expenses variables. Their removal did not significantly alter the parameters and relevance of the other regressors. We chose to include them in the models and analyses.

Because discretionary resources are intended for emergencies, and in most cases, they are intended for investments, it is expected that an increase in this expenditure implies more resources will be directed to these units. Analysis of the *pes* variable shows that personnel expenses may maximize population approval; in small municipalities, where income generation is low, payroll expenses serve constituent interests. These expenditures guarantee a minimum income to a part of the population, and the municipality is the main local employer. This enables politicians to maintain good electoral performance and political power.

In contrast, the *income* variable employed as a development proxy tests the theories that predict redistributive results towards the poorest regions. The variable presents positive coefficients in all models, suggesting that an increase in per capita income in the municipalities causes increase in the receipt of compulsory and voluntary transfers.

Table 2 presents estimations of transfers from states to municipalities.

TABLE 2   ESTIMATIONS OF TRANSFER MODELS FROM THE STATES TO THE MUNICIPALITIES

Independent variables	eobri		evol	
	Model 5		Model 6	
sobreal	0.086	[6.99]***	0.226	[1.43]
elepres	0.020	[9.86]***	0.380	[31.93]***
elemun	-0.014	[-6.31]***	0.197	[15.63]***
pes	0.515	[48.93]***	0.302	[10.78]***
inv	0.040	[21.47]***	0.411	[42.63]***
income	0.192	[18.24]***	0.032	[1.01]
constant	0.332	[6.22]***	-1.312	[-5.58]***
Adjusted R^2	0.95		0.46	
Prob > F	0.000		0.000	
Chi² Hausman	2749.0		1320.6	
Prob > chi²	0.000		0.000	
Chi² Wald	5.0		1.4	
Prob > chi²	0.000		0.000	
Notes	58.703		52.968	

Source: Elaborated by the authors based on estimations by the Stata software.
Notes: Brackets indicate *t*-values.
*** significant at 1% ** significant at 5%.
Continuous variables in LN.

As in the previous interpretations, the focus is on voluntary transfers (model 6). The *F* and *t* statistics indicate the significance of the models. R^2 values are satisfactory, indicating 95% and 46% of the explanatory power of models 5 and 6, respectively.

The first explanatory variable, *sobreal,* is a dummy variable for the municipalities of states overrepresented in the Legislative Assembly. It was not statistically significant to explain the receipt of voluntary transfers. The results of model 5 show a positive relationship between *sobreal* and the dependent variable. This suggests that the municipalities of states overrepresented in the Legislative Assembly receive an average of 9% more transfers of state resources provided for by law than the municipalities of underrepresented states.

The coefficients analyzing the existence of electoral cycles show an increase in the receipt of voluntary state resources in both presidential and municipal election years.

In the models with the dependent variable is in its logarithmic form, and when the coefficient of an independent dummy variable suggests a major proportional change in *y*, the exact proportional difference may be obtained by calculating semi-elasticity (Wooldridge, 2005). In general, if β1 is the coefficient of a dummy variable, say *x1*, when ln(*y*) is the dependent variable, the exact percentage difference in *y* predicted when *x1* = 1 versus when *x1* = 0 is calculated using the following formula:

$$100 \cdot [\exp(\beta 1') \; 1]$$

where *exp* is the antilogarithm of β1' (estimated parameter of the dummy variable).

Table 3 shows the results of the semi-elasticity calculation for the *elepres* and *elemun* variables[20] in model 6.

TABLE 3   **CALCULATION OF SEMI-ELASTICITY FOR THE ELEPRES AND ELEMUN VARIABLES OF MODEL 6**

β1'	Semi-elasticity 100 . [exp (β1') 1]
0.380	46.19
0.197	21.75

Source: Elaborated by the authors.

In presidential election years, there are 38% (most accurate estimate is 46%) more voluntary transfers per capita from the states to the municipalities. In municipal election years, this increase, according to the most precise estimate calculated in Table 3, is approximately 22%. This highlights

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[20] This calculation was completed for dummy variable coefficients with large values. In small-value coefficients, there is no significant change when the most precise estimate is calculated using semi-elasticity.

the existence of political electoral cycles related specifically to the amount of voluntary resources transferred from the states to the municipalities.

The two municipal expenditure headings have a positive relationship with the dependent variables. According to model 6, expenditures on personnel and investments influence the amount of resources transferred to the municipalities similarly — that is, a 1% increase in these expenditures is associated with an increase in transfers of 30% and 41%, respectively. There is an incentive to increase state transfers to municipalities that increase their investment and personnel expenses. It is likely that the transfer of more resources to the municipalities that spend on personnel is motivated by constituent interests.

Finally, the variable that tests the redistributive character of intergovernmental transfers was not statistically significant to explain the transfer of voluntary resources. It has a positive effect on constitutional resources, indicating that transfers are not made according to criteria for promoting equity among the various municipalities analyzed, as shown in previous models.

6. CONCLUSIONS

This study aimed to observe the effects of disproportionate representation in the Brazilian legislature on transfer of federal and state resources to municipalities. The main explicative valuable analyzed was overrepresentation. The general hypothesis guiding this research was that the municipalities of overrepresented states are favored in transfers of discretionary resources, because such transfers function as a means of exchange in the legislative bargaining model.

The study's findings suggest that disproportionate representation in the Chamber of Deputies, the Legislative Assembly, and the Senate is a factor influencing fiscal resource transfer. The municipalities of overrepresented states receive more transfers per capita than the municipalities of underrepresented states. This effect is quantitatively greater when it comes to voluntary transfers. These results are in line with the existing literature, in which smaller municipalities — those of overrepresented states — benefit most from discretionary transfers.

There is evidence that political determinants have prevailed over socioeconomic needs. The most developed municipalities receive more resources (even compulsory transfers), a fact that contradicts the idea of redistribution, identified as *reallocative federalism*. It is worth noting that not all overrepresented units — those that are less populated — have the lowest development indices.

To conclude, the effect of disproportionate representation in the National Congress on federal and state discretionary expenditures in Brazil is significant. Additionally, the political representation structure has guided the actions of the public administrators of the Union and the Brazilian states. One immediate consequence of this pattern of public resource distribution may be aggravation of interregional inequalities.

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