



**Responsible Editor:** Rafael Barreiros Porto  
**Associate Editor:** Pedro Miguel Alves Ribeiro Correia  
**Evaluation Process:** Double Blind Review pelo SEER/OJS

## The Relationship of Governmental Transfers Nature and the Fiscal Responsibility of Brazilian Municipal Governments

### ABSTRACT

**Objective:** to analyze the relationship between the government transfers nature and the fiscal responsibility of Brazilian municipal governments, from the perspective of Political Cycles.

**Method:** using panel data regression, with pooled effects, we analyzed the behavior of budgetary and electoral factors in 95 large Brazilian municipalities, from 2006 to 2016, with effects on fiscal responsibility, through regression with panel data, with pooled effects.

**Originality/relevance:** according to the theoretical constructs, the problem of fiscal illusion misrepresents the conduct of public budget in relation to taxpayers, which led this study to associate it with fiscal responsibility. Based on this assumption, such a relationship can be strengthened in electoral periods, which led this research to control it.

**Results:** the evidences confirmed that the responsibility in fiscal management is positively influenced by voluntary transfers presence, in view of the requirements linked to their receipt. On the other hand, when transfers are constitutional and therefore obligatory, spaces are allowed for behaviors that are aggressive to fiscal responsibility. In addition, it was found that in election and pre-election years, the manager also exhibits fiscal aggressive behavior.

**Theoretical/Methodological Contributions:** all findings incrementally contribute to the existing literature so far, to confirm the diagnosis and understanding of fiscal illusion problems caused by government transfers, and that is aggravated by observing the Budget Political Cycles, considerably impacting on government fiscal liability.

**Keywords:** Government transfers; Fiscal Illusion; Fiscal Responsibility; Budgetary Political Cycles.

Ronaldo José Rêgo de Araújo   
Universidade Federal da Paraíba (UFPB),  
Paraíba, Brasil  
E-mail: ronaldocontabilidade@gmail.com

Dimas Barrêto de Queiroz   
Universidade Federal da Paraíba (UFPB),  
Paraíba, Brasil  
E-mail: dimasqueiroz@gmail.com

Edilson Paulo   
Universidade Federal do Rio Grande do Sul  
(UFRGS), Rio Grande do Sul, Brasil  
E-mail: e.paulo@uol.com.br

Carla Janaina Ferreira Nobre   
Universidade Federal de Pernambuco,  
Pernambuco, Brasil  
E-mail: carlajanainanobre@gmail.com

Received: April 27, 2019  
Revised: July 30, 2019  
Accepted: December 02, 2019  
Published: April 30, 2020



#### How to Cite (APA)

Araújo, R. J. R. de, Queiroz, D. B. de, Paulo, E., & Nobre, C. J. F. N. (2020). The Relationship of Governmental Transfers Nature and the Fiscal Responsibility of Brazilian Municipal Governments. *Journal of Accounting, Management and Governance*, 23 (1), 124-140. [http://dx.doi.org/10.21714/1984-3925\\_2020v23n1a8](http://dx.doi.org/10.21714/1984-3925_2020v23n1a8)

## 1 INTRODUCTION

Governmental action can be divided into three strands - allocative, distributive and stabilizing –, which are considered basic and essential to any people and are regarded as governmental functions (Musgrave, 1959). To perform any of these functions, the government will need to have a good financial condition and achieve the so-called Welfare State (Lima & Diniz, 2016).

In this aspect, the financial condition is conceptualized as the ability of a government to provide services to the community while maintaining the desired levels and qualities of the population, while meeting their financial obligations as soon as required (Gasb, 1978; Groves & Valente, 1986). In other words, governmental financial condition must be understood as the balance between financial resources and short- and long-term financial obligations (Miller, 2001).

In this way, it is understood that an important frontier to maintain the financial health of the government entity is to obtain revenues. Although the federalism of Tiebout (1956) and Oates (1972) cannot be fully observed in the Brazilian case, the Brazilian Federal Constitution of 1988 defined the distribution of tax revenues among government entities, in order to give them administrative and financial autonomy, from the exploitation of its tax bases, giving conditions for the local (municipal) governments to also meet the obligations shared among the Federation entities.

Nevertheless, local governments may not be able to get enough tax bases for revenue collection to match community needs, which would imply a vertical fiscal gap (Shah, 2007). To correct the unfolding of the vertical fiscal gap, it would be necessary to cooperatively budget and financial support, cooperatively, from other governmental spheres (Varela, 2008), which have more resources, ensuring local governments financial autonomy (Diniz, 2012), ensuring, in turn, that these respective managers can meet population demands.

This financial and budgetary cooperation between government sphere is called governmental transfers and the literature demonstrates the existence of two types of these transfers: (i) the obligatory, also called constitutional ones, that the legal system itself determines that the federative entities with the highest collection capacity cooperate financially with those with difficulties in collecting; and (ii) the volunteers, who are completely at the discretion of the granting manager and who usually establish rules for its receipt and its application.

While government transfers may reduce the budgetary and financial gap in municipal finances, receiving such funds when they are required to transfer may discourage municipal public managers from levying taxes from their constituents, reducing their tax collection efforts, since no requirements are established for municipalities to receive them (Ribeiro & Toneto Júnior, 2004).

Under these conditions, intergovernmental transfers can create a moral hazard between the Union and municipalities, as resources reach municipal safes without any additional effort, what may generate accommodation of local public administrators (Zonatto; Kroth; & Rodrigues, 2011), causing dependence on these resources and, even more critically, neglecting fiscal responsibility aspects. To avoid behavior such as this, fiscal rules are established for managers to act responsibly when managing public resources.

The assessment of fiscal management, in turn, is not only limited to the disciplinary verification of the established legal fiscal goals, suggesting more transversal approaches. Besides planning, control and transparency, due monitoring of the results of budget execution should be properly monitored (Afonso, 2008; Cruz & Marques, 2017). In this area, fiscal responsibility must permeate aspects that involve the continuity of the provision of quality

public goods and services and avoid the tendency of fiscal mismatches, which reverberates aspects related to the good government financial condition (Lima & Diniz, 2016).

In another angle, intergovernmental transfers may cause informational asymmetry between receptor governments and voters, generating fiscal illusion problems when voters lose the connection between paid taxes and local public goods offered, as citizens from other locations are funding part of these goods via resources arising from government transfers (Fisher 1982; Oates 1979). This may be one more reason why the rulers neglect fiscal aspects and hold the adopted federalism accountable.

