

“The flypaper effect in the health area: An analysis of the municipalities of Mato Grosso State, Brazil”

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THE FLYPAPER EFFECT IN THE HEALTH AREA: AN ANALYSIS OF THE MUNICIPALITIES OF MATO GROSSO STATE, BRAZIL

Abstract

The flypaper effect, explained by the theory of fiscal illusion, occurs when funds transferred from other levels of government increase spending more than funds derived from local tax revenues. This study empirically analyzes the flypaper effect on the sources of funds derived from parliamentary amendments allocated to the health sector. A quantitative and descriptive approach is used, based on a panel of data from 140 municipalities in Mato Grosso, a state located in the central-western region of Brazil, covering the period from 2014 to 2024. Employing a fixed-effects panel data regression model (estimated via OLS), the study controls for unobserved, municipality-specific characteristics that remain constant over time. The analyses confirm the occurrence of the flypaper effect in the municipalities of Mato Grosso, showing that intergovernmental transfers have a greater capacity to induce health spending than own-source revenue. The results show that the fiscal stimulus generated by external resources is significantly stronger than the increase in local government revenue. On the other hand, parliamentary amendments exert a positive impact, although marginal, acting as complementary resources that do not compromise budgetary rigidity and do not serve as the main driver of expenditure expansion during the period. The relevance of this study stems from its contribution to understanding Brazilian fiscal federalism, offering valuable empirical evidence.

Keywords

flypaper effect, parliamentary amendments, public health, Mato Grosso, Brazil

JEL Classification

H83, H77, H72, I18, H71

INTRODUCTION

In Brazilian fiscal federalism, intergovernmental transfers are essential for financing local public services. However, this dynamic frequently triggers the flypaper effect, a phenomenon where resources transferred from higher levels of government expand local public spending significantly more than an equivalent increase in local own-source revenues or citizen income (Rios & Costa, 2005; Oates, 1988).

Although it is a well-established concept, analysis of the impact of the flypaper effect from the perspective of specific revenue sources, such as parliamentary amendments, remains limited in the literature. These amendments represent a transfer modality characterized by strong political and discretionary leverage, with flows and allocations that do not necessarily adhere to strictly technical criteria or social demands. This discretionary nature raises a central question for fiscal management: to what extent do parliamentary amendments allocated to health in the municipalities of Mato Grosso generate a flypaper effect of a different magnitude compared to local revenues and other intergovernmental transfers?

In light of this issue, it is interesting to conduct an empirical analysis of the flypaper effect on funding sources resulting from parliamentary amendments allocated to the health sector.

1. LITERATURE REVIEW AND HYPOTHESES

1.1. Fiscal illusion and flypaper effect

The study of fiscal illusion and the flypaper effect is crucial to understanding the dynamics of public finance. The fiscal illusion, a theory developed by Puviani (1903), is understood as a general sense of alienation and ignorance among citizens regarding taxation, which is sometimes viewed as an accident or “side effect” and other times as an instrument or tool of domination (Puviani, 1903 cited in Cunha, 2025). According to Berner (2021), the theory of illusion posits that the government creates methods to collect taxes with little awareness on the part of taxpayers, making them less resistant to taxation. The intent of public policy makers is to propose taxes that appear lower than they are, thereby enabling the exercise of the powers granted to them (Afonso, 2014).

Fiscal illusion finds its most direct expression in municipal finance through the so-called flypaper effect. The term derives from the idea that “money sticks where it lands”: resources transferred by the central government tend to be spent by recipient municipalities rather than returned to taxpayers in the form of tax reductions (Paz et al., 2020; Rios & Costa, 2005). Oates (1988) and Dollery and Worthington (1996) explain this phenomenon as a result of municipal managers perceiving a “reduced” price for public services when they are financed by external resources, thereby inducing budget expansion. Grossman (1990) complements this perspective by demonstrating that the greater the level of dependence on subsidies and public utility profits, or the smaller the proportion of revenue from other sources, the higher the level of illusion.

The Brazilian empirical literature on the flypaper effect yields heterogeneous results. Costa and Castelar (2015), analyzing 5,293 municipalities from 1999 to 2009, found no consistent evidence of the phenomenon. Conversely, Almeida (2015), using panel data from 5,507 municipalities (2002–2010) with fixed and random effects estimators, identified an expan-

sionary spending effect greater than that generated by an equivalent increase in local income. Nojosa and Linhares (2018) confirm the presence of the phenomenon in Brazilian municipalities with significant regional variability in magnitude. Diniz et al. (2017), in an analysis of municipalities in Paraíba, document transfer elasticities higher than those of own-source revenues, reinforcing that the flypaper effect transcends regions and spending functions.

Galdino and da Silva (2025) analyzed functional expenditures of the central government (2009–2024) using Autoregressive Distributed Lag (ARDL) and Nonlinear Distributed Lag (NARDL) models. They found fiscal synchronism in health, education, and social assistance functions, suggesting that these expenditures adjust slowly to changes in revenue collection, which reinforces the budgetary rigidity of the health sector and has direct implications for interpreting the municipal flypaper effect.

1.2. Fiscal federalism and government transfers

Federalism is a system of power sharing between central and regional governments, striking a balance between a unitary state and a confederation, in which autonomous entities organize themselves under a federal pact to form a sovereign unit, as exemplified by the Union in the Brazilian context (Coser, 2008). The Intergovernmental Transfers are (for the most part) the transfer of current or capital resources between federal entities; specifically, when the transfer involves financial resources, they are referred to as Fiscal Transfers (Ministry of Finance of Brazil, 2018). They constitute an important tool for financing the various functions and responsibilities of subnational governments, and their implementation ensures the execution of more uniform public policies throughout the national territory (Sakurai, 2013; Caetano et al., 2017).

In the post-1988 Constitution of Brazil, the expansion of municipal responsibilities increased dependence on federal and state funds. Nationally, unconditional transfers account for approximate-

ly 40% of municipalities' total revenues, while their own tax revenue accounts for only 20% (Nojosa & Linhares, 2018). It is in unconditional transfers that the flypaper effect manifests itself most intensely. Instead of returning the funds to taxpayers through tax cuts, public officials use the availability of these funds to increase the budget, creating the perception of a tax cut to finance local spending programs (Oates, 1988; Dollery & Worthington, 1996). According to Rezende (2007), the role of these transfers is to promote a balance between the responsibilities of each level of government and the resources they receive. However, Rodden (2005) acknowledges the possibility that this may facilitate tax competition among governments, increasingly leading to a smaller public sector.

