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INTERGOVERNMENTAL TRANSFERS AND PUBLIC SPENDING: AN ANALYSIS OF THE FLYPAPER EFFECT IN THE MUNICIPALITIES OF MINAS GERAIS

TRANSFERÊNCIAS INTERGOVERNAMENTAIS E GASTOS PÚBLICOS: UMA ANÁLISE DO EFEITO FLYPAPER NOS MUNICÍPIOS DE MINAS GERAIS

ABSTRACT
The Municipal Participation Fund (FPM, acronym in Portuguese) is a significant source of financial transfers from the federal government to municipalities, aiming to promote fiscal equity and support the financing of local expenditures. This study seeks to assess the effect of the fund on municipal spending in Minas Gerais. For this analysis, we employed a dynamic panel data regression methodology, and applied to a sample of 677 out of 853 municipalities in Minas Gerais, covering the period from 2008 to 2018, with the FPM as the variable of interest. The results indicate that public spending exhibit a dynamic behaviour, with past expenditures influencing current spending levels. We also observed that the receipt of the fund transfers generated an expansive effect on municipal public spending, highlighting the flypaper effect among municipalities in Minas Gerais, during the analyzed period. Overall, the findings confirm the hypothesis that public spendings of the municipalities in Minas Gerais were positively impacted by the FPM.

***Keywords*:** Municipal public spending; Municipal Participation Fund; Flypaper effect

RESUMO
O Fundo de Participação dos Municípios (FPM) é uma importante fonte de transferências financeiras do governo federal para os municípios, com o objetivo de promover a equidade fiscal e apoiar o financiamento de despesas locais. Este estudo tem como objetivo avaliar o efeito do fundo nos gastos dos municípios de Minas Gerais. Para esta análise, foi empregada a metodologia de regressão para dados em painel dinâmico, aplicada a uma amostra de 677 dos 853 municípios mineiros, no período de 2008 a 2018, tendo o FPM como variável de interesse. Os resultados evidenciam que os gastos públicos apresentam um comportamento dinâmico, com os valores desembolsados no passado influenciando os gastos atuais. Observou-se, também, que o recebimento de transferências do fundo gerou um efeito expansivo sobre os gastos públicos municipais, indicando a presença do efeito flypaper para os municípios mineiros, no período analisado. De maneira geral, os achados confirmam a hipótese de que os gastos públicos, dos municípios de Minas Gerais, foram positivamente impactados pelo FPM.

***Palavras–Chave*:** Gastos públicos municipais; Fundo de Participação dos Municípios; Efeito Flypaper

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1 INTRODUCTION

The Federal Constitution of 1988 implemented a new system of fiscal federalism in Brazil, based on the decentralization of public finances and the expansion of mechanisms for the transfer of resources between the three levels of the Federation, generating an expansion of municipal revenue, through intergovernmental transfers (Liparizi, 2006).

These have an emphasis on federative regimes, with emphasis on vertical and horizontal imbalances. Vertical imbalances occur due to differences in charges and efficiency of tax collecting, through the various levels of government. The horizontal ones result from disparities in the propensity of spending between the layers of government themselves, usually between regions, states or municipalities (Santos, 2006).

Moraes (2006) highlights that intergovernmental transfers aim to balance the spending capacity of municipalities, especially smaller ones, which, due to tax inequality, end up overburdening their citizens, in order to equalize revenue to more developed municipalities. Costa and Castelar (2015) complement this, stating that these transfers are essential for local governments to be able to execute balanced budgets and meet their needs, without burdening the population.

Despite its positive effects on the degrowth of inter-regional fiscal imbalances, the system of intergovernmental transfers in Brazil produces distorted effects in relation to the fiscal performance of the receiving units (Cossio, 2002). Corroborating this argument, the study developed by Almeida (2015) empirically evidences an expansive effect of public spending from the receipt of intergovernmental transfers. The author found that the receipt of untied transfers generated increases in municipal public expenditures greater than the volume that would be produced by equivalent increases in income, a phenomenon that became known in the literature as the flypaper effect.

In Brazil, the transfer system that tends to reconcile regional differences in the provision of local public goods and the existence of fiscal imbalances of municipal governments has as its main element the Municipal Participation Fund (FPM) (Costa & Castelar, 2015). This fund is essential to guarantee mandatory constitutional transfers by the Union and is composed of 22.5% of the collection of Income Tax (IR) and Tax on Industrialized Products (IPI) (Constitution of the Federative Republic of Brazil, 1988). Its distribution to the municipalities is based on the number of inhabitants, determined by population groups, measured by an individual coefficient, as defined in Law No. 5,172 (1996).

The literature that studies the behavior of public spending indicates that transfers provide room for the undervaluation of the costs of local public goods, which contributes to the excessive increase in their demand. As mentioned, this problem is known in the literature as the flypaper effect, which shows how the increase in transfers induces an increase in public spending greater than the increase in income (Bailey & Connolly, 1998; Caliman, Santos, Pitanga, Guia & Darós, 2024; Inman, 2008; Lee & Vuletin, 2012; Luz Nossa, Monte-mor & Bezerra, 2022; Mattos, Rocha & Arvate, 2011; Pacheco & Saiani, 2021; Santos, 2018).

Considering the need for responsible fiscal management, as established by the Fiscal Responsibility Law (LRF), this study aimed to answer the following question: How did the FPM influence the spending of the municipalities of Minas Gerais, between 2008 and 2018? To this end, we assessed the effect of the fund on the expenses of the municipalities of Minas Gerais during this period.

As indicated by the aforementioned studies, the empirical literature focuses the debate on the federal level, presenting the results in aggregate form by states and regions of the country. We observed that most of the studies focus on the analysis of the effects of intergovernmental transfers, not individualizing the FPM, an important source of municipal tax collection. Thus, it is relevant to investigate the fund and its implications on the spending of the municipalities of Minas Gerais, because, in a context in which the country faces reduced revenue and higher expenses with the population, it is essential that public managers seek to optimize expenses effectively, without compromising the state's debt.

This study contributes, in a theoretical way, by deepening the analysis of the effect of the FPM on municipal spending, filling a gap in the literature by addressing this fund in a specific way, instead of analyzing intergovernmental transfers in an aggregated way. In addition, the results provide subsidies for municipal public management, allowing managers to optimize the use of FPM resources, promoting more effective decisions in budget planning and in the execution of public policies, with a focus on fiscal sustainability and improving the quality of services to the population.

This work consists of five sections, including this introductory part. Section 2 presents the theoretical aspects regarding the Intergovernmental Transfers and the Flypaper Effect. Section 3 outlines the methodological procedures employed. Sections 4 and 5 present the discussions of the results and the final considerations, respectively.

2 THEORETICAL FRAMEWORK

2.1 Intergovernmental transfers

According to the National Treasury Secretariat (STN, 2018a), Intergovernmental Transfers include the transfer of resources, current or capital, from one entity called the transferor to another denominated favored or receiver. They may be voluntary, in this case, intended for collaboration, help or assistance, or resulting from a constitutional or legal determination.

