

Intergovernmental Transfers and Municipal Fiscal Behavior: Flypaper Effect and Oates' Veil Hypothesis in Bahia, Brazil

Transferências intergovernamentais e comportamento fiscal municipal: evidências sobre o efeito flypaper e a hipótese do véu de oates na bahia, Brasil

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Abstract

Intergovernmental transfers play a central role in decentralized fiscal systems; however, their effects on local government behavior remain a subject of theoretical and empirical debate. This study examines the extent to which transferred resources influence municipal spending (flypaper effect) and revenue collection effort (Veil of Oates Hypothesis) in the state of Bahia, Brazil. Using a balanced panel comprising all 417 municipalities in Bahia from 2013 to 2023, panel data models with fixed effects are employed to estimate the impacts of federal and state transfers on municipal expenditures and own-source revenues. The results provide strong evidence of the flypaper effect, indicating that transfers from the Municipal Participation Fund (FPM), the State Tax on the Circulation of Goods and Services (ICMS), and the Motor Vehicle Ownership Tax (IPVA) significantly increase municipal spending, particularly among municipalities with lower expenditure levels. Regarding fiscal effort, the findings offer partial support for the Veil of Oates Hypothesis, as FPM transfers reduce own-source revenue primarily in wealthier municipalities. In contrast, ICMS transfers have no significant effect on own-source revenue, whereas IPVA transfers contribute positively to local revenue generation. These findings advance the fiscal federalism literature by demonstrating that

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the effects of intergovernmental transfers are heterogeneous across municipalities and depend on local fiscal capacity.

Keywords: **Flypaper** Effect. Oates Veil Hypothesis. Intergovernmental Transfers. Municipal Spending. Municipal Revenue.

Resumo

As transferências intergovernamentais desempenham um papel importante nos sistemas fiscais descentralizados; contudo, seus efeitos sobre o comportamento dos governos locais permanecem objeto de debate teórico e empírico. Este estudo examina em que medida os recursos transferidos influenciam os gastos municipais (efeito *flypaper*) e o esforço de arrecadação própria (Hipótese do Véu de Oates) no estado da Bahia, Brasil. Utilizando um painel balanceado composto pelos 417 municípios baianos no período de 2013 a 2023, empregam-se modelos de dados em painel com efeitos fixos para estimar os impactos das transferências federais e estaduais sobre as despesas municipais e as receitas próprias. Os resultados fornecem fortes evidências do efeito *flypaper*, indicando que as transferências provenientes do Fundo de Participação dos Municípios (FPM), do Imposto sobre Circulação de Mercadorias e Serviços (ICMS) e do Imposto sobre a Propriedade de Veículos Automotores (IPVA) aumentam significativamente os gastos municipais, especialmente entre os municípios com menores níveis de despesa. Em relação ao esforço fiscal, os achados oferecem suporte parcial à Hipótese do Véu de Oates, uma vez que as transferências do FPM reduzem a arrecadação própria principalmente nos municípios mais ricos. Em contraste, as transferências do ICMS não apresentam efeito significativo sobre a receita própria, enquanto as transferências do IPVA contribuem positivamente para a geração de receitas locais. Esses resultados contribuem para a literatura sobre federalismo fiscal ao demonstrar que os efeitos das transferências intergovernamentais são heterogêneos entre os municípios e dependem da capacidade fiscal local.

Palavras-Chave: Efeito Flypaper. Hipótese do Véu de Oates. Transferências intergovernamentais. Gastos municipais. Receita municipal.

1. Introduction

Understanding how intergovernmental transfers affect public spending and municipal fiscal effort is fundamental to analyzing government behavior. In Brazil, the relevance of this debate stems from the changes introduced by the 1988 Constitution, which expanded the political, administrative, and fiscal powers of municipalities and strengthened fiscal federalism (Brazil, 1988). This system of state organization aims to promote decentralization and bring public decision-making closer to local needs, particularly in fiscal and tax management (Sousa & Monte, 2022).

However, the expansion of municipal responsibilities occurred in a context marked by regional and socioeconomic inequalities, which limit the ability of Brazilian municipalities to fully exercise their autonomy (Costa et al., 2025). In this context, transfers function as instruments of income redistribution, promoting greater balance among the different regions of the country (Araújo & Flores, 2017).

In Brazil, there are several types of intergovernmental transfers, both conditional and unconditional (Paz, Serrano & Ferreira, 2020). This study focuses on unconditional transfers, that is, resources that are not legally earmarked for a specific purpose, giving local governments greater discretion in their use. Among these, the Municipal Participation Fund (FPM), as well as municipal shares of the Tax on the Circulation of Goods and Services (ICMS) and the Motor Vehicle Ownership Tax (IPVA), are particularly important.

Although federal and state transfers are intended to reduce fiscal disparities and strengthen public services, they may also generate unintended effects (Louzano et al., 2020). In many municipalities, dependence on these revenues may emerge, leading local governments to finance and expand expenditures and investments without strengthening fiscal effort through local revenue collection (Wati, Ispriyahadi & Zakaria, 2022). Given this context, how do intergovernmental transfers influence municipal revenues and expenditures?

In Brazilian municipalities, particularly smaller ones, dependence on transfers is even more evident, as own-source revenues tend to stagnate or decline (Deda & Kauchakje, 2017), creating conditions conducive to both the flypaper effect and the Veil of Oates Hypothesis. The flypaper effect occurs when transfers lead to an increase in local public spending, generating a stronger response than an equivalent increase in own-source revenue (Nguyen-Hoang & Yinger, 2020). Similarly, the Veil of Oates Hypothesis describes a situation in which governments reduce their own-source revenue collection efforts, thereby increasing their dependence on intergovernmental transfers (Louzano et al., 2020).

These mechanisms have been observed in different contexts, reinforcing their empirical relevance. Evidence of the Veil of Oates Hypothesis has been found in the Western Balkans, where transferred funds reduce municipalities' own-source revenues, while local investments contribute to strengthening fiscal autonomy (Andonova & Trenovski, 2023). In Ghana, studies report the presence of the flypaper effect, whereby transfers from the central government exert a greater influence on local spending than own-source revenues. Furthermore, the predominant use of these transfers to finance current expenditures may constrain local development (Fitrianti et al., 2025), highlighting the importance of strengthening municipal revenue generation.

In Brazil, several initiatives have sought to increase municipal revenues through tax modernization and improvements in institutional management. The Program for Modernizing Tax Administration and the Management of Basic Social Sectors (PMAT), created by BNDES in 1997, promotes innovation in municipal revenue administration through measures such as computerization and personnel training. Likewise, the Program to Support the Management of Tax Authorities in Brazil (PROFISCO), launched in 2006 in partnership with the IDB, focuses on the digitalization and integration of fiscal management across Brazilian states (Fritscher et al., 2022).