One aspect frequently overlooked in the literature on the municipal flypaper effect is its interaction with local collection inefficiency. Valentin and Caldeira (2025), analyzing 636 São Paulo municipalities using Data Envelopment Analysis (DEA) and bootstrap methods, demonstrated that the current transfer model discourages municipalities, particularly smaller ones, from pursuing efficient own-source revenue collection, especially via property tax (IPTU). Among the analyzed municipalities, 85.84% exhibited increasing returns to scale and technical collection inefficiency. Gasparini and Miranda (2011) corroborate this finding by identifying that municipal public revenues could nearly double if tax bases were properly explored. This evidence is directly relevant to Mato Grosso municipalities. Here, the high dependence on transfers (a 4:1 ratio relative to own-source revenue) may reflect not only economic heterogeneity, but also the strategic choice to underexploit own-source revenue given the certainty of intergovernmental remittances.

Transfers can be classified as conditional or unconditional. Conditional transfers are those in which funds are earmarked for a specific, pre-designated area, while unconditional transfers occur when using funds is not tied to a specific purpose, which may imply greater autonomy for the recipient government regarding expenditures made using the funds received (Diniz et al., 2017, p. 98). It is through unconditional transfers, especially the Municipal Participation Fund (FPM), that the

flypaper effect manifests most intensely (Granai, 2022). However, health-linked conditional transfers create spending floors that limit budgetary redirection capacity, contributing to the rigidity identified by Galdino and da Silva (2025).

1.3. Parliamentary amendments and health

Parliamentary amendments (EPs) represent a *sui generis* mechanism of fiscal transfer. Unlike constitutional transfers, which are automatic, predictable, and formula-based, amendments are discretionary, dependent on political negotiation between legislators and the Executive Branch, and historically used as instruments of budgetary clientelism (Baptista et al., 2012). Implemented through amendments to the Annual Budget Bill (LOA), they were originally authorized on a discretionary basis; as of Constitutional Amendment No. 86/2015, they became mandatory for individual amendments, while Constitutional Amendments No. 100/2019 and 126/2022 progressively expanded this obligation (Ministry of Racial Equality of Brazil, 2025).

In the political-electoral sphere, Leal et al. (2025) identified a positive and statistically significant association between increased funding from budget amendments for healthcare and the probability of mayors' reelection. Party alignment between the mayor and the legislator influences the allocation of larger funds, reinforcing the mayor's image as an "efficient manager" or "capable of attracting resources," which directly influences voters' decisions. Between 2014 and 2023, legislators demonstrated a clear preference for direct transfers to municipalities, which absorbed, on average, 73.6% of total expenditure through amendments (Vieira, 2024).

The rise of EPs has profound implications for the financing of the Unified Health System (SUS), especially in Primary Health Care (PHC). Ulinski et al. (2024) identified a serious allocative imbalance in favor of municipalities with smaller populations, with differences of up to 16 times in per capita spending between municipalities with fewer than 5,000 inhabitants and those with more than 500,000. This scenario highlights distortions caused by the fragmentation of resources during the period evaluated. Additionally, the growth of budget amendments drastically reduced the Ministry of Health's (MOH)

ability to determine the allocation of discretionary spending. According to Vieira (2024), more than half of discretionary expenditures on Public Health Actions and Services (PHAS) came to be determined by the National Congress.

We also see a substitution effect: municipalities reduced the share of their own funds allocated to primary health care (PHC) when they received budget amendments, redirecting the savings to other expenditures (Ulinski et al., 2024). In addition to tax-related amendments, the expansion of rapporteur amendments has broadened parliamentary influence over federal resources (Piola & Vieira, 2019). According to Couto and Cardoso Junior (2024), this strengthening of the Legislative Branch as a priority-setter may negatively impact the supply of and access to public services in the country. The pattern observed by Valentin and Caldeira (2025) is particularly relevant: municipalities that receive high volumes of transfers, whether constitutional or through amendments, have less incentive to develop their own revenue-raising capacity, perpetuating fiscal dependence and amplifying fiscal illusion.

Conducting studies on health resources is of utmost importance for both public sector management and the supplementary (private) health sector, given the direct implications for the population's quality of life and the financial sustainability of institutions. The decentralization of the SUS in Brazil has brought social benefits, but its complex financing structure and high level of information asymmetry make the sector vulnerable to illicit acts and the phenomenon of rent-seeking (Albuquerque & Souza, 2017; Avelino & Biderman, 2014). As highlighted by Almeida-Santos et al. (2024), this behavior often manifests itself through the aggressive use of discretionary budgetary policies to legally divert resources, generating private benefits at the expense of diffuse social costs and resulting in levels of well-being significantly below the expected potential for the local population.

1.4. Research hypotheses

Fiscal illusion theory (Puviani, 1903; Oates, 1988) holds that voters do not perceive the real cost of services financed through intergovernmental transfers, making the opportunity cost appear

null. This phenomenon induces local managers to expand public spending beyond the level that could be sustained solely by own-source revenue, configuring the flypaper effect (Araújo & Siqueira, 2016).

In the municipal context, parliamentary amendments are discretionary and politically motivated, distinguishing them from automatic and constitutional transfers (FPM, ICMS revenue-sharing, IPVA, etc.¹). Since they are perceived as “external resources” obtained through a legislator's political effort, voters tend to exhibit an even more pronounced fiscal illusion (Nojosa & Linhares, 2018). Furthermore, the magnitude of this illusion is directly linked to the share of transfers in total revenue (Grossman, 1990) and to the asymmetry in expenditure responses, which tend to be sticky, rising faster during periods of revenue growth than they fall during periods of contraction (Sakurai, 2013; Richartz & Borgert, 2020).

This study aims to measure the marginal effect of budget amendments on these expenditures to identify evidence of the flypaper effect. The health sector constitutes the ideal locus for testing these premises due to its strong dependence on external resources and its concentration of the largest volume of parliamentary amendments. Moreover, it is worth mentioning an empirical gap in the regional literature (Grossman, 1990; Nojosa & Linhares, 2018; Sakurai, 2013; Albuquerque & Souza, 2017; Diniz et al., 2017; Vieira, 2024; Almeida-Santos et al., 2024; Ulinski et al., 2024; Leal et al., 2025). Based on this theoretical framework, the following research hypotheses are formulated:

H1: Intergovernmental transfers, especially parliamentary amendments, exert a marginal impact on municipal health expenditures, significantly greater than that of own-source revenues, characterizing the flypaper effect.

H2: Municipalities with greater relative dependence on parliamentary amendments in their health budgets exhibit higher overall expenditure elasticity, indicating that the concentration of this source amplifies the flypaper effect.

1 Municipal Participation Fund (FPM); Tax on the Circulation of Goods and Services (ICMS); Motor Vehicle Property Tax (IPVA).

H3: Municipal health expenditures react asymmetrically to variations in parliamentary amendments, showing proportionally larger expenditure increases than reductions during periods of revenue contraction.