Thus, the manager can take advantage of the exercise of his mandate to maximize his interest, which is to extend his time in power, and make timely use of government transfers, given their constitutional and mandatory nature does not establish requirements for their receipt, as well as the fiscal illusion of local voters, which may complicate the fiscal responsibility aspects of management.

Given these discussions, the problem of this research emerged: what is the relationship between the nature of government transfers and the fiscal responsibility of Brazilian municipal governments? Considering this concern, the objective of this research is to analyze the relationship between the government transfers nature and the fiscal responsibility of Brazilian municipal governments.

The serious risks of financial failures motivated by both the current Brazilian fiscal federalism model and poor fiscal management (Matias-Pereira, 2012) may be justified by the fact that municipalities have too much financial dependence on government transfers, losing this way, financial autonomy, whether due to difficulties in exploiting its bases (Shah, 2007) or due to the comfort caused by government transfers (Zonatto et al., 2011), what impacts negatively to the financial condition of subnational governments (Lima & Diniz, 2016), destabilizing public accounts due to practices contrary to fiscal responsibility.

Another aspect that the literature attaches to the guidelines of fiscal responsibility, concerns the model of the Economic Political Cycles (Nordhaus, 1975), which is characterized when the acting manager, when seeking the reappointment of the position, behaves in a timely manner, promoting expansionist economic policies before the elections and acting with fiscal aggressiveness. Opportunistic behavior can develop as much for the manager to remain in office, as for the continuity of his party in management (Klein & Sakurai, 2015).

Given this perspective, this research progresses incrementally by demonstrating that mandatory transfers can make the manager neglect aspects of fiscal responsibility, in the absence of conditions for their receipt, causing harm to social welfare, where the allocation of resources should be the solution. In the same way, it contributes to the Political Cycles literature, notoriously characterized in the Brazilian scenario, by demonstrating that the preset of periodic elections becomes an incentive for the manager to act with fiscal aggressiveness, and may even disrespect the fiscal rules established in Brazil. Both aspects lacked discussions in the Brazilian scenario and this research proposes to close this gap.

## **2 THEORETICAL AND EMPIRICAL DISCUSSIONS**

### **2.1 Intergovernmental Transfers and their consequences**

In the process of state organization, fiscal federalism presents itself as a systematizing form of an ideal model in the management of finances, so that both the process of fund raising

and the allocative, stabilizing and distributive policies are shared with all Federation (Musgrave & Musgrave, 1983).

In the Brazilian case, although the Federal Constitution of 1988 shared revenue collection and expenditure execution, the inter and intraregional social inequalities, as well as the inadequate distribution of the obligations of each federative entity (Affonso, 1996; Varela 2008), made Brazilian public management to present a decoupling of income and expenses, causing what the literature calls the fiscal gap (Shah, 2007).

To heal the problem of the fiscal gap and to equate public finances, the manager uses other governmental bodies to obtain resources and make his government plan viable (Varela, 2008). The problem is, both the manager may be too vulnerable to the financial conditions of other government entities, and can give up raising their own resources, relying on the help of other spheres (Varela, 2008). The intergovernmental transfers are the mechanisms adopted for allocating financial resources between levels of government, assuming that decentralized governments have limited collection capacity, and therefore governments cooperate with each other in the process of generating funds for public safes to meet collecting difficulties (Diniz, 2012).

Despite government transfers help to cover fiscal gaps in local finances, the receipt of such funds may discourage municipal public managers, reducing their collection efforts, as no requirement is made for the municipality to receive them (Ribeiro; Toneto Júnior, 2004), not even in fiscal terms, given its mandatory character of transfer between government levels. This is because this government model based on the Theory of Fiscal Federalism, can escape the ideal when put into practice, presenting problems.

That said, intergovernmental transfers, when constitutional, can create a moral hazard situation between the Union/States and Municipalities (Zonatto et al., 2011), given that the receiving management of these resources can use them in a timely manner, adverse to the pact of the tax office established in the Constitution.

Another aggravating factor concerns the effect of fiscal illusion, in which there will be a decoupling between the tax burden actually paid by the taxpayer and the level of public services offered (Fisher 1982; Oates 1979). In other words, the “average voter” will lose the notion of the purchasing power of management or move away from it (Strumpf, 1998), which becomes another channel for the manager's opportunistic behavior.

Another problem presented by the literature is the conception of the Oates' “veil hypothesis” (1999) that, given the untying of this revenue, they enter the public safes and enter the cake of the general revenues, allowing the manager to avoid fiscal evasion by proportional to the presence of these transfers, since the manager would depend less on local taxes to meet local demands.

Thus, it is observed that these aspects can cause unwanted situations for fiscal management (Varela & Fávero, 2010), by the fact that the manager accommodates himself to the dependency of these resources by not making collection efforts, not meeting the demands of the population, as well as neglecting aspects considered as of fiscal responsibility (Diniz; Lima; & Martins, 2017). However, this is the expected behavior, when constitutional transfers, in which there are no requirements for their receipt. In the case of voluntary transfers, where there are a number of requirements, including proper accountability of their resources, management tends to behave in a manner that is misleading when these resources are applied.

## 2.2 The Fiscal Responsibility of Governments

According to the Fiscal Responsibility Law (Complementary Law 101, 2000), responsibility for fiscal management is understood to be the action preceded by planning, in which risks can be prevented and create mechanisms to correct deviations that may affect the balance of public accounts, by meeting income and expenditure results targets in a transparent manner.

Thus, it is clear that the assessment of fiscal management is not only linked to the achievement of targets, but also due to the proper monitoring and persistence in the search of good results of budget execution in the short, medium and long term (Afonso, 2008; Isen, 2014; Cruz & Marques, 2017). Such monitoring aims at ensuring the proper financial condition and, consequently, the continuity in the provision of quality public goods and services to the community (Lima & Diniz, 2016).

Although the Fiscal Responsibility Law establishes a series of restrictive tax rules for credit operations, income waivers, indebtedness, and personnel expenses, for example, has not defined a objective rule for obtaining own revenues with respect to targets to be achieved. However, transversally, this gap indirectly impacts net current revenue, which is a base indicator for checking Brazilian tax rules, such as indebtedness and personnel expenses, for example.