These initiatives contribute to the modernization of public administration, strengthening municipal management capacity and fiscal autonomy. For example, the Electronic Invoice system modernizes taxpayer records, automates administrative processes, and strengthens oversight, thereby increasing revenue collection and tax autonomy (Pereira, Silva, & Rocha, 2024). By enhancing their capacity

to generate own-source revenues, municipalities become less dependent on transfers and gain greater flexibility to plan and implement public policies, which may help mitigate both the flypaper effect and the Veil of Oates Hypothesis (Silva & Silva, 2018).

Despite these advances, it remains important to examine how the relationship between transfers, public spending, and fiscal effort manifests itself across different contexts. Bahia represents a particularly relevant case, given its diversity and the fact that it is the third-largest Brazilian state in terms of the number of municipalities. In many of these municipalities, dependence on federal and state transfers is particularly high, accounting for approximately 80% of total revenues (Lira, Monteiro & Fadul, 2013), which underscores the importance of evaluating the effects of transfers on local fiscal management.

From this perspective, this study aims to analyze the extent to which transfers, particularly the FPM and the state shares of ICMS and IPVA revenues, influence municipal spending and fiscal effort in the municipalities of Bahia between 2013 and 2023. The analysis seeks to provide a better understanding of the fiscal behavior of local governments in response to intergovernmental transfers.

This study contributes to the literature on municipal public finance by examining the economic reality of Bahia's municipalities and assessing the effects of transfers on the composition of municipal revenues and expenditures. The findings may provide insights for strengthening local revenue collection, improving resource allocation criteria, and promoting greater fiscal autonomy and financial sustainability.

The remainder of this article is organized into five sections. The first section presents the introduction. The second section reviews the literature, focusing on the flypaper effect and the Veil of Oates Hypothesis. The third section describes the methodology and data. The fourth section presents the empirical results. Finally, the fifth section discusses the conclusions and provides suggestions for future research.

2. Literature review

Federalism is a model of state organization that distributes autonomy and powers among different levels of government (Paz, Serrano & Ferreira, 2020). This modern system of political organization was first consolidated in the United States following its independence from England (Andrade, Jesus & Santos, 2017). Subsequently, it was adopted by other countries, including Brazil, which abandoned the unitary system that had previously been in place.

The federal regime has existed in Brazil since 1891, but fiscal decentralization only gained momentum with the 1988 Constitution (Lopreato, 2022). This arrangement allows states and municipalities to manage taxes and allocate resources according to their priorities, making it one of the main instruments of fiscal federalism (Soares & Melo, 2016). In this way, the model enhances the efficiency of government actions and strengthens decision-making capacity in addressing regional specificities (Assis, 2020).

The theory of fiscal decentralization was consolidated through the contributions of Tiebout (1956) and Oates (1972), who discussed the distribution of public functions across levels of government according to their capacity to meet local demands. Oates (1972) defines fiscal federalism as a balance between centralization and decentralization, arguing that the provision of public goods tends to be more efficient at the local level because proximity to the population facilitates the identification of local needs and the adaptation of policies to regional differences.

Following the perspective favorable to fiscal federalism, the definition of the optimal degree of decentralization should consider not only economic efficiency but also equity (Louzano et al., 2020). Although the distribution of powers can improve efficiency in the provision of public goods and services, differences in revenue-generating capacity among federative entities may widen regional inequalities, making transfers and coordination mechanisms necessary (Oates, 1999).

In this context, the Constitution established and consolidated the system of intergovernmental transfers in Brazil by creating mechanisms for revenue sharing among different levels of government (Silva et al., 2020). In addition to serving as instruments of fiscal equalization aimed at reducing economic disparities across territories and ensuring a minimum level of fiscal equity (Oates, 1972), these transfers are particularly important for smaller municipalities, where they enable the provision of public services and contribute to improving citizens' well-being.

In the Brazilian context, municipalities benefit from state transfers, such as ICMS and IPVA revenue-sharing arrangements, which contribute to financing local government activities (Santos, 2023). In addition, municipalities receive transfers from the Federal Government, among which the Municipal Participation Fund (FPM) is the most prominent. The FPM is funded through 25% of the revenue collected from personal income tax (IRPF) and corporate income tax (IRPJ), as well as 25% of the revenue generated by the Tax on Industrialized Products (IPI) (Salomão & Santos, 2022).

The 1988 Federal Constitution establishes the criteria and percentages governing the distribution of FPM, ICMS, and IPVA revenues. The FPM is allocated through three quotas: 10% to state capitals, 86.4% to municipalities located in the interior of the country, and 3.6% to reserve municipalities (STN, 2018). According to the National Treasury Secretariat (2023), the Federal Court of Accounts (TCU) annually determines each municipality's participation coefficient based on population data provided by the Brazilian Institute of Geography and Statistics (IBGE) and state-level per capita income.

ICMS is a state tax, but a portion of the revenue is constitutionally transferred to municipalities. Specifically, 25% of ICMS revenue collected by the states is allocated to municipalities, with 75% distributed according to Fiscal Added Value (VAF) and the remaining 25% based on criteria established by state legislation (Brazil, 1988). The VAF measures municipal economic activity and primarily benefits municipalities with greater industrial and commercial development (Chamber of Deputies, 2024).

Regarding IPVA, each Brazilian state collects the tax from owners of vehicles registered within its territory. The 1988 Federal Constitution (Article 158, Item III) requires that 50% of the IPVA

revenue collected by the states be transferred to the municipalities where the vehicles are registered. This rule tends to favor more urbanized and wealthier municipalities, where vehicle ownership is more widespread.

From this perspective, the criteria governing the distribution of transfers generate effects that extend beyond the reduction of regional inequalities (Louzano et al., 2020). These resources involve a trade-off between equity and efficiency, as reducing disparities should not undermine incentives for municipalities to generate their own revenues (Baíão, Cunha & Souza, 2017). Consequently, the relationship between transfers, expenditures, and local fiscal effort is complex and heterogeneous (Paz, Serrano & Ferreira, 2020).

In public finance, two prominent explanations address the potentially contradictory effects of transfers: the flypaper effect and the Veil of Oates Hypothesis (Louzano et al., 2020). The flypaper effect occurs when resources transferred by central governments tend to remain within the public sector, stimulating the expansion of local government spending, particularly in contexts where citizens do not directly perceive the fiscal cost associated with higher public expenditures (Hines & Thaler, 1995).

In this regard, Inman (2008) argues that the flypaper effect cannot be explained solely by econometric shortcomings or measurement errors related to transfers, but rather by political and institutional incentives embedded in the relationship between central governments and subnational entities. According to the author, political representatives have incentives to increase spending based on the transfers received, reinforcing the expansion of local public expenditures and increasing the financial dependence of subnational governments on the central government.

Yüksel (2021), analyzing 81 Turkish provinces between 2008 and 2017, identified evidence of the flypaper effect, showing that transfers had a greater impact on local spending than own-source revenues. Similarly, Wati, Ispriyahadi, and Zakaria (2022), using data from 335 local governments in Indonesia between 2019 and 2020, found that central government transfers increased public spending, while own-source revenues became less relevant as a source of local financing during the COVID-19 pandemic.