2. METHOD

This study adopts a quantitative and descriptive approach to analyze the impact of the flypaper effect on health costs in 140 municipalities in the state of Mato Grosso, Brazil, from 2014 to 2024. The study employs a fixed-effects panel data modeling approach, estimated via Ordinary Least Squares (OLS) following the within transformation. This approach allows for controlling unobserved, municipality-specific characteristics that remain constant over time, thereby mitigating potential omitted variable bias. The choice of this study model is justified by the fact that, although the flypaper effect can be interpreted as an aspect of budget management, it may also signal the pursuit of resources in the public budget through rent-seeking actions (Almeida-Santos et al., 2024).

The data were obtained from public databases based on document analysis, including Health Expenditures and Revenues collected from the Institute of Applied Economic Research (IPEA) and the National Health Fund (FNS) Panels; Parliamentary Amendments Extracted from the Transparency Portal, detailing flows and allocations; and Socioeconomic Data Collected from the Brazilian Institute of Geography and Statistics (IBGE). All expenses and revenue variables are expressed in constant values, deflated by the Broad National Consumer Price Index (IPCA). The dependent variable is defined by municipal expenditures on public health actions and services. The independent variables include municipal own-source revenues, constitutional and statutory transfers, and parliamentary amendments.

As a methodological boundary, it is worth noting that the pandemic period (2020–2021) represented an extraordinary exogenous shock to public finances, introducing structural anomalies to both revenue generation and the rigidity of municipal health expenditures. Although incorporating spe-

cific controls for COVID-19 falls outside the delimited scope of this model, the inability to isolate this shock is recognized as an analytical limitation of this study. Consequently, future research should consider employing structural break tests or specific time-frame subsamples to evaluate the behavior of the flypaper effect strictly within the context of public health crises.

2.1. Analysis of the effect as a component of revenue

The equation models the growth of municipal health expenditures as a function of changes in revenue, incorporating an interaction term that captures possible asymmetries in the response of expenditures to increases or decreases in revenue. The model is as follows:

$$\begin{aligned} & \log \left[\frac{desp_saude_i}{desp_saude_{i,t-1}} \right] \\ &= \beta_0 + \beta_1 \log \left[\frac{receita_{i,t}}{receita_{i,t-1}} \right] \\ &+ \beta_2 dummy_{i,t} \cdot \log \left[\frac{receita_{i,t}}{receita_{i,t-1}} \right] + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

where $desp_saude_{i,t}$ is the dependent variable, representing municipal expenditure on public health actions and services. i corresponds to each observed municipality, t corresponds to each year, and $t-1$ indicates the previous period. $Receita_{i,t}$ corresponds to the municipality's total revenue in the same period. $Dummy_{i,t}$ is a binary variable that takes the value 1 when there is an increase in revenue compared to the previous period ($Revenue_{i,t} > Revenue_{i,t-1}$) and 0 when there is a decrease or stagnation. $\varepsilon_{i,t}$ is the random error term, which captures unobserved effects.

The coefficient β_1 measures the average effect of revenue variation on health spending; β_2 captures the differential when revenue grows. If $\beta_2 > 0$ and significant, revenue increases generate a proportionally larger expansion of expenditures than reductions, evidence of budgetary rigidity consistent with the flypaper effect. If β_2 is insignificant or negative, fiscal behavior is symmetric, and the phenomenon is not characterized.

2.2. Analysis of the effect with interaction between variables

Another approach is to retain total revenue and create an interaction term that captures the dependence of the budget-on-budget amendments. The equation is:

$$\begin{aligned} & \log\left(\frac{desp_saude_i}{desp_saude_{i,t-1}}\right) \\ &= \beta_0 + \beta_1 \log\left(\frac{receita_{i,t}}{receita_{i,t-1}}\right) \\ &+ \beta_2 \left[\log\left(\frac{receita_{i,t}}{receita_{i,t-1}}\right) \cdot \frac{emendas_{i,t}}{receitas_{i,t}} \right] + \varepsilon_{i,t}, \end{aligned} \quad (2)$$

where (*amendments / revenue*) measures the dependence of the budget on amendments.

For the municipality's total revenue, the β_1 coefficient measures the impact of total revenue on health spending, and the β_2 coefficient measures the impact of the interaction between revenue and the proportion of amendments on health spending.

If the coefficient of the interaction variable (β_2) is positive and significant, this indicates that the greater the weight of the amendments, the greater the effect of total revenue on health spending, which corroborates the flypaper effect.

2.3. Analysis of the effect as an additional level variable

This model includes the growth of appropriations directly in the calculation to determine whether they have an additional effect on spending, independent of overall revenue growth. The equation is:

$$\begin{aligned} & \log\left(\frac{desp_saude_i}{desp_saude_{i,t-1}}\right) = \beta_0 \\ &+ \beta_1 \log\left(\frac{receita_{i,t}}{receita_{i,t-1}}\right) \\ &+ \beta_2 \log\left(\frac{emendas_{i,t}}{emendas_{i,t-1}}\right) + \varepsilon_{i,t} \end{aligned} \quad (3)$$

If the coefficient for appropriations (β_2) is positive and significant, this indicates that appropriations do not substitute for, but rather increase, health spending (flypaper effect). If it is not significant, it may indicate a substitution effect.

To deepen our analysis, dummy and interaction variables are created, based on the methodology of Anderson et al. (2003) and adapted for public sector studies (Richartz & Borgert, 2020). This approach allows us to test the assumption that expenditure reacts differently to increases and decreases in transferred revenues. The analysis focuses on verifying whether budget increases have a greater impact on spending than budget decreases, revealing budget rigidity that complements the analysis of the flypaper effect.

The regression model is used to examine how public expenditures respond to changes in public revenues, with a description of the respective periods. The interaction equation for this analysis is:

$$\beta_3 \text{dummy_emenda}_{i,t} \cdot \log\left[\frac{emendas_{i,t}}{emendas_{i,t-1}}\right]. \quad (4)$$

The dummy variable (Dummy_Amendment) takes the value 1 for an increase in amendments and 0 for a reduction, with β_3 measuring the asymmetric impact on health expenditures. Robustness controls include municipal population, GDP share, and election-year dummy variables.

For the flypaper interpretation: if $\beta_2 > \beta_1$, transfers exert a disproportionately greater stimulus on health spending than own-source revenue, confirming the flypaper effect; if $\beta_2 \approx \beta_1$, no effect is identified; if β_2 is negative or insignificant, amendments merely displace existing resources without expanding total health expenditure, a substitution effect.

3. RESULTS AND DISCUSSION

The analysis was based on a panel dataset of 140 municipalities in Mato Grosso covering the period 2014–2024, totaling 1,540 observations. The municipality of Santo Antônio do Leverger was excluded due to missing data. Tables 1 and 2 present descriptive statistics in absolute nominal values and per capita terms, respectively.

