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ARTICLE

Punctuated Equilibrium Theory and the Dynamics of Change in Brazil's Federal Budget (2000-2021)

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The primary goal of this article is to examine the dynamics of changes in expenditure allocation in Brazil's federal budget over the past two decades, highlighting periods of incrementalism and punctuation based on the theoretical and methodological assumptions of Punctuated Equilibrium Theory (PET). To achieve this, a database of the approved federal budget from 2000 to 2021 was created, with budget classifications coded into 21 policy domains following the methodology of the Comparative Agendas Project (CAP). Descriptive analyses of the federal government's expenditures and budget changes were conducted across 21 domains, along with the calculation of the L-Kurtosis indicator to assess the distribution of budget changes and identify their types. The results show that Brazil's trajectory of budget changes is characterized by punctuations, as indicated by an L-Kurtosis value of 0.657. This pattern stems from a reform agenda initiated in 2003 to expand social policies, which began to reverse after 2015 due to a political, economic, and institutional crisis. Despite the rigidity of Brazil's budget and institutional constraints, political preferences also play a significant role in shaping government priorities and driving budget changes.
Keywords: Punctuated equilibrium theory; public budget; policy change; political institutions; government agenda.

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This article analyzes changes in expenditure allocation within Brazil's federal budget over the past two decades, applying the theoretical and methodological framework of Punctuated Equilibrium Theory (PET), as developed by Frank Baumgartner and Bryan Jones (1993), to identify periods of incrementalism and punctuated changes. Based on the collection and analysis of expenditure data from the Annual Budget Law (LOA) between 2000 and 2021, our goal is to investigate the presence of incrementalism and punctuations in the distribution of budgetary changes in Brazil. Using L-Kurtosis analysis — an analytical tool specifically designed for distribution analysis, thus offering a concise assessment of budget stability and change — we explore the dynamics of budgetary stability and change across various policy domains. This type of analytical tool has been employed by various countries participating in the Comparative Agendas Project (CAP) to examine the dynamics of budget change both within different national contexts and from a comparative, cross-country perspective. (ALSHOUBAKI and HARRIS, 2020; BAUMGARTNER et. al. 2009; GURAGAIN and LIM, 2019; MORTENSEN, 2005; WORDLICZEK, 2021).

Research on public budgeting in Brazil has produced a vast body of academic work across various disciplines, with two main approaches: 01. Studies on the budget process, found in synthetic manuals and textbooks (GIACOMONI, 2010; GIAMBIAGI, 2020; REZENDE, 2015, 2000; OLIVEIRA, 2009), which focus on understanding budget formation, the actors involved, institutional rules, budget composition, and the characteristics of Brazil's institutions; and 02. Research that examines the budget as an object of study, aiming to understand new legal and legislative decisions and regulations (CONTI and SCAFF, 2011); analyze specific policy domains (DAVIES, 2012; FUNCIA et al., 2022; MENDES, 2018; SALVADOR, 2012, 2010; OLIVEIRA, 2001; PINTO, 2018); explore the interrelationship between federalism and public policy financing (LOPREATO, 2022, 2018; REZENDE, 2015, 2000); and investigate budgetary governance (BORGES, 2022; COUTO and CARDOSO JR., 2018; DWECK, 2022; PERES, 2018).

Studies on budgetary governance, in particular, provide insight into the political-institutional context in which Brazil's public budget operates, as well as the rules that shape its structure. Barcelos (2012) identifies four governance

regimes that have characterized Brazil's budgetary governance over the past fifty years: 01. The first regime, established by the public finance law (Law Nº 4.320/1964), defines the fundamental operational principles of Brazilian budgeting; 02. The second regime, shaped by the Federal Constitution of 1988, advanced budget planning instruments and imposed restrictive fiscal rules on public debt, such as the golden rule, prohibiting the use of credit operation funds to cover current expenditures (DWECK, 2022); 03. The third regime, marked by the Fiscal Responsibility Law (LRF), seeks to maintain fiscal balance across all levels of government by implementing measures such as a cap on personnel expenses; 04. The fourth regime is marked by an institutional framework developed in the 2000s to facilitate public investment, particularly in infrastructure, coinciding with the development of a results-based budgeting proposition at the federal government (CORE, 2004). In addition to these, Barcelos, Couto, and Calmon (2022) identify a fifth budgetary governance regime, introduced by Constitutional Amendment Nº 95/2016. This amendment imposes a cap on public spending, restricting the growth of the federal government's primary expenditures for 20 years, allowing increases only in nominal terms, adjusted by the previous year's inflation rate.