Similar evidence has also been documented in Latin America. Torres Ortega and Ortega De la Rosa (2022), analyzing 1,101 Colombian municipalities between 2000 and 2017, found no evidence of the flypaper effect for the full sample of municipalities. However, when focusing on 957 smaller municipalities characterized by lower economic and fiscal capacity and high fiscal dependence, the authors found that unconditional transfers exerted a stronger influence on local public spending than own-source revenues.

Similarly, Sour (2013), analyzing Mexican municipalities between 1990 and 2007 using panel data, found evidence of the flypaper effect, demonstrating that local government spending responded more strongly to increases in unconditional federal transfers than to equivalent increases in private income. Furthermore, the study identified asymmetric behavior, indicating that municipal governments respond more strongly to increases in transfers than to reductions in those transfers.

In this context, increases in federal and state transfers are expected to be associated with higher levels of municipal spending. Therefore, the following research hypotheses are proposed to examine the effects of these transfers on municipal expenditures:

H1: FPM transfers positively influence municipal spending.

H2: ICMS transfers positively influence municipal spending.

H3: IPVA transfers positively influence municipal spending.

The Veil of Oates Hypothesis posits that the fiscal effort of subnational governments tends to decline when guaranteed intergovernmental transfers are available (Louzano et al., 2020). This dynamic may create disincentives for own-source revenue generation, reducing local fiscal autonomy and hindering the development of a sustainable tax base (Delgado & Cevada, 2019). This occurs because the political costs associated with raising taxes, combined with public resistance to tax increases, may lead local governments to rely on transferred resources rather than adopt measures aimed at expanding their own revenues (Lima, Dal-Comuni & Lima, 2023).

In Brazil, the Veil of Oates Hypothesis may be observed through the Municipal Participation Fund (FPM), which represents the main source of revenue for many municipalities. This dynamic arises because the distribution of FPM resources is not linked to local revenue-generation efforts, encouraging local governments to allocate these funds primarily to current expenditures rather than to initiatives aimed at expanding their own tax base (Silva, 2024). In this context, municipalities with larger populations tend to exhibit higher levels of fiscal effort (Pinheiro, 2009), which may help mitigate the negative effects of transfers on own-source revenue generation.

The literature (Fitrianti et al., 2025; Louzano et al., 2020) suggests that high levels of intergovernmental transfers may reduce incentives for local governments to generate their own revenues. Similarly, Delgado and Cevada (2019) found that although federal transfers have contributed to reducing regional inequalities, the most transfer-dependent municipalities tend to exhibit low levels of own-source revenue, suggesting a weakening of local revenue-generation incentives. This situation creates imbalances in municipal finances, as local governments become increasingly dependent on transfers instead of developing sustainable sources of revenue. Over the long term, such dependence may compromise fiscal sustainability (Fitrianti et al., 2025).

Based on these arguments, Hypotheses 4, 5, and 6 are proposed to examine the effects of federal and state transfers on municipal fiscal effort.

H4: FPM transfers negatively influence the level of municipal revenue.

H5: ICMS transfers negatively influence the level of municipal revenue.

H6: IPVA transfers negatively influence the level of municipal revenue.

According to Delgado and Cevada (2019), municipalities differ substantially in their degree of fiscal dependence, revenue-generating capacity, and economic structure. As a result, the effects of federal (FPM) and state (ICMS and IPVA) transfers are unlikely to be homogeneous across municipalities. Since smaller municipalities tend to rely more heavily on intergovernmental transfers, whereas larger municipalities generally possess broader tax bases and greater fiscal autonomy, the impact of transfers may vary according to municipal revenue capacity. Therefore, the following sub-hypotheses are proposed:

H1a: FPM transfers positively influence the spending of the poorest municipalities.

H1b: FPM transfers positively influence the spending of the richest municipalities.

H2a: ICMS transfers positively influence the spending of the poorest municipalities.

H2b: ICMS transfers positively influence the spending of the richest municipalities.

H3a: IPVA transfers positively influence the spending of the poorest municipalities.

H3b: IPVA transfers positively influence the spending of the richest municipalities.

H4a: FPM transfers negatively influence the revenue level of the poorest municipalities.

H4b: FPM transfers negatively influence the revenue level of the richest municipalities.

H5a: ICMS transfers negatively influence the revenue level of the poorest municipalities.

H5b: ICMS transfers negatively influence the revenue level of the wealthier municipalities.

H6a: IPVA transfers negatively influence the revenue level of the poorer municipalities.

H6b: IPVA transfers negatively influence the revenue level of the wealthier municipalities.

3. Methodology

The sample comprises the 417 municipalities of the state of Bahia and covers the period from 2013 to 2023 on an annual basis. Bahia was selected due to its relevance within the Brazilian federal system, both in terms of the volume of intergovernmental transfers received and the availability of consistent and complete data throughout the study period. The empirical analysis is based on secondary data.

Data on municipal public finances were obtained from the Brazilian Public Sector Accounting and Fiscal Information System (SICONFI), maintained by the National Treasury Secretariat (STN). Population and Gross Domestic Product (GDP) data were collected from the Brazilian Institute of

Geography and Statistics (IBGE). Data on inflation, measured by the Broad National Consumer Price Index (IPCA), and unemployment were obtained from the Unified Workers' Central of Bahia (CUT-BA) and the IBGE's SIDRA database, respectively.

All monetary variables were converted into per capita values and winsorized at the 1st and 99th percentiles to reduce the influence of extreme observations. To address the study's objectives, fixed-effects panel regressions were estimated using Ordinary Least Squares (OLS), following the results of the Hausman test (Hausman, 1978). In addition, diagnostic tests were conducted on the residuals of all estimated models.

The Shapiro-Wilk test rejected the null hypothesis of residual normality (p-value < 0.05). However, given the large sample size, violations of this assumption are unlikely to affect the consistency of the estimates. The Breusch-Pagan test provided evidence of heteroskedasticity (p-value < 0.05), while the Durbin-Watson test indicated the presence of serial correlation in the residuals (p-value < 0.05). To address these issues, Newey-West standard errors were employed, providing robust statistical inference in the presence of heteroskedasticity and autocorrelation.

Panel data models are particularly appropriate for this study because they allow the analysis of both cross-sectional and temporal variation across Bahia's municipalities. In addition, the large number of observations enhances the precision and robustness of the estimates, even over a relatively short time horizon.