Table 1. Analysis of expenditure, revenue, transfers, and amendments for the state of Mato Grosso from 2014 to 2024

Variables	Count	Average (R\$)	Standard Deviation (R\$)	Minimum (R\$)	Maximum (R\$)
Functional expenditure (VGA)	1,540	30,534,100	89,333,100	1,594,060	1,262,300,000
Own revenue	1,540	19,203,200	77,188,000	21,656	1,369,380,000
Transfer revenue	1,540	77,323,500	159,116,000	2,729,400	2,275,790,000
Amendments	1,540	1,655,180	10,313,800	0	255,893,000
Population	1,540	22,768	57,627	1,010	650,877

Table 2. Analysis of the per capita variables for expenditures, revenue, transfers, and state amendments in the state of Mato Grosso for the period from 2014 to 2024

Variables	Count	Average	Standard Deviation	Minimum	Median (50%)	Maximum
Expenditure	1,540	1,717.87	1,119.55	231.06	1,447.90	8,616.27
Revenue	1,540	0.50	0.40	0.01	0.41	6.30
Transfer	1,540	15.40	24.21	0.23	10.40	681.10
Amendment	1,540	0.017	0.022	0.000	0.012	0.417

Average health expenditure (BRL 30.5 million) exhibits a standard deviation nearly three times its mean, reflecting extremes ranging from Araguaína (BRL 1.6 million) to Cuiabá (BRL 1.26 billion). Constitutional transfers exceed own-source revenue by approximately four times, evidencing high structural dependence on external resources, a necessary condition for the manifestation of the flypaper effect. Parliamentary amendments display the highest relative volatility (SD = 6.2 times the mean), with some municipalities receiving no transfers at all and others receiving amounts above BRL 250 million, justifying the isolation of this source as a separate variable in the models. The pronounced fiscal and demographic heterogeneity across municipalities supports the use of fixed effects estimation.

Per capita scaling mitigates the effect of population size without altering the dispersion pattern: transfers and amendments maintain high relative variability (SD/Mean > 1), reinforcing the need for fixed effects controls. Maximum values far from the mean indicate municipalities with atypical characteristics, precisely the heterogeneities captured by the panel data model.

3.1. Regression results

Analysis of the regression test results allows for a preliminary assessment of the occurrence of the flypaper effect in health expenditures in Mato Grosso municipalities. The interpretation considers the three regression models tested, where the

dependent variable is always expenditure (municipal spending on public health actions and services). Table 3 summarizes the results of the fixed-effects regression, where the dependent variable is the logarithm of health expenditure in municipality i at time t .

Table 3. Summary of results from the fixed-effects regression of models with level variables (Log-Level)

Variable	Value	(Dependent Interaction)
Own Revenue	0.158*** (0.016)	0.160*** (0.016)
Transfers	0.211*** (0.017)	0.211*** (0.017)
Amendments	0.012* (0.007)	0.012* (0.007)
Total Revenue × Amendment/ Total Revenue		0.021 (0.023)
Fixed effect	SIM	SIM
R ² (Within)	0.570	0.570
N	1,540	1,540

Note: Values in parentheses are Standard Errors (Robust). *** $p < 0.01$; * $p < 0.1$.

The M1 model presented in Table 4 tests the classic flypaper hypothesis, which posits that external revenue (transfers) and amendments have a greater impact on local spending than internal revenue (own revenue).

The regression results confirm the presence of the classic flypaper effect in the municipalities of Mato Grosso. The coefficient for constitution-

Table 4. M1: Classic flypaper effect test

Coefficient	Value	Interpretation	Implication for flypaper
Own revenue	0.158***	A 1% increase in Own Revenue leads to a 0.158% increase in health expenditure	Basic expenditure elasticity with respect to internal revenue
Transfers	0.211***	A 1% increase in Amendments leads to a 0.012% increase in health expenditure	Expenditure elasticity in relation to specific transfers (amendments)
Amendments	0.012*	A 1% increase in Amendments leads to a 0.012% increase in health expenditure	Expenditure elasticity in relation to specific transfers (amendments)

Note: *** $p < 0.01$; * $p < 0.1$.

al and statutory transfers (0.211) exceeds that for own-source revenue (0.158), indicating that the stimulus to health spending via external resources is 33.5% greater than that generated by local tax capacity. This finding corroborates the theory that external capital tends to be fully absorbed by the public budget rather than being converted into tax relief for local taxpayers.

As for parliamentary amendments, the coefficient (0.012) is positive and marginally significant ($p < 0.10$), suggesting a limited additionality effect. Although the positive sign rules out a full substitution effect, where external funds would merely displace local investment into other areas, the small magnitude indicates that amendments do not act as the primary driver of spending expansion compared to general transfers.

In this respect, the results differ from the findings of Ulinski et al. (2024), who documented, for Primary Health Care at the national level, that municipalities receiving amendments proportionally reduced the share of own-source resources allocated to the sector. In Mato Grosso, amendments function as a genuinely complementary source of funding. The small magnitude of the coefficient (0.012) is consistent with the structural nature of amendments as a financing instrument. Piola and Vieira (2019) note that their flow is tied to political negotiations and the electoral calendar, generating the high volatility observed in the data, a standard deviation 6.2 times greater than the mean. Furthermore, Leal et al. (2025) demonstrated that partisan alignment between the mayor and the legislator is a determining factor in the

volume of amendments received, introducing an electoral logic that does not necessarily respond to local health care needs with the regularity required by multi-year budget planning. Therefore, the hypothesis *H1*, that structural dependence on amendments severely amplifies the flypaper effect finds limited statistical support in this sample.

Table 5 illustrates Model M2, which tests the hypothesis *H2* that a budget's reliance on amendments amplifies the impact of total revenue.

The coefficient of interaction (0.021) is positive but not statistically significant, leading to the rejection of *H2*. There is no evidence that the proportion of amendments in the total budget significantly alters the stimulative effect of total revenue on health spending.

This result is theoretically relevant: it indicates that the flypaper effect identified in Mato Grosso is a property of regular, predictable, and higher-volume transfers (FPM, SUS-linked transfers, FUNDEB) and is not amplified by the discretionary nature of parliamentary amendments. Couto and Cardoso Júnior (2024) and Vieira (2024) document that the growth of mandatory amendments reduced the Ministry of Health's capacity to centrally plan resource allocation, a relevant phenomenon at the federal level, but one that, according to the municipal data from Mato Grosso, has not yet translated into an amplification of local budget-maximizing behavior. This suggests that the flypaper effect identified in Model M1 is a general phenomenon of transfers and is not amplified by budgetary dependence on amendments.

Table 5. M2: Budget dependency and interaction

Variables	Coefficient	Interpretation	Implication for flypaper
Total Revenue × Amendments / Total Revenue	0.021	Effect of dependence on Amendments on the expenditure elasticity of total revenue	Test of amplification of the flypaper effect

Table 6. M3: Costs asymmetry

Variable	Coefficient	Significance	Interpretation
Amendments	0.003	Not Significant	Additional effect of log (Amendments) when there is an INCREASE (<i>Dummy</i> = 1).