During this period, the federal budget evolved under different governance models, resulting in changes to both revenues and expenditures; however, a more in-depth comparative analysis has yet to be fully conducted, particularly to assess the presence of punctuations. Although the application of concepts from Punctuated Equilibrium Theory to the Brazilian budget is not new in the Brazilian literature — having already been employed in previous studies (CARVALHO, 2018; GALDINO and ANDRADE, 2020; SILVA et al., 2020; SILVESTRE and ARAÚJO, 2015) — this article advances and innovates by operationalizing this theory. Using a dataset that has been processed and systematized in a manner compatible and comparable with the methodology of the Comparative Agendas Project (CAP). This project has internationally expanded studies on the dynamics of budget distribution across various countries through the lens of PET (BAUMGARTNER, FOUCAULT, and FRANÇOIS, 2006; SEBOK and BERKI, 2017). In Brazil, recent studies (BRASIL et al., 2023; MACHADO, BRASIL, and PERES, 2024) have adopted this analytical perspective to examine the behavior and changes in the federal budget over the years.

Building on this research agenda, which connects agenda-setting and policy change theories to the Brazilian budgetary process, this study applies PET assumptions and, more importantly, utilizes specific analytical tools widely used in the international literature. To examine the presence of both gradual changes (incrementalism) and abrupt, high-impact changes (punctuations) in budget distribution across different policy domains in Brazil between 2000 and 2021. More than that, the goal is to understand the nature of these changes by analyzing the kurtosis and shape that characterizes the distribution of budgetary expenditures in Brazil over this period.

Through their application of PET to U.S. budget data, Jones and Baumgartner (2005) demonstrated that two seemingly opposing and irreconcilable dynamics of budgetary change are, in fact, compatible. On the one hand, the concept of incrementalism, as proposed by authors like Lindblom (1959) and Wildavsky (1969), is based on the fundamental assumption that budgetary changes always take the form of small, gradual adjustments. In a scenario characterized by significant uncertainty, asymmetric and limited information, and competing interests and values, decision-makers tend to minimize costs and avoid direct conflicts by making gradual, incremental budget adjustments over time. Incrementalist analysis operates on the premise that a budgetary base, shaped by past decisions, dominates most budgetary resources, making its persistence inevitable due to sunk costs — marginal adjustments are then applied to this base, ensuring that budget changes remain consistently incremental (CAIDEN and WILDAVSKY, 1974). On the other hand, Jones and Baumgartner (2005) demonstrate that while incremental changes are the most common form of change in budget distributions over time, they are occasionally interrupted by periods of significant, abrupt changes — a phenomenon the authors term 'punctuated equilibrium'. These punctuations mark moments that break the modus operandi of incremental adjustments, resulting in substantial changes in government priorities, which reflect on budget distribution. According to Breunig (2006), "the punctuated equilibrium model joins incrementalism and dramatic changes under one model of public choice" (BREUNIG, 2006, p. 05).

Building on Jones and Baumgartner's (2005) findings in the U.S. context, various international studies have examined the distribution of budgetary attention across different policy domains over time to empirically demonstrate the dynamics of

change in the government agenda and in its priorities. Studies within this research paradigm have focused on budget authorizations as the primary means of analyzing the complex process involving the allocation of government attention and decision-making (BAUMGARTNER et al., 2009; BAUMGARTNER and JONES, 1993). As a result, researchers have prioritized the systematic collection and coding of budgetary data using shared methods, variables, and analytical tools — an effort that ultimately led to the creation of the Comparative Agendas Project (CAP) (BREUNIG, KOSKI, and MORTENSEN, 2009).

Our goal is to contribute to the internationally recognized agenda-setting literature by testing the punctuated equilibrium hypothesis within the context of Brazil's budget distribution, expanding its application and validation to a presidential, federal country in the Global South. Above all, this study seeks to assess the influence of political variables on budgetary governance by examining how political dynamics and priorities affect the distribution of budgetary changes in an economic context of instability and uncertainty and an institutional framework characterized by significant constraints. Following the methodological approach of the CAP research network, we use approved budget data as indicators of government attention, allowing us to measure year-by-year changes in budget distribution across different policy domains over time. The central question guiding this agenda-setting research is: Which approach best explains the dynamics of authorized budget expenditures in Brazil between 2000 and 2021? Pure incrementalism or Punctuated Equilibrium? If Punctuated Equilibrium Theory is confirmed in the Brazilian context, what are the L-kurtosis values, and what insights do they provide about national budgetary dynamics compared to findings from international studies? Additionally, this raises questions about the factors explaining budget distribution: What economic and political factors influence the pattern of budget distribution across different policy domains? Do both sets of factors carry the same weight in shaping this distribution? If punctuations exist in government attention to budget distribution in Brazil, what explains them?

