

# Strategic Voluntary intergovernmental transfer: analysis of the municipalities of Tocantins in the period from 2015 to 2020

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## Abstract

This study analyzes the influence of political alignment on strategic intergovernmental party transfers, which are voluntary transfers between federal and municipal entities, specifically in the state of Tocantins from 2015 to 2020. The data was obtained from IBGE, TSE, and the transparency portal. To achieve the proposed objectives, a balanced panel data regression model was used, with a fixed effects model. In this context, three out of the eight investigated variables were found to have significance for higher transfers to municipalities in Tocantins, namely: party affiliation; second term in office; and PIB *per capita*. In addition, indices regarding municipal development were evaluated, for this purpose data on basic sanitation in the treatment of water and treated sewage, fiscal management, formal employment and education were used, in order to verify the real performance of the municipalities with the largest and smaller intergovernmental transfers. It was verified, therefore, that among the regions with the lowest transfers, the influence of the “second term” variable generates a positive impact on the development and growth of the city, this occurred in the city of Sucupira. In the regions that receive the largest transfers, the variables that should imply greater transfers do not weigh considerably on those that generate development, that is, there are external influences that are analyzed in this search that can intervene in the results entered.

**Keywords:** Political Alignment. Voluntary Transfers. Panel Data. Municipal Development.

## Transferência intergovernamental voluntária estratégica: uma análise da esfera federal para os municípios do Tocantins no período de 2015 a 2020

### Resumo

Este artigo analisa a influência do alinhamento político para as transferências intergovernamentais partidárias estratégicas, de caráter voluntário, entre os entes federais e municipais, em específico no estado do Tocantins no período de 2015 a 2020. Os dados

foram retirados do IBGE, TSE e portal da transparência. Para atingir os objetivos propostos utilizou-se o modelo de regressão de dados em painel. Neste contexto, foram encontrados três variáveis das oito investigadas, com significância para explicar os repasses de maior quantidade aos municípios tocantinenses, são elas: partido do prefeito; segundo mandato do prefeito; e PIB *per capita*. Além disso, foram avaliados indicadores relacionados ao desenvolvimento municipal, para isso foi utilizado dados sobre o saneamento básico, gestão fiscal, geração de empregos e educação, no intuito de verificar o real desempenho dos municípios com os maiores e menores repasses intergovernamentais. Verificou-se, portanto, que dentre as regiões com os menores repasses, a influência da variável “segundo mandato” gera impacto positivo para o desenvolvimento e crescimento da cidade, tal ocorrido se deu na cidade de Sucupira. Já nas regiões que recebem as maiores transferências, as variáveis que deveriam implicar em maiores repasses não pesam consideravelmente sobre as que geram desenvolvimento, ou seja, há influências externas as que são analisadas nesta pesquisa que podem intervir nos resultados entrados.

**Palavras-chave:** Alinhamento Partidário; Transferências Voluntárias; Dados em Painel; Desenvolvimento Municipal.

### **Transferencia intergubernamental voluntaria estratégica: un análisis del ámbito federal para los municipios de Tocantins en el período de 2015 a 2020**

#### **Resumen**

Este estudio analiza la influencia del alineamiento político en las transferencias partidarias intergubernamentales estratégicas, de carácter voluntario, entre entidades federales y municipales, específicamente en el estado de Tocantins en el período de 2015 a 2020. Los datos fueron tomados del IBGE; Portal del TSE y la transparencia. Para lograr los objetivos propuestos se utilizó el modelo de regresión de datos de panel balanceado, en el modelo de efectos fijos. En este contexto, se encontraron tres variables, de las ocho investigadas, con significación para las mayores transferencias a los municipios de Tocantins, son: partido; segundo período; y el PIB per cápita. Además, se evaluaron índices relativos al desarrollo municipal, para ello se utilizaron datos de saneamiento básico en tratamiento de agua y alcantarillado tratado, gestión fiscal, empleo formal y educación, con el fin de verificar el desempeño real de los municipios con mayor y transferencias intergubernamentales más pequeñas. Se verificó, entonces, que entre las regiones con menores transferencias, la influencia de la variable “segundo plazo” genera un impacto positivo en el desarrollo y crecimiento de la ciudad, esto ocurrió en la ciudad de Sucupira. En las regiones que reciben mayores transferencias, las variables que deberían implicar mayores transferencias no pesan considerablemente sobre las que generan desarrollo, es decir, existen influencias externas que se analizan en esta buscar que pueden intervenir en los resultados ingresados.

**Palabras clave:** Alineamiento partidista. Transferencias Voluntarias. Panel de datos. Desarrollo Municipal.

## **1 Introduction**

Intergovernmental fiscal transfers are of fundamental importance in achieving an ideal balance of finances between federative entities, especially when dealing with a large territorial extension, as is the case in Brazil. In this way, the transfer of resources aims to reduce the horizontal and vertical imbalances that exist in the national territory. In addition, it aims to encourage best governance practices by local agents, so that indirectly society can enjoy a better quality of life (Duarte et al., 2009).

Such transfers can generate political conflicts between federative entities, as the municipalities that receive a relatively larger number of transfers can provide regional economic growth. In this way, being able to attract positive changes in relation to the management and infrastructure of the place, thus generating regional development (Louzano, Abrantes and Brunozi Júnior, 2023).

Although transfers are mandated by law so that the receiving region obtains a certain number of resources to improve services provided by the government, the use of such transfers can also be driven by partisan and electoral motivations. In other words, the allied base of democratic agents elected by society is capable of impacting the percentage of resources sent (Stuckert and Bugarin, 2022).

