Uncovering the Influence of the Fiscal Responsibility Law in the Brazilian States: Inferences regarding debt sustainability, the efficiency of personnel spending and responsible fiscal management

ABSTRACT

Objective: To verify whether the Fiscal Responsibility Law (FRL) influenced the behavior of personnel expenses in Brazilian States and responsible fiscal management.

Method: The research has a quantitative evaluation approach using the panel data regression model.

Originality/Relevance: The study's relevance lies in investigating the FRL as an effective tool for responsible fiscal management and the significant implications for understanding and improving public policies related to fiscal responsibility. The study's originality stands out due to the use of two variables that, according to the TCU, are essential to guarantee responsible fiscal management: Debt sustainability and the efficiency of personnel spending.

Results: The results highlight that the FRL advanced Brazil's fiscal rules and influenced the fiscal management of Brazilian States in several ways, such as the introduction of fiscal rules that include personnel expense limits. It is possible to observe that the FRL exerted a significant influence in promoting responsible fiscal management.

Theoretical/Methodological contributions: The theoretical contributions relate to the theory of public finances. Through the study, it is possible to ratify the neoclassical and Keynesian interpretations that explain the growth in public expenditures and form a basis for understanding that personnel expenditure influences the responsible fiscal management of States.

Keywords: Fiscal Responsibility Law, Responsible Fiscal Management, Panel Regression, Personnel Expenses, Sustainable Debt.

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1 INTRODUCTION

In the 1990s, fiscal rules applied at the federal level were limited to just five nations (Germany, Indonesia, Japan, Luxembourg, and the United States). However, over the years, more countries, including Brazil (in 2000), Argentina (in 2001), Bulgaria (in 2003), Uruguay (in 2006), and Romania (in 2013), have implemented similar regulations. Today, the International Monetary Fund (IMF) recognizes these standards in 105 economies worldwide.

In Brazil, the Fiscal Responsibility Law (FRL), a significant milestone in the country's fiscal management, was established with the promulgation of Complementary Law nº 101 on May 4, 2000 (Lei Complementar nº 101 de 04 de maio de 2000). This law, which set public finance standards for responsible fiscal management, has completed 22 years and is now one of the most extensively studied standards in various fields such as Law, Public Administration, Accounting, and Economics.

The Fiscal Responsibility Law (FRL) was modeled on other rules that regulated public spending and emerged to deal with problems similar to those faced by Brazil in the 1990s, including fiscal crises, growing primary deficits, and the political crisis that began in 1992 with the first impeachment of a president in the country. This standard, based on the pillars of planning, transparency, control, and accountability, promotes fiscal responsibility and discourages the allocation of public resources to short-term priorities. (Medeiros et al., 2017; Nascimento & Debus, 2002; Toledo & Rossi, 2005).

It is important to highlight that many studies on the Fiscal Responsibility Law (FRL) focus on state compliance with fiscal rules, leaving a research gap on topics such as debt and responsible fiscal management. This study stands out by using two variables considered essential by the Federal Audit Court (TCU) (2021) to ensure responsible fiscal management: debt sustainability and the efficiency of personnel expenses.

Several studies, such as Barroso and Rocha (2002), Neduziak and Correia (2017), Gama

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(2019), and Arraes et al. (2022), can help us understand the importance of fiscal balance in public accounts. In Brazil, we have a single budget approved by law to estimate revenue and set expenses of equal value for a given financial year. This Annual Budget Law (LOA) comprises three budgets: fiscal, social security, and investment, each with specific purposes.

The fiscal budget, the most relevant, basically refers to the funding of the public sector. It is from this budget that personnel expenses come from, which is responsible for a significant portion of that budget in all federative units in Brazil. Personnel spending is so important for fiscal balance that the FRL introduced an exclusive section to address this topic. For Linhares et al. (2013), the FRL brought austerity in implementing public spending, aiming to balance them. This balance is achieved through several limitations that legislators impose on public managers. Among the restrictions, the maximum percentages for personnel expenses concerning Net Current Revenue (NCR) stand out. For Dias (2009), the objective in establishing these limits is since personnel spending is one of the main items of public sector expenses in Brazil, and lack of control can affect the entire functioning of the public machine.

Ribeiro and Gasparini (2022), in a recent study awarded by the Ministry of Economy, emphasize that the biggest obstacle to carrying out public investments is budgetary rigidity and that most of it is concentrated in personnel expenses. Thus, to not compromise the development of federated entities, the FRL set limits for personnel expenses and established sanctions for those who fail to comply with the rules.

As a result, the constant increase in personnel expenses has been studied in several academic and technical areas because public expenses grow more than the economic growth of these federative entities. Furthermore, when analyzing the historical series of states and municipalities concerning these limits, it is likely that, at some point, the maximum percentages will be reached. (Arraes et al., 2022)

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This research is related to the science of finance. It provides a lens for the State's Financial Activity, involving a standard that establishes fiscal rules and limits public spending (Baleeiro, 2010). This field of study is widely explored in social sciences, mainly in public administration, accounting, law, and economics. According to Matias-Pereira (2017), the State's financial activity is supported by different theories developed and applied to tax systems, and he affirms that the level of economic activity is a relevant indicator for the study of public finance.

