



**THE INFLUENCE OF EXPENDITURE BY MINISTERIAL FUNCTIONS
ON PERSONAL EXPENDITURE ACCORDING TO ELECTORAL
POLITICAL CYCLES**

**A INFLUÊNCIA DOS GASTOS POR FUNÇÕES MINISTERIAIS NAS DESPESAS COM
PESSOAL DE ACORDO COM OS CICLOS POLÍTICOS ELEITORAIS**

**LA INFLUENCIA DE LOS GASTOS POR FUNCIONES MINISTERIALES EN LOS
GASTOS CON PERSONAL DE ACUERDO CON LOS CICLOS POLÍTICOS
ELECTORALES**

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ABSTRACT

The present study aimed to analyze the influence of expenditure by function in the expenditure with personnel of the Brazilian states according to the cycle. The theoretical foundation is based on the theory of public choice, economic political cycles, and personnel expenses. This study is characterized as a quantitative research, since a multiple linear regression with panel data was performed for each electoral cycle. The data were collected from the Accounting and Tax Information System of the Brazilian Public Sector (SICONFI), the time cut refers to the year 1995 to 2016. It is concluded that political interests can be evidenced through the influence of ministerial functions in the personnel expenses. And also, that the interests of managers are different in each electoral cycle, because they differ according to the need to meet the demands of the agents involved legitimizing themselves in power. The greatest positive influences found were related to energy and mineral resources in the electoral year (T0), judicial (T1) and commerce and services industry (T2), judicial (T3). The effect of the limits established by the fiscal responsibility law increased personnel expenses.

Keywords: Public Choice Theory; Personnel Expenses; Electoral Cycles; Fiscal Responsibility Law; Functional Classification of Expenditure.

RESUMO

O presente estudo objetivou analisar a influência das despesas por função nos gastos com pessoal dos estados brasileiros de acordo com o ciclo eleitoral. A fundamentação teórica é embasada pela teoria da escolha pública, ciclos políticos econômicos e gastos com pessoal. Este estudo caracteriza-se como pesquisa quantitativa, pois foi realizada uma regressão linear múltipla, com dados em painel, para cada ciclo eleitoral. Os dados foram coletados do Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro (SICONFI), e o recorte temporal refere-se ao ano de 1995 até 2016. Conclui-se que os interesses políticos podem ser evidenciados por meio da influência das funções ministeriais nos gastos com pessoal e também que os interesses dos gestores são diferentes em cada ciclo eleitoral, pois se diferenciam de acordo com a necessidade de atender às exigências dos agentes envolvidos para se legitimar no poder. As maiores influências positivas encontradas foram referentes à energia e aos recursos minerais no ano eleitoral (T0), judiciária (T1) e indústria e comércio e serviços (T2), judiciária (T3). O efeito dos limites estabelecidos pela lei de responsabilidade fiscal aumentou a despesa com pessoal.

Palavras-chave: Teoria da escolha pública; Despesa com Pessoal; Ciclos Eleitorais; Lei de Responsabilidade Fiscal; Classificação Funcional da Despesa.

RESUMEN

El presente estudio objetivó analizar la influencia de los gastos por función en los gastos con personal de los estados brasileños de acuerdo con el ciclo electoral. La fundamentación teórica está basada en la teoría de la elección pública, ciclos políticos económicos, y gastos de personal. Este estudio se caracteriza como una investigación cuantitativa, pues se realizó una regresión lineal múltiple, con datos en panel, para cada ciclo electoral. Los datos fueron recolectados del Sistema de Información Contable y Fiscales del Sector Público Brasileño (SICONFI), el recorte temporal se refiere al año 1995 hasta 2016. Se concluye que los intereses políticos pueden ser evidenciados por medio de la influencia de las funciones ministeriales en los gastos de personal. Y también, que los intereses de los gestores son diferentes en cada ciclo electoral, pues se diferencian de acuerdo con la necesidad de atender las exigencias de los agentes involucrados para legitimarse en el poder. Las mayores influencias positivas encontradas se relacionaron con los recursos energéticos y minerales en el año electoral (T0), judicial (T1) e industria de comercio y servicios (T2), judicial (T3). El efecto de los límites establecidos por la ley de responsabilidad fiscal aumentó el gasto con personal.

Palabras clave: Teoría de la Elección Pública; Gastos de personal; Ciclos Electorales; Ley de Responsabilidad Fiscal; Clasificación Funcional del Gasto.

1 INTRODUÇÃO

The theory of public choices, through political budget cycles, suggests that generally governments tend to increase public spending, evident in the electoral year, with the aim of showing efficiency and, thus, increasing the possibility of reelection (Rogoff, 1990).

In Brazil, political cycles take place at predefined periods, each 4 years, usually in October of the electoral year, as well as, the fiscal execution calendar coincides with the calendar year, a situation that favors opportunistic cycles, where the manager makes decisions that allow the maximization of the popularity of his public policies and increasing your chances of reelection or election of a political ally (Sakurai, 2009).

However, through some guidelines supported by transparency, planning, responsible control of public spending, the Fiscal Responsibility Law aims to promote fiscal accountability, as well as restrict the opportunistic use of public resources, one of the established limits that of personnel expenses which deserves special attention (Medeiros, Albuquerque, Tavares, & Souza, 2017).