In the context of partisan motivations, research by authors such as Bugarin and Marciniuk (2017, 2018, 2019 and 2020); Ferreira and Bugarin (2004, 2007 and 2021); Soares and Melo (2016); Stuckert and Bugarin (2022); among others, affirms the fact that the federal manager makes transfers of greater value to those municipalities in which the mayor belongs to the same political party or with the same political allied base as the president. The aforementioned studies, for the most part, carried out statistical analyses in order to confirm or reject whether the distribution of resources is related to political bias.

In this context, the research problem consists of identifying whether the "strategic partisan transfer hypothesis (SPTH)" also applies in the state of Tocantins. Therefore, is there a direct, partisan relationship between the voluntary transfers made by the Union to the municipalities of the state of Tocantins?

The general objective is to investigate the strategic voluntary transfers from the federal sphere to the municipal sphere of the state of Tocantins in the period from 2015 to 2020, in relation to the partisan alignment of both federative entities. As specific objectives, it sought to identify the total number of voluntary transfers; to analyze the partisan influence; and to test the "strategic party transfers hypothesis" in Tocantins, focusing on the transfers from the Union to the municipalities.

The work is structured in five sections, including an introduction. The second presents a brief theoretical framework, the third comprises the methodology of the work. Next are the results and discussions. And finally, in the last section, the concluding remarks.

## **2 Theoretical Framework**

Although states and municipalities have autonomy in implementing federal government projects and programs in their responsible region, the tax collection system has remained centralized in the federal government, which then redistributes financial resources to local governments (Marciniuk, Bugarin and Ferreira, 2020).

The federalism system adopted in Brazil, regarding intergovernmental transfers, is of significant importance for the performance of federative entities; fiscal balance, enabling the reduction of regional inequality; a better quality in the intervention of the public sector in the economy, thus the transfer of resources from the Union to the other federative entities contains economic assistance of equity and efficiency (Linhares and Almeida, 2022).

The federated entities and their respective legislative powers, after being elected and even in their electoral proposals, need communication with the community they represent. In this way, public agents can formulate and/or maintain public policies. Therefore, for such projects and activities to be effective, an intergovernmental relationship between the federated entities is fundamental (De Oliveira, et al., 2021).

The preparation of proposals to carry out intergovernmental transfers is the responsibility of both the federal executive and the legislative branches, but with the federal government as the main agent. In this context, transfers between the different levels of government in the federative system are categorized into two types: mandatory and voluntary. Both are transfers made by the federal government to states and municipalities (Linhares and Almeida, 2022).

The term intergovernmental transfers refer to the amounts/transfers of resources, current or capital, originating from the collection of federal, state, and municipal taxes, to the respective federative entities in accordance with the Brazilian Constitution. In other words, these transfers occur, as the name itself suggests, between different spheres of government (Union, states, and municipalities) (Araujo, Dos Santos Filho, and Gomes, 2015).

The transfers are not carried out randomly, without organization of the needs of each region. Thus, the distribution of resources is carried out according to the financial, social, cultural structure, and other criteria, since achieving the objective and basic right of the citizen requires regional planning and a study of the territories, in order to achieve financial balance throughout the country (Araújo, Dos Santos Filho and Gomes, 2015).

An important factor related to transfers is the impact on regional development, as this seeks to understand the social and economic factors within a region; such motivations help reduce or accelerate inequalities (De Oliveira, et al., 2018).

Regarding the economic factor, regional development encompasses the growth of regions in their productive activities; therefore, the greater the number of intergovernmental transfers to the municipality, the more likely it is to secure greater investments for the region and also lead to a positive transformation process in other sectors such as the social, cultural, and political sectors (De Oliveira, et al., 2018).

Regarding intergovernmental transfers in their normative origin, the delegation of financial resources can be classified in two distinct ways: mandatory (also called legal) or voluntary (also called discretionary) (Gomes, 2009). Both characteristics presented above are described in the Brazilian constitution, in the form of distinct documents and/or laws.

The main difference between the two categories, in terms of budget balance, lies in the legal provision and the moment of incorporating the data into planning. Voluntary transfers from the Union serve to supplement the budget already submitted through the Annual Budget Law in the management of a region; therefore, they are decided throughout the fiscal year, without needing to mention such expenditure in the Annual Budget Law, that is, resource allocations are not pre-defined (Dantas and Gadelha, 2022).

The main category for voluntary transfers is through agreements, but in addition to this, the following are also discretionary: funding agreements;

collaboration agreements; cooperation agreements; decentralized execution agreements; and transfer control agreements. Therefore, all are especially linked to specific projects, plans, and sectors, possessing a high degree of conditionality. This is because the transfers are linked to specific situations and also to unforeseen events that occur in the region in an economic and social way (Dantas and Gadelha, 2022).

Intergovernmental transfers of a voluntary nature are defined by the LRF (Fiscal Responsibility Law). This transfer is carried out to meet the demands of society, such as social actions (Federal Court of Accounts, 2008). This law establishes public finance standards aimed at responsibility in fiscal management.

The values of voluntary transfers are subsidies in which the Federal Government achieves a common interest, with mutual cooperation that can occur between the federal public administration (members of the Union's Fiscal and Social Security Budgets and Civil Society Organizations), state, municipal and also with private non-profit entities (Louzada, 2012).

The purpose of these transfers is to deliver financial resources mainly for cooperation, as mentioned above, but also for financial assistance, and which are not part of mandatory transfers and those destined for the SUS (Unified Health System) (Federal Government, 2022).