Vieira, Abrantes, Ferreira and Lopes (2017) state that the resources of municipal governments are often influenced by intergovernmental transfers, which characterizes Brazilian fiscal federalism. These transfers are part of the fiscal decentral-

ization procedure and have as their main purpose to reduce socioeconomic discrepancies. They favor the equalization of the spending efficiency of regional government, by giving smaller municipalities a greater possibility of acquiring essential resources, which will be transformed into quality public services, which will increase the socioeconomic growth of the region.

For Chakraborty (2003), fiscal transfer procedures involve a delineation of the transfer of resources between different levels of government. The purpose of the system of intergovernmental transfers is to correct vertical and horizontal imbalances in the distribution of resources. Vertical imbalances arise between the various levels of government due to the asymmetry of taxes and efficiency of tax collection. Horizontal imbalaces are the result of variations in spending capacity and revenue level, between federation units or between municipalities.

According to Nascimento (2010), the main stimuli for subnational governments to acquire resources from financial transfers are: the generation of positive externalities; the reduction of vertical imbalances – reflected in the accumulation of the amount of tax collection in the Union and in the states (to the detriment of the municipalities) –; and the reduction of horizontal – which appears at a time when some jurisdictions become more developed than others (being essential to direct incomes from more developed to less developed places). Thus, we identified that such transfers have as an essential characteristic to help improve the quality of life of the population, allowing socioeconomic growth and reducing inter and intra-regional disparities.

Silva and Silva (2018) explain that one of the forms of sharing revenue among the federative entities is the FPM, which is a type of intergovernmental transfer in which financial resources are transferred from the Union (Federal Government) to the Brazilian municipalities, provided for in the Federal Constitution, article 159, I, b and d:

Article 159. The Union will deliver:

> I - of the proceeds from the collection of taxes on income and proceeds of any nature and on industrialized products, 49% (forty-nine percent), as follows:
> b) twenty-two and five tenths percent to the Municipal Participation Fund;
> d) one percent to the Municipal Participation Fund, which will be delivered in the first ten months of December of each year (Constitution of the Federative Republic of Brazil, 1988).

In other words, these are funds that are constitutionally established, whose composition is composed of the resources collected from the IPI and the IR. Of its total value, 10% is allocated to the state capitals, 86.4% goes to municipalities that are not capitals and 3.6% is to municipalities with large populations (Mendes, Miranda & Cosio, 2008).

In general, regarding the municipalities' own collection capacity, intergovernmental transfers have generated some unfavorable results. Among the main points, we observed that the growth of expenditures does not always result in an increase in per capita revenue; municipalities have not adequately taken advantage of their tax efficiency, often falling short of the collection potential; and, although the central government has made efforts to reduce fiscal inequalities, transfers, which are one of the main tools used, have proven to be insufficient. In addition, unfavorable partisan political impacts influence the distribution of transfers from states to municipalities, often leading municipal managers not to tax appropriately (Passos & Nascimento, 2018).

2.2 Flypaper Effect

The literature that studies the behavior of public spending indicates that transfers open space for the undergrowth of the costs of regional public goods and for the unnecessary growth of their demand. This problem is recognized in the literature as the flypaper effect, which reveals how the increase in transfers induces growth in public spending greater than the growth in taxpayer income (Santos, 2018).

According to Inman (2008), analyzing this effect is essential because it is a matter of policy, therefore, understanding how the governments favoring these resources allocate their expenditures to the design of a competent fiscal policy. In addition to being a matter of knowledge, understanding the reason for subnational government spending provides valuable clarification on government policy priorities.

Romer and Rosenthal (1979) argue that the flypaper effect results from the excessive influence practiced by political groups that enhance estimates, or rather, the bureaucratic form provides for a cooperative conduct between politicians and bureaucrats who would act to their advantage, increasing public spending.

According to Fossett (1990), the flypaper effect appears in the face of indecision and inconsistency regarding transfer revenues, as well as the counter-risk performance of regional bureaucrats. For Roemer and Silvestre (2002), the influence of the flypaper effect would not be an imbalance, but a determination of patterns of political-economic balance.

According to Salto (2013), the flypaper effect is the difference studied between the growth of public spending derived from federal transfers to the subnational entity and the growth of per capita income in the region. In other words, the study of the flypaper effect intends to detect the objectives for which certain transfers cause a growth in public spending greater than the development of per capita income. The hypothesis of these studies is the allegation that the resources would be subdivided and would need to provide the greatest achievable benefit to the citizens, which would have to be portrayed in the behavior, simultaneously with that of the per capita income, in correspondence to the spending attributed by the local instances.

It is noteworthy that the flypaper effect has been proven in several investigations that establish a relationship between own revenue, intergovernmental transfers, and public spending, in the municipal context, as observed in the stud-

ies by Almeida and Ribeiro (2018), Caliman et al. (2024), Lima, Dal-Comuni and Lima (2023), Luz et al. (2022) and Reis, Abrantes and Brunozi (2022). The studies indicated that government transfers can encourage an increase in municipal spending, which negatively impacts the balance of local governments' accounts.

2.3 Related studies

There are several studies in the literature that investigate the existence of the flypaper effect. Inman (2008) initially classified such an effect as an anomaly, testing three possible explanations. Firstly, it would be a data problem, because the research misclassified conditional transfers as lump sum. The second point involves econometric problems, such as the mistaken specification of the model, ignoring the relevant variables. Third, it is about a problem of specification: either the median voter fails to observe the unconditional transfer, or, when he has observed it, he has misunderstood the impact on the average price of public goods and services. Finally, he indicates that none of these three hypotheses has been fully explained by empirical evidence.

Oates (1988) even stated that the flypaper effect is one of the possibilities of fiscal illusion and showed that no type of fiscal illusion is necessary to produce such an effect. For example, Romer and Rosenthal (1979) showed that where budget control models are established, there is a high possibility of excessive public spending. Those responsible for the budget will use unattractive budget alternatives (higher public spending). From the point of view of voters, the more attractive one can still be considered a reversal of the harmful situation of the less attractive one. This can cause a worst-budget correction. Therefore, Oates (1988) argued for the need for more empirical evidence on the flypaper effect.

Mattos, Rocha and Arvate (2011) suggested reinterpreting the traditional theory of the flypaper effect, believing that a larger change will lead to a decrease in the efficiency of government spending related to local taxation. The authors made a cross-sectional analysis of Brazilian cities in 2004, finding that the transfer to Brazilian municipalities would have a negative impact on the efficiency of tax collection and a positive impact on private income, that is, they empirically verified the opposite of the flypaper effect.

Costa and Castelar (2015) verified the occurrence of the flypaper effect using autoregressive vector techniques and quantile regression model, both in panel data versions. We conducted the study from samples that include information on revenue, GDP, population, current transfers and expenditures, for 5,293 Brazilian municipalities, in the period from 1999 to 2009. The results showed that the conditions to prove the practice of the flypaper effect by the municipal public administration were not observed. The authors also found that the effect of transfers on expenditures is not only reflected in the overall analysis, but also in different distribution quantiles.