In this sense, some studies examine the Fiscal Responsibility Law and spending on personnel at the municipal level (Covre & Matos, 2016; Medeiros et al., 2017; Souza, Silva, & Câmara, 2018). At the state level, other studies also examine Fiscal Responsibility Law (Conte, 2014; Pires & Platt, 2016; Santos & Ferreira, 2017, Cahan, 2019). Nevertheless, the effect of expenditures for ministerial functions on personnel expenditures in Brazil states according to the electoral cycle still deserves further study.

In view of this, considering that personnel expenditure consumes most of the public resources, and that they are also immersed in ministerial functions and can be subject to manipulation by managers during electoral cycles, this study following the question: **what is the influence of expenditure by function on personnel expenditure in Brazilian states according to the electoral cycle?** To answer this question, the general objective of this study is to analyze the influence of expenditures by function on personnel expenditures in Brazilian states according to the electoral cycle.

The answer to this question can contribute to the theory of public choices by describing which ministerial roles influence staff spending, as well as the extent to which political cycles shape these influences. In this sense, it can demonstrate the manipulation of resources with personnel, based on investments in ministerial portfolios in each electoral economic cycle.

Thus, this article is divided into five sections. In addition to the introduction, contained in the first section, the theoretical foundation that supports the work in the second part is addressed. In the third, the methodological procedures are highlighted and, in the fourth section, the analysis and discussion of the results are presented. And in the fifth section, the conclusion is described.

2 THEORETICAL FOUNDATION

2.1 PUBLIC CHOICE THEORY

The Theory of Public Choice, according to Meadowcroft (2016) was proposed by James M. Buchanan (1919-2013), Nobel Prize in Economics, under an individualistic ethical and methodological perspective. This individualistic thinking, added to Buchanan's subjective inclinations, was motivating for the conceptual discussion on the evaluation of social actions (Medema, 2016). Along these lines, in the background, Meadowcroft (2016) points out that the Theory of Public Choice is basically the application of economic and methodological theory, for investigations in the field of politics.

Based on this individualist philosophy, Meadowcroft (2016) contextualizes that in the Theory of Public Choice, the claim that any individual is more or less important is not acceptable. That is, the consent of all individuals, regardless of social class, social position, gender, skin color, with or without privileges must be considered for collective decisions to be legitimate (Meadowcroft, 2016). In addition, it is the consent of individuals that can define what is good for society, and determine the course of actions to be deliberated (Medema, 2016).

Considering the behavioral systematics of individuals in the government sector, Mello (2009) comments that the analysis in the Theory of Public Choice consists of the actions of individuals, according to their social position (voter, candidate, elected representative, etc.) in view of the results observed (or by the least should be). In this sense, Mello (2009, p. 29) argues that the Theory of Public Choice "[...] is intended to offer an understanding, an explanation, of the complex institutional interactions of the public sector".

Therefore, in the governmental context, Larkin (2016) points out that Theory of Public Choice instructs that the individual, when elected to represent certain interests, does not change his personality or personal purpose, but works according to his demanded demands. However, the central issue in this context consists of the interests claimed by individuals (maximizing well-being) formed by different groups, and those granted by the government, whose main purpose is to win and maintain the position (Larkin, 2016). Still, according to Mello (2009), these interest groups, positioned between voters and representatives, exert pressure in order to reach a series of particular demands.

2.2 POLITICAL ECONOMIC CYCLES

Based on the Public Choice Theory, Nordhaus (1975) presented an approach on the political economic cycles, in which he considered the choice between maximizing the inflation rate and reducing the unemployment rate (as a strategy for government officials to maintain political office). Furthermore, Nordhaus (1975) encompasses the impact caused by the choice of representatives in the voters' decision, a situation in which government officials are generally guided by severe macroeconomic policies in the first years and expansionist policies in the election year.

An adaptation carried out in the political economic cycles generated the model of political budget cycles, developed by Rogoff and Sibert (1988) and Rogoff (1990), which explains the choices regarding taxes and public spending, considering that the governments try to show efficiency by through these choices, and they are likely to increase spending or reduce taxes before the elections, with the aim of influencing opinion of voters.

One of the factors that contribute to the increase in spending and the reduction of taxes in the electoral years is the asymmetry of information, that is, the voter has no conditions or incentives to seek detailed information that allows identifying the level of efficiency of the manager in a timely manner, and the government official is aware of this temporary asymmetry, in which voters even receive information, however, with a delay period (Rogoff & Sibert, 1988, Rogoff, 1990).

However, informational asymmetry can produce a series of conflicting situations and, in this perspective, Mello (2009) points out that representatives tend to be concerned with the issue of transparency. It is hoped that maximizing transparency can give voters a sense of security about the actions taken by managers (Mello, 2009). In this sense, Ademmer and Dreher (2016) consider that voters create an expectation about the results presented in relation to the performance of managers, and with this, they condition their decisions on this information.

In view of this, it is worth noting that the inspection of political budget cycles, according to Ademmer and Dreher (2016), emerges as a limiting factor to the policies of fiscal stimulus, by the government before the elections. Another determinant factor in combating the opportune behavior of managers (aiming at the reappointment) is the press, especially when the country is home to a strong media (Ademmer & Dreher, 2016).