The relevance of the Strategic Party Transfers Hypothesis (SPTH) transcends the Brazilian context, finding robust growth in international studies that investigate the discretionary allocation of public resources.

In line with the analytical perspective that associates political-party alignment with the allocation of intergovernmental resources, the study by Andrade and Caldas (2025) offers a robust theoretical and empirical framework. By employing mixed-effects panel regressions to analyze federal voluntary transfers in Brazil (2010-2021), the authors revealed that political-party alignment between the President and the mayor exerts a significant influence on the distribution of resources, favoring municipalities with higher Gross Domestic Product.

In contrast, in the same study, socioeconomic indicators such as the Municipal Human Development Index (HDI-M) and the Sustainable Cities Development Index (SCDI) did not demonstrate a relevant impact on the allocation of these transfers. These results reinforce the thesis that discretion in the distribution of resources is permeated by political interests, and not primarily by criteria of socioeconomic need, which broadens the debate on the dynamics of Brazilian fiscal federalism (Andrade and Caldas, 2025).

In a study conducted in Colombia to analyze the impact of political alignment on the distribution of royalties, the authors found evidence that political alignment between subnational (municipal) and central (national) governments influences the allocation of resources (in this case, royalties from natural resources, which function as a discretionary transfer). In other words, the central government uses the allocation of these resources strategically to reward political allies and gain support in municipalities where support is more volatile. To obtain these results, the study used the panel data method at the municipal level with fixed-effects models to isolate the effect of political alignment, which lends credibility and comparability to the results (Collazos-Ortiz, Wong, and Londoño Bedoya, 2025).

In Germany, a study was conducted regarding state-level to municipal government transfers. As a result, the authors of the research confirmed the

Strategic Party Transfer Hypothesis (SPT), in which aligned municipalities receive more discretionary resources. The study used panel data combining electoral and fiscal information to test the hypothesis that state governments favor aligned municipalities (Baskaran and Hessami, 2017).

A subsequent study conducted in Germany, using the Regression Discontinuity Design (RDD) method in close municipal elections to mitigate the endogeneity inherent in the alignment variable, found a considerable positive effect of political alignment. This study relates the local mayor and the state government to the number of transfers received by the municipality. After quantifying this effect, it was found that alignment increases transfers by 20% per year. This effect is more prominent in the years leading up to local elections (Quinckhardt, 2023).

### 3 Methodological

To meet the demands of the central objectives of this work and to obtain the necessary data regarding voluntary intergovernmental transfers; personal and political information of each mayor; and monetary data regarding GDP per capita and taxes, the information was retrieved from the National Treasury's Transparent Portal; the Superior Electoral Court; and the IBGE, respectively.

On the National Treasury's Transparent Portal, it is possible to find mandatory/legal and voluntary transfers, which are freely disclosed and in clear language for the entire society. This is because it aims to help citizens better understand the economy of their region.

The focus of this research is to analyze the overall transfer of all six types of voluntary transfers (Agreement; Funding Agreement; Collaboration Agreement; Cooperation Agreement; Decentralized Execution Agreement; and Transfer Contract), but without detailing each type of voluntary transfer made.

Empirical analysis and statistical models were used to explain the development of the economy in the region explored, the state of Tocantins. Thus, the econometric model was employed, specifically the statistical technique of balanced panel data regression. Consequently, the analysis is performed with several units and in different time periods. Therefore, it is an analysis in spatial (municipalities) and temporal (years) dimensions (Gujarati and Porter, 2011).

The panel data model, carried out in this research, allows OLS regression analyses for stacked data; fixed effects; and random effects. These are worked with the stacked data regression models, fixed effects model and random effects model, respectively. After these analyses, comparison tests were carried out between the aforementioned models, which are hypothesis tests, represented by the restricted F test; Hausman test; and the Breusch-Pagan LM test.

To filter only the data necessary for the research on voluntary transfers on the transparency portal, filters were applied, namely: time period: to be chosen; type of transfer: Legal, Voluntary and Specific; Type of beneficiaries: Municipal Public Administration; State: Tocantins.

Regarding this research, the different units worked with comprise the following variables: voluntary transfers; sex; age; years of study; party; coalition; second term; GDP per capita; and taxes. The time period analyzed is a span of 6 years,

from 2015 to 2020. Below, the data is detailed in its minimum, maximum, and arithmetic mean characteristics. In this way, highlighting the discrepancy and inequality between the data collected in the state of Tocantins for the analysis of this research.

Table 1: Descriptive statistics of the variables used

Variable	Minimum	Maximum	Median
Gender	0	1	0,1655
Age	24	80	49,73
Years of study	2	16	13,47
Political Party	0	1	0,09
Coalition	0	1	0,36
Second Term	0	1	0,22
PIB per capita	6,78	82,37	18,09
Taxes	357	1476908	24529
Voluntary Transfers	6.496	40.832.535	1.249.273

Source: Authors (2025).

The variables gender; party; coalition; and second term were analyzed using dummy variables. The purpose of this application to the data was due to the need to qualify the variables analyzed in the work in a binary way (0 and 1), which is better suited to the statistical model used and the R language.

Regarding the political characteristics of the mayor, that is, the information on party and coalition, they were represented with zero (absence of the characteristic) when the mayor is not part of the same political segment as the president, and 1 (non-absence of this characteristic) when they are part of it. In the second term variable, 0 (zero) represents when the mayor was not re-elected, and 1 (one) corresponds to the sequential term.

As for the personal characteristics of each mayor, a dummy variable was used only for the sex characteristic, with zero representing male and 1 female.