Almeida (2015) used panel data for a sample of 5,507 Brazilian municipalities to verify the occurrence of the flypaper effect, from 2002 to 2010. The author did not limit herself to verifying the existence of the phenomenon in finances, but also analyzed whether it undergoes changes due to the various types of expenses. The results pointed to the existence of this effect on municipal finances and, in general, its implication in the various items of expenses analyzed.

Almeida and Ribeiro (2018) analyzed municipal public finances, regarding the impacts of FPM and ICMS transfers on local expenses, and, for this, they were based on the study of the flypaper effect. We conducted the analysis in 5,507 municipalities, for the period from 2000 to 2010, using panel data with spatial correction. The main results indicated that the impact of the transfer on expenditure is greater than on own revenue, and in less concentrated areas, the effect is more severe. In addition, transfers have a greater impact on current expenditures than on capital expenditures, which indicates that the behavior of municipal public finances needs to be changed in order to stimulate more investment.

Winkler (2018) checked whether there was evidence to support the hypothesis that the flypaper effect occurred in the municipalities of Rio Grande do Sul. In order to estimate the econometric model of panel data for 413 municipalities, we used the budget data of the municipalities of Rio Grande do Sul, the municipal GDP, the total population (youth and elderly). We found evidence on the hypothesis that the effect occurs for the municipalities analyzed. The results show that positive changes in the municipal GDP generate variations in the same direction for total and current expenditures, but in the opposite direction for capital and investment expenditures. Unlike the literature, the figures on intergovernmental transfers indicate that they lead to larger increases in investment spending.

Table 1 presents a summary of some recent studies that analyze the flypaper effect in municipalities.

Table 1 – Summary of some recent studies related to the topic

Authorship	Goal	Conclusion
Pacheco and Saiani (2021)	To investigate whether conditional and unconditional transfers affect Brazilian municipal public expenditures in a heterogeneous way.	Unconditional transfers result in greater capture of resources.
Trevizan (2021)	To assess how the sources of current municipal revenues influence the quality of public spending in the municipalities of Rio Grande do Sul, with emphasis on the dependence of the municipalities regarding the FPM.	In smaller municipalities, dependence on the FPM is negatively related to investment expenditures, while in larger municipalities, this relationship is weak or non-existent, suggesting that dependence on the FPM impacts the quality of public spending.
Luz et al. (2022)	To examine the occurrence of the flypaper effect in the transfers of voluntary transfers from the Union to Brazilian municipalities.	The flypaper effect on capital budget expenditures, which increased beyond the capacity of municipalities to maintain installed assets.
Ferreira and Serrano (2022)	To analyze the existence and causes of the flypaper effect in Brazilian states and municipalities, between the years 2000 and 2018.	A significant flypaper effect in the states, especially in those with greater financial autonomy, as well as in municipalities with more than 50 thousand inhabitants, especially in the Southeast region.
Reis et al. (2022)	To study the impact of economies of scale on the manifestation of the flypaper effect in Brazilian municipalities.	The presence of the flypaper effect in municipal spending has been confirmed, but the economy of scale helps to reduce or even eliminate it, especially in aggregate spending, administration and health.
Pereira, Matos, Bender and Medeiros (2022)	To investigate the impact of FPM transfers on municipal expenditures in Rio Grande do Sul, from 2008 to 2016.	FPM transfers have a greater influence on municipal expenditures than other budget revenues, with the flypaper effect being more pronounced in smaller municipalities.
Lima et al. (2023)	To analyze how the flypaper effect, resulting from voluntary transfers of financial resources, impacts the efficiency of municipalities in Paraná in tax collection, in the years 2018 and 2019.	An inverse relationship between the voluntary transfers received and the efficiency in fundraising, corroborating the implications of the flypaper effect.
Caliman et al. (2024)	To investigate how the flypaper effect is present in the efficiency of local tax collection in the municipalities of the state of Espírito Santo.	The increase in untied transfers is related to a decrease in the GDP per capita of the municipalities, indicating the presence of the flypaper effect.

Source: Prepared by the authors.

Studies on the flypaper effect reveal a diversity of results, with evidence both for and against the presence of this phenomenon in municipal public finances. While some research confirms that unconditional transfers, such as FPM, can lead to excessive spending increases, especially in current expenditures, others suggest that the effect can be mitigated by factors such as budget control, the financial autonomy of municipalities, or economies of scale. In addition, the heterogeneity of the effects, observed in different regions and population groups, indicates that the flypaper effect is not uniform and that local fiscal management plays a crucial role in defining the effectiveness and quality of the use of public resources.

3 METHODOLOGICAL PROCEDURES

3.1 Units of Analysis and Time Frame

In order to assess the effect of FPM transfers on public spending, the units of analysis considered were the municipalities in the state of Minas Gerais, which total 853, according to data from the Brazilian Institute of Geography and Statistics (IBGE, 2019a).

The period studied comprised the years 2008 to 2018. The choice of this time frame is related to the availability of data necessary to understand the flypaper effect.

3.2 Panel Data Model

For the purpose of the study, we chose the regression model with panel, which combines time series with cross-section observations. Panel data have the advantage of presenting more informative elements, with greater variability, in addition to circumventing the problem of collinearity between variables and offering degrees of freedom, as well as better efficiency (Gujarati & Porter, 2011).

We used the dynamic panel model developed by Arellano and Bond (1991) and improved by Arellano and Bover (1995) and Blundell and Bond (1998). The GMM System estimation method used in this work is related to the addition to the GMM in difference to the initial equation in level, increasing its capacity, due to the existence of more instruments. This increase in capacity is due to the fact that the GMM System estimator is similar to the Arellano-Bond estimator (1991) – GMM difference –, but adding an additional hypothesis: the first difference of the instruments is not correlated with the fixed effects, which allows to increase the number of instruments and gain in efficiency.

Although this method allows the inclusion of instruments (lagged variables/and levels) to control endogeneity, their consistency is conditioned by the absence of serial correlation of the error term and its validity. The most suitable tests to observe these two conditions are: the Arellano-Bond (1991) autocorrelation test of first and second order and the validity test of the Sargan (1958) and Hansen (1982) instruments.

In the tests devised by Arellano and Bond (1991), the absence of second-order correlation is assumed in the errors of first difference. In this sense, the null hypothesis of the test is that the transformed errors are uncorrelated. Thus, we intended to reject the null hypothesis in the first-order test. On the other hand, in the second-order hypothesis, we expected that the null hypothesis will not be rejected, evidencing the inexistence of autocorrelation. Evidence of second-order autocorrelation would invalidate the model specification, given that the consistency of the estimators is affected (Louzano, Abrantes, Ferreira, & Zucolotto, 2019; Santos, 2016).