Galli and Rossi (2002), in a study carried out in West Germany, defined the periods of the political budget cycle in a situation in which electoral mandates are predefined, with elections occurring each 4 years, in which case the electoral cycle is divided into: T0, election year, T1, post-election year, T2, mid-cycle, and T3, pre-election year.

In analyzing electoral cycles focusing on elections for governors of the United States of America, Cahan (2019) found evidence that governments can plan policies that tend to increase employment before the elections, or even postpone cuts after that period, acting in an opportunistic manner. As such, this pattern is consistent with manipulation, and can occur through freezing hires after an election or through vetoes before elections.

In this sense, the electoral political cycles can influence the increase of various expenses in an opportunistic way in the electoral year, through the maximization of the offer of services, salaries, among other actions, because these expenses have the purpose of propagating to the voters the efficiency of the manager. Therefore, the next topic addresses studies related to personnel expenses.

2.3 PERSONNEL EXPENDITURES

Analyzing personnel expenses, interest and debt charges, according to Souza, Silva and Câmara (2018), is a relevant factor in the public sector, given that the functioning of public entities is linked to the allocation of total current resources for these expenses. Therefore, the non-responsible management of personnel expenses may affect the maintenance of these entities, the provision of public services, and consequently, society in general (Santos, & Ferreira, 2017, Souza, Silva, & Câmara, 2018).

Thus, according to Pires and Platt (2016) and Santos and Ferreira (2017) aiming to balance public accounts, spending limits were established in Complementary Law 101/2000, known as Fiscal Responsibility Law (FRL). The FRL establishes for the executive branch, in relation to net current revenue, a maximum limit of cats with staff of 40.9% at the federal level, 49% at the state level and 54% at the municipal level. It should be noted that these percentages apply only to the executive branch, and for other branches the respective law provides for specific limits (Law No. 101, 2000).

At the federal level, compliance with the limits for personnel expenses, defined by the FRL, between the powers and bodies of the Union was the object of the study by Campagnoni and Platt (2014). The results showed that the Powers and Organs of the Union complied with the maximum and prudential limits in all the years studied. It is evident that organizations need human capital to carry out their purposes, with the State it is no different, exercising their functions without the people in their organizations is not feasible, thus, it is expected that personnel expenses will be significant (Campagnoni & Platt, 2014).

Based on the criticality of state public finances, Conte (2014) assessed whether the FRL contributes to improving the fiscal indicators of the state of Rio Grande do Sul, considering an analysis period from 2004 to 2012. However, the results showed that the established standards, although important, were not sufficient to sustain an improvement in the fiscal situation of the state of Rio Grande do Sul, as the expenses grew in a greater proportion than the current net revenue (Conte, 2014).

The effect of political budget cycles on the fiscal situation of Brazilian municipalities in the context of the FRL was studied by Covre and Matos (2016). Based on the Firjan Tax Management Index - FTMI, the results pointed to the existence of political budget cycles in the municipalities, however, with an improvement in fiscal indicators, a result opposite to the theory, possibly due to an adaptation of the political budget cycles to the rules established by the FRL. In the same study, the effects of federal and state elections on the fiscal situation of municipalities were analyzed, pointing out that in years of federal and state elections the fiscal situation of municipalities worsens, probably because there is no increase in restrictions for municipalities in relation to municipalities. personnel expenses in the federal and state election years (Covre & Matos, 2016).

At the state level, Pires and Platt (2016) sought to show whether there was compliance with the limits for personnel expenses, established by the FRL, in the State of Mato Grosso do Sul, covering the period from 2000 to 2014. The results showed that as of 2004, all the Powers in the respective State have complied with the limits specified in the FRL. Still, after the monetary update, by the Broad Consumer Price Index (IPCA), there was an increase of 86.15% in personnel expenses, while the current net revenue grew 134.35% (Pires & Platt, 2016).

Still at the state level, Santos and Ferreira (2017) analyzed the behavior of personnel expenses in the Executive Branch of the State of Tocantins in relation to the current net revenue in the period from 2005 to 2014. The findings allowed concluding that in the period from 2005 to 2009, the personnel expenditures limit provided for in the FRL was not observed. However, in 2010 and 2011 the prudential limit was extrapolated and, finally, from 2012 to 2014 the maximum limit was not observed (Santos & Ferreira, 2017).

In this sense, Medeiros et al. (2017), based on the limits on personnel expenses, analyzed the linear trend of personnel expense indicators and the correlation of this with the profile of health personnel expenses, covering 5,356 Brazilian municipalities, in the period 2004 and 2009. The findings showed an average growth of 1.3% in the total expenditure on personnel in the municipalities, however, expenditure on health personnel did not follow this evolution. The collection scenario of the municipalities observed pointed out that if municipal conditions were maintained for the next periods, these municipalities could be more vulnerable to fiscal sanctions. In addition, the results did not show any correlation between the indicators, contrasting with the statement of health managers, that the problem with hiring staff and expanding health systems is concentrated in the FRL (Medeiros et al., 2017).

The analysis of the situation of personnel expenses in northeastern capitals, in the period from 2006 to 2016, was the object of study by Souza, Silva and Câmara (2018), aiming at the relation of the limits imposed by the FRL (net current revenue) and the current revenue total. Considering the sample composed of nine municipalities (capitals), the findings showed a significant level of periods in which the maximum limit (above 54%) or prudential limit (above 51.3%) of expenditures in relation to total current revenues does not observed. Another noteworthy point is that the results showed, on average, an increase in personnel expenses of 50% to 77%, for each R\$ 1.00 increase in net current revenue (Souza, Silva, & Câmara, 2018).