Current transfers, in turn, are part of the calculation of net current revenue. Thus, the manager may underestimate the tax burden and continue or even raise its standard of production of public goods and services (Diniz; Lima; & Martins, 2017). While this may circumvent the legal aspect, it may undermine the long-term sustainability of the fiscal balance and other aspects may expose management risks in the future, presenting negative signs in fiscal management, such as reduced liquidity (ability to repay debt) or raising the cost of debt by refinancing and postponing debt, for example.

In this sense, Cruz, Macedo and Sauerbronn (2013) identified that the fiscal responsibility of municipal governments is directly linked to financial autonomy, which implies that when the manager reduces his tax effort, his management runs counter to fiscal responsibility. Besides that, Afonso and Araújo (2000) already pointed out that a large number of Brazilian municipalities had financial dependence, which can be a complicating factor for fiscal responsibility, as having a good collection is expected that the manager presents good indicators of fiscal responsibility, and not having it can be a complicating factor of these indicators (Akutsu & Pinho, 2002).

Assuming that financial autonomy is inversely proportional to transfers, Diniz, Lima and Martins (2017) point out that, although governmental transfers have positive aspects, when they are not preceded by conditions for their receipt and application, that is, non-tied transfers, the manager may present an expansionary behavior of its expenses to the detriment of social welfare.

Given these discussions, the following research hypothesis is established:

H1: Fiscal liability is negatively related to compulsory constitutional transfers.

In contrast, the rules of Brazilian financial law allow for another nature of government transfers, which are voluntary. These correspond to financial and budgetary cooperation between the federative entities, which are characterized especially by the discretion of those who grant to provide them or not and by the establishment of conditions for their receipt and application. When not linked, transfers open up the manager's opportunistic behavior (Diniz et

al., 2017), when linked, a manager's probable behavior is assumed, in line with fiscal responsibility.

Thereby, it is understood that their presence and representativeness in public budgets should establish direct relations with fiscal responsibility. Thus, the following research hypothesis is raised:

H2: Fiscal responsibility is positively related to voluntary transfers.

### **2.3 Electoral Opportunism and Theory of Budgetary Cycles**

The verification of fiscal liability is linked to compliance with fiscal rules established by law. However, it should not be forgotten that the manager may have interests other than merely legal interests in the relationship between political and institutional factors and fiscal performance (Alesina & Perotti, 1996; Poterba, 1996). Among the factors, the Public Choice Theory, which assumes rational decisions, shows that the manager will make efforts to maximize the budget under his management by increasing the number of employees as well as their power, prestige and bargaining power, even this collapsing with social and collective interests (Niskanen, 1971).

In this sense, the model of the Economic Political Cycles designed by Nordhaus (1975) is characterized when an acting politician, seeking reelection, behaves in a timely manner, promoting expansionist economic policies before the elections. Opportunistic behavior can develop as much for the manager to remain in office, as for the continuity of his party in management (Klein & Sakurai, 2015).

Managers later adopted alternative expansionary fiscal policies, moving from less visible types to more visible and electoral types of spending, without necessarily increasing total spending and, above all, without promoting deficits, appearing to be more competent in office (Klein & Sakurai, 2015; Rose, 2006). In this way, demonstrating to the voter a bad behavior in the management of public finances through indicators of fiscal responsibility may be one more motivation for the manager. This is characterized as the Budget Political Cycles, idealized by Rogoff (1990).

On both cases, by developing expansionary policies or changing the budget composition, the manager will be acting in a timely manner to benefit from the electoral process. As Brazil's democracy is not considered established or solid, given its youth, this study chose to outline the research hypothesis considering Rogoff's (1990) expansionary policy. That is, the manager may neglect or press the fiscal rules, due to the proximity of the elections, as he may have his mandate extended. Given this, the third research hypothesis was established:

H3: The election and pre-election years influence fiscal responsibility in a negative way.

In addition, not all public managers are eligible and not all seek reelection, as electoral rules may prohibit the manager from continuing in office in the subsequent period (Klein & Sakurai, 2015), as is the case with Brazilian law (Constitutional Amendment n. 16/1997), which allows the manager to be reelected for a single subsequent period.

This behavior was already highlighted by Rogoff (1990), in the sense that this prospect of power being able to run for (re)election in the future raises the temptation to distort fiscal policy and thus tends to exacerbate the budget political cycle. In contrast, if the manager is unable, for legal reasons, to stand for reelection, he may reduce his political efforts to try to demonstrate a competent image for the electorate. The manager may also, when prevented

from running for reelection, seek to leave an unfavorable fiscal environment for the political opponent (Klein & Sakurai, 2015).

In this way, the observable differences in managerial fiscal behavior can be explained by different manager of reelection conditions (Alt et al., 2011; Besley & Case, 1995; Nogare & Ricciuti, 2011; Smart & Sturm, 2013). Given these notes, the fourth research hypothesis was established.

H4: Managers in the first term of government are more likely to comply with fiscal responsibility rules.

### 3 METHODOLOGICAL PROCEDURES

#### 3.1 Universe and Sample

This study's universe, in thesis, englobes all Brazilian municipalities. Regarding the sample, it was composed by the municipalities that met the following criteria: (i) one hundred largest municipalities in terms of population; and (ii) the availability of all variables necessary for this investigation throughout the analysis period. The choice of the largest municipalities is justified by the spatial arrangement, that is, by the fact that such municipalities cover all geographic regions of the country, and being endowed with significant economic capacity at national level, which conditions greater capacity for collection efforts, giving relevance to this research findings.

Given this, some budget data were absent, reason why five municipalities were completely removed from the sample due to persistent absence of data. As for those municipalities in which data were not obtained within three years at most, it was decided to remove them only in the respective years. Thus, the sample resulted in 95 municipalities.

The sample space corresponds to the financial years 2006 to 2016, limited by the dependent variable that presents data availability exactly in this period.

The variables required for the study were collected from the following databases: (i) the budget and population variables in the Finance of Brazil (FINBRA) database, available on the National Treasury Secretariat (STN) website; (ii) the variables corresponding to demographic and economic indicators, through the website of Brazilian Institute of Geography and Statistics (IBGE); and (iii) the electoral variables on the website of the Superior Electoral Court (TSE).