Another control variable explored in this research was the education level of each mayor, determined by years of study, based on the principle of basic education provided for in the Federal Constitution. Furthermore, the characteristics of schooling were defined in the Laws: LDB (Law of guidelines and bases of national education) and in Law No. 12,796, of April 4, 2013.

And finally, the monetary variables, which are Voluntary Transfers; GDP per capita; and taxes, were analyzed in the Rstudio language in natural logarithmic form. That is, the estimated coefficients were interpreted directly as an elasticity. Therefore, the slope coefficient measures the elasticity of the dependent variables in relation to voluntary transfers.

#### 4 Results and discussions

The data were evaluated with the purpose of verifying the following hypotheses: whether the Union makes a relatively larger transfer of voluntary

resources to mayors of the same political affiliation, and whether there are other variables that influence these transactions.

The estimated coefficient, which represents the interaction between the variables, was therefore analyzed. If a negative result is obtained, it means that there is an inverse relationship, that is, as the independent variable increases, the dependent variable decreases.

In the p-value, if results with values below 0.05 are reached, the respective variable becomes significant for the model. On the other hand, if it exceeds 0.05, the variable is not significant, and is therefore discarded as an explanation for the verification of the hypothesis. Next to  $Pr(> | t |)$  there are some characters, which are represented as follows: “ \*\*\* “ = 0.0001; “ \*\* “ = 0.001; “ \* “ = 0.05; “ . ” = 0.1; and when there is no character it means 1.

In the general information of the table, located in the last row, regarding the coefficient of determination,  $R^2$ , this aims to explain the variability of the variables; in statistics, the higher the number obtained, the better the model fits the data provided. In conclusion, the F-statistic calculations serve to test the overall significance of the regression model.

Among the analyzed models stacked data, fixed effects, and random effects, tests were performed to find the model best suited to the objectives and hypothesis initially presented. Therefore, three comparison tests were executed between them: the F-test; the Hausman test; and the Breusch-Pagan LM test.

The F-test and Breusch-Pagan LM are performed to discard the stacked data model, which is called the null hypothesis in the test. Thus, with the presence of an alternative hypothesis with significant effects, the null hypothesis must consequently be rejected; that is, the stacked data model is not the ideal model for data analysis in this research. Furthermore, the alternative hypotheses in the aforementioned tests are the fixed effects and random effects models, respectively.

Rejecting the stacked data model, it remains to test the fixed and random effects against each other. For this, the Hausman Test was performed, in which the null hypothesis is the random effect and the alternative is the fixed effect.

The result found in the Hausman test shows that the alternative hypothesis encountered an inconsistent model, therefore, the null hypothesis is rejected, and the fixed effect is preferable for use in this research. The aim is to analyze whether federal transfers are more significant for municipalities of the same political party and what variables influence the realization of this transfer.

Next, the results obtained from the regression for stacked data are presented, the model that is suitable for this research.

Table 2: Model results for panel data with stacked data

Variable	Coefficients	Standard Error	P-value
Gender	-0.1182	0.0839	0.1591
Age	0.3344	0.1538	0.0300 *
Years of study	0.0311	0.0098	0.0016 **
Political Party	-0.3107	0.1167	0.0079 **
Coalition	0.0239	0.0699	0.7317
Second Term	0.1309	0.0730	0.0733 .

PIB <i>per capita</i>	-0.3494	0.0759	4,89e-03 ***
Taxes	0.4426	0.0248	< 2.2e-16 ***
$R^2 = 0.3275$	F-statistic = 50.1117	P-value = < 2.22e-16	

Source: Authors (2025).

In the information obtained according to the regression calculation of the stacked data model, it should be noted that the estimated coefficient reached a negative result in the variables of sex, party, and GDP per capita.

In this way, it does not refer to the binary variable of sex; the greater the number of transfers to the municipality, the more likely the mayor is male. Regarding the political party, I mean that the municipal manager is not from the same political segment as the president of the republic. And finally, in the monetary variable, GDP per capita, the greater the transfer of resources, the lower the GDP.

Even with the results of the estimated coefficient being negative, the party and GDP per capita variables are significant for the research model, according to the values obtained in the p-value. That is, a variable influence on the greater amount of voluntary financial resources that the Union sends to the municipalities.

In addition to these two variables mentioned, others such as age; years of study; second term; and taxes were significant for the model. This means that the referenced variables have a specific impact on intergovernmental transfers.

In general, the coefficient of determination,  $R^2$ , presented in the stacked data model, achieved a result with a moderate value to explain the variability of the variables. The F statistic, along with the p-value result, highlights the significance of the variations in relation to the transfers made from the federal sphere to the municipality.

To verify if the data are aligned and homogeneous in the variation of errors, the homoscedasticity test was performed. This test checks the dispersion of the data around the regression line. This analysis is of fundamental importance, as it guarantees the reliability of the data and estimated results. If the opposite occurs, it means that there is heteroscedasticity in the model, which is explained by the variation of the standard error of the dependent variables with the independent one.

According to the homoscedasticity test, in which the Breusch-Pagan test was applied in this research, the model presented consists of the presence of heteroscedasticity, since the p-value obtained was less than 0.05 (the result found was p-value = 0.00012).

In order to correct this error and thus acquire the necessary reliability for the research, an error adjustment was performed with the regression coefficient test in the fixed-effect model. Thus, new results were obtained with the application of this test, as can be seen in the following table.

Table 3: Results correcting for the standard error of the fixed-effects model.