The study seeks a theoretical basis mainly in public finance and neo-institutional theories. The theory of public finances is one of the main theoretical problems of fiscal federalism, which is the definition of the optimal structure of the State; in addition, it is applied to fiscal systems at different levels of government. The neo-institutional theory provides theoretical support to social science studies, and accounting stands out in this research, given that it is a science that integrates government and organizational actions, with society being one of the main stakeholders in the performance of institutions and public agents (Matias-Pereira, 2017; Arraes & Matias-Pereira, 2023).

Thus, based on the controversy of academic studies and the motivation to understand the impact of the FRL on the financial activity of Brazilian States, it is necessary to investigate the relationship between personnel expenses on collections and whether there is sustainability in the debt of Brazilian States, verifying whether the FRL influenced the debt of these entities. Therefore, the following research question is defined: Did the FRL influence the responsible fiscal management of the States?

Thus, the Federal Audit Court (TCU) (2021) listed some necessary steps for good fiscal management: promoting debt sustainability and ensuring the efficiency of personnel spending. Responses are expected to admit whether the purpose of the FRL was achieved concerning good fiscal management, analyze whether the rule influenced the behavior of personnel

expenses in the States, and determine whether the increase in expenses of this nature compromises their financial health.

2 THEORETICAL REFERENCE

2.1 Fiscal Rule: Fiscal Responsibility Law and its Innovations

In 1990, only five countries (Germany, Indonesia, Japan, Luxembourg, and the United States) had fiscal rules in force and applied at least at the federal government level. In recent decades, several countries have established rules that promote responsibility in fiscal management; at the end of 2012, the number of countries with fiscal rules rose to 76, and according to the International Monetary Fund (IMF), currently, the design of these rules is observed in 105 savings. These rules, typically in response to political and economic crises, seek to contain pressures for excessive spending, especially in times of good economic results, and ensure fiscal responsibility and debt sustainability. (Davoodi et al., 2022; FMI, 2022; Schaechter et al., 2012).

Figure 1

Evolution of countries with tax rules (national and supranational) from 1985 to 2022
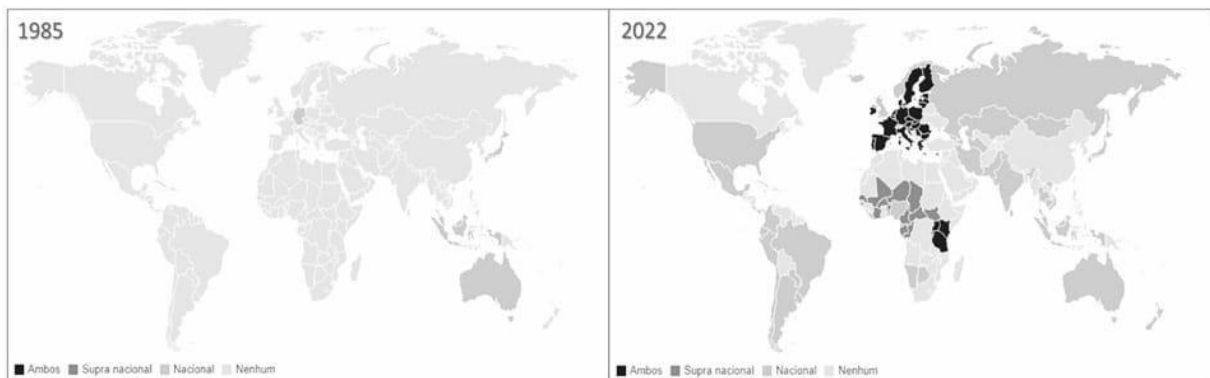
Source: International Monetary Fund. (2022)

Fiscal rules have become more widespread worldwide, mainly in response to fiscal crises. Most countries now have standards that combine sustainability objectives with balancing budget cycles. Just as the globalized world has a more complex economy, future tax rules tend

to follow this complexity. (Schaechter et al., 2012).

Culau and Fortis (2006) highlight that although the FRL presents complex language concerning fiscal and budgetary matters, making it difficult for citizens to understand, the law made the Public Administration more transparent, mainly due to the obligation to publish more detailed reports summarized information on public spending, as is the case with the Summary Report of Budget Execution (RREO) and the Fiscal Management Report (RGF).

The purpose of the FRL is to ensure a balance between revenue and expenditure in the three spheres of government, as well as to strengthen national federalism and allow equal treatment of the federal, State, and municipal governments. Among the established fiscal rules, attention given to the limits and control of personnel expenses stands out, considering that high expenses with public services can reduce the revenue available for investment in important areas such as health, education, and security. (Medeiros et al., 2017).

The FRL introduced some fiscal rules to guarantee fiscal balance, including personnel expenses, contracting credit operations, debt, unpaid balances, and voluntary transfers. These rules must be observed mainly during the transition period and at the end of the mandate, precisely so that government officials can guarantee responsible administration. (Nascimento, 2011).

In Brazil and most developing countries, fiscal imbalances result mostly from fiscal indiscipline and the lack of planning guidelines. These factors make the National State expensive and inefficient, causing distrust and frustration throughout society. However, countries that dared to develop initiatives that reversed this inefficiency and poor performance presented encouraging results due to these efforts. (Nascimento & Debus, 2001).