#### 3.2 Operationalization of variables and proposed econometric model

Finding a metric for government fiscal responsibility, that is reasonable and acceptable, has been a difficulty in studies addressing this issue (Araújo & Loureiro, 2005; Cruz & Marques, 2017; Kloha; Weissert; & Kleine, 2005). Nevertheless, a measure widely used in scientific research has been the Firjan Fiscal Management Index (IFGF), which assesses the fiscal situation of Brazilian municipalities based on five budget indicators: (i) municipalities own revenues; (ii) expenditure on personnel; (iii) the investments made; (iv) the liquidity of management; and, (v) the cost of debt. Notably, these indicators cover the aspects considered as fiscal liability provided for in Complementary Law n. 101/2000. Thus, this research will use as a dependent variable the IFGF score of Brazilian municipalities, released by the Federation of Industries of the State of Rio de Janeiro (FIRJAN).

As the objective of this research is to analyze the relationship between government transfers and fiscal responsibility of Brazilian municipal governments, will use two variables of interest: (i) the proportion of constitutional government transfers in the budget revenues of

the sample municipalities, assuming that such large-scale resources are not related to the requirements for their receipt, therefore may not have direct relations with fiscal responsibility; and (ii) the proportion of voluntary transfers to total budget revenues, assuming that such resources are tied and, by their nature, related to the requirements for their receipt, presenting direct relations with fiscal responsibility.

Although the IFGF basis presents its own revenues in its calculation methodology, the FIRJAN takes into consideration tax revenues, fees, contributions, including employers, from services and other capital income. However, the fiscal action of the manager involves primarily raising financial resources through sufficient tax efforts to support a certain level of community demand (Matias-Pereira, 2010), without which it would negatively impact the balance of public finances, leading to deficits or indebtedness (Lima & Diniz, 2016). In this way, this research will use as an independent variable the ratio of tax revenues to budget revenues, as a proxy for the tax effort of local governments.

Moreover, another factor that demonstrates the fiscal thermometer of governments concerns the budget result, which when negative demonstrates the need for funding (Lima & Diniz, 2016), which can weaken the manager's fiscal responsibility and is not in the IFGF basis. Thus, this study will also use, as an independent variable, the Municipal Primary Result as a proxy for the fiscal responsibility of local managers.

Besides that, the Political Cycle Theory predicts that the manager may exhibit opportunistic behavior influencing the budget composition aimed at the electoral process, either by his own permanence in power or by his party's postulation in continuity of management (Drazen & Eslava, 2010; Klein & Sakurai, 2015; Nordhaus, 1975; Rogoff, 1990; Schneider, 2010). The manager's fiscal behavior can be explained by the manager's different reelection conditions, whether first or second term (Alt et al., 2011; Besley & Case, 1995; Nogare & Ricciuti, 2011; Smart & Sturm, 2013). In this way, in order to control this effect and if, effectively, the manager is responsibly fiscal in the electoral and pre-election years, dummies variables were established for these years and for the terms of management and interaction between them and the years with voluntary transfers.

Additionally, economic, demographic and regional control variables were established, given the discrepancies caused by the economic, demographic and regional dispersion that characterizes the Brazilian scenario, due to its continental extension. All these variables were taken to the econometric model proposed in this research and are presented in Equation 1.

$$IRF_{it} = \beta_0 + \beta_1 TCons_{it} + \beta_2 TVol_{it} + \beta_3 RT_{it} + \beta_4 RGov_{it} + \beta_5 E_t + \beta_6 PrE_t + \beta_7 Mand_{it} + \beta_8 (E_t * TVol_{it}) + \beta_9 (PrE_t * TVol_{it}) + \beta_{10} (PrE_t * Mand_{it}) + \beta_{11} Pop_{it} + \beta_{12} PIB_{it} + \beta_{13} SSE_i + \varepsilon \quad (Equation 01)$$

- $IRF_{it}$  corresponds to the Firjan Fiscal Management Index score of municipality  $i$  in period  $t$ ;
- $TCons_{it}$  corresponds to the ratio between Current Transfers, subtracting Agreement Revenue, and Total Budget Revenue from municipality  $i$  in period  $t$ ;
- $TVol_{it}$  is the ratio between the sum of the Capital Transfers and the Revenue from Covenants and the Total Budgetary Revenue of municipality  $i$  in period  $t$ .
- $RT_{it}$  corresponds to the ratio between Tax Revenue and Total Budget Revenue for municipality  $i$  in period  $t$ ;
- $RGov_{it}$  is a *dummy* variable where 1 corresponds to the year in which the municipality presented primary surplus result and 0 otherwise;
- $E_t$  is a *dummy* variable where 1 corresponds to the election year and 0 to the others;
- $PrE_t$  is a *dummy* variable where 1 corresponds to the pre-election year and 0 to the others;



- $Mand_{it}$  is a *dummy* variable where 1 corresponds to the manager's first term and 0 to the others;
- $PIB_{it}$  is the Gross Domestic Product per capita of municipality  $i$  in period  $t$ ;
- $Pop_{it}$  corresponds to the population quantity of municipality  $i$  in period  $t$ ;
- $SSE_i$  is a *dummy* variable where 1 corresponds to the municipalities belonging to the South (S) and Southeast (SE) Regions and 0 to the other Brazilian Regions.

Having verified the basic assumptions for the regression models, we used the panel data model for the sampling period, which was previously tested for the recommended effect. After that, the statistical estimates presented in the model for the hypothesis tests raised in this research were observed. For a better analysis of model estimates, the variables were added to the model as follows: (i) initially, only the variables related to government transfers; (ii) added to the model the other budget variables; (iii) then the political cycles; (iv) subsequently, voluntary transfers were withdrawn and interacted with political cycles; and, (v) finally, all the variables worked in this research were put together, as presented in Equation 01.

## 4 RESULTS AND ANALYSIS

### 4.1 Results Presentation

The purpose of this paper is to analyze the relationship between the nature of government transfers and the fiscal responsibility of Brazilian municipal governments. Guided by this objective, the methodological procedures defined the operationalized variables with the basis to make inferences from the perspective of political cycles and fiscal illusion.

The results of the descriptive statistics of the budget variables used in this research are shown in Table 1.