The remainder of this article is divided into three sections, followed by a conclusion. The first section presents the theoretical foundations, with a focus on Punctuated Equilibrium Theory. The second section introduces the reader to the

methodological approaches, explaining how search, coding, and budget data processing methods were applied, while highlighting the specificities and adaptations of the Brazilian case. The third section presents and analyzes the results from the analysis of budget distribution across different policy domains over time — the first part focuses on the descriptive analysis of kurtosis results, while the second part examines the econometric models of changes in government attention. Finally, we present the conclusion.

Punctuated equilibrium theory applied to the public budget

Over the past few decades, the dynamics of the budget and its behavior within political systems have been extensively studied through the analytical lenses of incrementalism (HAYES, 1992; LINDBLOM, 1959; SCHICK, 1983; WILDAVSKY, 1969). According to this approach to policy change, the 'status quo' remains largely unchanged over the years because changes occur through small adjustments to norms and/or rules or through 'mutual adjustments' agreed upon by the actors. As presented by Jones and Baumgartner (2005, p.09), incrementalism "can be the result of a deliberate decisional style", in which "decision makers make limited, reversible changes in the status quo", carried out "to predict the impact of their decisions" (JONES and BAUMGARTNER, 2005, p. 09). Incremental decisions can be reversed, allowing incrementalism to sustain a system that maintains a 'dynamic equilibrium with its political environment', where groups continuously mobilize and counter-mobilize priorities, creating a 'dynamic equilibrium'. As a result, dramatic changes to the 'status quo' are unlikely to occur (JONES and BAUMGARTNER, 2005).

This approach, groundbreaking in the international context of the 1960s and 1970s, is regarded as the first to model policy change behavior and the dynamics of resource allocation through budgeting. For nearly two decades, it dominated unquestioned. From this perspective, governments — viewed as organized anarchies marked by uncertainty about consequences, resource scarcity, and imperfect information — tend to adopt more simplified operational strategies. This is because finding alternatives to social problems requires gathering information. The high costs of transactions and information acquisition — including economic, political,

opportunity, and time-related costs — ensure that the existing structure is respected and considered as the foundation for continuity.

When evaluating changes, policymakers typically focus on incremental adjustments built upon existing decisions. This pattern includes adjustments, updates, and minor regulatory corrections. As a result, existing policies serve as the foundation for all new policies. In this process, preserving the 'status quo' serves as a reference point for evaluating any proposed changes. Change happens gradually, and reversing previous decisions requires bearing the costs of past choices.

In budget studies within the analytical framework of incrementalism, public expenditures and revenues evolve through gradual, targeted adjustments, shaping the concept of 'budgetary equilibrium', which reflects a sort of perception/action that budget formulation and maintenance are constrained by a limited set of variables. With changes tied to specific policy changes, ultimately revolving around the question of the government's capacity to budget and the constraints on the 'behaviors' and 'choices of key actors' (particularly legislators and bureaucrats involved in the budgeting process) (SAVAGE, 2002; WILDAVSKY, 1969). Thus, this parameter involving the importance of budgetary balance and deficit reduction is connected to the intrinsic need for creating and maintaining formal budgetary rules to guide the act of 'budgeting' for key actors (SAVAGE, 2002, p. 262).

In revisiting the perspective of incrementalism, Baumgartner and Jones (1993) argue that this view of policy change represents only one aspect of policy-making studies. The other, non-incremental aspect is defined by what the authors call punctuated equilibrium. According to the authors, two complementary — rather than mutually exclusive — paths can help explain different types of changes in the dynamics of budget allocation. The first path links bounded rationality to incrementalism (LINDBLOM, 1979, 1959), while the second refers to periods of rapid change, known as 'punctuations', which are triggered by significant events or crises, leading to abrupt and substantial shifts in politics, policies, and institutions (JONES and BAUMGARTNER, 2005). Punctuated Equilibrium Theory highlights that 'punctuations' represent critical changes in government priorities and agendas. Identifying these shifts in attention requires analyzing the process of issue selection and how certain topics rise to the forefront of policymakers' priorities (BAUMGARTNER and JONES, 2005, 1993).

One of the key analytical foundations supporting Baumgartner and Jones' (1993) Punctuated Equilibrium Theory hypothesis was their study of budgetary data on public expenditures in the United States. That study sought to analyze government spending patterns over time and identify periods of stability as well as abrupt changes. The findings of that study offered strong evidence for punctuated equilibrium, demonstrating extended periods of stability in public spending, punctuated by critical moments of significant shifts in resource allocation. Those findings underscore the significance of PET in explaining political decision-making within government budgeting, following the notion that "[b]ecause budgets are reflections of priorities, and budget change distributions reflect changing priorities, the dynamics of budget changes indicate the occasional occurrence of bursts of urgency about the external world" (JONES et al., 2009, p. 870).