In contrast, Model M3, described in Table 6, tests whether increases in amendments have a different effect than reductions (budgetary rigidity).

The asymmetrical coefficient (0.003) is positive but not statistically significant (p -value greater than 0.10). The total impact of a reduction in amendments is given solely by the base term (0.012). An increase in amendments would be the sum of the two terms ($0.012 + 0.003 = 0.015$). The absence of statistically significant asymmetry contrasts with the findings of Galdino and da Silva (2025) for the health function at the central government level, where negative fiscal shocks produced more lasting impacts than positive ones, and with the asymmetry in general transfers documented by Sakurai (2013) for Brazilian municipalities. The difference can be attributed, to a large extent, to the marginal scale of amendments in the municipal budget: with an average share of only 2.1% of total revenue, amendments fall below the threshold at which the methodology of Anderson et al. (2003), adapted by Richartz and Borgert (2020) for the public sector, has sufficient statistical power to detect asymmetries. There is therefore no evidence of budgetary rigidity driven by parliamentary amendments: health expenditures react symmetrically to increases and decreases in this specific revenue source.

Table 7 summarizes the results of the fixed effects (FE) regression, where the dependent variable is the logarithm of per capita health spending ($\log(\text{health spending}/\text{population})$), and the independent revenue variables are also in logarithmic form per capita.

The economic interpretation and flypaper effect (Log-Per Capita) in M1 (Table 8), using per capita variables, is the most robust model for testing the flypaper effect and the elasticity of spending relative to revenue, while controlling for municipality size.

The coefficient for transfers (0.219) is significantly higher than that for own-source revenue (0.117). The elasticity of transfers is nearly double that of own-source revenue. A more pronounced result than in the level specification (0.211 vs. 0.158). Controlling for population size amplifies the evidence of the flypaper effect: smaller municipalities, with greater per capita dependence on transfers, are proportionally more susceptible to fiscal illusion, as demonstrated by Grossman (1990). Diniz et al. (2017) identified a similar pattern for municipalities in the state of Paraíba.

The classic flypaper effect is not only confirmed but becomes even more evident when the vari-

Table 7. Summary of results from the fixed-effects regression (in per capita terms)

Variable	M1	M2	M3
$\log(\text{Own Revenue}_{i,t} / \text{Population}_{i,t})$	0.117*** (0.019)	0.120*** (0.019)	0.120*** (0.019)
$\log(\text{Transfers}_{i,t} / \text{Population}_{i,t})$	0.219*** (0.023)	0.219*** (0.023)	0.219*** (0.023)
$\log(\text{Amendments}_{i,t} / \text{Population}_{i,t})$	0.016* (0.009)	0.016* (0.009)	0.017* (0.009)
$\log(\text{Amendments}_{i,t} / \text{Population}_{i,t}) \times \text{Dummy}_{i,t}$			-0.007 (0.007)
$\log(\text{Total Revenue}_{i,t} / \text{Population}_{i,t}) \times \text{Amendments}_{i,t} / \text{Total Revenue}_{i,t}$		-0.024 (0.029)	
Fixed Effects	Yes	Yes	Yes
R ² (Within)	0.570	0.570	0.570
N	1,540	1,540	1,540

Note: Values in parentheses are Standard Errors (Robust). *** $p < 0.01$; * $p < 0.1$.

Table 8. M1: Confirmation of the flypaper effect and the impact of amendments

Coefficient	Value	Interpretation	Implication for flypaper (Per Capita)
log(Own-Source Revenue per capita)	0.117***	A 1% increase in Own-Source Revenue per capita leads to a 0.117% increase in VGA per capita	Decrease in elasticity compared to the previous model (0.158)
log(Per capita transfers)	0.219***	A 1% increase in per capita transfers leads to a 0.219% increase in per capita VGA	Elasticity remains stable and dominant
log(Per capita amendments)	0.016*	A 1% increase in per capita amendments leads to a 0.016% increase in per capita health spending	Marginally significant elasticity

Note: ***p < 0.01; *p < 0.1.

ables are scaled by population, highlighting the strong stimulatory power of per capita transfers on per capita health spending. The coefficient for amendments (0.016) remains positive and marginally significant ($p < 0.10$), and slightly higher than in the previous model (0.012). Even on a per capita basis, the impact of amendments on health spending is very small compared to other sources, confirming that this is a marginal and additional effect, but not the main driver of spending growth.

Table 9 presents the M2 model results. The interaction coefficient ($\beta_{Int} = -0.024$) is negative and not statistically significant. As in the log-level model, there is no evidence that the dependence on amendments amplifies (or, in this case, damp-

ens) the effect of total revenue on spending. The phenomenon remains a property of constitutional and statutory transfers, robust to the per capita specification, confirming the rejection of $H2$.

Table 10 presents the M3 model results. The asymmetry coefficient ($\beta_{Ass} = -0.007$) is negative and not statistically significant. There is no evidence that health spending reacts asymmetrically to increases or decreases in amendments. The low marginal impact of amendments (0.017) holds, regardless of the direction of the variation, confirming the rejection of $H3$. This reinforces that parliamentary amendments, with an average share of only 2.1% of total municipal revenue, do not generate the budgetary rigidity expected by the theory of

Table 9. M2: Interaction and budgetary dependence

Variable	Coefficient	Significance	Implication for flypaper (Interaction)
log (Total Revenue per capita) × Amendments/Total Revenue (β_{Int})	-0.024	Not Significant	Impact of dependence on amendments on the expenditure elasticity of Total Revenue

Table 10. M3: Analysis of cost asymmetry

Variable	Coefficient	Significance	Implication for flypaper (Asymmetry)
log(Amendments per capita) × Dummy(β_{Ass})	-0.007	Not Significant	Additional effect of log(Amendments per capita) when there is an INCREASE

Table 11. The log-per capita models

Hypothesis Tested	Result	Conclusion
Classic flypaper effect (Transfers > Own revenue)	Confirmed: (0.219) > (0.117)	Overall, per capita transfers have a significantly greater stimulating effect on per capita health spending than own revenue
Flypaper effect of amendments	Additional, but Marginal: (0.016) is positive ($p < 0.1$), but very small	Amendments provide additional resources, but their impact is limited and they are not the main driver of spending growth
Amplification through Dependency	Rejected: Interaction coefficient not significant	The budget's dependency on amendments does not amplify the flypaper effect
Asymmetry / Rigidity	Rejected: Asymmetry coefficient not significant	There is no evidence that budget rigidity manifests differently in increases or decreases in amendments

Table 12. Evidence of the classic flypaper effect

Variable	Coeff. M1 (Log-Level)	Coeff. M1 (Log-Per Capita)	Comparison
log(Own Revenue)	0.158***	0.117***	Decrease when controlling population
log(Transfers)	0.211***	0.219***	More stable and dominant

Note: ***p < 0.01.