Table 1

**Descriptive Statistics of Budgetary Variables for Fiscal Management Responsibility of Brazilian Municipal Governments from 2006 to 2016.**

Variable/Statistics	Mean	Standart Deviation	Minimum	Maximum
IRF	0,6262	0,1275	0,2478	0,9346
Tconst	0,6166	0,1299	0,2657	0,9545
Tvol	0,0341	0,0370	0,0000	0,3236
RT	0,2461	0,1382	0,0225	0,8169
RGov	0,8313	0,3746	0,0000	1,0000

**Analysis Period:** 2006 to 2016; **Municipalities Sample Qty.:** 95; **Observation Deck Qty.:** 1,014

**Notes:** *IRF* corresponds to the FIRJAN Fiscal Management Index; *TConst* corresponds to Mandatory Constitutional Transfers; *TVol* corresponds to Covenants and Capital Transfers; *RT* corresponds to Tax Revenue; and *RGov* corresponds to the government result (obeying the simple revenue – expenditure equation), where 1 was attributed to the positive result and 0 to the negative result.

The data in Table 1 show how the data is distributed. Overall, these results show that the municipalities in the sample demonstrated, according to the FIRJAN Fiscal Management Index scale, good fiscal responsibility, given their average indicator of fiscal responsibility (0.62), even existing municipalities with excellence management (0.93) according to scale.

Despite this, there was a municipality that presented critical management (0.24). The extreme behavior on both sides demonstrates the dispersion of values around the mean.

Besides that, these data indicate that much of the municipal revenue comes from compulsory constitutional transfers (0.61), meeting the initial expectations of this investigation. Tax revenue is another important source of revenue in municipal budgets (0.24), but on average accounts for less than half of the constitutional transfers of the sample municipalities. Regarding voluntary transfers, their presence was well reduced in the government budgets of the sample and period analyzed (0.03). Moreover, it was observed that most of the analyzed exercises were characterized by the presence of surplus results.

Table 2, in sequence, shows the Pearson and Spearman Correlation Matrices with the bivariate correlations between the research budget variables.

As the data worked are indicators that do not vary to infinity, being limited on a scale from zero to one, it is recommended to use the correlations presented by the Spearman method. Thus, three of the four variables showed a significant correlation with the variable of interest. In this way, the results show that compulsory government transfers have inverse relationships with fiscal management responsibility (- 0.31), alluding to the problem of fiscal illusion presented in the literature, although voluntary transfers also had significance with inverse relationship (- 0.05).

In turn, the variables tax revenues and government results showed direct relations with the responsibility in fiscal management, suggesting that when the municipal government has higher volumes of own revenues (0.23) and its budget execution is in surplus (0.18) , the manager is more likely to be more responsible in managing the public budget.

**Table 1**  
**Correlation between Budgetary Variables for Fiscal Management Responsibility of Brazilian Municipal Governments**

Variable/Statistic	IRF	Tconst	Tvol	RT	RGov
IRF		-0.3139*** (0.0000)	-0.0551* (0.0785)	0.2362*** (0.0000)	0.1817*** (0.0000)
Tconst	-0.3087*** (0.0000)		0.2793*** (0.0000)	-0.6720*** (0.0000)	-0.2169*** (0.0000)
Tvol	-0.0534* (0.0892)	0.2537*** (0.0000)		-0.3162*** (0.0000)	-0.1301*** (0.0000)
RT	0.0971*** (0.0020)	-0.5252*** (0.0000)	-0.2433*** (0.0000)		0.1425*** (0.0000)
RGov	0.1776*** (0.0000)	-0.2061*** (0.0000)	-0.1716*** (0.0000)	0.1355*** (0.0000)	

**Notes:** The asterisks indicate the levels of statistical significance, as follows: \* p <0.10; \*\* p <0.05; \*\*\* p <0.001; *IRF* corresponds to the FIRJAN Fiscal Management Index; *TConst* corresponds to Mandatory Constitutional Transfers; *TVol* corresponds to Covenants and Capital Transfers; *RT* corresponds to Tax Revenue; and *RGov* corresponds to the government result (obeying the simple revenue - expenditure equation), where 1 was attributed to the positive result and 0 to the negative result.

In response to the problem of this research, we tried to test the hypotheses outlined by theoretical models through econometric estimates, according to Equation 1, with the end of testing relationships between the variables worked in this research. To better understand the proposed relationships, it was decided to add the variables to the model.

The basic assumptions for the regression models were verified and the model orientation tests were applied. The most adjusted model corresponds to the pooled model, rejecting the fixed and random effects models (Breusch-Pagan: 0.0000 and Parman: 0.0000).

Thus, estimates show that the variables worked on the model influence the fiscal management responsibility of the Brazilian municipal governments analyzed, although these variables moderately explain fiscal performance (from 9% to 30%), as shown in Table 3.

**Table 3**  
**Estimates resulting from the proposed Econometric Model for Fiscal Management Responsibility of Brazilian Municipal Governments**

IRF	Model according to				Equation 2 (E)
	Transfers Only (A)	Budgetary Variables Only (B)	Aggregating Political Cycles (C)	Adding to Interactions (D)	
Tconst	-0.1302***	-0.1705***	-0.3262***	-0.3081***	-0.3081***
Tvol	0.4084***	0.3695***	0.3951**		
RT		-0.0540**	-0.1551***	-0.1462***	-0.1780***
RGov		0.0155*	0.0238**	0.0223*	0.0228**
E			-0.0041		-0.0264
PrE			-0.0094		-0.0356***
Mand			-0.0127		-0.0109
E * Tvol				0.5558***	0.6609***
PrE * TVol				0.1927	0.7359**
E*Mand				-0.0222*	-0.0091
Pop					4.4709
PIBp					7.0406
SSE					0.0295**
Constante	0.6923***	0.7189***	0.8469***	0.8329***	0.8343***
R <sup>2</sup> :	0.0960	0.1848	0.3006	0.3058	0.2780
Teste F:	0.0000	0.0000	0.0000	0.0000	0.0000
VIF:	1.07	1.25	1.28	1.31	1.90
Breusch-Pagan:	0.0000	0.0000	0.0000	0.0000	0.0000
Parman:	0.0000	0.0000	0.0000	0.0000	0.0000
Observações:	1.014	1.014	659	659	659

**Notes:** The asterisks indicate the levels of statistical significance, as follows: \* p <0.10; \*\* p <0.05; \*\*\* p <0.001; *IRF* corresponds to the FIRJAN Fiscal Management Index; *TConst* corresponds to Mandatory Constitutional Transfers; *TVol* corresponds to Covenants and Capital Transfers; *RT* corresponds to Tax Revenue; *RGov* corresponds to the government result (obeying the simple income - expenditure equation), where 1 was attributed to the positive result and 0 to the negative result; And it corresponds to the election years; *PrE* corresponds to the pre-election years; *Mand* corresponds to the first term of office of the manager; *Pop* is the municipality population; *GDPp* corresponds to the Gross Domestic Product per capita; and *SSE* corresponds to the municipalities belonging to the southern and southeastern regions of Brazil.