Many studies bring the benefits of implementing the FRL in Brazil. Gama (2019) studied the impact of the Fiscal Responsibility Law (FRL) on the fiscal results of subnational units and the electoral cycle from 1987 to 2010. The author concludes that the FRL promoted

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a substantial change in how state governments began to implement their spending policies concerning periods before the promulgation of the Complementary Law. The investigation by Neduziak and Correia (2017) in 26 States and the Federal District in the period 1995-2011 demonstrated the positive impacts of the introduction of fiscal rules by the FRL and that the imposition of the rules has been beneficial in promoting an environment conducive to greater economic growth. Furthermore, sharing this understanding, Barroso and Rocha (2002) conclude that the FRL proves to be an effective instrument for reducing the debt of States.

The return of inflation, the pressure for increases, and the financial incapacity of entities due to the drop in revenue are nothing new to be faced by these federative units. These problems are already known to society, including published transparently by the Federal Government through bulletins from the Brazilian National Treasury Secretariat (STN) and confirmed by a more recent investigation by Arraes et al. (2022), which presents a scenario in which States are increasingly committing their revenues to personnel expenses, as seen in the heat map below:

Figure 2

Performance of States according to the limits established in the FRL *for Executive power*
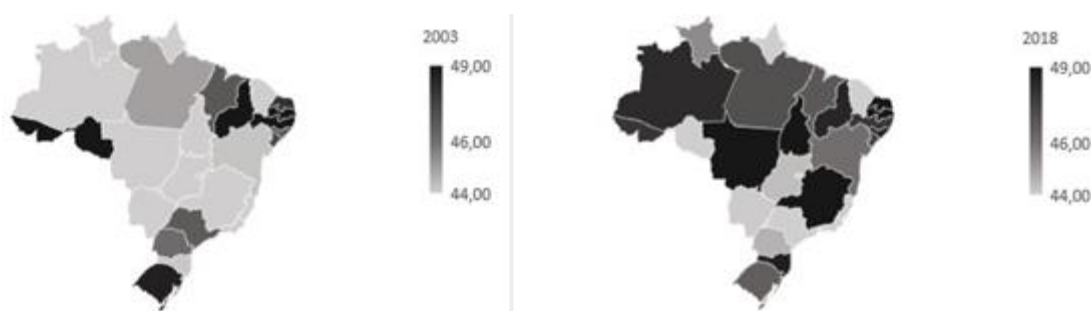
Source: Arraes et al. (2022)

Thus, based on the literature review related to FRL, it is possible to observe that the standard benefits the balance of public accounts and responsibility in fiscal management. However, different results can be seen among the federated entities when the studies investigate personnel expenses and debt sustainability. Studies point to an increase in personnel expenses in States and Municipalities but present obstacles regarding the effectiveness of the maximum

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percentages established in the standard.

2.2 Public Finance Theory

The science of finance studies aspects and activities of the State regarding the obtaining and using material means and services to achieve its purposes. The progress of civilization influenced the growth of the State and other legal entities that make up it, such as federated states, provinces, municipalities, etc. (Baleeiro, 2010). Rosen and Gayer (2015) elucidate that a federal system "is composed of different levels of government that provide public goods and services and that have some margin for decision-making" (p. 495). In contrast, fiscal federalism "examines the functions performed by different levels of government and how different levels of government interact with each other." (Rosen & Gayer, 2015, p. 495).

The theory of public finance applied to fiscal systems with different levels of government leads to the understanding that goods and services must be offered and their costs divided among the region's residents. Therefore, fiscal federalism's main problem is determining an optimal structure for the public sector (Matias-Pereira, 2017).

Buchanan (1975) argues that public finances have significantly changed since the Second World War. Two gaps—fiscal expenditure and decision-making processes—need to be filled. Although policy discussions continue, these gaps have been partially filled over time.

Several academic studies have examined the development of States and their broad economic growth. Many thinkers attempt to explain the growth of public expenditures from the 19th century onwards through theories that either defend this growth as a logical result of demographic growth or argue that this growth is because public institutions intend to maximize their returns and, in doing so, assume the role of economic agents.

From the 18th century onwards, with the formation of Modern States, state action in the economy began, influenced by mercantilist movements and capitalist ideologies. This capitalist

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spirit emerges, presenting a "conception of an economic system based on private ownership of the means of production, the accumulation of savings and the search for investments for the organization of a free or liberal market" (Barbieri & Ribeiro, 2012 p. 2). For the authors, the liberal State, typical of capitalist countries, proved to be a defender of the principle in which economic development is constituted by the natural laws of the market and with a minimal State, which began to intervene both in social life and the market, aiming to ensure the necessary conditions for society and the economy to act on their own (Barbieri & Ribeiro, 2012).

Until the middle of the 19th century, many countries went through economic changes that impacted public accounts due to the State's interest in intervening in the economy. Until then, we had a liberal state, where everything belonged to the individual, and there was support for free trade and an inhibition of state participation in the economic domain. At the end of the 19th century, with financial capitalism, marked by the discovery of oil, the State began to participate more in the economy, expanding its responsibilities and consequently increasing its expenses (Giacomoni, 2021).

Different doctrinal currents interpret the reasons for the growth in public expenditure. Despite the agreement that the State's economic participation was decisive for this increase, the theories defend different points. On one side, the neoclassical and Keynesian currents protect the theoretical hypothesis that public expenditure advances more than economic growth. On the other hand, the neo-institutional currents defend the theory that public agents are also economic agents and intend to maximize their returns (Giacomoni, 2021).