Equations 1, 2, and 3 examine the effects of federal and state transfers on municipal expenditures, thereby testing for the presence of the flypaper effect. Model 1 includes both federal and state transfers, Model 2 includes only federal transfers, and Model 3 includes only state transfers.

$$\text{Expenditure}_{i,t} = \beta_0 + \beta_1 \text{FPM}_{i,t} + \beta_2 \text{IPVA}_{i,t} + \beta_3 \text{ICMS}_{i,t} + \beta_4 \text{OwnRevenue}_{i,t} + \beta_5 \text{GDP}_{i,t} + \beta_6 \text{Inflation}_t + \beta_7 \text{Unemployment}_t + \beta_8 \text{Crise}_t + \varepsilon_{i,t} \quad (1)$$

$$\text{Expenditure}_{i,t} = \beta_0 + \beta_1 \text{FPM}_{i,t} + \beta_2 \text{OwnRevenue}_{i,t} + \beta_3 \text{GDP}_{i,t} + \beta_4 \text{Inflation}_t + \beta_5 \text{Unemployment}_t + \beta_6 \text{Crisis}_t + \varepsilon_{i,t} \quad (2)$$

$$\text{Expenditure}_{i,t} = \beta_0 + \beta_1 \text{ICMS}_{i,t} + \beta_2 \text{IPVA}_t + \beta_3 \text{OwnRevenue}_{i,t} + \beta_4 \text{GDP}_{i,t} + \beta_5 \text{Inflation}_{i,t} + \beta_6 \text{Unemployment}_t + \beta_7 \text{Crisis}_t + \varepsilon_{i,t} \quad (3)$$

Similarly, Equations 4, 5, and 6 examine the effects of intergovernmental transfers on municipal own-source revenues in the context of the Veil of Oates Hypothesis, while maintaining the same model specification adopted for the expenditure analysis.

$$\text{OwnRevenue}_{i,t} = \beta_0 + \beta_1 \text{FPM}_{i,t} + \beta_2 \text{IPVA}_t + \beta_3 \text{ICMS}_{i,t} + \beta_4 \text{Expenditure}_{i,t} + \beta_5 \text{GDP}_{i,t} + \beta_6 \text{Inflation}_{i,t} + \beta_7 \text{Unemployment}_t + \beta_8 \text{Crisis}_t + \varepsilon_{i,t} \quad (4)$$

$$\begin{aligned}
& \text{OwnRevenue}_{i,t} \\
& = \beta_0 + \beta_1 \text{FPM}_{i,t} + \beta_2 \text{Expenditure}_{i,t} + \beta_3 \text{GDP}_{i,t} + \beta_4 \text{Inflation}_t \\
& + \beta_5 \text{Unemployment}_t + \beta_6 \text{Crisis}_t + \varepsilon_{i,t}
\end{aligned} \tag{5}$$

$$\begin{aligned}
& \text{OwnRevenue}_{i,t} \\
& = \beta_0 + \beta_1 \text{ICMS}_{i,t} + \beta_2 \text{IPVA}_{i,t} + \beta_3 \text{Expenditure}_{i,t} + \beta_4 \text{GDP}_{i,t} \\
& + \beta_5 \text{Inflation}_t + \beta_6 \text{Unemployment}_t + \beta_7 \text{Crisis}_t + \varepsilon_{i,t}
\end{aligned} \tag{6}$$

t denotes the per capita own-source revenue of municipality i in period t ; represents the per capita expenditure of municipality i in period t ; denotes the per capita value of the Municipal Participation Fund received by municipality i in period t ; represents the per capita share of the Tax on the Circulation of Goods and Services allocated to municipality i in period t ; denotes the per capita share of the Motor Vehicle Ownership Tax allocated to municipality i in period t ; corresponds to the per capita Gross Domestic Product of municipality i in period t ; represents the inflation rate in the state of Bahia in period t ; denotes the unemployment rate in the state of Bahia in period t ; and represents the economic crisis indicator in period t .

The dependent variable is municipal own-source revenue or municipal expenditure, depending on the model specification. These variables capture the ability of local governments to generate and allocate financial resources. Both variables are measured on a per capita basis and are used to assess the effects of intergovernmental transfers on municipal fiscal behavior over time.

The Municipal Participation Fund (FPM) is the main explanatory variable in the model. As the principal federal transfer mechanism to municipalities, it plays a central role in assessing the effects of intergovernmental transfers on municipal fiscal outcomes. In addition, the municipal shares of ICMS and IPVA revenues are included to capture the effects of state-level transfers. All monetary variables are expressed in per capita terms.

To mitigate omitted-variable bias and isolate the effects of the explanatory variables, four control variables are included. GDP is used as a proxy for local economic activity, reflecting both municipal wealth and revenue-generating capacity. Inflation is included to control for macroeconomic conditions that may affect municipal revenues and expenditures. The unemployment rate is incorporated because it influences the local tax base independently of intergovernmental transfers. Finally, a crisis dummy variable is included, assuming a value of 1 for 2015 and 2016, corresponding to the Brazilian political and economic crisis, and for 2020, reflecting the effects of the COVID-19 pandemic.

4. Results

With the variables calculated, the descriptive evaluation of the research data begins (Table 1). The data show that some variables have similar means and medians, indicating less dispersion, while others exhibit greater dispersion. Therefore, the results help clarify the differences among the municipalities.

Table 1. Descriptive statistics

Variable	Min.	Q1	Median	Mean	Q3	Max.	Standard Deviation
OwnRevenue _{i,t}	19.02	58.16	89.84	138.16	148.57	1035.00	155.32
FPM _{i,t}	293.00	673.50	841.90	889.90	1019.30	2203.10	337.84
ICMS _{i,t}	99.39	160.36	210.13	297.62	295.87	2220.07	311.89
IPVA _{i,t}	3.67	9.80	14.79	18.89	6.41	84.37	14.37
GDP _{i,t}	4.45	6.92	8.68	11.58	11.82	74.16	10.21
Expenditure _{i,t}	1245.00	1777.00	2146.00	2329.00	2684.00	5282.00	763.84
Inflation _t	2.95	4.31	5.91	6.10	6.41	10.67	2.54
Unemployment _t	9.10	12.40	16.60	15.03	17.30	20.60	3.62
Crisis _{i,t}	-	-	-	0.33	-	-	0.47

Notes: : Own-source revenue of municipality i in year t; : Municipal Participation Fund of municipality i in year t; : Tax on the Circulation of Goods and Services of municipality i in year t; Tax on Motor Vehicle Ownership in municipality i in year t; : Gross Domestic Product of municipality i in year t; : Expenditure of municipality i in year t; : inflation rate in the state of Bahia in year t; : Unemployment rate in the state of Bahia in year t; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise.

The largest transfers are associated with the FPM, followed by ICMS and IPVA revenues. The relatively high standard deviations suggest substantial heterogeneity in the distribution of transfers across municipalities, reflecting the constitutional allocation rules that govern the distribution of federal resources through the FPM, particularly those based on population size and per capita income.

Municipal expenditures exceed the average value of intergovernmental transfers, indicating that municipalities rely on additional revenue sources to finance public services, infrastructure, education, and healthcare. Furthermore, the high standard deviation of municipal GDP highlights considerable disparities in economic activity across municipalities, revealing significant regional asymmetries in economic development.