In the 1990s, the establishment of PET led to the creation of The U.S. Policy Agendas Project, a research initiative coordinated by Baumgartner and Jones (BEVAN, 2019). This project was meticulously designed to systematize data by coding issues and topics, enabling the identification of variations and possibilities in government attention (BEVAN, 2019). The methodology for creating the databases relied on instruments that convert official public spending data into predefined variables, allowing for the systematic tracking of how frequently issues are addressed over a long period. To achieve this, a coding manual was developed, connecting government-addressed and prioritized issues to specific codes and subcodes that represent subtopics of the main issues (BAUMGARTNER, BREUNIG, and GROSSMAN, 2019; BEVAN, 2019). In 2000, the Comparative Agendas Project (CAP) was established, an international research group with the participation of twenty-four countries, including Brazil since 2015 (BRASIL and REY, 2022). The CAP standardized the methodological process across all member countries to systematically map and code data and then create a comprehensive platform of policy issues, enabling comparative analyses of the systematized data. Since its beginning, the project has focused on monitoring the evolution and changes in the attention of institutions and actors to a broad spectrum of policy issues. This monitoring seeks to measure the stability and punctuations in the level of attention devoted to each sectoral policy outlined in the codebook (BAUMGARTNER, BREUNIG, and GROSSMAN, 2019).

Thus, the core theoretical foundation of this article is built on the concept of punctuated equilibrium. The theory posits that while budgets typically remain stable due to incremental changes, the budgeting process is occasionally "punctuated by periods of abrupt change" (JONES and BAUMGARTNER, 2005, p. 151). Punctuated Equilibrium Theory frames both stability and abrupt change as integral moments of the broader budgetary dynamic. The application of this theory has contributed to a growing and extensive body of empirical research (BAUMGARTNER et al., 2006; BREUNIG, 2006; CITI, 2013; JONES et al., 2009). Reinforced by the widespread adoption of the model proposed by CAP, a series of empirical studies has validated Punctuated Equilibrium Theory as an explanatory alternative to pure incrementalism across various types of research. Studies on federal budget distribution in the United States and Western Europe (BREUNIG, 2011, 2006; BREUNIG and KOSKI, 2006; BREUNIG et al., 2009; JONES et al., 2014); subnational studies (BAUMGARTNER, FOUCALT and FRANÇOIS, 2006; MORTENSEN, 2005; SEBOK and BERKI, 2017; WORDLICZEK, 2021); and comparative studies across different countries and regimes (BAUMGARTNER et al., 2009; BAUMGARTNER et al., 2017). These confirming results led to the establishment of a "general empirical law of public budgets" (JONES et al., 2009).

These international studies examine shifts in budget distribution over time across various types of public policies. As Workman, Baumgartner, and Jones (2022) describe, the goal is to facilitate comparisons between time series and cross-sectional data to enhance the understanding of public policies through studies that apply statistical analyses based on empirical distributions. These analyses are used to describe these distributions, as "the shape and contour of empirical distributions are central to the craft of comparison in punctuated equilibrium" (WORKMAN, BAUMGARTNER, and JONES, 2022, p.61). Such characteristics are divided into three groups: the center mass of the distribution (used based on comparisons linked to mean, median, and mode values), the dispersion of the data (related to statistical inference studies in the use of interval, standard deviation, and variance values) and, finally, the shape of the distribution (skew and kurtosis values and behavior). In what concerns distribution, observing the values and behavior of kurtosis is particularly significant. Grounded in the theoretical framework of PET, this indicator helps determine whether

a sample of budget changes exhibits punctuations (with values more concentrated in the 'tails' of the normal distribution) or stability (with an excess of cases near the center mass) (WORKMAN, BAUMGARTNER, and JONES, 2022).

The statistical instrument used to measure the distribution dynamics is kurtosis, which "provides a scale-free summary measure of the shape of a distribution" (DECARLO, 1997; BREUNIG and JONES, 2011, p.106). Its values range from "zero to one, where an increasing number identifies a higher level of kurtosis, i.e., more punctuations" (BREUNIG, 2006, p. 1076), and "a Normal distribution's approximates 0.123" (BREUNIG, 2006, p. 1076).

The studies conducted by CAP on kurtosis values have been applied in various countries to explain budgetary dynamics based on the principles of PET. In a comparative study of democratic and authoritarian regimes, Baumgartner et al. (2017) systematized the kurtosis values of three countries (Russia, Turkey, and Brazil) and found that democratic regimes exhibit lower kurtosis values (their political systems are more responsive to information about social issues) compared to authoritarian regimes. This aligns with the logic that "[...] the greater the responsiveness to opinion, we argue, the lower accumulation of representational errors, which leads to fewer policy punctuations" (FAGAN, JONES, and WLEZIEN, 2017, p. 819).