Anderson et al. (2003) as adapted by Richartz and Borgert (2020) for the public sector.

Table 11 provides a summary that reinforces the initial conclusions. The econometric analysis employed fixed-effects panel regression models, which are ideal for controlling for unobserved and time-invariant heterogeneity across municipalities, thereby ensuring the robustness of the fiscal elasticities. Two main sets of models were tested: one using Log-Level variables (M1 and M2) and another using Log-Per Capita variables (M1, M2, and M3), thereby controlling for the effect of population size.

The main objective of the study was tested in Models M1 (Log-Level) and M1 (Log-Per Capita) by comparing the expenditure elasticities of own-source revenue and transfers, as shown in Table 12.

In both models, the coefficient for transfer revenue is significantly higher than the coefficient for own-source revenue. In the Log-Per Capita model, the stimulatory power of transfers is nearly double that of own-source revenue (0.219 vs. 0.117). The results are robust and confirm the existence of the classic flypaper effect in the municipalities of Mato Grosso. This implies that an increase in external resources (constitutional and statutory transfers)

has a disproportionately greater impact on the expansion of health spending than an equivalent increase in local tax-raising capacity, corroborating the theory that the resource “sticks” to the level of government that receives it.

The models consistently isolate the impact of parliamentary amendments, as shown in Table 13. The coefficient for amendments is positive, which refutes the substitution effect hypothesis (where amendments would merely displace existing resources). Amendments are, therefore, additional resources for the health budget. However, the coefficient value (0.016) is very low compared to other revenue sources. This suggests that, although amendments contribute to health spending, their marginal effect is limited, and they are not the main driver of spending growth, unlike general transfers.

Table 14 shows that the hypotheses that amendments modify the expenditure elasticity of total revenue or generate asymmetric rigidity in spending were tested in Models M2 and M3.

The results indicate that the flypaper effect in Mato Grosso is a general phenomenon of transfers (M1) and is not amplified by the specificity of parliamentary amendments (M2 and M3). For munici-

Table 13. The marginal impact of parliamentary amendments

Variable	Coeff. M1 (Log-Level)	Coeff. M1 (Log-Per Capita)	Implication
log(Amendments)	0.012*	0.016*	Positive and marginally significant effect ($p < 0.1$)

Note: *p < 0.1.

Table 14. Interaction and asymmetry tests

Model	Hypothesis tested	Coefficient	Significance	Result
M2 (Interaction)	Does dependence on amendments amplify the flypaper effect?	0.021 (Log-Level) and -0.024 (Log-Per Capita)	Not Significant	Rejected: The proportion of amendments does not modify the effect of total revenue on spending
M3 (Asymmetry)	Does spending react differently to increases and decreases in amendments?	-0.007 (Log-Per Capita)	Not Significant	Rejected: There is no evidence of budget rigidity or asymmetric reaction

pal managers, this evidence reinforces the need for budget planning anchored in epidemiological and efficiency criteria, rather than solely in the availability of external transfers. Strengthening own-source tax revenue, particularly through property tax (IPTU) and services tax (ISS), would reduce the elasticity asymmetry identified and contribute to a more efficient allocation of SUS resources (Valentin & Caldeira, 2025). For legislators and

oversight bodies, the marginal and additional effect of amendments confirms their legitimate complementary role in municipal health financing. However, their high volatility, the unequal per capita distribution documented by Ulinski et al. (2024), and the dependence on political alignment identified by Leal et al. (2025), indicate that amendments should not be incorporated as a structural source in multi-year health planning.

CONCLUSION

This study empirically analyzed the occurrence of the flypaper effect in municipalities in Mato Grosso, Brazil, between 2014 and 2024, seeking to determine to what extent parliamentary amendments allocated to health in these municipalities generate a flypaper effect of a different magnitude compared to local revenues and other intergovernmental transfers. The results confirm that the flypaper effect in Mato Grosso is a structural phenomenon of constitutional and statutory transfers, and not of parliamentary amendments. The high dependence on external resources, at a ratio of approximately four times the average own-source revenue, creates the institutional conditions for fiscal illusion to manifest persistently and independently of the discretionary source of financing. In this sense, the phenomenon is not contingent on the volume or political nature of amendments: it is rooted in the very architecture of Brazilian fiscal federalism.

Parliamentary amendments, in turn, fulfill a legitimate complementary role: they add resources to the health budget without generating a substitution effect, but also without producing the budgetary rigidity or the amplification of the flypaper effect that part of the literature might predict. Their intrinsic volatility and electoral-political logic limit their capacity to function as a structural driver of spending, and it is precisely for this reason that they should not be incorporated into multi-year health planning as a regular source of financing.

The main contribution of this study lies in empirically distinguishing what political rhetoric frequently conflates: constitutional transfers and parliamentary amendments are not functionally equivalent in terms of their effects on public spending. This distinction is essential for municipal managers, legislators, and oversight bodies to accurately understand the actual drivers of budgetary expansion in health, and, on that basis, to design planning, transparency, and accountability mechanisms that effectively reduce fiscal illusion and direct public resources to where epidemiological need is greatest.

To advance this topic, future studies should investigate specific types of amendments (individual, caucus, and rapporteur) separately; analyze the influence of election years on the volatility of these transfers; and assess whether the “sticky money” from transfers results in actual improvements in health indicators or merely in the expansion of public bureaucracy.

AUTHOR CONTRIBUTIONS

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DECLARATION OF GENERATIVE AI IN THE WRITING PROCESS

In preparing this manuscript, the authors used Gemini (Google) to assist in the development of econometric equations and in the logical processing of the calculations described in the method and results and discussion sections. Following its use, the authors processed and edited the text and assume full responsibility for the content of the publication.