4.1 Hypothesis testing – spending level

Table 2 presents the results of the first set of regressions, estimated to identify the determinants of municipal spending using the complete sample of 417 municipalities in Bahia from 2013 to 2023. The estimates from the three specifications of the econometric model show how different combinations of variables affect the analysis. Thus, the table systematically organizes the coefficients and standard errors, offering a structured view of the estimated parameters for the municipalities in the sample.

Table 2. Estimates from regression models for the expenditure of municipalities in Bahia

Variable	Model (I)	Model (II)	Model (III)
FPM _{i,t}	0.4696*** (0.0342)	0.2198*** (0.0329)	
ICMS _{i,t}	0.2965*** (0.0276)		0.3757*** (0.0353)
IPVA _{i,t}	0.2298*** (0.0328)		0.3333*** (0.0501)
GDP _{i,t}	0.0680* (0.0264)	0.1909*** (0.0322)	0.0321 (0.0326)
OwnRevenue _{i,t}	0.2795*** (0.0257)	0.3512*** (0.0390)	0.2537*** (0.0256)
Inflation _t	0.0238 (0.0121)	0.1449*** (0.0133)	0.1520*** (0.0100)
Unemployment _t	0.2398*** (0.0195)	0.4608 (0.0216)	0.4241*** (0.0192)
Crisis _{i,t}	-0.0311** (0.0117)	-0.1527*** (0.0122)	-0.1391*** (0.0102)

Notes: (i) Model I includes transfers from the FPM, ICMS, and IPVA; Model II considers only the FPM; and Model III includes ICMS and IPVA transfers.

(ii) : Municipal Participation Fund of municipality i in year t ; : Tax on the Circulation of Goods and Services of municipality i in year t ; Tax on Motor Vehicle Ownership in municipality i in year t ; : Gross Domestic Product of municipality i in year t ; : Own-source revenue of municipality i in year t ; : Expenditure of municipality i in year t ; : inflation rate in the state of Bahia in year t ; : Unemployment rate in the state of Bahia in year t ; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise

(iii) Standard errors in parentheses; $p < 0.01$ ***, $p < 0.05$ **, $p < 0.1$ *

(iv) Newey-West standard errors were employed to obtain robust statistical inference in the presence of heteroskedasticity and autocorrelation.

In Models I and II, FPM transfers exhibit positive and statistically significant coefficients, indicating that increases in federal transfers lead to higher levels of municipal spending. The estimated coefficients indicate that a R\$1 increase in FPM transfers raises municipal expenditures by between R\$0.21 and R\$0.46. Likewise, ICMS and IPVA transfers display positive and statistically significant effects in Models I and III, suggesting that state transfers also contribute to higher spending levels. Specifically, a R\$1 increase in ICMS transfers increases municipal expenditures by between R\$0.29 and R\$0.37, whereas the corresponding effect of IPVA transfers ranges from R\$0.22 to R\$0.33.

To assess whether the effects of federal and state transfers persist among municipalities with lower spending levels, Table 3 presents the second set of regressions estimated for the 30% of municipalities with the lowest expenditures. The estimated coefficients provide evidence on how

transfers influence the spending behavior of this group, allowing comparisons with the results obtained for the full sample.

Table 3. Regression estimates for the 30% of municipalities with the lowest spending

Variable	Model (I)	Model (II)	Model (III)
FPM _{i,t}	0.3606*** (0.0432)	0.1119*** (0.0199)	
ICMS _{i,t}	0.6126*** (0.1747)		0.9740*** (0.1860)
IPVA _{i,t}	0.1897** (0.0615)		0.2189*** (0.0657)
GDP _{i,t}	0.3462*** (0.0930)	0.6338*** (0.1152)	0.4130*** (0.1079)
OwnRevenue _{i,t}	0.4184*** (0.0966)	0.5036*** (0.0959)	0.4069*** (0.0978)
Inflation _t	0.0400* (0.0173)	0.1656*** (0.0151)	0.1120*** (0.0180)
Unemployment _{i,t}	0.1871*** (0.0291)	0.4117*** (0.0202)	0.3008*** (0.0278)
Crisis _{i,t}	-0.0655*** (0.0184)	-0.2035*** (0.0145)	-0.1273*** (0.0189)

Notes: (i) Model I includes transfers from the FPM, ICMS, and IPVA; Model II considers only the FPM; and Model III includes ICMS and IPVA transfers.

(ii) : Municipal Participation Fund of municipality i in year t ; : Tax on the Circulation of Goods and Services of municipality i in year t ; Tax on Motor Vehicle Ownership in municipality i in year t ; : Gross Domestic Product of municipality i in year t ; : Own-source revenue of municipality i in year t ; : Expenditure of municipality i in year t ; : inflation rate in the state of Bahia in year t ; : Unemployment rate in the state of Bahia in year t ; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise

(iii) standard error in parenthesis; $p < 0.01$ ***, $p < 0.05$ **, $p < 0.1$ *

(iv) Newey-West standard errors were employed to obtain robust statistical inference in the presence of heteroskedasticity and autocorrelation.

The FPM exhibits positive and statistically significant coefficients in both Models I and II. Likewise, state transfers are positive and statistically significant in Models I and III. The estimated coefficients indicate that a R\$1 increase in FPM transfers leads to an increase of between R\$0.11 and R\$0.36 in municipal expenditures. Similarly, a R\$1 increase in ICMS transfers raises municipal expenditures by between R\$0.61 and R\$0.97, whereas the corresponding effect of IPVA transfers ranges from R\$0.18 to R\$0.21. These findings suggest that, even among municipalities with lower expenditure levels, federal and state transfers remain important determinants of public spending.

To examine whether these effects differ among municipalities with higher expenditure levels, Table 4 reports the results for the 30% of municipalities with the highest expenditures in the sample. This analysis provides further insights into municipal fiscal behavior and allows for comparisons between municipalities with relatively low and high levels of public spending.

Table 4. Regression estimates for the 30% of municipalities with the highest expenditures

Variable	Model (I)	Model (II)	Model (III)
FPM _{i,t}	0.4800*** (0.0576)	0.3307*** (0.0626)	
ICMS _{i,t}	0.2879*** (0.0294)		0.3452 (0.0347)
IPVA _{i,t}	0.2268*** (0.0389)		0.3225** (0.0587)
GDP _{i,t}	0.0779** (0.0301)	0.1985*** (0.0335)	0.0576*** (0.0363)
OwnRevenue _{i,t}	0.2359*** (0.0285)	0.2638*** (0.0355)	0.2139*** (0.0277)
Inflation _t	0.0190 (0.0194)	0.1167*** (0.0231)	0.1492 (0.0140)
Unemployment _t	0.2573*** (0.0293)	0.4636*** (0.0364)	0.4023 (0.0328)
Crisis _{i,t}	0.0098 (0.0169)	-0.0849*** (0.0204)	-0.0884*** (0.0153)

Notes: (i) Model I includes transfers from the FPM, ICMS, and IPVA; Model II considers only the FPM; and Model III includes ICMS and IPVA transfers.