## 4.2 Discussion of Results

The results presented in Table 3 confirmed the first hypothesis of this research, which assumed that *fiscal responsibility is negatively related to compulsory constitutional transfers*. This implies that such results admit the problem of *fiscal illusion* in the analyzed Brazilian municipal governments, since such resources are assured to the municipalities without making greater demands. With this, the manager is comfortable in the position and starts to neglect aspects considered as fiscal responsibility, causing unwanted effects to the balance of public finances, corroborating the studies of Zonatto *et al* (2011), Varela and Fávero (2010) and Diniz *et al.* (2017).

Similarly, the results also confirm the second hypothesis of this research which assumed that *fiscal responsibility is positively related to voluntary transfers*, demonstrating that by linking rules or requirements for the receipt of these public resources, managers are encouraged to make efforts to demonstrate appropriate fiscal behavior and ensure the receipt of new resources, the balance of public finances and the continuity of government activities, a similar result to that identified by Diniz *et al.* (2017).

Thus, both findings reinforce the dissociation that the different natures of government transfers cause in public finances, when free, unlinked, without being accountable to the grantor, the manager is more comfortable and aggressive in his directionality, which impacts negatively on fiscal liability and therefore on the lives of the local population. When these transfers are discretionary, linked and obligatory to account, the manager becomes more cautious and prudent, which reflects positively on his fiscal responsibility, systematically gaining the health and balance of public finances and society as a whole.

Another finding of the research refers to the verification of the inverse relationship between tax revenues and fiscal liability, referring to aspects that larger contributions of public resources do not necessarily condition to better governmental results, suggesting that it may generate excess spending or that they imbalance the income budgetary equation, undermining fiscal responsibility.

The data show, in addition, that when governments present (positive) surplus budget results, they demonstrate, despite a lesser extent, greater accountability for resource management. This alludes to the fact that the manager, by presenting a positive result, may not be allocating resources in a disorderly manner, that is, wouldn't be unbalancing public finances.

Additionally, we sought to add to the model variables that correspond to the budgetary policy cycles and their interactions with voluntary transfers, as a way to understand and justify the fiscal behavior of the manager in the period analyzed, from 2006 to 2016. In this period, there were three municipal elections (2008, 2012 and 2016) and, given the difficulty in collecting data, regarding the proxy variables for the political cycles, the sample remained with 95 municipalities, but with 659 observations, on an unbalanced panel. The results of these econometric estimates are shown in columns C, D and E of Table 3, from which it's possible to observe the existence of some discrepant behaviors of the manager in the electoral and pre-election years or in the first term, compared to the other periods of his administration. Only in column E was significant significance, confirming the third hypothesis raised by this research, characterizing a posture of fiscal aggressiveness that the manager adopts in order to obtain advantages, since the inverse relationship was identified in the pre-election year, given the proximity of the elections. This characterization is in line with the political cycles model defended by Nordhaus (1975), McRae (1977) and Alesina (1987) and corroborates the findings of the works of Rose (2006), Costa (2006) and Queiroz (2015).

By interacting the political cycles with voluntary transfers, statistical significance was found at 1% in the electoral year and at 5% in the pre-election year. This suggests that the manager will capture covenants and capital transfers and will behave responsibly in fiscal terms given the positive sign between the variables. These results reinforce the second hypothesis outlined by this research, which showed that *fiscal responsibility is positively related to voluntary transfers*, implying that the manager, as he approaches the election period, will make a more consistent effort to obtain increased resources from other government instances, which could benefit him in the imminent electoral process.

Likewise, although the variable that captured the effect of the first mandate of the manager alone wasn't statistically significant, when interacting with the election year, it was found that the manager is slightly more likely to violate fiscal responsibility rules in the first

mandate. Thus, this result confirms the fourth hypothesis discussed in this research, which argues that *managers in the first term of government have a greater predisposition to breach fiscal responsibility rules*.

Besides that, it was found that managers of municipalities located in southern and southeastern Brazil have a greater predisposition to appropriate and responsible behavior in the face of governmental fiscal aspects, justified by better social and educational conditions notably present in these regions, compared to the others.

In general terms, all hypotheses were confirmed by the statistical results. Thus, it was confirmed that the responsibility in fiscal management is characterized by the presence of voluntary transfers (*hypothesis 2*), in view of the existing requirements for their receipt. However, when transfers are constitutional, that is, they are obligatory, spaces are allowed for behaviors that are contrary to fiscal responsibility (*hypothesis 1*). Moreover, it was found that in electoral and pre-electoral years, the manager demands expansionary behavior and fiscal aggressiveness, seeking particular benefits in the electoral process (*hypothesis 3*), as well as when facing the possibility of reelection, in his first term of office (*hypothesis 4*). All of these findings are in line with the *fiscal illusion* problem provoked by government transfers and the theory of Budget Policy Cycles.

## 5 FINAL CONSIDERATIONS

The aim of this paper was to analyze the relationship between the government transfers nature and the fiscal responsibility of Brazilian municipal governments.

In this context, there are two types of governmental transfers: constitutional, which are obligatory, and voluntary, discretionary. The theoretical arrangements indicate that when they are mandatory, they can generate a moral hazard situation between Union/States and Municipalities, characterizing the *fiscal illusion* effect. In another aspect, Brazilian legislation establishes well-defined periodic elections, which may give rise to electoral opportunism, characterizing what the literature calls the political cycles.

In both cases, the manager may neglect aspects of fiscal responsibility and act with fiscal aggression, which may unbalance public finances, either in the current or future fiscal year.

From this perspective and based on empirical evidence and theoretical assumptions, four hypotheses were established: that compulsory transfers have a negative relationship with fiscal responsibility (1); the volunteers had a positive relationship (2); the electoral period makes the manager problematize fiscal responsibility (3); and that the manager seeking reelection has a greater predisposition to comply with the established fiscal rules (4).

In this sense, by confirming the formulated hypotheses, the evidence from this research allowed us to affirm that the responsibility in fiscal management is influenced by the presence of voluntary transfers, in the face of the existing requirements for their receipt. On the other hand, when transfers are constitutional and, therefore, obligatory, spaces are allowed for behaviors that are adverse to fiscal responsibility, since there are no large requests for their receipt.