Variable	Coefficients	Standard Error	Pr(> t )
Gender	-0.0892	0.1281	0.4861
Age	0.1826	0.3099	0.5558
Years of study	-0.0088	0.0161	0.5868
Political Party	-0.4264	0.1266	0.0008 ***

Coalition	-0.0568	0.0756	0.4526
Second Term	-0.1625	0.0910	0.0747 .
PIB <i>per capita</i>	1.1712	0.1735	3.179e-11 ***
Taxes	-0.2241	0.1811	0.2165

Source: Authors (2025).

With this adjustment, it is noted that the variables obtained an increase in values compared to Table 2, in which the initial results of the model with fixed effects were presented. The estimated negative coefficients remain the same in both tables. However, regarding the p-value, the logarithm of taxes was no longer considered a significant variable for the proposed objectives of this research, as it exceeded the standard error margin, which allows obtaining results with the appropriate level of confidence of a study.

The standard error margin assigned to this research was an error of up to 10%, that is, the p-value must be less than 0.1. Thus, the significant variables are the party; second term; and GDP per capita. The other variables did not achieve results considered significant for the model. The tests carried out aimed to identify the variables that generated the greatest impacts on the execution of intergovernmental transfers between the Union and municipalities, for this purpose the data collected were in relation to Tocantins in general.

But in order to identify the real impact on development within a municipality, this research presents the municipalities that received the largest and smallest transfers from the Union, and from this identification of the regions it was possible to analyze social and development indicators.

Therefore, the indicators composed of the following were analyzed: FIRJAN Fiscal Management (which evaluates autonomy; personnel expenses; investments; and liquidity); IDEB (this is composed of a relationship between the student approval rate and the results obtained in Saeb); SNIS (with indicators of sewage and treated water); and finally, the data regarding social work information displayed by RAIS.

To identify the regions that underwent the most in-depth investigation, a review of 10 municipalities assessed those that appeared most frequently in the six years of research regarding intergovernmental transfers. Thus, the municipalities with the largest transfers, in descending order, were identified as: Palmas; Araguaína; Porto Nacional; Gurupi; and Paraíso of Tocantins. These cities are the five largest in Tocantins. Furthermore, the municipalities that received the smallest transfers are: Araguaianã; Aurora; Chapada de Areia; Crixás; Rio da Conceição; and Tupiratins.

#### 4.1 Municipal Development

To aid municipal development, it is necessary to analyze several parameters, including social ones. For this purpose, this study used some indicators from the SNIS (National Sanitation Information System), including: sewage collection (basic sanitation); sewage treatment (basic sanitation); urban water supply (basic sanitation); and treated sewage in relation to water consumed.

Regarding the four municipalities that received the smallest number of intergovernmental transfers, data was found only on the urban water supply indicator during the six years of research.

In the first two years of the research, both cities did not uniformly and fully provide adequate treated water supply in the area defined as urban. However, in 2017, which represents the first year of the municipal mandate, all municipalities achieved 100% water supply coverage in the urban area, and these data extend to 2018. In 2019, only Abreulândia continued to provide water to 100% of the population residing in the urban area. It is important to highlight that only the municipality of Sucupira, from 2017 to 2020, according to the variables significant for receiving greater transfers from the Union, had at least one characteristic compatible with the previously conducted study, in which the city's mayor is in his second term.

However, even with this similarity, regarding the mayor's political characteristics, in 2019 the municipality did not achieve the provision of treated water to the entire population residing in the urban area.

Regarding the same indicator, for those municipalities that received the largest intergovernmental transfers, represented by Araguaína; Gurupi; Palmas; Paraíso of Tocantins; and Porto Nacional, both achieved 100% urban coverage of treated water in five of the six years of research. In 2016, all five cities did not reach 100% of the population, with 97.5%; 94.9%; 97.0%; 97.1%; and 99.7%, respectively.

Another indicator worked with data taken from SNIS was sewage collection, an item considered as basic sanitation. The results collected are relatively low in many of the cities with the largest transfers.

The municipality that obtained the most satisfactory results regarding sewage collection was Porto Nacional, the fourth largest city in the state (according to the 2022 IBGE census), with an average of 68.5%. It is noted that in 2018, a federal election year, the municipality achieved the best recorded result compared to all other regions explored, but in the years following this, the percentage of sewage collection drops considerably, reaching 45.3% in 2019, the year in which the municipality obtained its lowest result.

Next, regarding the highest sewage collection results, the capital Palmas was shown, which presented a reasonable average of 56.0%. All other municipalities achieved averages below 22%, with Paraíso of Tocantins being the region where the population has access to considerably precarious sanitary sewage collection, with an average of only 9.7%.

Taking into account the growth and development of this indicator over the years, only the city of Araguaína showed constant evolution, all other municipalities showed fluctuations. It is noted that in 2018, it obtained the best records among the municipalities, with the exception of Gurupi, in which the most satisfactory result was 45.3% in 2020.

Regarding the indicator on the treatment of this collected sewage, whose purpose is to reduce contamination and transmission of diseases through this resource, all municipalities in all years of analysis achieved 100% of this procedure. With the exception of Porto Nacional, which in 2016, the municipality achieved only 79.49% sewage treatment coverage for the urban population. This treatment also refers to the water consumed by the population residing in the municipality.

In the indicators related to the FIRJAN, which include: autonomy (capacity to finance the administrative structure); personnel expenses (degree of rigidity of the budget); liquidity (fulfillment of financial obligations); Investments (capacity to generate well-being and competitiveness) were all analyzed in a general way.