(ii) : Municipal Participation Fund of municipality i in year t ; : Tax on the Circulation of Goods and Services of municipality i in year t ; Tax on Motor Vehicle Ownership in municipality i in year t ; : Gross Domestic Product of municipality i in year t ; : Own-source revenue of municipality i in year t ; : Expenditure of municipality i in year t ; : inflation rate in the state of Bahia in year t ; : Unemployment rate in the state of Bahia in year t ; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise

(iii) standard error in parenthesis; $p < 0.01$ ***, $p < 0.05$ **, $p < 0.1$ *

(iv) Newey-West standard errors were employed to obtain robust statistical inference in the presence of heteroskedasticity and autocorrelation.

The FPM continues to exhibit positive and statistically significant coefficients in Models I and II. ICMS transfers display a positive and significant coefficient in Model I but lose statistical significance in Model III, suggesting that their effect is sensitive to model specification and may not be robust across all estimations. In contrast, IPVA transfers remain positive and statistically significant in Models I and III. The estimated coefficients indicate that a R\$1 increase in FPM transfers leads to an increase of between R\$0.33 and R\$0.48 in municipal expenditures. Likewise, the estimated effect of a R\$1 increase in IPVA transfers ranges from R\$0.23 to R\$0.32.

Overall, the results indicate that FPM transfers increase municipal spending throughout the sample, including among municipalities with both lower and higher expenditure levels. In contrast, the effects of state transfers appear less consistent, particularly for ICMS transfers, which do not exhibit a robust influence on spending among municipalities with higher expenditure levels.

4.2 Hypothesis testing – own-source revenue

Table 5 reports the regression results examining whether federal and state transfers reduce municipal fiscal effort, as predicted by the Veil of Oates Hypothesis. The sample comprises 417 municipalities in the state of Bahia over the period from 2013 to 2023. The results obtained from the three econometric specifications are presented below.

Table 5. Estimates from regression models for the own revenue of municipalities in Bahia

Variable	Model (I)	Model (II)	Model (III)
FPM _{i,t}	-0.1954*** (0.0310)	-0.0725*** (0.0153)	
ICMS _{i,t}	-0.0059 (0.0576)		-0.0009 (0.0584)
IPVA _{i,t}	0.2004*** (0.0457)		0.1562*** (0.0481)
GDP _{i,t}	0.3094*** (0.0621)	0.3423*** (0.0508)	0.3342*** (0.0608)
Expenditure _{i,t}	0.2659*** (0.0221)	0.2737*** (0.0265)	0.2196*** (0.0224)
Inflation _{i,t}	0.0398*** (0.0143)	0.0196* (0.0115)	-0.0059 (0.0099)
Unemployment _t	0.0329 (0.0266)	0.0268 (0.0224)	-0.0182 (0.0202)
Crisis _{i,t}	-0.0604*** (0.0134)	-0.0474*** (0.0106)	-0.0224** (0.0098)

Notes: (i) Model I includes transfers from the FPM, ICMS, and IPVA; Model II considers only the FPM; and Model III includes ICMS and IPVA transfers.

(ii) : Municipal Participation Fund of municipality i in year t ; : Tax on the Circulation of Goods and Services of municipality i in year t ; Tax on Motor Vehicle Ownership in municipality i in year t ; : Gross Domestic Product of municipality i in year t ; : Expenditure of municipality i in year t ; : inflation rate in the state of Bahia in year t ; : Unemployment rate in the state of Bahia in year t ; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise

(iii) standard error in parenthesis; $p < 0.01$ ***, $p < 0.05$ **, $p < 0.1$ *

(iv) Newey-West standard errors were employed to obtain robust statistical inference in the presence of heteroskedasticity and autocorrelation.

In Models I and II, FPM transfers exhibit negative and statistically significant coefficients, suggesting that increases in federal transfers are associated with lower levels of municipal own-source revenue. Among state transfers, ICMS is not statistically significant, indicating that it does not affect municipal revenue generation. In contrast, IPVA displays a positive and statistically significant coefficient, suggesting that this source contributes to higher levels of local revenue collection. The estimated coefficients indicate that a R\$1 increase in FPM transfers reduces municipal own-source revenue by between R\$0.07 and R\$0.19. Conversely, a R\$1 increase in IPVA transfers raises municipal own-source revenue by between R\$0.15 and R\$0.20.

To assess whether these effects persist among municipalities with lower revenue levels, Table 6 presents the second set of regressions estimated for the 30% of municipalities with the lowest own-source revenues. The results provide evidence on how intergovernmental transfers affect fiscal effort in this group and allow comparisons with the findings obtained for the full sample.

Table 6. Regression model estimates for the 30% of municipalities with the lowest revenue

Variable	Model (I)	Model (II)	Model (III)
FPM _{i,t}	-0.0206* (0.0122)	-0.0070 (0.0054)	
ICMS _{i,t}	0.0099 (0.0408)		-0.0055 (0.0401)
IPVA _{i,t}	0.0978*** (0.0181)		0.0951*** (0.0176)
GDP _{i,t}	-0.0422* (0.0253)	-0.0079 (0.0229)	-0.0420* (0.0252)
Expenditure _{i,t}	0.0443*** (0.0096)	0.0488*** (0.0091)	0.0390*** (0.0091)
Inflation _{i,t}	0.0098* (0.0049)	0.0113*** (0.0038)	0.0061 (0.0044)
Unemployment _t	0.0349*** (0.0084)	0.0467*** (0.0060)	0.0308*** (0.0075)
Crisis _{i,t}	-0.0183*** (0.0052)	-0.0219*** (0.0038)	-0.0157** (0.0048)

Notes: (i) Model I includes transfers from the FPM, ICMS, and IPVA; Model II considers only the FPM; and Model III includes ICMS and IPVA transfers.

(ii) : Municipal Participation Fund of municipality i in year t ; : Tax on the Circulation of Goods and Services of municipality i in year t ; Tax on Motor Vehicle Ownership in municipality i in year t ; : Gross Domestic Product of municipality i in year t ; : Expenditure of municipality i in year t ; : inflation rate in the state of Bahia in year t ; : Unemployment rate in the state of Bahia in year t ; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise

(iii) standard error in parenthesis; $p < 0.01$ ***, $p < 0.05$ **, $p < 0.1$ *

(iv) Newey-West standard errors were employed to obtain robust statistical inference in the presence of heteroskedasticity and autocorrelation.

The subsample analysis reveals important differences across municipalities. In Table 6, FPM transfers are not statistically significant at the 5% level in Models I and II and remain significant only at the 10% level in Model I, suggesting that federal transfers exert a limited influence on the own-source revenue of municipalities with lower revenue levels. Likewise, ICMS transfers are not statistically significant in any of the estimated models. In contrast, IPVA transfers continue to exhibit positive and statistically significant coefficients. The estimated coefficients indicate that a R\$1 increase in IPVA transfers raises municipal own-source revenue by approximately R\$0.09.