The Hansen-Sargan test verifies whether the instruments are valid. Its null hypothesis analyzes whether the instrumental variables are uncorrelated with the error term. Thus, the rejection of the null hypothesis indicates that at least one instrumental variable is not exogenous (Santos, 2016).

Based on the above, the estimated model in this study proposes to explain the effect of FPM transfers on the expenditures of the municipalities of Minas Gerais, according to Equation 1:

$$DOpc_{it} = \gamma DOpc_{i,t-1} + \beta FPMpc_{it} + \theta X_{it} + \alpha_i + \nu_t + \varepsilon_{it} \qquad (1)$$

i = 1, ..., 677 municípios
t = 2008, ..., 2018

where: is the per capita budget expenditure of municipality i, in period t; represents the lagged dependent variable; is the value of the transfer of the FPM per capita of municipality i, in period t; are the control variables; , and are the unknown parameters to be estimated by regression; is the specific effect not observed in each municipality; corresponds to the specific effect on time that does not vary between municipalities; and is the random error.

The variable of interest is the transfer of the FPM, which refers to a redistributive transfer from the federal government to the municipality. This variable is expected to have a positive impact on the dependent variable. This means that constitutional intergovernmental transfers, of a lump sum nature, have a more expansive impact on municipal spending (Almeida & Ribeiro, 2018; Cossio & Carvalho, 2001; Costa & Castelar, 2015; Santos, 2018; Winkler, 2018).

The monetary variables were transformed into logarithms and their values adjusted by the General Price Index (IGP-DI), of the Getúlio Vargas Foundation (FGV, 2020), on December 31, 2018.

Table 2 presents a summary of the variables used in this study.

Table 2 - Description of the variables used in the regression model with panel data

Variable	Characterization	Expected Effect	Theoretical Basis	Source
$DOpc_{(t-1)}$	Lagging per capita budget expenditure	+	Almeida and Ribeiro (2018), Gobetti and Orair (2015), Louzano et al. (2019) and Santos (2018)	STN (2018b)
FPMpc	Municipal Participation Fund per capita	+	Almeida and Ribeiro (2018), Cossio and Carvalho (2001), Costa and Castelar (2015), Santos (2018), Fisher (1982) and Winkler (2018)	
RTpc	Tax Revenue per capita	+	Peacock and Wiseman (1979)	
IPIEXPpc	Tax on Industrialized Products – Exports per capita	+	Birth (2010)	
IPVApc	Motor Vehicle Property Tax per capita	+	Santos (2018) and Winkler (2018)	
ICMSpc	Tax on the Circulation of Goods and Provision of Services per capita	+	Almeida and Ribeiro (2018), Santos (2018) and Winkler (2018)	
GDP pc	Gross Domestic Product per capita	+	Almeida and Ribeiro (2018), Costa and Castelar (2015), Vieira et al. (2017) and Winkler (2018)	IBGE (2019b)
DPOP20000	Dummy representative of municipalities with up to 20 thousand inhabitants	+/-	Almeida and Ribeiro (2018), Costa and Castelar (2015) and Santos (2018)	
Time Dummies (vt)	Representative dummies of years to capture the specific effect	+/-	Roodman (2006)	-

Source: Prepared by the authors.

It was necessary to exclude some municipalities from the sample, because, for some periods, they did not present data for the analysis of the explanatory variables considered in the model. Due to this unavailability of numbers, the final sample totaled 677 municipalities, corresponding to approximately 90.38% of the total population of Minas Gerais. Thus, of the 853 municipalities, 176 were eliminated from the database (20.76%). Of this total, seven were due to the lack of information on Tax Collection (two) and Budget Expenditure (five). The other 169 municipalities were excluded for not presenting IPVA and ICMS data.

4 RESULTS AND DISCUSSIONS

4.1 Descriptive Analysis

Considering that the object of analysis of this research is the budget expenditure, Table 3 shows its performance by year analyzed.

Table 3 - Descriptive Statistics of Public Expenditure per capita, in the period from 2008 to 2018

Year	Mean	Standard deviation	Minimum	Maximum	Annual variation (%)
2008	2.866,85	1.364,65	340,69	12.106,72	-
2009	2.863,12	1.349,72	1.238,04	11.778,75	-0,13
2010	2.979,30	1.359,97	1.220,27	16.020,51	3,90
2011	3.044,17	1.442,29	1.192,43	15.601,88	2,13
2012	3.066,53	1.408,71	147,52	15.527,88	0,73
2013	3.056,21	1.358,54	1.378,18	14.827,24	-0,34
2014	3.088,88	1.352,29	1.438,14	16.715,06	1,06
2015	3.107,03	1.319,29	1.415,27	14.449,77	0,58
2016	3.092,28	1.355,35	1.241,88	16.317,77	-0,48
2017	3.061,94	1.378,83	224,90	16.289,90	-0,99
2018	3.199,36	1.421,27	43,80	15.046,37	4,30
Overall Mean	**3.038,70**	**1.376,58**	**43,80**	**16.715,06**	

Source: Survey Result.

Table 3 shows that the average budget expenditure was R$ 3,038.70 and a standard deviation of R$ 1,376.58. When checking the mean, we noted that, from the first to the last year, it showed a growth of approximately 1.00% per year, from R$ 2,866.85 to R$ 3,199.36 – the highest average expenditure in the period studied. Based on the data, we observed that the municipalities of Minas Gerais analyzed spent a minimum amount equal to R$ 43.80, in 2018, in Conselheiro Lafaiete, with 125,421 inhabitants, and a maximum of R$ 16,715.06, in 2014, for the municipality of Serra da Saudade, which registers 815 inhabitants.

Table 4 below shows the individual performance of the FPM per capita of the municipalities in the sample, by year analyzed.

Table 4 - Descriptive Statistics of the FPM per capita, in the period from 2008 to 2018

Year	Mean	Standard deviation	Minimum	Maximum	Annual Variation (%)
2008	1.390,22	968,43	4,52	9.736,81	-
2009	1.369,91	932,72	114,50	8.539,44	-1,48
2010	1.402,40	967,04	130,70	10.648,87	2,32
2011	1.442,57	1.115,48	130,58	14.959,52	2,78
2012	1.427,12	971,09	136,45	10.800,21	-1,08
2013	1.427,47	986,06	129,61	9.741,55	0,02
2014	1.458,05	1.143,52	130,02	13.004,50	2,10
2015	1.453,21	1.062,44	130,42	11.156,51	-0,33
2016	1.447,19	1.031,81	127,68	10.728,53	-0,42
2017	1.567,50	2.268,73	112,07	48.443,52	7,68
2018	1.678,70	1.612,41	7,99	10.808,73	6,62
Overall Average	**1.460,39**	**1.250,67**	**4,52**	**48.443,52**	

Source: Survey Result.