Therefore, in the next section, the methodological aspects used for the development of the research are presented.

3 METHODOLOGY

The present study, regarding the objectives, is characterized as descriptive (Creswell, 2007). As for the procedures, this research is characterized as documentary (Flick, 2013), since the data come from the national treasury and collected through the Brazilian Public Sector Accounting and Tax Information System (SICONFI). The period analyzed is from 1995 to 2016, this cut is relevant due to the consolidation of the real plan and stabilization of the country's inflation. Therefore, the electoral cycles analyzed are shown in Table 1.

Table 1
Electoral cycles

Time/ Electoral cycles	T0 Cycle	T1 Cycle	T2 Cycle	T3 Cycle
Year 1	1998	1995	1996	1997
Year 2	2002	1999	2000	2001
Year 3	2006	2003	2004	2005
Year 4	2010	2007	2008	2009
Year 5	2014	2011	2012	2013
Year 6	:	2015	2016	:

Source: Prepared by the authors (2019).

Within the analyzed period, the first year after the election (Cycle T1) and the second year after the election (Cycle T2), it was possible to obtain 6 periods for comparison. The election year (Cycle T0) and the year preceding the election (T3), obtained only 5 observations for each of the States and the Federal District.

The influence of expenditure by function on personnel expenditures in Brazilian states, according to the electoral cycle and the Fiscal Responsibility Law, was verified through four multiple linear regressions with panel data, for each electoral cycle, according to Equation 1.

$$\begin{aligned}
 Gp_{it} = & \beta_0 + \beta_1 leg_{it} + \beta_2 jud_{it} + \beta_3 adm_{it} + \beta_4 agr_{it} + \beta_4 com_{it} + \beta_4 def_{it} + \beta_4 edu_{it} \\
 & + \beta_4 ener_{it} + \beta_4 hab_{it} + \beta_4 ind_{it} + \beta_4 sau_{it} + \beta_4 ass_{it} + \beta_4 trp_{it} + \beta_4 lrf_{it} \\
 & + \varepsilon_{it}
 \end{aligned}
 \tag{1}$$

In order to identify the variables, Table 2 shows the nomenclature of the variables used in the model.

Table 2
Variables and model nomenclature

Variables	nomenclature	Type
Gp_{it}	Personnel expenses and social charges	Dependent
leg_{it}	Legislative	Independents
jud_{it}	Judiciary	
adm_{it}	Administration and planning	
agr_{it}	Agriculture	
com_{it}	Communication	
def_{it}	National defense and public security	
edu_{it}	Education and culture	
$ener_{it}$	Energy and mineral resources	
hab_{it}	Housing and urbanism	
ind_{it}	Industry, commerce and services	
sau_{it}	Health and sanitation	

(Continue)

(Conclusion)

Variables	nomenclature	Type
ass_{it}	Assistance and social security	Independents
trp_{it}	Transport	
lrf_{it}	Dummy variable for the Fiscal Responsibility Law, 1 for years after 2000 and; 0 otherwise	

Source: Prepared by the authors (2019).

Personnel expenses, a dependent variable, underwent changes in its accounting account, in 1995, it was possible to identify them as II.A.1 - costing expense, in 1996, it was changed to II.A.1.1 - personnel and charges, which remained until 1999. In the following year, it became II.A.1 - operating expenses that comprise the expenses with active personnel, charges and others. As of 2002, it became personal and social charges, however, after the year 2008, there was a segregation of all accounts in pledged, paid, settled, among others, thus, it was opted for paid.

It is noteworthy that many of the institutional functions, related to the ministries at the federal level, with the secretaries at the state and municipal levels and with the powers in both existing spheres, have been allocated since the initial period of analysis, 1995. Thus, for the temporal analysis was necessary to add the developments to find the values coming from the institutional functions. For example, National defense and public security, which were deployed after 2001, but in later years it is possible to identify them separately

In addition, the limitation of this analysis is the ministries that did not exist in 1995, as well as the Ministry of Foreign Affairs and Labor due to the lack of data. Thus, in view of these methodological procedures, the present study has a quantitative approach (Hair, Babin, Money, & Samouel, 2005). Therefore, it was carried out with the help of electronic spreadsheets and the statistical software STATA®.

The estimation with panel data allows to analyze the same cross-sectional unit (companies, families, States) concurrently with a series of time, thus, it allows to analyze both the spatial and the temporal dimension. However, panel data can be estimated by different models, in which heteroscedasticity is assumed. In pooled data models it is assumed that the transversal units are not heterogeneous, but if at least one of the units is different, the most efficient model is estimated by the least squares with dummies variables for each unit (LSDV). It is also necessary to analyze the errors, if they are not correlated with the regressors, the random effects model is more efficient compared to the stacked data model (Gujarati & Porter, 2011).

However, to identify the most efficient models between Pooled and fixed effect, we have the Chow test that identifies the heterogeneity of the cross section units. And to identify the correlation between the errors and the regressors and to decide between the Pooled and random effect models, we have the test of the Lagrange multiplier by Breusch Pagan (Gujarati & Porter, 2011).