The database used to construct these indicators is structured according to official fiscal results declared by the municipalities themselves. The data is generated in the form of a score ranging from 1 to 0. Fiscal management is classified as excellent when the results are above 0.8 points; good management between 0.6 and 0.8; in difficulty with results between 0.4 and 0.6; and finally, management is considered to be in a critical situation when the results are below 0.4 points.

In the municipalities that received the lowest intergovernmental transfers, none achieved excellent management. The city that came closest to this classification was Sucupira in 2020, with an indicator of 0.75, and also in 2019 with 0.70. This city obtained the best results, standing out in 2015 and 2016. 2019 and 2020. Regarding the significant variables for intergovernmental transfers, Sucupira had the political characteristic of the mayor being in his second municipal term.

This municipality recorded the largest jump in score from one year to the next compared to other regions that received the lowest intergovernmental transfers and even those with the highest transfers, with a jump of 0.25 points from 2018 (0.45 points) to 2019 (0.70 points).

All municipalities at some point presented critical management; in the city of Abreulândia, this classification was present in 2017; Ipueiras in 2015 and 2019, according to the data recorded, as information was not available for the years 2017.

Among the municipalities that received the largest intergovernmental transfers, there is a vast difference in score compared to those with the lowest.

The municipality that stood out the most in fiscal management, in relation to the arithmetic mean when compared to the others, was Araguaína. The city achieved excellent management only in 2020, but in previous years the score was at high levels in the good classification. Next is the municipality of Gurupi, the state's third-largest city, which also achieved excellent management in 2020, and in previous years a good management rating.

The state capital did not achieve excellent management in any of the years explored; most were good management, and in the first two years of this research, it was classified as having difficulties. 2020 was the year in which the municipality obtained its best result.

Regarding the variables significant for greater intergovernmental transfer, all are represented by the same mayor in the six years of the study. That is, from 2017 onwards, the year in which the new electoral term begins, there is a considerable evolution in the score of this indicator. However, there is an exception: the municipality of Porto Nacional, where the score fell from 2017 onwards, a period in which, regarding the political characteristics of the mayor, the head of the executive branch was not re-elected.

On the other hand, even though the municipality of Porto Nacional showed this decline in the last four years of the study, it was not the one that achieved the lowest arithmetic average of the data, but rather the city of Paraíso of Tocantins.

Another indicator analyzed was the RAIS, Annual Social Information Report, which aims to computerize labor data, such as formal jobs, number of dismissals, and

others. The data collected refers to "formal employment" in the branches of productive activity and subsectors of economic activity, which are delimited into eight categories by the IBGE, namely: mineral extraction; manufacturing industry; industrial public utility services; civil construction; commerce; services; public administration; and agriculture, plant extraction and hunting.

Data provided by RAIS on formal employment in cities that received the lowest intergovernmental transfers showed that until 2018 the quantity varied significantly from one city to another, while in 2019 and 2020 the data remained similar, indicating a balance between municipalities.

The biggest drop and also growth occurred in the city of Ipueiras, where from 2015 to 2016 there was a reduction of 135 jobs, but from 2016 to 2017 there was an increase of 147 in the number of jobs, totaling 213 in that year. In the following year, 2018, the municipality recorded its highest number of formal jobs in the six years of study, reaching 257. However, even with this significant increase, in terms of the final average, the municipality presented the lowest record of formal jobs in activities.

The municipality of Sucupira showed the best arithmetic average among the cities and also the best results for formal jobs over the years, but it is observed that the number of jobs has been falling year after year, thus showing a decline in formal jobs in the productive activities of the region. Furthermore, while its fiscal management improved from 2017 to 2020, the formal employment ratio declined from 2017 onwards, the same occurring in Abreulândia.

Abreulândia had good numbers in 2015, being the second region with the most formal jobs, but in the last year of this research, the municipality had the lowest number of jobs.

While the cities that received the smallest intergovernmental transfers manage to maintain similar average levels of formal employment, the municipalities that received the largest transfers, for the most part, do not reach similar numbers, especially Palmas, Araguaína, and Gurupi, the three largest cities in the state respectively.

There is a vast difference in the number of formal jobs between the two largest cities in Tocantins, in terms of population, Palmas and Araguaína. According to the latest IBGE census, 2022, the population difference between the two cities is 131,391 inhabitants, thus justifying the large imbalance between them, since with regard to formal jobs, it is noted that Palmas has approximately 100,000 more formal workers every year. Thus, the state capital was the municipality that presented the highest number of formal jobs, with the year with the highest number in 2017 (132,783) and the lowest in 2019 (121,027).

In Araguaína, its highest number of formal jobs occurred in 2018 (33,264), the same year in which the sewage collection index obtained the most satisfactory percentage among the years surveyed in the municipality. On the other hand, it was the year in which fiscal management presented the worst result, although it was still considered good management.

Porto Nacional was the city with the lowest number of formal jobs, achieving its best result in 2017. In the previous year, 2016, the municipality obtained the lowest number compared to all years of research and also compared to other municipalities, resulting in only 7,581. In contrast, in the same year, it achieved its best result in fiscal management.

Finally, the last indicator studied was the IDEB (Basic Education Development Index), which measures the student approval rate based on student results in the SAEB (National Basic Education Assessment System). The tests applied to measure the level of student learning are carried out every two years and are applied in municipal and state schools, both part of the public education system.

The main indicator of basic education in Brazil uses a scale ranging from 0 to 10, with scores closer to 10 indicating a better educational level for the school/region. For this research, data related to regular elementary education in the final years (IDEB from 2015, 2017, and 2019) and information from secondary education (IDEB from 2017 and 2019) were analyzed.