One of the oldest studies that contributed neoclassical and Keynesian interpretations of The German Adolf Wagner explains the growth of public expenditures. In the 1880s, Wagner formulated the so-called 'Law on the Incessant Growth of State Activities,' later known as Wagner's Law.

Santos (1986) clarifies that Wagner's Law resulted from empirical observations made

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in civilized and progressive nations of that period. However, the author emphasizes that the growth of public activities "manifests itself in extensive and intensive terms: as industrial progress advances, the public sector gradually expands its sphere of action to new activities." (Santos, 1986, p. 170). The author also highlights that phenomena associated with industrialization and demographic growth motivate the growth of state activity, but they do not represent an absolute answer to Wagner's statement.

Matias-Pereira (2017) elucidates that the accelerated growth in public spending results from society's high demand for goods and services. This growth was made possible and financed by the progress brought by industrialization and the distribution of wealth, which was no longer a privilege only of the monarch or aristocrat.

For Santos (1986), studies of public expenditure growth must be compared by observing three stages of the State's economic development, cited by Bernard Herber: pre-industrialization, industrialization, and post-industrialization. In the first case, society would prioritize the satisfaction of basic consumption, such as food and clothing traditionally supplied by the private sector. In the second stage, there is a growing demand for goods that, due to their characteristics, are provided by the public sector, such as transport, health, communication, and education. Thus, once this phase was exhausted and the demand for these goods was satisfied, the increases in society's income in the post-industrial period would begin to be channeled again to private sector production.

The acceptance of the public budget in Brazil and its standardization for all levels of government contributed to controlling public spending in the country. So, at the beginning of the 20th century, norms emerged that regulated the administrative and financial management of the State and that remain in force in the Brazilian Public Administration, as is the case of Law No. 4,320/64, Decree Law No. 200/64 and Law Complementary n. 101/2000 that address Financial Law, Planning, the administrative organization of the Union, and responsible fiscal

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management. For Bezerra (2013), the republican períod in Brazil brought several relevant facts to the country's advancement of control, budgeting, and public accounting.

Therefore, the State is responsible for enabling the functioning of essential public services demanded by society. The concept of public services is of a political and legal nature, which infers a personal and material organization under the responsibility of people governed by public law for performing activities within their competence. (Baleeiro, 2010; Matias-Pereira, 2017).

For Baleeiro (2010), the study of financial facts is complex. It is up to the science of finance to observe and describe facts and institutions or investigate causes and effects because, when applied, it will indicate the means to achieve certain ends in the financial activity of the State or other people of political law. Therefore, the need for knowledge of the theoretical analysis of causes and principles can inspire applying practical measures or financial techniques that can lead to rational financial policies.

In this way, it is possible to observe that several important community-demanded activities are in the hands of state and municipal governments. Therefore, it is necessary to understand how the evolution of financial science and financial studies influences the analysis of the investigated phenomena through knowledge of the theoretical foundations that involve government actions in the field of public finances. These topics include relevant aspects such as economics, the modern State, government functions, and market failures.

3 METHODOLOGY

This research has a descriptive purpose, as it aims to verify whether the Fiscal Responsibility Law influenced the behavior of personnel expenses in the Brazilian States and responsible fiscal management. For Dulock (1993), descriptive research collects information from a target population to describe preferences, practices, characteristics, common points, or

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differences. Thus, the population of all 26 Brazilian states was defined as the population to investigate the following hypothesis:

Hypothesis – The FRL influenced the responsible fiscal management of the States.

- H0 - the FRL did not influence the responsible fiscal management of the States.

- H1 - the FRL influenced the responsible fiscal management of the States.

Regarding the data collection and analysis process, this research stands out for employing a quantitative approach. It relies on statistical techniques to collect and interpret the data gathered. This methodology offers a quantifiable and objective view of the influence of the Fiscal Responsibility Law (FRL) on the fiscal management of States.

Finally, secondary data were used from consolidated federal government sources and publicly available statistical data, such as the Siconfi portal (Accounting and Tax Information System of the Brazilian Public Sector). The quantitative analysis of these data allowed us to identify patterns, trends, and possible correlations between implementing the FRL guidelines and the states' financial health indicators.

3.1 Sample

The sample comprises the 26 states of the federation for a period ranging from 1998 to 2022. The total period of the historical series has served to analyze the trend line concerning revenues and personnel expenses and contribute to observing the evolution of the debt of these entities. However, when analyzing the influence of the Fiscal Responsibility Law on fiscal management, a sample was defined for analysis only from 1998 to 2005, totaling 208 observations. This cut is justified by the need for symmetry in the data compared before and after the standard. Thus, as the data available before the enactment of the law was limited to 1998, it was considered four years before (1998-2001) and four years after (2002-2005).

It should also be noted that although the law was published in 2000, it only came into effect for all federation entities from 2002 onwards, which justifies the period ex-ante to the norm being defined as 1998 to 2001.

3.2 Data Collection and Study Variables

The data was collected by Siconf (Brazilian Public Sector Accounting and Tax Information System). Based on public spending efficiency studies by Lima and Diniz (2016), Table 1 summarizes each of the variables used to carry out this work's proposal and briefly describes what each represents. The variables Efficiency of Personnel Spending, Sustainable Debt, and Balance of Accounts are the dependent variables of the models. The rest are the explanatory variables.