But, if both are more efficient than the pooled data model, it is necessary to identify whether the error components are correlated with the explanatory variables. Thus, if there is this correlation, the most efficient model will be the fixed effect, otherwise it will be the random effect, this can be observed by the Hausman test (Gujarati & Porter, 2011).

4 PRESENTATION AND ANALYSIS OF RESULTS

4.1 DESCRIPTIVE ANALYSIS

The four cycles analyzed have very similar descriptive characteristics, although T1 and T2 are only a period of five years and the others a period of six years. Table 3 shows the descriptive statistics of the electoral cycles from 1995 to 2016.

Table 3
Descriptive statistics of electoral cycles between 1995 and 2016.

Factor	T0 cycle	T1 cycle	T2 cycle	T3 cycle
Minimum	R\$ -	R\$ -	R\$ -	R\$ -
1st Quartile	R\$ 590,056,717	R\$ 1,324,863	R\$ 609,667,723	R\$ 7,396,796
Mean	R\$ 5,309,654,327	R\$ 4,960,988,416	R\$ 5,835,267,457	R\$ 2,338,660,184
Median	R\$ 2,389,916,071	R\$ 1,986,640,713	R\$ 2,475,657,416	R\$ 778,762,464
3rd Quartile	R\$ 6,309,318,404	R\$ 5,908,895,684	R\$ 6,674,407,217	R\$ 2,906,781,436
Maximum	R\$ 84,020,150,617	R\$ 92,762,029,943	R\$ 98,761,346,002	R\$ 36,630,410,585

(Continue)

(Conclusion)

Standard deviation	R\$ 9,682,793,183	R\$ 9,967,736,547	R\$ 10,773,912,841	R\$ 4,758,455,008
Asymmetry	4.90	5.24	5.03	4.75
Kurtosis	32.24	37.54	34.80	27.99
Coefficient of variation	15.69522418	15.78595392	14.50625088	17.51184728

Source: Research data (2019).

All cycles have a minimum value of 0, as there are certain periods that do not have personnel expenses and social charges paid. Of the first quartiles, the first year after the election year, cycle T1, has the lowest value and cycle T2 the largest, with a value of R\$ 609,667,723. However, on average the years of the electoral cycle that have the most expenses with personnel and social charges is the cycle of the second year after the election (Cycle T2), with an average value of R \$ 5,835,267,457, but, the electoral year holds the second position with the value of R \$ 5,309,654.327

The fact that the T2 cycle had the highest average corroborates with the study developed by Covre and Matos (2016), in the sense that State/Federal elections influence the fiscal management of municipalities, because, in this case, that electoral period may also have influenced spending, increasing expenditure on personnel in the states. In this sense, Figure 1 shows the boxplot graphs of personnel expenses and social charges for all electoral cycles.

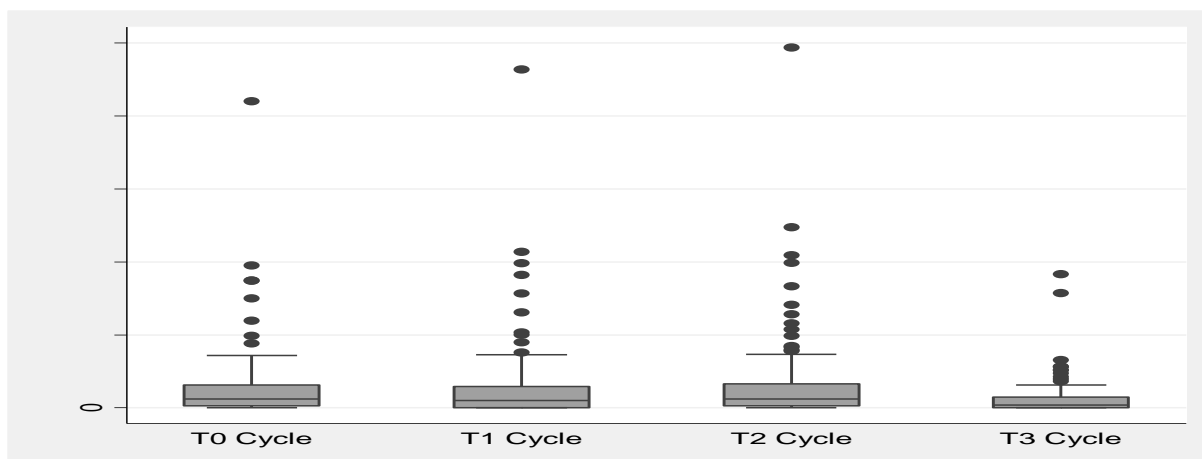


Figure 1. Boxplot graphs of the personnel expenses and social charges by electoral cycles from 1995 to 2016.

Source: Research data (2019).

Regarding the T0 cycle, the study by Covre and Matos (2016) points out that it had the best fiscal indicators in the analyzed period, in a possible adaptation to the rules of the established by the LRF. In the present research, the T0 cycle presented the second highest average of expenditure on personnel partially agreeing with theory and with the study by Covre and Matos (2016), as it presents lower average values than the T2 cycle, so that according to the electoral cycles (Rogoff, 1990), expenditures would be higher in T0 and with the study by Covre and Matos (2016), where the rules established by the LRF for the electoral year inhibit the opportunistic increase in personnel expenses.