The municipality of Sucupira was the only one that did not present data in 2019, thus making it impossible to compare it with the previous year and verify the development education. However, if we consider that all other municipalities obtained an increase in their indices, if Sucupira maintained the same score, the city would have the worst score in the year among the municipalities analyzed.

The city that obtained the greatest increase in score according to the IDEB score was Ipueiras from 2017 to 2019, with an increase of 0.6 points. But the city that achieved the highest score in 2017 was Gurupi, along with Paraíso of Tocantins, both with 3.9 points. In 2019, Abreulândia and Gurupi obtained the best scores, both at 4.3.

Gurupi, one of the cities that receives the largest intergovernmental transfers, was the municipality in which education, related to high school, achieved the best results in the two years analyzed, thus being the region that has an education closest to being adequate for young people, but still far from obtaining an excellent result.

Among the municipalities with the lowest scores in 2017 are Ipueiras and Lagoa of Tocantins, together with 3.3 points. For the year 2019, only Lagoa of Tocantins is found, thus becoming the municipality that obtains the least educational development, both in terms of the result obtained in 2019 and the growth in the form of points from one year to the next, among the nine municipalities analyzed.

The capital, Palmas, in both 2017 and 2019, is in fifth place among the nine municipalities analyzed. The municipality loses position to Abreulândia, Araguaína, Gurupi and Paraíso of Tocantins, in both years. Abreulândia manages to achieve relatively high scores in the IDEB (Basic Education Development Index), even though it is one of the cities that receives the lowest number of intergovernmental transfers. In other words, it can be said that the municipality invests considerably well in the basic rights of citizens. In contrast, Porto Nacional, one of the cities that receives the largest amounts of transfers from the Union, has low IDEB scores, and it is noted that it is at the same scoring level as the municipalities with the lowest transfers.

Therefore, regarding educational development for those cities that received the lowest intergovernmental transfers, the municipality of Sucupira has the least satisfactory results for good regional development, as it presented the lowest averages in water treatment; fiscal management; RAIS (Annual Social Information Report); and also, in the IDEB score for high school.

With regard to regular elementary education in the final years, the scores increase considerably when compared to the same years in the previous high school analysis, 2017 and 2019.

All municipalities show either the same score or an improvement when compared to the difference in score from one year to the next, in relation to the data

provided. The cities of Abreulândia and Ipueiras maintained the same score from 2017 to 2019. However, Palmas is an exception, as the municipality experienced a drop of 0.1 in its IDEB score from 2017 to 2019.

Abreulândia was the municipality with the greatest improvement in score, compared to all the other eight cities in relation to the years, achieving a growth of 1.3 points from 2015 to 2017. Next is the capital of the state of Tocantins, also from 2015 to 2017, with a growth of 1.1 points.

The municipalities that showed the least improvement in their IDEB score were Lagoa of Tocantins; Araguaína; Gurupi; and Porto Nacional, both from 2017 to 2019. In other words, the growth during the same period mentioned was the one that had the least impact on the development of basic education.

In 2015, Porto Nacional was the municipality with the highest IDEB score, followed by Gurupi, both with a difference of 0.3 points. However, in the following years, the two cities had the same values, with 5.3 points in 2017 and 5.4 in 2019.

The municipality of Ipueiras had the lowest IDEB scores in all years analyzed, referring to regular elementary education in the final years. It is worth remembering that this city had difficulties finding data related to fiscal management, thus making it complicated to verify if there is any indication of management influence on education.

Regarding this municipality, in relation to the variables significant for a greater transfer of resources from the federal government, it did not present any of the common characteristics in the political aspect. Concerning municipal social development, the treated water index did not reach 100% of the population in the years 2017, 2018 and 2020, the same years in which data regarding the municipality's fiscal management were not available, but in the other periods it was considered to have critical or struggling management.

Regarding formal employment, from 2016 to 2017, the municipality of Ipueiras showed the greatest growth in jobs compared to all other cities and time periods, thus ending the year 2020 with a higher number of personnel in the productive sectors than in 2015. Finally, in educational development, according to the IDEB score, the region obtained the lowest result in 2017 in relation to high school, while in the final years of elementary school the municipality had the lowest scores in all years of data released and analyzed, 2015, 2017 and 2019.

Abreulândia, regarding the significant variables for a greater transfer, did not possess any of the characteristics similar to the president of the republic. In terms of fiscal management, the municipality was in a critical state in 2017, and regarding formal employment, it ended 2020 with a lower number than the data found in 2015. But even so, it was a municipality that stood out among the four, in terms of access to drinking water and educational development for both high school and the final years of elementary school.

Lagoa of Tocantins did not present any of the political characteristics similar to the president, in terms of the significant variables for receiving larger intergovernmental transfers. It obtained access to treated water in only three of the six years of research, 2017, 2018 and 2020. In the first two years mentioned, the region achieved better results in terms of fiscal management compared to the other municipalities that received the smallest transfers.

Regarding Lagoa of Tocantins, the years 2019 and 2020 were the best results for formal employment in the productive sectors. In relation to the educational development of secondary education, this was the municipality with the lowest scores in both 2017 and 2019, however, regarding primary education, the region has positive results, achieving scores in 2015 that are higher than two municipalities that receive the largest intergovernmental transfers.

Sucupira, the last city analyzed among those that receive the smallest transfers, has as a political characteristic of the significant variables for receiving larger transfers, the mayor being re-elected (that is, having a second term) in 2016, thus being the same manager of the executive branch for all the years analyzed.

In 2017, the year in which the mayor begins his second municipal term, he obtained a fiscal management classified as critical, but it is the same year in which the municipality has its first result of 100% treated water service. In the following years, 2019 and 2020, Sucupira achieved the best results in the six years studied and also when compared to the other 3 municipalities, thus obtaining good management.