On the other hand, some studies focus on domestic dynamics within individual countries, such as the case of Hungary, where Sebok and Berki (2017) examine kurtosis values and the shape of budget change distribution, testing the hypotheses of PET in relation to national budget dynamics and comparing them with the l-kurtosis values of other countries. In line with this perspective, analyses also explore the causes of punctuations by examining explanatory variables such as electoral cycles, economic indicators, and the country's fiscal situation, establishing correlations with budgetary dynamics (SEBOK and BERKI, 2017).

Therefore, by applying these analytical tools to approved expenditure data from Brazil's Annual Budget Law (LOA) between 2000 and 2021, this study seeks to examine the dynamics of budget distribution within the theoretical and methodological framework of PET. To clarify the dynamics of budgetary change in Brazil, the next section examines the country's budgetary governance, followed by another section

discussing the study's methodological approach, including data collection, database construction, l-kurtosis analyses, and the identification of federal budget punctuations over the past two decades.

The debate on budgetary governance in Brazil: implications for punctuated equilibrium

In Brazil, scholars examine and debate various aspects of budgetary governance, including its dimensions, challenges, and key actors. Some studies highlight the normative and regulatory challenges of budgetary governance, while others focus on its political dimensions. Afonso (2016), for example, analyzes the historical trajectory of public budgeting in Brazil and emphasizes that the country has a modern and advanced institutional framework for fiscal management — laws such as Law Nº 4,320/64 and the Fiscal Responsibility Law (Law Nº 101/2000) are comparable to the budgetary regulatory frameworks of developed countries. However, in practice, this framework exhibits several distortions and challenges, including a lack of integration between different levels of government, the use of fiscal maneuvers ('creative accounting'), and the gradual deterioration of budgetary practices.

According to Couto and Cardoso Jr. (2018), Brazil's federal budgetary governance has undergone significant changes, particularly since the enactment of the 1988 Federal Constitution, reflecting shifts in the balance of power among the actors involved in the process. The authors emphasize that, beyond the classic guardians and spenders defined by Wildavsky (1975), new actors have entered the competition for public funds. According to Couto and Cardoso Jr. (2018), the budgetary landscape in Brazil includes priority setters since 1988, who are closely linked to the core of the government, as well as controllers, represented by internal and external oversight bodies, the legislature, and civil society organizations, making Brazil's budgetary process increasingly contested and conflict-ridden in recent years. The authors illustrate how changes in budgetary institutions and rules have affected the balance of power among these actors. Notably, guardians and controllers have gained strength at the expense of spenders and priority setters, especially following the approval of the Fiscal Responsibility Law and Constitutional Amendment Nº 95/2016, also known as the spending cap amendment. This new rule significantly increased the budgetary

rigidity of primary expenditures in the Union's General Budget (OGU), which had already been growing since the early 2000s.

According to Blondal, Goretti, and Kristensen (2003), federal budget rigidity affects over 90% of Brazil's total expenditures due to constitutional and legal provisions that protect, for example, public sector salaries, education and health spending, and transfers to states and municipalities. This rigidity is partly driven by the widespread use of revenue earmarking for specific expenditures (PERES, 2007). This feature of Brazil's budgetary model intensifies conflicts over public funds, as the discretionary portion of the budget remains insufficient to accommodate all interests not protected by the Constitution (PERES, 2018).

As discussed in Peres (2022; 2018), political discretion is a fundamental element of budgetary governance, enabling the accommodation of conflicts of interest among various groups and actors competing for public funds. This political discretion, which allows the executive branch to allocate investments, expand expenditures, or launch new budget expenditures, is influenced by a combination of political, economic, institutional, and bureaucratic factors. Exogenous changes, economic crises, or political upheavals can influence discretion and, as a result, affect the potential for political balance. A limited space for political discretion can result in a deadlock in budgetary governance, preventing the executive branch from resolving disputes over public funds. This type of crisis can lead to budget punctuations or even changes in the normative framework.

Furthermore, Blondal et al. (2003) emphasize that Brazil's budgetary governance treats planning and budgeting as independent modules (SCHICK, 1966), undermining the integration of evaluation, formulation, and proper resource allocation, thereby weakening medium-term planning and prioritization discussions. This simultaneously sustains inertia in certain projects and the unassessed interruption of others.

Barcelos, Couto, and Calmon (2022) offer an analysis of Brazil's federal budgetary governance, describing the current regime and contrasting it with previous ones. Drawing on Elinor Ostrom's principles of common-pool resource governance, the authors characterize the current regime by emphasizing the strengthened role of the legislature and oversight bodies while noting an imbalance that prioritizes fiscal

sustainability over institutional, political, and social considerations. They conclude that the budgetary governance regime has not yet reached a stable equilibrium, both reflecting and contributing to the country's institutional instability.