However, it is noted that the standard deviation is high, since the first three cycles T0, T1 and T2 have values close to R\$ 10 billion, whereas the electoral predecessor cycle, T3 cycle, has approximately R\$ 5 billion as standard deviation. As for asymmetry, all electoral cycles have positive asymmetries, that is, the asymmetry on the right due to the greater distance of the third quartile. The kurtosis shows to have more tapered curves (leptocurtic) due to the values found. The coefficient of variation in personnel expenses and charges, for all electoral cycles, varies approximately 15.8% around the average.

It is possible to identify that the cycle preceding the electoral cycle has the average, median, first and third quartiles, and standard deviations close together. But even so, it presents outlier values, the highest value for the T3 cycle is approximately R\$ 36 billion. However, the T0 electoral year was not the year with the largest outlier, even with an outlier of approximately R\$ 84 billion. The second year after the election (T2 cycle) has the highest outlier value, of approximately R\$ 98 billion, followed by T1 cycle with R\$ 92 billion.

4.2 ESTIMATED MODELS

The estimated coefficients for personnel expenses according to all expenditures for ministerial functions separated by the electoral cycle are contained in Table 4.

Table 4
Coefficients and statistical tests of the estimated model of all functions according to the electoral cycle

Variables	T0 cycle	T1 cycle	T2 cycle	T3 cycle
Panel A - Model coefficients				
Legislative	-0.3515675	-3.873543***	-0.6560225	-2.809816
Judiciary	-0.7196639	1.684797**	0.6138569	6.601804***
Administration and planning	-0.1380963	0.9102542**	-0.8279896***	0.0086022
Agriculture	4.239645**	-0.1204411	2.50936	0.1352785
Communication	-3.89946	-1.247211	-25.32515***	-1322726*
National defense and public security	0.3575586*	-0.0582723	0.0196457	0.1028677
Education and culture	0.412241**	0.4644009**	0.3306284*	-0.2461617
Energy and mineral resources	6.434637***	6.737646	-8.696418	-0.2058021
Housing and urbanism	-0.9090479*	-0.2900636	0.1501042	0.631046*
Industry, commerce and service	-2.450631	2.709767	7.659759***	-1.479408
Health and sanitation	0.0668415	0.2036156	0.8018428***	-0.1846383
Assistance and social security	0.3201161**	0.3461551***	0.2658476**	-0.1017381
Transportation	0.3074462	-1.162766***	-0.3236674	0.2629262
LRF	2.69E+09***	3.01E+09***	2.78E+09***	1,37e+09**
Constant	149000000	-134818.1	6.96E+08*	9,008,084
Panel B - model tests				
Chow f statistic	3.79***	2.52***	2.49***	0.94
Breusch Pagan test	1	1	1	1
Hausman test	0.27	6.21**	0.7591	1.94
Breusch Pagan/Cook-Weisberg Heteroscedasticity	82.67***	129.10***	117.30***	213.94***
R square	0.9030	0.9241	0.9124	0.7665
VIF mean	19.18	20.60	18.99	18.52

Note: ***p value <1%, **p value <5%, *p value <10%
Source: Research data (2019).

It is possible to identify that the expenditures made in the electoral years (T0) that did not obtain statistically significant influences were as follows; (I) legislative, (II) judiciary, (III) administration and planning, (IV) industry, commerce and service, (V) health and sanitation, and (VI) transportation. It should be noted that, similarly, other functions in the post-election cycle (T1), two years after the election (T2) and for the predecessor cycle of the elections (T3) these expenditures were also not significant. In order to find the variables that most explain the model and reduce multicollinearity and make the model more parsimonious (Hair Jr. et al., 2005), Table 5 describes the regressions with the expenses for ministerial functions that obtained significance in the general model.

Table 5
Model with significant variables

Variables	T0 cycle	T1 cycle	T2 cycle	T3 cycle
Panel A - Model coefficients				
Legislative	-	-3.655055*	-	-
Judiciary	-	1.379334**	-	4.6134***
Administration and planning	-	1.162198	-0.436808***	-
Agriculture	2.124541**	-	-	-
Communication	-	-	-32.83773***	-18.3776***
National defense and public security	0.1458287	-	-	-
Education and culture	0.455277***	0.5471704***	0.496058*	-
Energy and mineral resources	5.040735*	-	-	-

(Continue)

(Conclusion)

Variables	T0 cycle	T1 cycle	T2 cycle	T3 cycle
Housing and urbanism	-1.21025***	-	-	-0.6114491
Industry, commerce and service	-	-	11.576160**	-
Health and sanitation	-	-	0.709179***	-
Assistance and social security	0.3288778*	0.3489672	0.352698***	-
Transportation	-	-1.072723***	-	-
LRF	2.46E+09***	3.06E+09***	2.53E+09***	9.78E+08**
Constant	1.71E+08	34398.36	1.27E+08*	343538.9
Panel B - model tests				
Chow f statistic	3.83***	3.17***	2.63***	0.59
Breusch Pagan test	1	1	1	1
Hausman test	1.96	4.13**	4.58**	2.57
Breusch Pagan/Cook-Weisberg Heteroscedasticity	82.82***	148.41***	131.34***	387.11***
R square	0.9008	0.9145	0.9227	0.6501
VIF mean	5.29	11.37	9.52	1.71

Note: ***p value <1%, **p value <5%, *p value <10%

Source: Research data (2019).