Therefore, it is noted that in these four municipalities, which receive the smallest transfers, the influence of the significant variable of a second term generates a positive impact on municipal social and especially fiscal development.

Araguaína, Palmas, Gurupi and Paraíso of Tocantins presented, as a significant variable of political characteristic for a greater transfer of intergovernmental resources, the second municipal electoral term. With the exception of Porto Nacional, which does not contain any significant variable similar to the political characteristics of the president of the republic.

The capital, Palmas, regarding the development of fiscal management, showed numbers in which the municipality is identified as the second to have the lowest result for good management when compared to the averages of the others. In 2015, the year of its worst performance, the region's fiscal management was considered to be in difficulty, while in 2020, the year with the best result, management was classified as good.

As with fiscal management, the IDEB score for high school, Palmas is identified as the second to have the lowest result in both 2017 and 2019. For the final years of elementary school, it was the only city to show a drop in score, from 2017 to 2019.

Araguaína is the second largest city in the state and consequently the second to present the highest data on formal employment, given that the distance between it and the third largest city is considerably large. In fiscal management, the municipality obtained the best results over the years and still demonstrated excellent management in 2020.

However, despite Araguaína boasting excellent data in the previous indicators, in terms of educational development, the municipality failed to achieve the best results. Thus, indicating that the investments applied by the municipality do not directly impact education, and should be influenced by variables external to those analyzed in this research.

The city of Gurupi, the third largest in the state, follows the same pattern as the previous cities, that is, it is the municipality with the third largest number of formal jobs and still differs significantly from the data of Paraíso and Porto Nacional. In terms of fiscal management, it is the second with the highest average among the

five analyzed, in addition to presenting excellent management in 2020 and in previous years with a good classification.

As for the IDEB index for high school and elementary school final years, Gurupi boasted the best scores in both 2017 and 2019 among the five municipalities analyzed. On the other hand, the indicator related to sewage collection shows the city as the second with the lowest percentages of this basic sanitation service.

Paraíso of Tocantins, in terms of sewage collection, presented the worst results in all six years of study when compared to the other municipalities. The same is true for the fiscal management indicator, analyzing the final average; however, even with the data being lower than other regions, Paraíso maintained its management in the good classification.

In contrast to the previous indicators, the municipality, in the educational category of secondary education, boasted the best score in 2019 and the second best in 2020. On the other hand, in regular primary education, Paraíso of Tocantins had the worst scores.

And finally, Porto Nacional, the only municipality among the five that received the largest intergovernmental transfers, did not present any significant variable related to political characteristics.

This municipality is among those that obtained the lowest number of formal jobs in the productive sectors. Fiscal management is average compared to the other municipalities, that is, neither very good nor very bad. The result in which Porto Nacional obtained the worst performance was in relation to the IDEB score for high school in both 2017 and 2019.

But on the other hand, the IDEB scores for elementary school in the final years, in the same period, were the best. Another indicator in which the municipality stands out positively is sewage collection, reaching 98.1% of residences with adequate collection in 2018.

Therefore, it is noted that for municipalities with the largest intergovernmental transfers, the variables of social and fiscal development will not always present excellent results, regardless of whether the region manifests any of the variables significant for a greater number of transfers from the government.

## 5 Conclusion

This study sought to investigate strategic voluntary transfers, specifically federal transfers to municipalities in the state of Tocantins from 2015 to 2020, focusing on the relationship of partisan alignment between both federative entities.

The balanced panel data regression model that best suited the research objectives was the fixed-effects model. This was due to the results found in the comparison tests between the models and subsequently in the correction of the standard error with the presence of heteroscedasticity.

Thus, the result obtained is favorable to the hypotheses of strategic voluntary transfers, so that there are promises that the federal entity will in fact make more significant transfers to those municipalities in which it has a partisan identification. This result is in line with the theories and studies of major researchers such as Bugarin

and Marciniuk (2017); Stuckert and Bugarin (2022); among others who have already been cited in this research.

On the other hand, this study includes the variable of "second term," which has real significance for the allocation of funds, that is, mayors who are in their second term receive a greater number of funds from the federal government. Thus, a preference for mayors with more political experience is noted. This result contradicts some studies such as those by Stuckert and Bugarin (2022).

In general, the significant variables are: party; second term; and GDP per capita. The variables that are not significant for the allocation of funds from the federal government to the municipalities of Tocantins are: sex; age; years of schooling; coalition; and taxes.

Thus, in evaluating the social and fiscal development generated in the municipalities of the state of Tocantins, it is noted that for those municipalities that receive the largest transfers, partisan influence and the significant variables generated by the panel data model do not immediately affect basic sanitation and education services. However, for those regions that receive the smallest transfers, the significant variables impact the quantity of transfers and, especially, the social municipal performance.

Therefore, this research evaluated the results generated by the HTPE in the state of Tocantins with the data produced by the social and fiscal development indices in the municipalities that received the largest and smallest intergovernmental transfers.

The main contribution of this research was to expand on studies already carried out in some locations in Brazil, but focusing only on Tocantins in the period from 2015 to 2020, since this state does not contain research on the subject discussed in this research. Furthermore, it analyzed a comparison between the significant variables for a larger transfer and the actual development of the municipality.

This study can be extended to include research focused on microregions, also incorporating the influence of transfers made to the state government. A dummy variable can be included to represent election years for both mayor and president. Furthermore, other variables such as health can be included for the analysis of municipal development.

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