Table 1

Collected variables that will be part of the model

Efficiency of Personnel Spending (EPS)	Calculated as Personnel Expense - 0.49*Net Current Revenue
Sustainable Debt (SD)	Calculated as debt - 1.2*Net Current Revenue
Balance Accounts (BA)	The ratio between Budget Revenue and Budget Expenditure
Debt (DEBT)	The total amount of debt a city or country has
Capital Structure (CS)	The proportion of debt a city or country has relative to its net worth
Liquidity (LQ)	The ability of a city or country to pay its short-term obligations
Degree of Dependence (DD)	The proportion of a city or country's revenue that depends on external sources
Personnel Expense (PE)	The amount a city or country spends on salaries and benefits for its employees
Investment Expense (IE)	The amount a city or country spends on long-term investments, such as infrastructure
Lagged Debt (LD)	The total amount of debt owed by a city or country in a previous period
Fiscal Responsibility Law (FRL)	A dummy variable that takes the value 1 for years before 2001, 0 otherwise
D_final_year	A dummy variable indicating the final year of the mayors' term, 1 for the last year of the term, 0 otherwise

Source: Prepared by the authors.

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It is necessary to analyze the relationship of these explanatory variables with those that represent responsible fiscal management to investigate the hypothesis. For this, two regressions were analyzed for panel data, with the variables Efficiency of Personnel Spending and Sustainable Debt as predicted; this will make it possible to observe spending behavior concerning responsible fiscal management.

3.3 Panel Regression Model

During the exploratory data analysis phase, the time series was visually inspected to detect possible inconsistencies in data collection and outliers and to understand the latent correlation between the dependent and independent variables. In addition, important statistical values such as the mean and median were calculated, along with variation indicators such as standard deviation and range. A correlation matrix was created to quantify the relationship between two variables.

Stationarity is important for several reasons, including compliance with the statistical assumptions that underpin regression models, such as linearity, independence of errors, and normality of data. Furthermore, it is crucial to correctly interpret regression coefficients and establish the causal link between the dependent and independent variables.

Ensuring that the series is stationary before proceeding with panel regression modeling improved the accuracy of the interpretation of results, reinforcing the robustness of the econometric analysis. After the exploratory analysis stage and stationarity check, it was possible to move on to regression modeling for panel data to clarify the cause-effect relationship between the variables studied. Panel data regression was performed using Stata 15.1 software.

Equations 1, 2, and 3 describe the regression models that were estimated for the panel data:

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$$Efficiency\ Personnel\ Spend_{it} = \beta_0 + \beta_1 DEBT_{it} + \beta_1 CS_{it} + \beta_2 LQ_{it} + \beta_3 DD_{it} + \beta_4 DP_{it} + \beta_5 IE_{it} + \beta_6 LD_{it} + \beta_7 FRL_{it} + \beta_8 Final\_year_{it} \quad (1)$$

$$Sustainable\ Debt_{it} = \beta_0 + \beta_1 DEBT_{it} + \beta_1 CS_{it} + \beta_2 LQ_{it} + \beta_3 DD_{it} + \beta_4 DP_{it} + \beta_5 IE_{it} + \beta_6 LD_{it} + \beta_7 FRL_{it} + \beta_8 Final\_year_{it} \quad (2)$$

$$Balance\ Accounts_{it} = \beta_0 + \beta_1 DEBT_{it} + \beta_1 CS_{it} + \beta_2 LQ_{it} + \beta_3 DD_{it} + \beta_4 PE_{it} + \beta_5 IE_{it} + \beta_6 LD_{it} + \beta_7 FRL_{it} + \beta_8 Final\_year_{it} \quad (3)$$

Being that:

- DEBT – Debt

- CS – Capital Structure

- LQ – Liquidity

- DD – Degree of Dependence

- PE – Personnel Expense

- IE – Investment Expense

- LD – Lagged Debt

During the modeling stage, the estimated coefficients for each variable were computed and evaluated as long as they presented a statistically significant value other than zero. The analysis continued through a panel data regression using three estimation methods: Pooled, Fixed Effects, and Random Effects. Each model has its unique characteristics, assumptions, and specific uses. The choice between them is not arbitrary but rather depends on the nature of the data and the objective of the research, underscoring the importance of this decision in the statistical analysis.

After estimating the models, four tests were carried out to check autocorrelation, errors in the model, collinearity, and cross-sectional dependence in panel data. Three tests were applied to the model residuals to check the validity of the regression estimators, and the fourth

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was applied to the model to check the collinearity between the variables. The first test to be applied will be the normality of the residues. This test checks whether a regression model's residuals (errors) have a normal distribution. The second test is Wooldridge's test for autocorrelation in panel data. This test is used to identify the presence of autocorrelation (when errors from one period are correlated with errors from another) in panel data. In the third test, called Belsley, Kuh and Welsch collinearity diagnosis, multicollinearity is identified in multiple linear regression models. Finally, the last test is the Pesaran CD Test for Cross-Sectional Dependence, used to identify the presence of cross-sectional dependence in panel data.