Thus, it is concluded that establishing strings attached to the receipt of funds from other governmental instances is beneficial to the municipalities fiscal management, since it can rebalance the balance between revenues and expenses, in the correct allocation of public resources, as well as encouraging the manager to raise funds larger amounts of resources, whether own or from other federative entities. These results are in line with those of Zonatto, *et al.* (2011), Varela and Fávero (2010) and Diniz *et al.* (2017).

Thus, this research contributes incrementally to the accounting literature by reinforcing the divergent behavior of municipal management regarding the receipt of government transfers, depending on its nature, whether voluntary or mandatory, showing that the absence of rules opens spaces for the manager neglect fiscal rules, which undermines the financial health of governments. Likewise, regarding the aspects related to the Political Cycles, notoriously characterized in the Brazilian scenario, by demonstrating that the preset of periodic elections becomes an incentive for the manager to act with opportunism. Also, it raises questions about the Brazilian federative pact, the rules for receiving intergovernmental transfers and the fiscal rules, demonstrating that they need adjustments to improve the *accountability* process.

## REFERENCES

- Afonso, J. R. R.; & Araújo, E. A. (2000). A capacidade de gasto dos municípios brasileiros: arrecadação própria e receita disponível. *Cadernos de Finanças Públicas*, 1, 19-30.
- Akutsu, L.; & Pinho, J. A. G. (2002, set./out.). Sociedade da informação, accountability e democracia delegada: investigação em portais de governo no Brasil. *Revista de Administração Pública*, 36(5), 723-745.
- Alesina, A.; Perotti, R. (1996). Fiscal discipline & the budget process. *American Economic Review*, 86(2), 401-407. <http://dx.doi.org/10.2307/1884222>
- Araujo, F. C.; & Loureiro, M. R.. Por uma metodologia pluridimensional de avaliação da LRF. *Revista de Administração Pública*. Rio de Janeiro 39(6):1231-52, Nov./Dez. *Constituição da República Federativa do Brasil de 1988*. (1988). Recuperado em 20 agosto, 2018, de [http://www.planalto.gov.br/ccivil\\_03/constituicao/constituicao.htm](http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm)
- Cruz, C. F.; Afonso, L. E. (2018). Gestão fiscal e pilares da Lei de Responsabilidade Fiscal: evidências em grandes municípios. *Revista de Administração Pública*. Rio de Janeiro 52(1):126-148, jan. - fev. <http://dx.doi.org/10.1590/0034-7612165847>
- Costa, M. M. A. (2006). Reeleição e Política Fiscal: um estudo dos efeitos da reeleição nos gastos públicos. *Dissertação* (Mestrado em Economia do Setor Público) – Universidade de Brasília, Curso de Pós-Graduação em Economia, UNB, Brasília.
- Cruz, C. F.; Macedo, M. A. da S.; & Sauerbronn, F. F. (2013, nov./dez.). Responsabilidade fiscal de grandes municípios brasileiros: uma análise de suas características *Revista de Administração Pública*, 47(6), 1375-399. <http://dx.doi.org/10.1590/S0034-76122013000600003>.
- Daflon, B; & Perritaz, S. (2003). L'influence de la taille des communes sur leur degré d'autonomie budgétaire: présentation d'une méthode d'analyse et application aux communes fribourgeoises. *Working Paper*, n. 336, Faculté des Sciences Economiques et Sociales, University of Fribourg.
- Diniz, J. A. (2012). *Eficiência das transferências intergovernamentais para a educação fundamental de municípios brasileiros*. Tese de Doutorado, Programa de Pós-Graduação em Ciências Contábeis, Universidade de São Paulo, São Paulo, SP, Brasil.
- Diniz, J. A., Lima, R. H. de, & Martins, V. G. (2017, abr-jun). O efeito *flypaper* no financiamento da educação fundamental dos municípios paraibanos. *Administração Pública e Gestão Social*, abr-jun: 9(2), 75-134. <https://doi.org/10.21118/apgs.v1i2.1211>
- Drazen, A.; Eslava, M. (2010). Electoral manipulation via voter-friendly spending: theory & evidence. *Journal of Development Economics*, 92(1), 39-52. <https://doi.org/10.1016/j.jdevec0.2009.01.001>

- Gasb. (1978). Governmental Accounting Standard Board. *Concept statement n° 1: objectives of financial reporting*. Stamford, Connecticut.
- Groves, S. M.; & Valente, G. (1986). *Evaluating financial condition: a handbook for local government* (4th ed., Karls Nollenberger, rev.). Washington: The International City/Country Management Association-ICMA.
- Klein, F. A.; Sakurai, S. N. (2015). Term limits & political budget cycles at the local level: evidence from a young democracy *European Journal of Political Economy*, 37, 21-36. <https://doi.org/10.1016/j.ejpoleco.2014.10.008>
- Isen, A. (2014). Do local government fiscal spillovers exist? Evidence from counties, municipalities, and school districts. *Journal of Public Economics*, v. 110, p. 57-73, 2014. <https://doi.org/10.1016/j.jpubeco.2013.12.005>
- Kloha, P.; Weissert, C. S.; & Kleine, R. (2005). Developing and testing a new composite model to predict local fiscal distress. *Public Administration Review*, v. 65, n. 3, p. 313-323, 2005. <https://doi.org/10.1111/j.1540-6210.2005.00456.x>
- Lei Complementar n.º 101, de 4 de maio de 2000. (2000). Estabelece normas de finanças públicas voltadas para a responsabilidade na gestão fiscal e dá outras providências. Recuperado em 20 agosto, 2018, de [http://www.planalto.gov.br/ccivil\\_03/leis/lcp/lcp101.htm](http://www.planalto.gov.br/ccivil_03/leis/lcp/lcp101.htm)
- Lima, S. C.; & Diniz, J. A. (2016). *Contabilidade Pública: Análise financeira governamental*. São Paulo: Atlas.
- Matias, A. B.; & Campello, C. A. G. B. (2000). *Administração financeira municipal*. São Paulo: Atlas.
- Matias-Pereira, J. (2010). *Finanças públicas: a política orçamentária no Brasil* (5. ed.). São Paulo: Atlas.
- Matias-Pereira, J. (2012). Federalismo fiscal e crise econômica nos municípios brasileiros. *Jornal do Brasil*, Rio de Janeiro, p. 1, 17 set.
- Musgrave, R. A (1959). *Teoria das finanças públicas: um estudo de economia governamental*. Tradução de Auriphebo Berrance Simões. São Paulo: Atlas.
- Musgrave, R. A.; & Musgrave, P. B (1983). *Finanças públicas: teoria e prática*. São Paulo: Atlas.
- Miller, G. J. (2001, June). *Fiscal health in New Jersey's largest cities*. Cornwall Center Publication Series. Department of Public Administration, Faculty of Arts & Sciences.
- Niskanen, W. A (1971). *Bureaucracy & representative government*. Chicago: Aldine-Atherton.
- Nordhaus, W. D. (1975, Apr.). The political business cycle. *The Review of Economic Studies*, 42(2), 169-190. [10.2307/2296528](https://doi.org/10.2307/2296528)
- Poterba, J. M. (1996). Balanced budget rules & fiscal policy: evidence from the States. *National Tax Journal*, 48(3), 329-336.
- Oates, W. (1979). Lump-sum intergovernmental grants have price effects. In: P. Mieszkowski, & W. H. Oakland. *Fiscal federalism & grants-in-aid*. Washington, D.C.: Urban Institute.
- Oates, W. (1999, Sep.). An essay on fiscal federalism. *Journal of Economic Literature*, 37(3), 1120-1149.
- Queiroz, D. B. (2015). Composição dos gastos públicos e resultados eleitorais: um estudo nos municípios brasileiros. *Tese* (Doutorado em Ciências Contábeis) – Programa Multiinstitucional e Interregional de Pós-graduação em Ciências Contábeis da UnB/UFPB/UFRN. Natal, RN.
- Ribeiro, T. B.; & Toneto Júnior, R. (2004, jun./dez.). As receitas tributárias das praças de pedágio e as finanças públicas municipais: uma análise do esforço fiscal no estado de São