Pereira and Orellana (2009) examine how the combination of majoritarian and consensual institutions affects Brazil's budgetary governance at the federal level, centering their analysis on a key mechanism of dispute over public fund allocation: parliamentary budget amendments, which can be either individual or collective. The authors argue that individual amendments have a positive impact on legislative support for the president, while collective amendments have a negative impact. They demonstrate that budgetary instruments play a role in shaping certain aspects of governance (CHARLOTTE, LASCOUMES, and LE GALÈS, 2021) and emphasize that even seemly similar institutions, such as individual and collective amendments, can have vastly different effects on governability depending on their interaction with the country's hybrid institutional framework.

By bridging the debate between Brazil's budgetary process and the changes in expenditure allocation, studies in Brazil have sought to explore the various nuances of this relationship. Brasil et al. (2023) highlight the significant relationship between normative changes implemented by the executive and legislative branches — such as laws and constitutional amendments — that modify budgetary rules and the composition and distribution of the budget. Such normative changes ultimately affect budget distribution, as evidenced by the defunding of various social policies between 2016 and 2021 and the introduction of different types of parliamentary budget amendments, both individual and collective. These shifts, in turn, reshape the power dynamics among the various actors involved in the budget process. In a subsequent study, Machado et al. (2024) examined the level of governmental attention to intergovernmental transfers from the federal government to subnational entities between 2000 and 2023. Their findings indicate that institutional factors, such as revenue earmarking for health and education policies, reflect a high level of attention to fiscal decentralization in both domains; moreover, other institutional elements related to policy financing arrangements, such as the Fundeb program, have expanded the federal government's role in funding basic education. Broader institutional factors, such as the spending cap, also affect the distribution of governmental attention across

policy domains by ensuring the decentralization of mandatory resources and simultaneously reducing attention on discretionary funds.

These authors' observations make it clear that Brazil's budgetary governance has a strong institutional structure, with binding rules and expenditure protection mechanisms that organize the budgetary framework, aligning with Wildavsky's (1969) analysis. However, the governance structure also exhibits significant conflict and power imbalances, particularly between representatives of the executive and legislative branches (guardians and controllers), potentially leading to important changes and punctuations in government programs and even sparking disputes over changes in norms intended to review the budgetary framework. This study examines a seemingly paradoxical context in which conditions for stability and incrementalism coexist alongside forces driving significant change, assessing the extent to which these two outcomes have manifested in budgetary changes in Brazil over the past two decades.

Methodology

This study's methodology is structured into three parts. The first part focuses on the development of the databases, the data sources used, and the coding procedure implemented. The second part details the calculation of the L-Kurtosis indicator and its interpretation. The third part outlines the process of defining the punctuation parameters: that is the range, that identifies occurrences of incrementalism and punctuation in the percentage changes of Brazil's budget from 2000 to 2021.

Databases and coding processes

The methodology used in this article integrates both qualitative and quantitative approaches. It is qualitative in that it applies tools to convert raw federal expenditure data into predefined labels by policy domain, facilitating the coding of budgetary variables. At the same time, it is quantitative, as it uses the monetary values of budgetary expenditures as an indicator of governmental attention. The database for this research is built using values from the Annual Budget Law (LOA), which defines the legally approved budgetary expenditures for execution. The budget is a short-term planning instrument developed by the executive branch through the

Annual Budget Bill (PLOA), which is then submitted to the legislative branch for review, where it may be amended before being approved and ultimately sanctioned by the executive to become law.

In Brazil, the budget has an authorizing nature, meaning the executive receives legislative approval to execute it; however, a substantial portion of the budget is mandatory and must be implemented, though not always in full (PERES, 2020). Therefore, in the Brazilian context, analyzing budget execution is also important, although the approved budget serves as a key indicator of budgetary priorities, reflecting the Union's priorities during its formulation (GRATON, BONACIM, and SAKURAI, 2020). This study analyzes the period from 2000 to 2021, encompassing 22 fiscal years. The database for this study was compiled using data on the Union's budgetary expenditures from an official government platform, the Integrated Planning and Budget System (SIOP)[1], which is managed by the Ministry of Finance (MF, formerly the Ministry of Economy). The database, compiled from the government website, includes 9,925 budget allocations related to functions and subfunctions over the entire analysis period. These allocations correspond to 814 unique function and subfunction combinations, with many recurring across different years. It is important to note that the database excludes expenditures related to 'interest and charges on public debt' and 'public debt amortization', as these expenses are not directly tied to sectoral policies, which are the focus of this study.