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Results

Table 2 presents the correlation tests between the variables. Only correlation values commonly considered moderately strong were highlighted, that is, values greater than 0.5 and less than -0.5. The results of the tests indicate several significant correlations. For instance, the correlation between EPS and *DEBT* is -0.8215, a negative correlation considered vital; this suggests that the greater the efficiency of personnel spending, the lower the debt tends to be.

Table 2

Correlation Matrix

	EPS	SD	BA	*DEBT*	CS	LQ	DD	PE	DI	LD	D_final_year	FRL
EPS	1											
SD	0,2687	1										
BA	-0,0383	-0,0308	1									
DEBT	-0,8215	0,3285	0,0193	1								
CS	-0,7781	0,1002	0,1101	0,8223	1							
LQ	-0,1774	-0,0972	-0,2856	0,1165	0,0286	1						
DD	0,5494	0,2355	0,1462	-0,3993	-0,4692	-0,2775	1					
PE	-0,0778	-0,0258	-0,8727	0,061	-0,0039	0,3752	-0,2069	1				
DI	0,2626	0,1563	-0,2851	-0,165	-0,2066	-0,1979	0,0297	-0,0864	1			
LD	-0,8695	0,0949	-0,0163	0,9088	0,8125	0,0636	-0,4355	0,0831	-0,1433	1		
D_final_year	-0,0296	-0,1006	0,0664	-0,0305	-0,0463	0,0464	0,0042	-0,0675	-0,0542	-0,0329	1	
FRL	0,1843	0,1006	0,709	-0,1211	-0,0544	-0,4853	0,1307	-0,7238	0,1729	-0,1566	0	1

Source: prepared by the authors.

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The correlation for EPS and CS is -0.7781, which is another solid negative correlation; this suggests that the more efficient the spending on personnel, the less leveraged the capital structure is. Therefore, the proportion of debt concerning equity is lower. For EPS and DD, the correlation is 0.5494, indicating a moderate positive correlation; this suggests that the greater the efficiency of personnel spending, the greater the dependence on revenue from external sources. Furthermore, EPS and LD are also strongly negatively correlated, with a value of -0.8695, suggesting that the greater the debt in a previous period, the lower the efficiency of personnel spending in the current period tends to be.

As for the explained variable, Sustainable Debt (*SD*)'s correlation with *DEBT* is 0.3285, indicating a weak positive correlation; this suggests that the more sustainable the debt is, the more debt is below 1.2 times revenue), the greater the total debt tends to be.

For BA, the correlation with PE is -0.8727, which is a strong negative correlation; this indicates that the greater the balance of accounts (i.e., the greater the ratio between budget revenue and budget expenditure), the lower personnel expenditure tends to be. The correlation of the same variable with LQ is -0.2856, a weak negative correlation, suggesting that the higher the balance of accounts, the lower the ability to pay short-term obligations tends to be. With FRL, the correlation is 0.709, indicating a strong positive correlation, proposing that implementing FRL is associated with a greater balance of accounts.

There are strong correlations between the explanatory variables *DEBT* and CS. The correlation is 0.8223, suggesting that the greater the debt, the more leveraged the capital structure. It is also correlated to LD, with a value of 0.9088, a very strong positive correlation; this indicates that debt in a previous period is strongly associated with debt in the current period.

The p-values shown in Table 3 test the null hypothesis that the time series is non-stationary (has a unit root). If the p-value is less than a certain significance level (usually 0.05), we reject the null hypothesis and conclude that the series is stationary.

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Table 3

Stationarity test

Variable	Test Statistics	p-value	Null hypothesis rejected?
EFFICIENCY OF PERSONNEL SPENDING	4.7012	1.0000	No
SUSTAINABLE DEBT	0.4114	0.6596	No
ACCOUNTS BALANCE	-5.8283	0.0000	Yes
DEBT	-4.4850	0.0000	Yes
CAPITAL STRUCTURE	-8.0625	0.0000	Yes
LIQUIDITY	2.9590	0.9985	No
DEGREE OF DEPENDENCE	-4.9166	0.0000	Yes
PERSONNEL EXPENSES	-4.2194	0.0000	Yes
INVESTMENT EXPENSES	1.3756	0.9155	No
LATE DEBT	-1.1704	0.1209	No

Source: prepared by the authors.

With the differentiated variables, the POOLED models were estimated for each suggested dependent variable, also considering the effects of time as a predictor, with the year variable and the effects of the indicator variable for each State of the federation, CodIBGE.

The results show that some of the State variables (CodIBGE) are statistically significant at the 5% level (i.e., $p < 0.05$) or the 1% level (i.e., $p < 0.01$). In particular, codes 17 (Tocantins) and 25 (Paraíba) are significant at the 5% level and codes 33 (Rio de Janeiro) and 35 (São Paulo) are important at the 1% level, suggesting that spending efficiency with personnel varies significantly between these States and the others.

Among the effects between years, the year 2002 is statistically significant at the 1% level ($p < 0.01$), and the year 2003 is essential at the 5% level ($p < 0.05$), indicating that there is a significant time effect in the efficiency of personnel spending in these specific years. It can also be noted that the variables Debt ($DEBT$), Capital Structure (CS), Degree of Dependence (DD), and Dif (LD) are statistically significant, reinforcing the conclusion that these variables are strongly associated with spending efficiency with personnel.