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REFERENCES

1. Afonso, W. B. (2014). Fiscal illusion in state and local finances: A hindrance to transparency. *State and Local Government Review*, 46(3), 219–228. <https://doi.org/10.1177/0160323X14550103>
2. Albuquerque, A., & Souza, C. N. (2017). Corrupção na saúde no Brasil: Reflexão à luz da abordagem baseada nos direitos humanos [Corruption in healthcare in Brazil: A reflection in light of a human rights-based approach]. *Revista Brasileira de Bioética, – Brazilian Journal of Bioethics*, 13(6), 1–17. (In Portuguese). <https://doi.org/10.26512/rbb.v13.2017>
3. Almeida-Santos, P. S., Mendes, N. C. F., & Matias-Pereira, J. (2024). Impactos de ações rent-seeking sobre o orçamento público: O efeito do caso “Máfia das Ambulâncias” nos municípios mato-grossenses [Impacts of rent-seeking actions on the public budget: The effect of the „Ambulance Mafia“ case in municipalities of Mato Grosso]. *Revista Brasileira de Ciência Política – Brazilian Journal of Political Science*, 43, Article e275921. (In Portuguese). <https://doi.org/10.1590/0103-3352.2024.43.2759>
4. Anderson, M. C., Banker, R. D., & Janakiraman, S. N. (2003). Are selling, general, and administrative costs “sticky”? *Journal of Accounting Research*, 41(1), 47–63. <https://doi.org/10.1111/1475-679X.00095>
5. Araújo, J. M., & Siqueira, R. B. (2016). Demanda por gastos públicos locais: Evidências dos efeitos de ilusão fiscal no Brasil [Demand for local public spending: Evidence of the effects of fiscal illusion in Brazil]. *Estudos Econômicos (São Paulo) – Economic Studies (São Paulo)*, 46(1), 189–219. (In Portuguese). <https://doi.org/10.1590/0101-416146116jar>
6. Avelino, G., & Biderman, C. (2014). A doença da corrupção: O desvio de fundos e a saúde pública nos municípios brasileiros [The disease of corruption: Misappropriation of funds and public health in Brazilian municipalities]. *Anuário de Pesquisa 2013–2014 – Research Yearbook 2013–2014*. FGV. (In Portuguese). Retrieved from <https://periodicos.fgv.br/apgpesquisa/article/download/58357/56830>
7. Baptista, T. W. F., Machado, C. V., & Lima, L. D. (2012). As emendas parlamentares no orçamento federal da saúde [Parliamentary amendments to the federal health budget]. *Cadernos de Saúde Pública – Public Health Notebooks*, 28(12), 2267–2279. (In Portuguese). <https://doi.org/10.1590/S0102-311X2012001400006>
8. Berner, C. V. (2021). *Relação da ilusão fiscal, do efeito flypaper e da Felicidade Interna Bruta considerando a dívida pública do Brasil [The relationship between fiscal illusion, the flypaper effect, and Gross National Happiness considering Brazil's public debt]* (Doctoral Thesis). University of Brasília. (In Portuguese). Retrieved from <http://repositorio.unb.br/handle/10482/42672>
9. Caetano, C. C. R., Ávila, L. A. C., & Tavares, M. (2017). A relação entre as transferências governamentais, a arrecadação tributária própria e o índice de educação dos municípios do estado de Minas Gerais [Relation between the government transfers, own tax collection and education index of the municipalities of the state of Minas Gerais]. *Revista de Administração Pública – Public Administration Review*, 51, 897–916. (In Portuguese). <https://doi.org/10.1590/0034-7612174433>

10. Coser, I. (2008). O conceito de federalismo e a idéia de interesse no Brasil do século XIX [The concept of federalism and the notion of interest in 19th century Brazil]. *Dados*, 51(4), 941-981. (In Portuguese). <https://doi.org/10.1590/S0011-52582008000400005>
11. Costa, R. F. R., & Castelar, L. I. de M. (2015). O impacto das transferências constitucionais sobre os gastos dos municípios Brasileiros [The impact of constitutional transfers on expenses of Brazilian municipalities]. *Análise Econômica – Economic Analysis*, 33(64). (In Portuguese). <https://doi.org/10.22456/2176-5456.51004>
12. Couto, L. F., & Cardoso Junior, J. C. (2024). Planejamento, governança orçamentária e emendas parlamentares: Como conciliar racionalidade técnica, participação social e legitimidade política [Planning, budgetary governance, and parliamentary amendments: how to reconcile technical rationality, social participation, and political legitimacy]. *Blog Gestão, Política e Sociedade – Blog: Management, Politics and Society*. (In Portuguese). Retrieved from <https://periodicos.fgv.br/cgpc/an-ouncement/view/263>
13. Cunha, I. R. (2025). *Ilusão fiscal, cidadania e tributação do consumo em reforma: A (in)consciência do contribuinte antes, durante e depois (?) da Emenda Constitucional n. 132/2023 e da Lei Complementar n. 214/2025 (Reforma Tributária)* [Fiscal illusion, citizenship and consumption taxation under reform: The (un)consciousness of the taxpayer before, during and after (?) Constitutional Amendment No. 132/2023 and Complementary Law No. 214/2025 (Tax Reform)]. (In Portuguese). Retrieved from <http://repositorio.ufc.br/handle/riufc/80683>
14. Diniz, J. A., Lima, H. R., & Martins, V. G. (2017). O efeito flypaper no financiamento da educação fundamental dos municípios Paraibanos [The effect flypaper in the funding of fundamental education of municipalities in Paraíba]. *Administração Pública e Gestão Social*, 1(2), 95-104. (In Portuguese). <https://doi.org/10.21118/apgs.v1i2.1211>
15. Dollery, B. E., & Worthington, A. C. (1996). The empirical analysis of fiscal illusion. *Journal of Economic Surveys*, 10(3), 261-297. <https://doi.org/10.1111/j.1467-6419.1996.tb00014.x>
16. Galdino, R. H. N., & da Silva, C. G. (2025). Arrecadar e gastar ou gastar e arrecadar? Uma análise das despesas funcionais Brasileiras [Collect and spend or spend and collect? An analysis of Brazilian functional expenditures]. In *53rd National Meeting of Economics ANPEC 2025*. (In Portuguese). Retrieved from https://www.anpec.org.br/encontro/2025/submissao/files_I/i5-dae026c-8328ce533b412f7d7062aa00.pdf
17. Gasparini, C. E., & Miranda, R. B. (2011). Transferências, equidade e eficiência municipal no Brasil [Transfers, equity, and municipal efficiency in Brazil]. *Planejamento e Políticas Públicas – Planning and Public Policies*, 36, 311-349. (In Portuguese). Retrieved from <https://ipea.gov.br/ppp/index.php/PPP/article/view/230/211>
18. Granai, F. B. (2022). *Federalismo Fiscal e Desigualdades Regionais: Uma análise dos impactos do Fundo de Participação dos Municípios (FPM) sobre o desenvolvimento e a equalização fiscal* [Fiscal Federalism and Regional Inequalities: An analysis of the impacts of the Municipal Participation Fund (FPM) on development and fiscal equalization] (Master's Thesis). Universidade Estadual Paulista. (In Portuguese). Retrieved from <http://hdl.handle.net/11449/215852>
19. Grossman, P. J. (1990). The impact of federal and state grants on local government spending: A test of the fiscal illusion hypothesis. *Public Finance Quarterly*, 18(3), 313-327. <https://doi.org/10.1177/109114219001800304>
20. Leal, J. G. R. P., Lima, L. D. D., Rodrigues, F. B. S., & Silva, A. S. D. (2025). Emendas parlamentares destinadas ao Sistema Único de Saúde e a reeleição de prefeitos municipais do Brasil em 2024 [Parliamentary amendments allocated to the Unified Health System and the reelection of municipal mayors in Brazil in 2024]. *Cadernos de Saúde Pública – Public Health Notebooks*, 41(4), Article e00220924. (In Portuguese). <https://doi.org/10.1590/0102-311XPT220924>
21. Ministry of Finance of Brazil. (2018). *O que você precisa saber sobre as transferências fiscais da união: Fundo de Participação dos Municípios FPM* [What You Need To Know About Fiscal Transfers From The Union: Municipal Participation Fund FPM]. Brazil: Ministério da Fazenda, Secretaria do Tesouro Nacional. (In Portuguese). Retrieved from https://sisweb.tesouro.gov.br/apex/f?p=2501:9:::9:P9_ID_PUBLICACAO_ANEXO:6370
22. Ministry of Racial Equality of Brazil. (2025). *Manual sobre emendas parlamentares* [Manual on parliamentary amendments]. Brazil: Ministério da Igualdade Racial. (In Portuguese). Retrieved 30 September 2025, from <https://www.gov.br/igualdaderacial/pt-br/acesso-a-informacao/assessoria-parlamentar/emendas-parlamentares/manual-de-emendas-2025>
23. Nojosa, G. M., & Linhares, F. C. (2018). Variabilidade do efeito flypaper e força política: Uma análise para os municípios brasileiros [The size of the flypaper effect and political strength: an analysis for Brazilian municipalities]. *Pesquisa e Planejamento Econômico – Economic Research and Planning*, 48(3), 137-164. (In Portuguese). Retrieved from <https://ppe.ipea.gov.br/index.php/ppe/article/view/1751>
24. Oates, W. E. (1988). On the nature and measurement of fiscal illusion: A survey. In G. Brennan, B. S. Grewal, & P. Groenewegen (Eds.), *Taxation and fiscal federalism: Essays in honour of Russell Mathews* (pp. 65-82). Australian National University Press.
25. Paz, R. N., Serrano, A. L. M., & Ferreira, L. O. G. (2020). Desempenho dos municípios brasileiros: Uma análise gerencial da realidade econômica e fiscal por meio do