For municipalities with the highest revenue levels (Table 7), FPM transfers exhibit negative and statistically significant coefficients, indicating that federal transfers reduce municipal own-source revenue. As in the previous specifications, ICMS transfers remain statistically insignificant, whereas IPVA transfers continue to display positive and statistically significant effects.

Table 7. Regression model estimates for the top 30% of municipalities in terms of revenue

Variable	Model (I)	Model (II)	Model (III)
FPM _{i,t}	-0.2609*** (0.0524)	-0.1368*** (0.0354)	
ICMS _{i,t}	-0.1078* (0.0629)		-0.1001 (0.0637)
IPVA _{i,t}	0.1841*** (0.0554)		0.1122** (0.0661)
GDP _{i,t}	0.3109*** (0.0661)	0.3090*** (0.0586)	0.3360*** (0.0638)
Expenditure _{i,t}	0.3333*** (0.0362)	0.3111*** (0.0335)	0.2802*** (0.0356)
Inflation _{i,t}	0.0699*** (0.0196)	0.0482*** (0.0171)	0.0102 (0.0142)
Unemployment _t	0.0942** (0.0383)	0.1022*** (0.0342)	0.0512 (0.0336)
Crisis _{i,t}	-0.1052*** (0.0185)	-0.0903*** (0.0160)	-0.0588*** (0.0144)

Notes: (i) Model I includes transfers from the FPM, ICMS, and IPVA; Model II considers only the FPM; and Model III includes ICMS and IPVA transfers.

(ii) : Municipal Participation Fund of municipality i in year t ; : Tax on the Circulation of Goods and Services of municipality i in year t ; Tax on Motor Vehicle Ownership in municipality i in year t ; : Gross Domestic Product of municipality i in year t ; : Expenditure of municipality i in year t ; : inflation rate in the state of Bahia in year t ; : Unemployment rate in the state of Bahia in year t ; : dummy variable equal to 1 if a crisis occurred in year t and 0 otherwise

(iii) standard error in parenthesis; $p < 0.01$ ***, $p < 0.05$ **, $p < 0.1$ *

(iv) Newey-West standard errors were employed to obtain robust statistical inference in the presence of heteroskedasticity and autocorrelation.

A comparison of the three sets of regressions reveals important differences across municipalities. For the full sample, FPM transfers exert a negative effect on municipal own-source revenue, although this effect is heterogeneous. The negative impact is stronger and statistically significant among municipalities with higher revenue levels, whereas no significant effect is observed among municipalities with lower own-source revenues. ICMS transfers do not exhibit a statistically significant effect in any of the specifications, while IPVA transfers display positive and statistically significant coefficients across all groups, although with a smaller magnitude among municipalities with lower revenue levels.

The estimated coefficients indicate that a R\$1 increase in FPM transfers reduces municipal own-source revenue by between R\$0.13 and R\$0.26. In contrast, a R\$1 increase in IPVA transfers raises municipal own-source revenue by between R\$0.11 and R\$0.18. The following section provides a discussion of the results and their implications for fiscal federalism and municipal public finance.

5. Discussion and implications

The results provide evidence on how intergovernmental transfers shape municipal fiscal behavior in Bahia from both the expenditure and revenue perspectives. Overall, the findings support the mechanisms predicted by the flypaper effect and the Veil of Oates Hypothesis, confirming that transfers not only redistribute resources but also influence local fiscal decisions. These results are broadly consistent with previous evidence reported by Andonova and Trenovski (2023), Louzano et al. (2020), Yüksel (2021), and Torres Ortega and Ortega De la Rosa (2022).

Regarding municipal expenditures, the results indicate that increases in FPM transfers lead to higher levels of public spending, consistent with the flypaper effect documented by Wati, Ispriyahadi, and Zakaria (2022) and Deda and Kauchakje (2017). Therefore, H1 is supported. The positive effect of FPM transfers is also observed among municipalities with both lower and higher expenditure levels, supporting H1a and H1b. Although the effect is smaller among municipalities with lower expenditures, additional federal resources continue to translate into higher spending levels, suggesting that transfers expand local fiscal capacity regardless of municipal size.

For ICMS transfers, the results support H2 and H2a, indicating that higher transfers are associated with greater municipal spending in the full sample and among municipalities with lower expenditure levels. These findings are consistent with previous evidence showing that intergovernmental transfers stimulate the expansion of local public expenditures (Yüksel, 2021; Wati, Ispriyahadi, & Zakaria, 2022). However, among municipalities with higher expenditure levels, the effect of ICMS is not robust across model specifications, providing only partial support for H2b.

The results for IPVA transfers support H3, H3a, and H3b. Positive and statistically significant coefficients are observed across all groups of municipalities, indicating that this source of state transfers also contributes to higher levels of public spending. Together, these findings suggest that federal and state transfers expand local fiscal capacity and increase municipal expenditures, reinforcing fiscal dependence on resources transferred from higher levels of government.

These findings have important implications for the design of intergovernmental transfer systems. The evidence that federal and state transfers consistently increase municipal expenditures suggests that transfers not only fulfill an equalization function but also influence local budgetary decisions. From a policy perspective, this highlights the need for transfer mechanisms that balance fiscal support with incentives for efficient resource allocation, particularly in municipalities that rely heavily on external revenues.

More broadly, the results contribute to international debates on fiscal federalism by showing that the effects of intergovernmental transfers are not uniform across municipalities. The heterogeneous responses observed among municipalities with different expenditure levels suggest that local fiscal behavior is conditioned by administrative and economic capacity. This finding reinforces the argument that fiscal dependency under decentralized systems is context-specific, implying that transfer policies should consider local characteristics when seeking to strengthen fiscal sustainability and municipal autonomy.

The second dimension of the analysis concerns municipal fiscal effort. The results indicate that FPM transfers negatively affect own-source revenue generation in the full sample and among municipalities with higher revenue levels, supporting H4 and H4b. These findings are consistent with the Veil of Oates Hypothesis, which predicts that guaranteed transfers may reduce incentives for local revenue mobilization (Louzano et al., 2020). In this context, local governments may prefer relying on external resources rather than expanding their own tax base, given the political costs associated with higher taxation (Lima, Dal-Comuni, & Lima, 2023).

In contrast, no significant effect of FPM transfers is observed among municipalities with lower revenue levels. Consequently, H4a is not supported. A possible explanation is that these municipalities already possess limited economic activity and a relatively narrow tax base, which restricts their capacity to expand own-source revenue regardless of the volume of transfers received.

These findings have important policy implications. Reduced incentives for local revenue generation may increase fiscal dependence, weaken municipal autonomy, and heighten vulnerability to fiscal shocks and changes in federal budget allocations. Such concerns are consistent with Oates' (1999) arguments regarding the challenges associated with transfer-dependent fiscal decentralization.

These findings have important implications for the design of intergovernmental transfer systems and local fiscal incentives. The negative effect of FPM transfers on own-source revenue collection suggests that unconditional transfers may weaken incentives for local tax mobilization, particularly in municipalities with greater revenue-generating capacity. This result indicates that transfer systems should be carefully designed to avoid creating fiscal dependency and reducing incentives for strengthening local tax administration and revenue collection efforts.