Therefore, Table 4 presents the results of the three POOLED models estimated for each variable.

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Table 4

Results of the three POOLED regressions

	Dif(EPS)	Dif(ES)	Dif(BA)
DEBT	-0,129***	-0,0614	-1,64e-12
	(-3,64)	(-0,89)	(-0,79)
CS	1,070***	2,258***	5,16e-11**
	(3,42)	(3,70)	(2,82)
Dif(LQ)	436614608,4	1,44952e+09	0,0669*
	(0,97)	(1,66)	(2,55)
DD	3,98231e+09**	9,82562e+09***	0,0877
	(2,88)	(3,64)	(1,08)
PE	3,05608e+09	3,89385e+09	-4,084***
	(0,70)	(0,46)	(-16,08)
Dif(DI)	6,47883e+09**	1,16620e+10*	-0,768***
	(2,74)	(2,52)	(-5,54)
Dif(LD)	-0,357***	-0,873***	-2,15e-12
	(-9,69)	(-12,13)	(-1,00)
FRL	128333654,8	1,01049e+09	0,145***
	(0,26)	(1,06)	(5,06)
D_final_year	-405687613,0	-2,66316e+09***	0,0125
	(-1,12)	(-3,78)	(0,59)
_cons	-3,24647e+09	-6,53679e+09	3,472***
	(-1,56)	(-1,61)	(28,56)
. t statistics in parentheses			
* p<0.05, ** p<0.01, *** p<0.001			

Source: prepared by the authors.

For Dif (EPS), *DEBT* is significant at the 1% level (p<0.001). Therefore, an increase in State debt is associated with decreased efficiency of personnel spending. Furthermore, (CS) is also significant at the 1% level (p<0.001), indicating that an increase in the proportion of the State's debt concerning its net equity (CS) is associated with an increase in efficiency of personnel spending.

Thus, according to the regression results for Dif (BA), the FRL variable is significant at the 1% level (p<0.001), suggesting that the Fiscal Responsibility Law (FRL) influenced responsible fiscal management. Therefore, the null hypothesis (H0 - the FRL did not influence responsible fiscal management) was rejected, supporting the alternative hypothesis (H1 - the FRL influenced responsible fiscal management). These results corroborate the understanding of the relationships between different variables presented in the correlation matrix (Table 2).

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Therefore, the first part of the results is a descriptive data analysis. For the debt variable, the average was R\$2.77 billion, with a large standard deviation of R\$8.14 billion, indicating a significant variation in debt between different States. The minimum is R\$0.142565 billion, and the maximum is R\$62.2 billion. The average for capital structure is 589 million Reais, also with a large standard deviation of 1.04 billion Reais, indicating a significant variation in the proportions of debt concerning equity.

As for liquidity, the average is 0.827, suggesting that States can pay their short-term obligations well. The standard deviation is 0.664, so the variation in this measure is relatively high. The degree of dependence variable has an average of 0.423, indicating that, on average, 42.3% of State revenues depend on external sources. The standard deviation is 0.133, so the variation in this proportion is significant.

Finally, the average expenditure for personnel expenses is 0.383. Therefore, on average, 38.3% of State expenditure goes to salaries and benefits. The variation is also notable, with a standard deviation of 0.056. As for the efficiency of personnel spending, this variable has an average of -2.17 billion with a standard deviation of 3.59 billion. Negative values indicate that average personnel expenses exceed 49% of Net Current Revenue. This result confirms the most recent investigation by Arraes et al. (2022), which presents a scenario in which States increasingly commit their revenues to personnel expenses, as already demonstrated in Figure 1.

4.2 Discussion of Results

Firstly, the correlation matrix highlights various relationships between the variables. For example, the strong negative correlation between efficiency of personnel spending (EPS) and debt ($DEBT$) suggests that the more efficient the personnel spending, the lower the debt relative to revenue. Similarly, the strong negative correlation between (EPS) and capital structure (CE)

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suggests that the more efficient the spending on personnel is, the less leveraged the capital structure is, and the lower the proportion of debt concerning equity. On the other hand, the moderately positive correlation between EPS and degree of dependence (DD) indicates that the greater the efficiency of personnel spending, the greater the reliance on revenue from external sources.

The results show that for the variables Efficiency of Personnel Spending, Sustainable Debt, Liquidity, Investment Expense, and Lagged Debt, the null hypothesis was not rejected for these series, which suggests that they are not stationary. Therefore, it may indicate the presence of trends or seasonality in these series. Furthermore, the null hypothesis was rejected for the variables Balance Accounts, Debt, Capital Structure, Degree of Dependence, and Personnel Expenses, which suggests that they are stationary. The results presented reveal an in-depth analysis of the relationships between different variables related to the public finances of the States. Let's break down these results for a better understanding.

In short, the results presented provide a comprehensive understanding of the relationships between different financial variables in Brazilian states, highlighting the correlations between the variables and the significant effects of certain variables in the regression models. These findings are crucial for effective policymaking and decision-making regarding state public finances.

The results also indicate significant differences between States and over time in personnel spending efficiency. These differences may reflect local tax policies, economic conditions, or other characteristics that vary across states and over time. However, these differences are not large enough for all years and states to the point where estimating a model that considers these effects is necessary.