According to the tests performed to identify the panel data model that best fits this data sample, the Chow test, Breusch-Pagan test and Hausman test, it is concluded that for the T0, T1 and T2 cycles the best model refers to the fixed effect, estimated by the least square dummy variable estimator (LSDV). However, according to the Breusch-pagan/Cook-Weisberg test, the estimated models have problems of heteroscedasticity, therefore, they were estimated using White's robust error correction. And, for T3 cycle, the existence of a correlation between errors and regressors was not identified, as well as, there was no heterogeneity between States, therefore, the pooled model is the most appropriate.

Multicollinearity, on the other hand, was observed using the variance inflation factor (VIF), according to Corrar, Paulo and Dias (2007), it should remain between 1 and 10. However, it is noteworthy that the presence of multicollinearity does not affect the intention of forecasting, since the patterns between the explanatory variables of relationship are incorporated, thus, the solution to this problem consists only in detecting it (Gujarati & Porter, 2011).

It is worth emphasizing that the coefficient of determination of the models for the T0, T1 and T2 cycles are greater than 90%, thus, in these three models the error explains less than 10% of the variations. As for the T3 cycle, the coefficient of determination shows that 65% of the variations are explained by the equation variables and 35% by the error.

The resources destined to the legislative functions influence to the level of significance of 1% the expenses with personnel and social charges, in T1 cycle, post-election year. It can be seen by the coefficient, that in this cycle, costs are beneficial for reducing personnel expenses and social charges, as it presents a negative sign. Thus, for each real unit spent on the legislative function, expenditures decrease almost four times in the post-election cycles.

Although, not significant for the other electoral cycles, the results suggest that in T1 cycle, post-election year, there may be a readjustment in the workforce, and thus, expenditures for the legislative function reduce costs and demonstrate efficiency. Although personnel expenses can affect the maintenance of entities and the public service offer (Santos & Ferreira, 2017, Souza, Silva, & Câmara, 2018), the results suggest that the resources allocated to legislative functions are decreasing the expenses with hand of work.

In the inherent expenses of the Judiciary function, the opposite occurs, in the post-electoral cycle, the resources allocated to personnel expenses increase in the States. Significance levels equal to 5% and 1% for T1 and T3 respectively are considered. In the year before the election, this effect also occurs, but it is 3.34 times greater according to the values of the coefficients.

These results point out that possibly the expenses of the judicial functions are a concern in the cycles before and after the electoral year, T1 cycle and T3 cycle, as they demand more amounts for hand of work. This fact points out that there may be a possible management, on the part of the government, through the resources allocated in these periods in order to increase personnel expenses.

However, even if the entities need human capital to fulfill their objectives, personnel expenses are expected to be significant (Campagnoni & Platt, 2014), however, the results found show that in the pre-election year the resources invested demonstrate the greatest influence on human capital.

On the ministerial function inherent to public administration, only the T2 cycle was statistically significant, at the level of 1%. Thus, it is noted that in the second year of government mandate, the resources allocated to administration and planning decrease expenses.

These findings demonstrate that the investment in administration and planning in the second year of government mandate, are subject to readjustments in expenses. Considering the investments in these functions in the two periods T1 and T2, the readjustment of the second year is insufficient for the expenses to return to the same level. Therefore, the findings are in line with the findings of Conte (2014), as the legislation is not sufficient for an improvement in the fiscal situation to occur, as well as, it is not sufficient to prevent growth in spending.

Expenses with functions inherent to agriculture are high during election years (T0). The obtained coefficient was established at 5% of significance. This result suggests that they may reflect the need for government officials to obtain support from parliamentarians in these niches with an interest in reelection, thus, the resources for the ministry in this period increases personnel expenses.

Although in the municipal sphere the increase in personnel expenses can vary between 50% to 77% in northeastern capitals, as found by Souza, Silva and Câmara (2018), the coefficient found for agriculture shows that for R\$ 1.00 invested in the ministry agriculture, expenditure on personnel increases by an average of R\$ 2.12. These results show, at a minimum, the flexibility of government officials. In the communication ministry, in turn, investments have a negative influence on personnel expenses from the end of the mandate, in T2 and T3 cycles. The significance levels of the T2 and T3 cycles are 1%.

These results suggest that investments in communication tend to increase these sectors during the electoral year, in this sense, it contradicts the assumption of the Public Choice Theory (Rogoff & Sibert, 1988, Rogoff, 1990), because the expenses of these ministerial functions do not increase the expenses and reduce taxes in the election period. However, these results can be attributed to the ineffectiveness of the electoral contribution of this function in these periods, since the opportune behavior of managers in relation to the re-election to the position is opposed by the press (Ademmer & Dreher, 2016).

The resources allocated to national defense and public security have no influence on personnel expenses, regardless of the electoral economic cycle. These results suggest that there may be a lack of interest on the part of government officials in strengthening these areas, because although they are paramount, they are areas in which those involved do not have the right to strike to claim improvements and damage the images of government officials. In this sense, these results are in line with the Theory Public Choice Theory, as it is evident that the main purpose is to win and maintain the position (Larkin, 2016).