- Paulo. *Planejamento e Políticas Públicas*, 27, 117-139. Recuperado em 20 agosto, 2018, de <http://www.ipea.gov.br/ppp/index.php/PPP/article/view/52/52>
- Rogoff, K. (1990, March). Equilibrium political budget cycles. *The American Economic Review* Vol. 80, N. 1 (Mar., 1990), 21-36. Retrieved 20 August, 2018, from <https://www.jstor.org/stable/2006731>
- Rose, S. (2006). Do fiscal rules dampen the political business cycle?. *Public Choice*, 128, 407-431. <http://doi.org/10.1007/s11127-005-9007-7>
- Schneider, C. J. (2010). Fighting with one hand tied behind the back: political budget cycles in the West German states. *Public Choice*, 142(1-2), 125-150. <http://doi.org/10.1007/s11127-009-9480-5>
- Shah, A. (2007). A practitioner's guide to intergovernmental fiscal transfer. In: R. Boadway, A. Shah. *Intergovernmental fiscal transfers: principles & practice*. Washington, D.C. World Bank.
- Strumpf, K. S. (1998). A predictive index for the flypaper effect. *Journal of Public Economics*, 69(3), 389-412.
- Varela, P. S. (2008). *Financiamento e controladoria dos municípios paulistas no setor de saúde*. Tese de Doutorado, Programa de Pós-Graduação em Ciências Contábeis, Universidade de São Paulo, São Paulo, SP, Brasil.
- Zonatto, N.; Kroth, D. C.; & Rodrigues, M. P. (2011, jul./dez.). Desempenho fiscal dos municípios catarinenses e seus determinantes: uma análise econométrica para o período de 2000 a 2008. *Perspectiva Econômica*, 7(2), 78-92. <http://doi.org/10.4013/pe.2011.72.02>



## *A Relação da Natureza das Transferências Governamentais e a Responsabilidade Fiscal de Governos Municipais Brasileiros*

### RESUMO

**Objetivo:** analisar a relação entre a natureza das transferências governamentais e a responsabilidade fiscal de governos municipais brasileiros, sob a ótica dos ciclos políticos.

**Método:** por meio de regressão com dados em painel, com efeitos pooled, analisou-se o comportamento de fatores orçamentários e eleitorais em 95 grandes municípios brasileiros, no período de 2006 a 2016, com reflexos na responsabilidade fiscal.


**Originalidade/relevância:** de acordo com os construtos teóricos, o problema da ilusão fiscal deturpa a condução do orçamento público em relação aos contribuintes, o que levou este estudo a associá-lo à responsabilidade fiscal. Partindo desse pressuposto, tal relação pode ser fortalecida em períodos eleitorais, motivo que levou esta pesquisa a controlá-lo.


**Resultados:** as evidências confirmaram que a responsabilidade na gestão fiscal é influenciada positivamente pela presença de transferências voluntárias, tendo em vista as exigências atreladas para seu recebimento. No contraponto, quando as transferências são constitucionais e, portanto, obrigatórias, admitem-se espaços para comportamentos agressivos à responsabilidade fiscal. Além disso, verificou-se que, em anos eleitorais e pré-eleitorais, o gestor, também, apresenta um comportamento de agressividade fiscal.


**Contribuições teóricas/metodológicas:** todos os achados contribuem, de forma incremental, para a literatura existente até o momento, de modo a confirmar o diagnóstico e o entendimento dos problemas da ilusão fiscal provocados pelas transferências governamentais, e que se agrava ao se observar os ciclos políticos orçamentários, que impactam, consideravelmente, a responsabilidade fiscal governamental.


**Palavras-chave:** Transferências governamentais; Fiscal Ilusion; Responsabilidade Fiscal; Ciclos Políticos Orçamentários.

---

Ronaldo José Rêgo de Araújo   
Universidade Federal da Paraíba (UFPB),  
Paraíba, Brasil  
E-mail: ronaldocontabilidade@ymail.com

Dimas Barrêto de Queiroz   
Universidade Federal da Paraíba (UFPB),  
Paraíba, Brasil  
E-mail: dimasqueiroz@gmail.com

Edilson Paulo   
Universidade Federal do Rio Grande do Sul  
(UFRGS), Rio Grande do Sul, Brasil  
E-mail: e.paulo@uol.com.br

Carla Janaina Ferreira Nobre   
Universidade Federal de Pernambuco,  
Pernambuco, Brasil  
E-mail: carlajanainanobre@gmail.com

---

Recebido: Abril 27, 2019  
Revisado: Julho 30, 2019  
Aceito: Dezembro 02, 2019  
Publicado: Abril 30, 2020