Finally, DD, Dif (IE), and Dif (LD) are also significant, which suggests that the State that depends more heavily on external sources for its revenues tends to have an increase in

efficiency of personnel spending. This result draws attention, as it involves the degree of dependence of federated entities concerning mandatory transfers from the Union. Therefore, the increase or reduction in external revenues, as in the State Participation Fund (FPE) case, has significant relevance regarding results involving the efficiency of personnel spending. Furthermore, the results showed that an increase in investment expenditure is associated with an increase in the efficiency of personnel spending and that an increase in a State's total debt in a previous period is associated with a decrease in the efficiency of personnel spending.

5 FINAL CONSIDERATIONS

The Fiscal Responsibility Law (FRL) ushered in significant advancements in Brazil's fiscal rules. The standard established key pillars: planning, transparency, control, and accountability. Moreover, it was explicitly designed to promote fiscal *accountability* by preventing the allocation of public resources to immediate priorities. As we approached the 22nd anniversary of its validity in 2022, it became crucial to delve into the effects of these public finance rules.

The FRL influenced the fiscal management of Brazilian States in several ways. It introduced fiscal rules, including limits on personnel expenses, contracting credit operations, debt, outstanding payments, and voluntary transfers, which must be observed mainly during the transition period and the end of the mandate, aiming to guarantee responsible administration. Furthermore, the FRL promoted a substantial change in how state governments began to execute their spending policies concerning periods before its promulgation.

Due to the FRL's attention to balancing public accounts, the Federal Audit Court (TCU) also began to guide federated entities in promoting debt sustainability and ensuring the efficiency of personnel spending, demonstrating the FRL's influence on the fiscal management of Brazilian states.

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Among the main challenges faced in applying the FRL is the complexity of the language concerning fiscal and budgetary matters, which makes it difficult for citizens to understand; this is why control bodies play a fundamental role in ensuring citizen language.

The need to balance revenue and expenditure in the three spheres of government and control personnel expenses represents a constant challenge for public managers. Therefore, ensuring the sustainability of debt and the efficiency of personnel spending are some of the basic steps for the public manager to guarantee responsible fiscal management.

The present study highlights the relationships between the Efficiency of Personnel Spending (EPS) and variables such as debt ($DEBT$), capital structure (CS), and degree of dependence (DD). Negative correlations suggest that efficient management is associated with lower debt and capital structure. The positive correlation with DD indicates greater efficiency is related to greater dependence on external sources.

Based on the results of the regression analysis for the Difference in Conditional Quadratic Estimates (Dif(BA)), it is highlighted that the FRL variable demonstrated statistical significance at the 1% level ($p<0.001$). This finding suggests that implementing the Fiscal Responsibility Law (FRL) influenced the promotion of responsible fiscal management. Thus, as the null hypothesis (H0), which stated that the FRL had no impact on responsible fiscal management, was rejected based on the results obtained, this strengthens the acceptance of the alternative hypothesis (H1), which postulates that the FRL had, of fact, influence on responsible fiscal management.

This conclusion highlights the importance of fiscal responsibility law as an effective tool in promoting more responsible and transparent fiscal management practices. These results may have significant implications for understanding and improving public policies related to fiscal responsibility.

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Finally, the study presents some time series limitations. The *ex-tant and ex-post FRL periods could be extended; however, the availability of financial information from federated entities prior to 1998 is limited. The analyzed time series had to be reduced* to maintain the symmetry of periods before and after the standard.

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Desvendando a Influência da Lei de Responsabilidade Fiscal nos Estados Brasileiros: Inferências Quanto a Sustentabilidade do Endividamento, a Eficiência do Gasto com Pessoal e a Gestão Fiscal Responsável

RESUMO

Objetivo: verificar se a Lei de Responsabilidade Fiscal teve influência no comportamento das despesas com pessoal dos Estados brasileiros e na gestão fiscal responsável.

Método: a pesquisa possui uma abordagem de avaliação quantitativa, utilizando-se o modelo de regressão de dados em painel.

Originalidade/Relevância: a relevância do estudo está na investigação sobre a LRF como uma ferramenta efetiva da gestão fiscal responsável e nas implicações significativas para a compreensão e aprimoramento das políticas públicas relacionadas à responsabilidade fiscal. A originalidade do estudo destaca-se pela utilização de duas variáveis que segundo o TCU são indispensáveis para garantir uma gestão fiscal responsável, sendo elas: A sustentabilidade do endividamento e a eficiência do gasto com pessoal.

Resultados: os resultados destacam que a LRF trouxe um avanço nas regras fiscais do Brasil e influenciou a gestão fiscal dos Estados brasileiros de diversas maneiras, como a introdução das regras fiscais que incluem os limites de despesa com pessoal. É possível observar que LRF exerceu influência significativa na promoção de uma gestão fiscal responsável.

Contribuições Teóricas/Metodológicas: as contribuições teóricas estão relacionadas à teoria das finanças públicas. Por meio do estudo é possível ratificar as interpretações neoclássicas e keinesianas que explicam o crescimento das despesas públicas, além de formar base para o entendimento de que a despesa com pessoal influencia na gestão fiscal responsável dos Estados.

Palavras-chave: Lei de Responsabilidade Fiscal, Gestão Fiscal Responsável, Regressão em Painel, Despesa com Pessoal, Endividamento Sustentável.

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