- efeito flypaper [Performance of Brazilian municipalities: A managerial analysis of the economic and fiscal reality through the flypaper effect]. *Revista Universo Contábil – Accounting Universe Magazine*, 16(2), 50-66. (In Portuguese). Retrieved from <https://www.semanticscholar.org/paper/DESEMPENHO-DOS-MUNICIPIOS-BRASILEIROS%3A-UMA-AN%C3%81LISE-Paz-Serra/7a5b29d4f441230aa9ab5202e8879c5b423e5e83>
26. Piola, S. F., & Vieira, F. S. (2019). *As emendas parlamentares e a alocação de recursos federais no Sistema Único de Saúde [Parliamentary amendments and the allocation of federal resources in the Unified Health System]* (Discussion Paper No. 2497). Institute for Applied Economic Research (IPEA). (In Portuguese). Retrieved from <https://hdl.handle.net/10419/211448>
 27. Puviani, A. (1903). *Teoria dell'illusione finanziaria [Theory of financial illusion]*. Sandro. (In Italian).
 28. Rezende, F. (2007). Descentralização e transferências intergovernamentais de recursos na América Latina: Argentina, Brasil e Colômbia [Decentralization and intergovernmental resource transfers in Latin America: Argentina, Brazil, and Colombia]. *Documentos y Aportes en Administración Pública y Gestión Estatal – Documents and contributions in Public Administration and State Management*, (9), 55-102. (In Portuguese). Retrieved from <https://www.scielo.org.ar/pdf/daapge/n9/n9a06.pdf>
 29. Richartz, F., & Borgert, A. (2020). Fatores explicativos para o comportamento assimétrico dos custos das empresas listadas na B3 [Explanatory factors for the asymmetrical cost behavior of companies listed on the B3]. *Revista Universo Contábil – Accounting Universe Magazine*, 16(3). (In Portuguese). Retrieved from <https://www.semanticscholar.org/paper/FATORES-EXPLICATIVOS-PARA-O-COMPORTAMENTO-DOS-DAS-Richartz-Borgert/61e4eef756e44a854d3ab451137d7223a29bb3fb>
 30. Rios, M. E., & Costa, J. S. (2005). O efeito flypaper nas transferências para os municípios portugueses [The flypaper effect on transfers to Portuguese municipalities]. *Revista Portuguesa de Estudos Regionais – Portuguese Journal of Regional Studies*, (8), 85-108. (In Portuguese). Retrieved from <https://www.redalyc.org/articulo.oa?id=514351907005>
 31. Rodden, J. (2005). Federalismo e descentralização em perspectiva comparada: Sobre significados e medidas [Comparative federalism and decentralization: On meaning and measurement]. *Revista de Sociologia e Política – Journal of Sociology and Politics*, (24), 9. (In Portuguese). <https://doi.org/10.1590/S0104-44782005000100003>
 32. Sakurai, S. N. (2013). Efeitos assimétricos das transferências governamentais sobre os gastos públicos locais: Evidências em painel para os municípios brasileiros [Asymmetrical effects of government transfers on local public spending: Panel evidence for Brazilian municipalities]. *Pesquisa e Planejamento Econômico – Economic Research and Planning*, 43(2), 309-322. (In Portuguese). Retrieved from <http://repositorio.ipea.gov.br/handle/11058/4873>
 33. Ulinski, K. G. B., Carvalho, B. G., Vieira, F. S., Rodrigues, R., & Lima, L. D. D. (2024). Efeitos das emendas parlamentares no financiamento municipal da atenção primária à saúde do Sistema Único de Saúde [Effects of parliamentary amendments on municipal financing of primary health care in the Brazilian Unified National Health System]. *Cadernos de Saúde Pública – Public Health Notebooks*, 40(3), Article e00007323. (In Portuguese). <https://doi.org/10.1590/0102-311XPT007323>
 34. Valentin, J., & Caldeira, T. C. M. (2025). The inefficiency of IPTU collection in São Paulo municipalities. *Revista Cadernos de Finanças Públicas*, 25(02). Retrieved from <https://publicacoes.tesouro.gov.br/index.php/cadernos/article/view/236/331>
 35. Vieira, F. S. (2024). *Financiamento federal de ações e serviços públicos de saúde por emendas parlamentares e suas implicações para a regionalização da saúde [Federal funding of public health actions and services through parliamentary amendments and its implications for the regionalization of healthcare]* (Discussion Paper No. 3048). Brazil: Instituto de Pesquisa Econômica Aplicada (IPEA). (In Portuguese). Retrieved from <https://hdl.handle.net/10419/306755>