From the data in Table 4, it is possible to observe that, when calculating the Geometric Growth Rate of the FPM per capita, for the period studied, no changes were observed in the transfer of transfers to the municipalities. According to the results, the municipal entities obtained a minimum value equal to R$ 4.52 in 2008, registered in Camacho, with

approximately 3 thousand inhabitants. We noted that the territory of Consolação, with 1,810 inhabitants, obtained a maximum value of R$ 48,443.52 in 2017. The FPM showed a mean value of R$ 1,460.39 and a standard deviation of R$ 1,250.67.

In view of this, it is clear that the current criterion used for the distribution and transfer of FPM resources does not have an incentive for efficient management. Therefore, very small municipalities end up benefiting from the criterion of distribution of resources, and the first distribution range is municipalities with up to 16,980 inhabitants. Thus, one with a population of 5,000 inhabitants, for example, will receive the same amount from the fund as another with twice the population (Massardi, 2014).

4.2 Effect of the FPM on Municipal Public Expenditures

Table 5 presents the results for the estimated models, as well as the aforementioned tests for choosing between them. In order to generate robust estimates, the model was estimated by the GMM System, Ordinary Least Squares (OQ) and Fixed Effects. As a result of the lagged expenditure, we found that the coefficient found is between the limits obtained through MQO and Fixed Effects, which indicates the robustness of the estimated dynamic model.

Considering that the dynamic panel is sensitive to the autocorrelation of the residuals, we applied the first and second order autocorrelation test of Arellano and Bond (1991). Based on the results, this test rejects the null hypothesis of absence of first-order autocorrelation, but does not reject the second-order hypothesis, as desired in the estimation. The tests conducted on the GMM System model show that its properties are adequate.

The use of the GMM System estimation method with instrumental variables was appropriate because it allows endogeneity control. The use of instruments also requires tests to verify their validity, so that they satisfy the conditions of the moment, that is, they are not correlated with the error term. In this case, the tests applied were those of Sargan and Hansen, in which the null hypothesis of joint validity of the conditions of moment should not be rejected. According to the results, when applying the Sargan and Hansen tests, the null hypothesis is not rejected, indicating that the instruments used are valid. In addition, we conducted the Difference-in-Hansen test, which assesses the exogeneity of groups of instruments, i.e., whether they are exogenous. Once again, the hypothesis is not rejected, implying adequacy of the instruments.

Table 5 - Results of Panel Data Model Estimates

Variables	GMM *System*	MQO	Fixed Effect
Total Expenses lagging behind	0,1144**	0,5073***	-0,0315*
	(0,0564)	(0,0285)	(0,0193)
FPM	0,0718**	0,1260***	0,0198***
	(0,0301)	(0,0098)	(0,0050)
GDP	-0,7530***	-0,0454***	0,1225***
	(0,1848)	(0,0074)	(0,0439)
Tax Revenue	0,1963***	0,0708***	0,1013***
	(0,0317)	(0,0058)	(0,0074)
IPI – Export	0,0758***	0,0475***	0,0617***
	(0,0171)	(0,0091)	(0,0083)
IPVA	0,1704***	-0,0031NS	0,0696***
	(0,0479)	(0,0044)	(0,0067)
ICMS	0,6534***	0,1530***	0,2013***
	(0,0976)	(0,0167)	(0,0152)
Population size dummy	-0,0951***	-0,0273***	-0,0017NS
	(0,0350)	(0,0065)	(0,0254)
Constant	8,0460***	2,0907***	4,7004***
	(1,1794)	(0,1301)	(0,1942)

Number of instruments	36	Sargan's test	*p-value* = 0,082
First-order autocorrelation	*p-value* = 0,000	Hansen's test	*p-value* = 0,223
Second-order autocorrelation	*p-value* = 0,620	Difference-in-Hansen test	*p-value* = 0,150

Source: Survey Result.

Notes: i. *** Significant at 1%; ** Significant at 5%; * Significant at 10%; NS not significant; ii. Two-stage systemic GMM estimates, with sample correction proposed by Windmeijer (2005) for bias in standard errors (in parentheses); iii. 677 municipalities were considered, in the period from 2008 to 2018; iv. In the estimate, time dummies were included , in which the year 2009 was a reference. The years that presented significant and positive coefficients were 2010, 2011, 2014 and 2016; and v. In the estimation of the GMM System, the collapse option was used, since estimates with larger numbers of instruments presented p-values lower than 10% in the Hansen's and Difference-in-Hansen tests.

According to the results in Table 5, from a statistical point of view, the explanatory variables used in the study were significant, being relevant to explain the budget expenditures of the municipalities.

Analyzing the results of the regression model for panel data, we verified that the FPM variable exhibited a positive and significant coefficient. Transfers from the FPM per capita have a positive impact on total expenditures, where a variation of 1% in the volume of transfers from the fund increases the volume of total expenditures per capita by 0.07%, showing that the result found is consistent with expectations. Thus, this indicates that, by receiving more of this type of resource, municipal governments tend to increase their spending.

In the period from 2008 to 2018, federal transfers related to the FPM collaborated for the expansion of public expenditures in the municipalities of Minas Gerais studied. This expansive effect can result in an increase in public services and investments in municipalities, bringing relevant social benefits, such as improved quality of life and infrastructure. However, it can also lead to challenges, such as inefficient spending and excessive dependence on federal transfers, which can undermine long-term financial sustainability.

Nascimento (2010) comments that transfers, such as the FPM, have a discouraging effect on the collection of municipalities and, consequently, have a greater representativeness in the composition of the municipal financing structure, especially in small municipalities. In this sense, the analysis highlights the importance of reformulating Brazilian federalism, through modifications in the tax system, the redefinition of the taxes of each of the federated entities and the redistribution of resources through transfers. Lima et al. (2023) state that the transfer of resources from the federal government to municipalities reduces the effort required to achieve the budget's collection goals, which reflects the characteristics of the flypaper effect.

The results of the present research are similar to those found by Santos (2018), Vieira et al. (2017) and Winkler (2018), who found that the receipt of intergovernmental transfers tends to increase public spending by a higher amount. We are supposed to highlight that, in both analyses, the set observed was the totality of Brazilian municipalities. Reis et al. (2022) state that the relationship between transfer resources and total expenditures can be minimized with economies of scale.

In relation to the lagged dependent variable ($DOpc_{(t-1)}$), we noted that the coefficient was significant and positive, confirming the dynamic character of public spending. Thus, it is proven that the past values of the explained variable exert an influence on its current values. The implication of this result is that municipalities may face difficulties in adjusting their spending after periods of increase, due to the dynamic and persistent nature of expenditures. This suggests that even as municipalities try to reduce costs, past spending continues to impact their finances, making budgetary adaptation difficult. This behavior may harm theirability to balance the bills.