The ministerial function of education and culture positively influences personnel expenses in the T0, T1 and T2 cycles. However, it is noted that the coefficients have a conservative influence, that is, the values of the coefficients are not above R\$ 0.54 for each real allocated. These findings can be attributed to the timely behavior of government officials in the third year of office, so that in the electoral year the expansionist effect appears as a strategy, and according to Nordhaus (1975), this strategy has the purpose of influencing voters' choices.

The resources allocated to energy and mineral resources tend to influence personnel expenses only in the election year. This finding is in harmony with the results pointed out by Covre and Matos (2016), which evidenced a worsening in the fiscal situation in state electoral years, even though the findings are inherent to the municipal scope.

On the other hand, housing urbanism negatively influences personnel expenses, this result can demonstrate the opportunistic behavior of public managers in the election years, in the sense of allocating resources in areas of housing and urbanism with the minimum possible personnel expenditure, that is, through outsourcing.

The function of the industry, commerce and service only influences personnel expenses in the second year of the mandate (T2), however, it is noted that for each R\$ 1.00 allocated in this area, personnel expenses are increased by R\$ 11.57. In view of this, the remaining years may be covered, or even over-staffed.

The difference is perceived when comparing the influence on personnel expenses of the resources allocated in health and sanitation in relation to the influence with the resources allocated in industry, commerce and services. It is observed that each R\$ 1.00 allocated to health and sanitation increases personnel expenses by R\$ 0.71 compared to R\$ 11.57 in industry, commerce and services.

Assistance and social security also had an influence on different cycles (T0 and T1), however, the values of the coefficients show conservatism, as they are below R\$ 0.36 for each R\$ 1.00 allocated.

The resources allocated to Transportation decrease personnel expenses, only in the first year of office. This fact can be attributed to the sector's technological gap, as well as outsourcing. Besides that, the resources allocated to Transportation decrease personnel expenses, only in the first year of government mandate. This fact can be attributed to the sector's technological gap, as well as outsourcing.

In line with the studies by Campagnoni and Platt Neto (2014), Conte (2014), Covre and Matos (2016), Pires and Platt Neto (2016) and Santos and Ferreira (2017), after the implementation of the Fiscal Responsibility Law, the personnel expenditure was high. In the same way as Conte (2016), these findings demonstrate that this legislation is not sufficient to prevent the growth of spending.

However, the justification for the different influences of the functions still lacks theoretical deepening, as, as highlighted by Mello (2009), there is informational asymmetry between the conflicting situations, and yet, the different influences can be justified according to the performance of the weighted public managers by voters' expectations, as highlighted by Ademmer and Dreher (2016).

In summary, the interests of managers in the electoral cycle (T0) demonstrate that the resources allocated to ministerial functions; (a) agriculture, (b) education and culture, (c) energy and mineral resources, (d) assistance and social security, positively influence personnel spending. In contrast, (e) housing and urbanism have a negative influence.

In the post-election cycle, the first year in government mandate (T1 cycle), the functions that positively influence personnel spending are; (a) Judiciary, (b) Education and Culture. It is noted that the investments made in the (c) Legislative and (d) Transportation functions decrease personnel expenses.

Two years after the elections (T2 cycle), the positive influences on personnel spending are; (a) education and culture, (b) industry, commerce and service, (c) health and sanitation and (d) assistance and social security. Negative influences are inherent to the following activities; (e) administration and planning and (f) communication. In the pre-electoral cycle (T3), it is noted that only two ministerial functions influence personnel spending; (a) Judiciary, increasing expenses and (b) communication, decreasing expenses.

5 CONCLUSION

The present study aimed to analyze the influence of expenditure by function on personnel expenditure in Brazilian States according to the electoral cycle. It was possible to analyze that the resources destined to some ministerial functions influence their personnel expenses, according to the electoral cycles, and this can show possible managements according to the interests of the government.

The results suggest that political interests can be evidenced through the influence of ministerial functions on personnel spending. And also, it is possible that the interests of managers are different in each electoral cycle, as they differ according to the need to meet the demands of the agents involved to legitimize themselves in the position.

The limits established by the FRL for personnel expenses caused the increase in personnel expenses. However, after the law, the T1 electoral cycle was the one that most governors increased spending, on the other hand, the pre-electoral years (T3), the increase was 68% smaller compared to the highest period (T1). Thus, the results suggest that, after the implementation of the Fiscal Responsibility Law, the increase in personnel expenses was weighted according to electoral cycles.

In this sense, the main contribution of this study was to highlight which ministerial functions that influenced personnel expenses in each electoral cycle, such as, for example, the biggest positive influences in T0, T1, T2 and T3 were related to energy and mineral resources, judiciary and industry, commerce and service respectively. The importance of these facts occurs through the disclosure of how much the allocation of resources in ministerial functions guides the interests of government officials to increase or decrease personnel expenses in each cycle.

As a limitation of this research, there is the behavior of expenses, disregarding the number of public employees related to the expenses of each State. In addition to disregarding the influence of political parties and their respective ideological spectra of state managers in each political cycle. Thus, for future research, it is recommended to compare the influence of the main political parties on personnel expenses in Brazilian States according to electoral cycles. And also, the development of similar studies with a sample composed of other countries, since it is possible to compare the influence of each cycle of the other countries in with the existing influence in Brazil or other countries of interest.

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