After compiling the database of the Union's budgetary expenditures, the raw data was coded to generate the final dataset. The coding process involved assigning a sectoral policy code to each of the 814 function and subfunction combinations that originally structured Brazil's budget in the LOA, following the methodology used by the CAP. Developed within the framework of the CAP, the Brazilian Policy Agendas Project (BPAP) adopted the major topics from the General Master Codebook (BEVAN, 2019), which correspond to 21 policy domains (see Table 01). This standardization ensures that all studies conducted by CAP-affiliated groups use the same classification for

[1]Available at <https://www1.siop.planejamento.gov.br/QvAJAXZfc/opendoc.htm?document=IAS%2FExecucao_Orcamentaria.qvw&host=QVS%40pqlk04&anonymous=true>.

coding both budgetary and non-budgetary indicators, enabling comparative analyses across different countries and various types of indicators.

Although the coding process followed this standardized methodology, the unique characteristics of Brazil's budget required certain adaptations. Specifically, two additional codes were introduced to the 21 original categories in the Master Codebook: 01. contingency reserve (99), a budget classification used to allocate funds for unforeseen expenses during the fiscal year, which can be associated with various sectoral policies; and 02. special charges (28), a budget classification unrelated to a specific good or service, which was therefore excluded from the analyses. Finally, after completing the coding process, all expenditures assigned to each code were aggregated by year, resulting in a finalized database covering 22 policy domains over a 22-year period.

Table 01. Classification of the Brazilian codebook for sectoral policies, adjusted for analyzing the specificities of Brazil's federal budget

Code	Policy Domain
01	Macroeconomics
02	Civil rights, political rights, liberties, and minorities
03	Health
04	Agriculture, livestock, and fisheries
05	Labor, employment, and social security
06	Education
07	Environment
08	Energy
09	Immigration and refugees
10	Transportation
12	Judiciary, justice, crimes, and violence
13	Social policy
14	Housing, infrastructure, and land reform
15	Banking system, financial institutions, and domestic commerce
16	Defense, armed forces, military, and warfare
17	Science, technology, and communications
18	Foreign trade, imports, and exports
19	International affairs and foreign policy
20	Government and public administration
21	Territory, indigenous peoples, and natural resources
23	Culture, sport, and leisure
28	Special charges
99	Contingency reserve

Source: Brasil et al. (2023).

L-Kurtosis indicator

After the database was constructed, nominal values for each year were adjusted for inflation using the Broad Consumer Price Index (IPCA-IBGE) for 2021, allowing for the calculation of kurtosis and the L-Kurtosis indicator to analyze the distribution of changes in Brazil's budget allocations from 2000 to 2021. Budget changes were calculated for each policy domain by measuring the percentage variation between each year and the preceding one. The L-Kurtosis indicator calculated for each year considers the budget changes across all domains in that specific year, while the L-Kurtosis indicator calculated for each domain accounts for budget changes across all years within that domain. Lastly, the overall indicator accounts for budget changes across all years and all policy domains.

To accurately characterize budgetary distribution within the theoretical framework of PET, calculating L-Kurtosis is essential, as it provides not only a numerical value but also reveals the distribution's shape by measuring its tails. If the distribution has an excess of cases in its tails, meaning they are far from the center mass, the distribution is classified as leptokurtic — a type of distribution characterized by punctuations and abrupt, large changes in policy agendas and public policies. If the shape is concentrated around the mean and its center mass, it reflects a distribution involving greater stability and incrementalism (WORKMAN, BAUMGARTNER, and JONES, 2022). A high L-Kurtosis indicator value is regarded in the literature as a sign of punctuation in equilibrium, whereas "incremental decision-making implies a Normal distribution of policy changes" (JONES and BAUMGARTNER, 2005, p. 140).

The L-Kurtosis indicator ranges between 0 and 01. A normal distribution has an L-Kurtosis value of 0.123, whereas a perfectly uniform distribution has a value of 0. A government exhibiting a normal distribution of policy change has never been documented in the literature, though some democracies achieve L-Kurtosis values around 0.200. Dysfunctional democracies, those in stabilization phases, and those undergoing prolonged reforms typically have L-Kurtosis values between 0.400 and 0.600, while authoritarian governments have historically scored above 0.650 (BAUMGARTNER et al., 2017; FAGAN et al., 2017).

Definition of punctuation parameters

Following the descriptive analysis of budget change indicators and the kurtosis indicator (L-Kurtosis), the next step is to establish the parameters that define budget changes indicative of punctuations. Although punctuation parameters are often set arbitrarily, Dezhbakhsh, Tohamy, and Aranson (2003) argue that this approach is flawed and advocate for determining these parameters based on the observed data for percentage budget changes in each case. Thus, punctuation parameters should be defined according to the specific case (country) and the period under analysis. The quantitative distinction between incremental changes and punctuations is therefore relative and depends on the specific set of budget changes being analyzed.