The variable GDP per capita (GDP pc) was statistically significant, but presented a negative coefficient. The results show that spending is increasing, not because of the increase in income, but because of the expansive effect of transfers. Thus, analyzing together the coefficients of the variables GDP pc and FPMpc, it is proven that there was the presence of the flypaper effect on municipal expenditures. Therefore, the negative coefficient of GDP per capita may suggest that median voters in richer municipalities demand fewer public services than poorer ones and, therefore, less public spending. According to Martins (2020), this result can be justified by the fact that, in industrialized municipalities and, for the most part, richer, the political preference of the electorate, which generates the composition of expenditures, may determine not spending on public hospitals and schools, for example, if the largest portion of their voters has access to a private service.

In relation to the variable Tax Revenue, which was also statistically significant and presented a positive coefficient, we observed that an increase in the municipalities' own collection contributes to the increase in budget expenditures. Specifically, an increase of 1% results, on average, in an expansion of 0.19%, respectively, keeping the other variables constant. This indicates that the greater collection capacity allows municipalities to increase their expenses, reflecting a direct relationship between increased revenue and growth in public spending.

In this sense, Massardi and Abrantes (2016) comment that, in economic merit, the search for a system that takes advantage of the available tax base, the implementation of mechanisms that bar incompatibility with expenditures, and the implementation of fiscal effort as an integral part of the criteria for transferring resources would contribute to the local government increasing its own collection and having more resources, in order to promote development in the region.

The ICMS variable (ICMSpc) had a positive impact of greater magnitude on expenses than Tax Revenue. Therefore, increases in the values of these variables cause increases in public spending in the municipalities of Minas Gerais. The transfer of ICMS, according to Mendes et al. (2008), is pro-cyclical, given that it rises in times of economic expansion, revealing greater expenditures by the states and more resources for the municipalities, which drives an increase in expenditures. On this aspect, Soares, Gomes and Toledo (2011) understand that taxes on goods and services are extremely important in the country's economy, since they interfere in the productive activity of the various economic sectors.

As for the variable IPVA (IPVApc), which represents a transfer from the state to the municipalities, we observed that it was statistically significant and presented the expected signal in the estimation of the GMM System model. This indicates that, as the transfer of resources from the IPVA increases, municipal spending increases by 0.17%, with the other variables remaining constant. This result suggests that municipalities can use these resources to finance new investments or expand public services, which can benefit the local population. However, it can also generate challenges, if spending increases without proper control, creating a dependence on state transfers to maintain expenses.

The transfers of the IPI – Export per capita showed a positive impact on total expenditures, in which a variation of 1% in its volume increases that of total expenditures per capita by 0.0758%. The finding shows that this type of transfer contributes to increasing municipal spending in the areas for which they were destined.

In the modeling, we considered the population size dummy, representative of municipalities with less than 20 thousand inhabitants. Regarding the behavior of this variable, its coefficient was significant and presented a negative sign, indicating that the expenditures per inhabitant of these municipalities are lower in relation to those with more inhabitants. The negative results may be related to the fact that the municipality with a smaller population contingent demands less volume of expenditures to meet its needs. On the other hand, the most populous demand a greater volume of spending to do so.

The results observed are in line with the characteristics of the fiscal illusion associated with the flypaper effect, corroborating the findings of studies, such as those by Almeida (2015), Almeida and Ribeiro (2018), Lima et al. (2023), Luz et al. (2022) and Reis et al. (2022), which also identified the occurrence of this effect, using municipal data. These studies indicate that the relationship between resource transfers and increased public spending is a common feature in municipal contexts, reinforcing the need for more efficient fiscal management, to avoid excessive dependence on government transfers and ensure financial sustainability.

5 FINAL REMARKS

The general objective of this research was to assess the effect of the FPM on the public spending of the municipalities of Minas Gerais. For this, we analyzed 677 municipalities in Minas Gerais, during the period from 2008 to 2018. We conducted the data treatment through its exploratory analysis and econometric regression models for dynamic panel data.

The results of the study indicated a significant and positive relationship between the FPM and municipal spending, suggesting that transfers from the fund are more subject to resource capture, presenting positive impacts on municipal public spending. In other words, fiscal transfers have implications for public spending. This result points to the existence of the flypaper effect for the municipalities of Minas Gerais, in the period of analysis. The presence of this effect is mainly due to the fiscal federalism adopted in Brazil, which makes municipalities more dependent on intergovernmental transfers.

The findings showed that the dependent variable presents a dynamic behavior, with its past value being related to the present value. The variables Tax Revenue, IPI – Export, IPVA and ICMS had a positive influence on expenditures. The GDP variable was significant, but, with the opposite sign to the expected one, with regard to the flypaper effect, and the population size dummy showed that budget expenditures per inhabitant are lower in municipalities with a population of less than 20 thousand inhabitants.

These results suggest the importance of public agents rethinking the criteria for redistributing FPM resources, in a way that is more consistent with the reality experienced by the municipalities, enabling a fairer and more equitable distribution.

The limitations of the study are the small sample size – which did not include all municipalities in Minas Gerais – and the limited time frame, due to the absence of data necessary for its realization, since these are of a secondary nature and, until the conclusion of the study, some variables were only available until the period of 2018.

For future research, we suggest to deepen the analysis by inserting new variables, such as geographic regions of the state, in order to identify whether the effects on public spending vary according to the location of the municipalities. It is appropriate to extend the analysis to other periods, expanding the time horizon, in order to capture the effects highlighted in the literature as influential in the expansion of public spending.

REFERENCES

Almeida, E., & Ribeiro, E. A. (2018, dezembro). Transferências de renda intergovernamentais e seus impactos sobre as despesas de capital e despesas correntes nos municípios brasileiros. Anais do Encontro Nacional de Economia, Rio de Janeiro, RJ, 44.

Almeida, R. N. de. (2015). Os efeitos das transferências intergovernamentais nas finanças públicas municipais brasileiras. Revista do Tribunal de Contas do Estado de Minas Gerais, 33(4), 52-72. Retrieved from https://revista.tce.mg.gov.br/revista/index.php/TCEMG/article/view/50/101

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies, 58(2), 277-297. https://doi.org/10.2307/2297968

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29-51. https://doi.org/10.1016/0304-4076(94)01642-D

Bailey, S. J., & Connolly, S. (1998). The flypaper effect: identifying areas for further research. *Public choice, 95*(3), 335-361. https://doi.org/10.1023/A:1005053921709

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87, 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Caliman, D. R., Santos, A. D. S. dos, Pitanga, E. C., Guia, G. A. M., & Darós, L. da P. (2024). Efeito Flypaper: uma análise nos municípios do estado do Espírito Santo. *ConTexto - Contabilidade Em Texto*, *24*(57), 51–65. Retrieved from https://seer.ufrgs.br/index.php/ConTexto/article/view/130643

Chakraborty, P. (2003). *Unequal Fiscal Capacities Across Índia States: how corrective is the fiscal transfer mechanism*. United Nations University Centre. Tokio.