More broadly, the results suggest that the effects of intergovernmental transfers on fiscal effort depend on their institutional design. While FPM transfers appear to reduce incentives for own-source revenue generation, ICMS transfers show no significant effect and IPVA transfers are positively associated with fiscal effort. These findings indicate that transfers linked to local economic activity

or accompanied by incentives for administrative capacity may support fiscal sustainability without undermining municipal autonomy. Therefore, the study contributes to broader debates in fiscal federalism by showing that fiscal dependency is not an inevitable consequence of decentralization but rather a function of how transfer mechanisms are structured.

For state transfers, the results indicate that ICMS transfers do not significantly affect municipal fiscal effort, regardless of municipal size. Unlike the FPM, ICMS transfers are closely linked to local economic activity because their distribution depends on each municipality's contribution to state fiscal added value. Moreover, ICMS transfers represent a relatively small share of municipal revenues and therefore are insufficient to replace own-source revenues. As a result, no empirical support is found for H5, H5a, or H5b.

Finally, IPVA transfers exhibit a positive relationship with municipal fiscal effort across all groups analyzed. Because IPVA transfers are relatively small and cannot substitute for own-source revenues, municipalities appear to maintain incentives for local revenue generation. In addition, these transfers may contribute to improvements in administrative capacity, including tax enforcement, cadastral updating, and revenue management. Consequently, the results do not support H6, H6a, or H6b, as no evidence is found that IPVA transfers reduce municipal fiscal effort.

These findings have important implications for the design of intergovernmental transfer systems and local fiscal incentives. The negative effect of FPM transfers on own-source revenue collection suggests that unconditional transfers may weaken incentives for local tax mobilization, particularly in municipalities with greater revenue-generating capacity. This result indicates that transfer systems should be carefully designed to avoid creating fiscal dependency and reducing incentives for strengthening local tax administration and revenue collection efforts.

More broadly, the results suggest that the effects of intergovernmental transfers on fiscal effort depend on their institutional design. While FPM transfers appear to reduce incentives for own-source revenue generation, ICMS transfers show no significant effect and IPVA transfers are positively associated with fiscal effort. These findings indicate that transfers linked to local economic activity or accompanied by incentives for administrative capacity may support fiscal sustainability without undermining municipal autonomy. Therefore, the study contributes to broader debates in fiscal federalism by showing that fiscal dependency is not an inevitable consequence of decentralization but rather a function of how transfer mechanisms are structured.

5.1 Summary of Hypotheses

Table 8 summarizes the results of the hypotheses in this study.

Table 8. Summary of results

Hypotheses	Result
H1 – Transfers from the FPM positively influence municipal spending.	Supported
H1a – Transfers from the FPM positively influence the spending of the poorest municipalities.	Supported
H1b – Transfers from the FPM positively influence the spending of wealthier municipalities.	Supported
H2 – ICMS transfers positively influence municipal spending.	Supported
H2a – ICMS transfers positively influence the spending of the poorest municipalities.	Supported
H2b – ICMS transfers positively influence the spending of wealthier municipalities.	Not Supported
H3 – Transfers of IPVA positively influence municipal spending.	Supported
H3a – Transfers of IPVA positively influence the spending of the poorest municipalities.	Supported
H3b – Transfers of IPVA positively influence the spending of wealthier municipalities.	Supported
H4: Transfers from the FPM negatively impact municipal revenue.	Supported
H4a: Transfers from the FPM negatively impact the revenue of the poorest municipalities.	Not Supported
H4b: Transfers from the FPM negatively impact the revenue of wealthier municipalities.	Supported
H5: ICMS transfers negatively impact municipal revenue.	Not Supported
H5a: ICMS transfers negatively impact the revenue of the poorest municipalities.	Not Supported
H5b: ICMS transfers negatively impact the revenue of wealthier municipalities.	Not Supported
H6: Transfers of IPVA negatively impact municipal revenue.	Not Supported
H6a: IPVA transfers negatively impact the revenue of the poorest municipalities.	Not Supported
H6a: Transfers of IPVA negatively impact the revenue of wealthier municipalities.	Not Supported

6. Conclusion

This study examined the effects of intergovernmental transfers on municipal expenditures and fiscal effort in Bahia between 2013 and 2023, considering different groups of municipalities. The results indicate that, although transfers play an important equalizing role, they also stimulate public spending, providing evidence consistent with the flypaper effect. Regarding fiscal effort, the findings offer only partial support for the Veil of Oates Hypothesis, as FPM transfers are associated

with lower own-source revenue generation, whereas ICMS and IPVA transfers do not appear to discourage municipal fiscal effort.

The effects of transfers on public spending vary across municipalities. Federal and state transfers exert a stronger influence on municipalities with lower expenditure levels, reflecting their greater dependence on external resources and more limited capacity to generate own-source revenues. Although transfers also increase spending among municipalities with higher expenditure levels, the estimated effects are generally smaller.

With respect to fiscal effort, FPM transfers are associated with a reduction in own-source revenue generation, particularly among municipalities with greater revenue capacity. In contrast, this effect is not observed among municipalities with lower revenue levels, whose limited tax bases restrict their ability to expand local revenue collection regardless of the volume of transfers received.

This study contributes to the literature on fiscal federalism by demonstrating that intergovernmental transfers affect municipal fiscal behavior through multiple channels. The results show that transfers not only influence public expenditures but may also alter incentives for local revenue mobilization. Moreover, these effects are heterogeneous and depend on the economic and fiscal characteristics of municipalities.

From a policy perspective, the findings suggest that transfer systems should consider differences in municipal fiscal capacity and economic structure. Designing transfer mechanisms that preserve incentives for local revenue generation while maintaining their redistributive role may help strengthen municipal fiscal sustainability and reduce excessive dependence on external resources.

The results should be interpreted considering the institutional and economic characteristics of Bahia. Although the state provides an appropriate setting for examining fiscal federalism, differences in administrative capacity, economic development, and political conditions may produce distinct outcomes in other contexts. Therefore, caution is warranted when generalizing these findings to other Brazilian states or countries.

This study has some limitations. First, the analysis is restricted to municipalities in Bahia; therefore, the findings should not be generalized to other Brazilian states or countries without caution, as institutional and socioeconomic conditions may differ substantially. Second, although fixed-effects models help control for unobserved heterogeneity, endogeneity concerns may remain due to potential reverse causality and omitted variables. Data limitations at the municipal level prevent the inclusion of some political, institutional, and administrative factors that may influence both transfers and fiscal behavior.

Future research could extend this analysis by comparing municipalities across different Brazilian regions and incorporating variables related to administrative capacity, such as fiscal digitalization, tax administration, and governance indicators. Additional studies could also investigate whether political alignment with state or federal governments influences municipal spending patterns and own-source revenue generation.

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