Constituição da República Federativa do Brasil de 1988. (1988). Retrieved from http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm

Cossio, F. A. B. (2002). *Ensaios sobre federalismo fiscal no Brasil*. (Tese de doutorado). Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, RJ, Brasil. Retrieved from http://www2.dbd.puc-rio.br/pergamum/tesesabertas/9716215_02_cap_03.pdf

Cossio, F. A. B., & Carvalho, L. M. de. (2001). Os Efeitos Expansivos das Transferências Intergovernamentais e Transbordamentos Espaciais de Despesas Públicas: evidências para os Municípios Brasileiros: 1996. Pesquisa e Planejamento Econômico, 31(1), 75-124. Retrieved from http://repositorio.ipea.gov.br/bitstream/11058/5064/1/PPE_v31_n01_Efeitos.pdf

Costa, R. F. R., & Castelar, L. I. de M. (2015). O impacto das transferências constitucionais sobre os gastos dos municípios brasileiros. *Revista Análise Econômica, 33*(64), 171-189. https://doi.org/10.22456/2176-5456.51004

Ferreira, L. O. G., & Serrano, A. L. M. (2022). Os efeitos das transferências nos estados e municípios brasileiros: a construção de um índice flypaper. *Cadernos de Finanças Públicas*, *22*(01). https://doi.org/10.55532/1806-8944.2022.172

Fisher, R. C. (1982). Income and grant effects on local expenditure: The flypaper effect and other difficulties. *Journal of urban Economics, 12*(3), 324-345. https://doi.org/10.1016/0094-1190(82)90021-3

Fossett, J. W. (1990). On confusing caution and greed: A political explanation of the *flypaper effect. Urban Affairs Quarterly, 26*(1), 95-117. https://doi.org/10.1177/004208169002600105

Fundação Getúlio Vargas. (2020). *Indicadores de preços*. Rio de Janeiro: FGV. Retrieved from https://portalibre.fgv.br/indices-de-precos

Gobetti, S. W., & Orair, R. O. (2015). Política fiscal em perspectiva: o ciclo de 16 anos (1999-2014). *Revista de Economia Contemporânea*, *19*(3), 417-447. https://doi.org/10.1590/198055271934

Gujarati, D. N., & Porter, D. C. (2011). *Econometria básica*. (5a ed., D. Durante, M. Rosemberg, & M. L. G. L. Rosa, Trad.). Porto Alegre: Mc Graw Hill. (Obra original publicada em 2008).

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. Econometrica, 50(4), 1029-1054. https://doi.org/10.2307/1912775

Inman, R. P. (2008, dezembro). The Flypaper Effect. [Working Paper n. 14579]. National Bureau of Economic Research, Cambridge. DOI 10.3386/w14579

Instituto Brasileiro de Geografia e Estatística (2019a). Estimativas da População. Retrieved from https://www.ibge.gov.br/estatisticas/sociais/populacao/9103-estimativas-de-populacao.html?edicao=17283&t=destaques

Instituto Brasileiro de Geografia e Estatística (2019b). *Produto Interno Bruto dos Municípios*. Retrieved from https://www.ibge.gov.br/estatisticas/economicas/contas-nacionais/9088-produto-interno-bruto-dos-municipios.html?edicao=18021&t=publicacoes

Lee, L., & Vuletin, G. (2012) The Flypaper and Teflon Effect: evidence from China. *Modern Economy, 3*, 811-816. http://dx.doi.org/10.4236/me.2012.37103

Lei n. 5.172, de 25 de outubro de 1966. (1966). Dispõe sobre o Sistema Tributário Nacional e institui normas gerais de direito tributário aplicáveis à União, Estados e Municípios. Retrieved from https://www.planalto.gov.br/ccivil_03/leis/l5172compilado.htm

Lima, S. S. F., Dal-Comuni, S. S. L., & Lima, F. F. (2023). O Efeito Flypaper e a Preguiça Fiscal: uma análise da eficiência de arrecadação municipal em relação às transferências voluntárias recebidas. Contabilidade Gestão e Governança, 26(1), 92–120. https://doi.org/10.51341/cgg.v26i1.3018

Liparizi, F. B. (2006). *Descentralização fiscal no Brasil: evolução e tendências recentes*. (Dissertação de mestrado). Universidade de

Brasília, Brasília, DF, Brasil. Retrieved from https://repositorio.unb.br/bitstream/10482/4896/1/2006_fabricio%20bacelar%20liparizi.pdf

Louzano, J. P. de O., Abrantes, L. A., Ferreira, M. A. M., & Zuccolotto, R. (2019). Causalidade de Granger do índice de desenvolvimento socioeconômico na gestão fiscal dos municípios brasileiros. Revista de Administração Pública, 53(3), 610-627. https://doi.org/10.1590/0034-761220180139

Luz, E. O. da, Nossa, S. N., Monte-mor, D. S., & Bezerra, J. E., F. (2022). Transferências Voluntárias e o Efeito *Flypaper*. *Administração Pública e Gestão Social*, *14*(3). https://doi.org/10.21118/apgs.v14i3.12321

Martins, F. S. (2020). *Efeito expansivo das transferências intergovernamentais e a interdependência espacial dos gastos públicos nos municípios brasileiros.* (Dissertação de mestrado). Universidade Federal do Ceará, Fortaleza, CE, Brasil. Retrieved from https://repositorio.ufc.br/handle/riufc/53604

Massardi, W. de O., & Abrantes, L. A. (2016). Dependência dos Municípios Mineiros em relação ao Fundo de Participação dos Municípios. *Revista Eletrônica Gestão & Sociedade, 10*(27), 1397-1416. https://doi.org/10.21171/ges.v10i27.1963

Massardi, W. de O. (2014). *Esforço fiscal e desempenho socioeconômico dos municípios mineiros.* (Dissertação de mestrado). Universidade Federal de Viçosa, Viçosa, MG, Brasil. Retrieved from https://www.locus.ufv.br/handle/123456789/1997

Mattos, E., Rocha, F., & Arvate, P. (2011). Flypaper Effect Revisited: evidence for tax collection efficiency in Brazilian municipalities. *Estudos Econômicos*, *41*(2), 239- 267. https://doi.org/10.1590/S0101-41612011000200002

Mendes, M., Miranda, R. B., & Cosio, F. B. (2008). *Transferências intergovernamentais no Brasil: diagnóstico e proposta de reforma*. [Texto para Discussão, n. 40]. Brasília, DF: Senado Federal. Retrieved from https://www2.senado.leg.br/bdsf/bitstream/handle/id/94747/Textos%20para%20discussão%2040.pdf?sequence=7

Moraes, D. P. de. (2006). *Arrecadação tributária municipal: esforço fiscal, transferências e Lei de Responsabilidade Fiscal.* (Dissertação de mestrado). Fundação Getúlio Vargas. São Paulo, Brasil. Retrieved from https://bibliotecadigital.fgv.br/dspace/bitstream/handle/10438/2421/155046.pdf?sequence=3&isAllowed=y

ÿÿÿÿ*}8±dQ □v¶Nascimento, J. dos S. (2010). *Efeito das transferências financeiras sobre os gastos e a arrecadação dos municípios brasileiros.* (Tese de doutorado). Universidade Federal de Viçosa, Viçosa, MG, Brasil. Retrieved from https://www.locus.ufv.br/bitstream/handle/123456789/130/texto%20completo.pdf?sequence=1

Oates, W. E. (1988). On the nature and measurement of fiscal illusion: a survey. *In* Brennan *et al.* (eds.), *Taxation and Fiscal Federalism: essays in Honor of Russel Mathews* (pp. 65-82). Camberra.

Pacheco, C. P., & Saiani, C. C. S. (2021, dezembro). Efeitos das Transferências Condicionais e Incondicionais e da Lei de Responsabilidade Fiscal nas Despesas Públicas: evidências para os Municípios Brasileiros. Anais do Encontro Nacional de Economia, Brasil, 49.

Passos, C. R., & Nascimento, J. C. H. B. (2018, novembro). Fundo de Participação dos Municípios na composição das receitas: um estudo sobre dependência dos municípios piauienses nos anos 2013 a 2016. Anais do Congresso Brasileiro de Custos, Vitória, ES, 25.

Peacock, A. T., & Wiseman, J. (1979). Approaches to the analysis of government expenditure growth. Public Finance Quarterly, 7(1), 3-23. https://doi.org/10.1177/109114217900700101

Pereira, M. M. de, Matos, S. R. A. de, Bender, R. F., & Medeiros, A. P. de (2022). Transferências governamentais e despesas públicas: evidências do efeito *Flypaper* para municípios do Rio Grande do Sul entre 2008 e 2016. *Revista Política e Planejamento Regional, 9*(1), 79-101. Retrieved from https://www.revistappr.com.br/conteudo.php?m=NDE2&l=tx

Reis, A. de O., Abrantes, L. A. & Brunozi, A. C., Jr. (2022, setembro). Análise do efeito flypaper em governos locais brasileiros sob a perspectiva da economia de escala. Anais do Encontro da Associação Nacional de Pós-Graduação e Pesquisa em Administração, online, 46.

Roemer, J. E., & Silvestre, J. (2002). The "Flypaper Effect" Is not an anomaly. Journal of Public Economic Theory, 4(1), 1-17. https://doi.org/10.1111/1467-9779.00085

Romer, T., & Rosenthal, H. (1979). "Bureaucrats vs. Voters: on the political economy resource allocation by direct democracy". *The Quarterly Journal of Economics, 93*(4),563-587. https://doi.org/10.2307/1884470

Roodman, D. (2006, dezembro). How to do xtabond2: an Introduction to Difference and System GMM in Stata. (Working Paper nº 103). *Center for Global Development.* http://dx.doi.org/10.2139/ssrn.982943

Salto, F. S. (2013). *A economia política das transferências fiscais no Brasil: o Fundo de Participação dos Estados (FPE) contribuiu no processo de redução das disparidades regionais entre 1985 e 2009?* (Dissertação de mestrado). Fundação Getúlio Vargas, São Paulo, Brasil. Retrieved from https://bibliotecadigital.fgv.br/dspace/bitstream/handle/10438/10635/Felipe_Salto_Disserta%c3%a7%c3%a3o_Mestrado_Final.pdf?sequence=9&isAllowed=y

Santos, F. V. D. dos. (2018). Os efeitos expansivos das transferências intergovernamentais e o efeito transbordamento das despesas públicas dos municípios brasileiros: um estudo com dados em painel para o período de 2010-2015. 2018. (Dissertação de mestrado). Universidade Federal do Espírito Santo, Vitória, ES, Brasil. Retrieved from http://repositorio.ufes.br/jspui/bitstream/10/10407/1/tese_10211_Fládia%20Dantas%20-%20dissertação%20final.pdf

Santos, M. A. S. S. (2006). *O Fundo de Participação dos Municípios em Minas Gerais: impactos redistributivos da inclusão da variável PIB municipal no cálculo do rateio.* (Dissertação de mestrado). Escola de Governo Prof. Paulo Neves de Carvalho, Belo Horizonte, MG, Brasil Retrieved from http://tede.fjp.mg.gov.br/bitstream/tede/234/1/Maria%20Aparecida%20Sales.pdf

Santos, R. B. dos. (2016). *A prática da gestão de riscos financeiros e geração de valor ao acionista: um estudo das empresas brasileiras não financeiras.* (Tese de doutorado). Universidade de São Paulo, São Paulo, SP, Brasil. Retrieved from https://www.teses.usp.br/teses/disponiveis/96/96133/tde-20102016-142034/en.php

Sargan, J. D. (1958). The estimation of econometric relationships using instrumental variables. *Econometrica*, *26*(3), 393-415. https://doi.org/10.2307/1907619

Secretaria do Tesouro Nacional (2018a). *Manual de Contabilidade Aplicada ao Setor Público (MCASP)*. Brasília, DF. Retrieved from http://www.tesouro.gov.br/mcasp

Secretaria do Tesouro Nacional (2018b). *FINBRA – Finanças do Brasil – Dados*. Retrieved from https://www.gov.br/tesouronacional/pt-br

Silva, A. D. da, & Silva, A. D. da (2018). Autonomia municipal no federalismo fiscal brasileiro: a eficiência na administração tributária municipal. *Dom Helder Revista de Direito*, 1(1), 19-44. http://dx.doi.org/10.36598/dhrd.v1i1.1414

Soares, M., Gomes, E. do C. O., & Toledo, J. R. de F. (2011). A repartição tributária dos recursos do ICMS nos municípios da Região Metropolitana de Curitiba. *Revista de Administração Pública, 45*(2), 459-481. https://doi.org/10.1590/S0034-76122011000200008

Trevizan, L. E. (2021). *Transferências intergovernamentais e a qualidade no gasto público em municípios gaúchos: um estudo no contexto do federalismo e descentralização fiscal*. (Dissertação de mestrado). Universidade do Vale do Rio dos Sino. Retrieved from http://www.repositorio.jesuita.org.br/handle/UNISINOS/10087

Vieira, M. A., Abrantes, L. A., Ferreira, M. A. M., & Lopes, J. V. S. (2017). Implicações do esforço de arrecadação no desempenho socioeconômico dos municípios de Minas Gerais. *Gestão & Regionalidade, 33*(99), 21-38. https://doi.org/10.13037/gr.vol33n99.3981

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics, 126* (1), 25–51. https://doi.org/10.1016/j.jeconom.2004.02.005

Winkler, K. L. B. (2018). *Efeitos das transferências intergovernamentais sobre as despesas públicas dos municípios do Rio Grande do Sul: uma análise entre os anos de 2002 e 2014*. (Dissertação de mestrado). Universidade Federal do Rio Grande do Sul, Rio Grande do Sul, Brasil. Retrieved from https://editora.pucrs.br/edipucrs/acessolivre/anais/encontro-de-economia-gaucha/assets/edicoes/2018/arquivos/62.pdf