To identify punctuations in a sample of budget changes, researchers use two distributions: 01. the actual distribution of budget changes and 02. the standardized distribution of those same changes. In short, the first distribution reflects the pattern of observed budget changes, while the second establishes the punctuation parameters of the first by using a standardized sample (normal distribution). The second distribution thus seeks to transform the first into a normal distribution, characterized by the prevalence of incrementalism. From this distribution, the critical values (tails) of the standardized distribution can be identified, allowing us to determine punctuation parameters — that is the lower (5th percentile) and upper (95th percentile) thresholds, beyond which a budget change qualifies as a punctuation. Once these parameters are established using the standardized distribution, the actual distribution is analyzed to identify values that exceed the punctuation thresholds. Changes surpassing these limits are classified as punctuations, while the rest are considered incremental changes. This protocol has been applied in studies by Sebok and Berki (2017) and Lundgren, Squartrito, and Tallberg (2017).

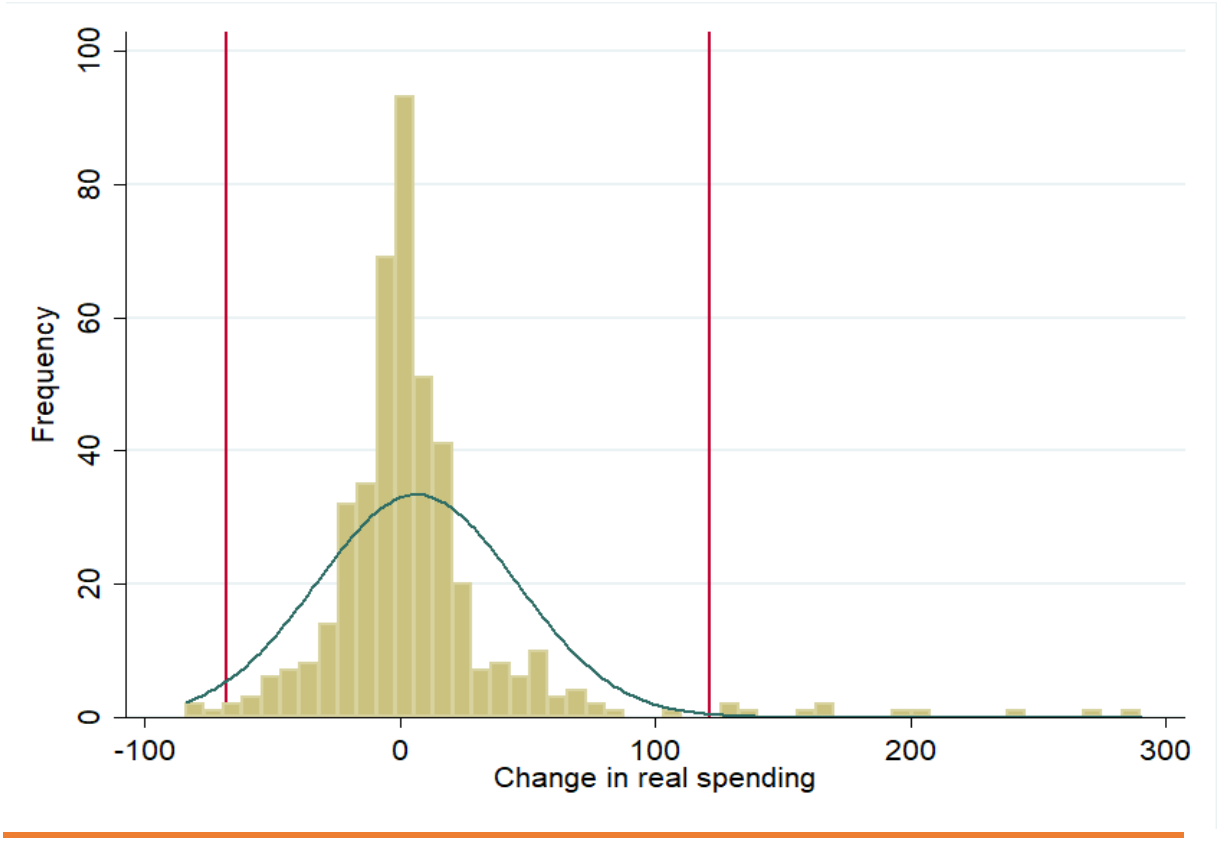
In this study, budget change data was standardized by subtracting the median and dividing by the standard deviation[2]. However, the maximum value in the sample was excluded from the calculation of the median and standard deviation, as it was significantly discrepant and skewed these measures. While the highest value in the full

[2]As in Dezhbakhsh, Tohamy, and Aranson (2003), the median was used instead of the mean because the distribution is right-skewed.

sample is 5,771%, the second highest is 564%. In the standardized sample, the 5th percentile was identified as -67.9% and the 95th percentile as 121.3%. Therefore, all actual budget changes falling below -67.9% or exceeding 121.3% are classified as abrupt changes, and considered punctuations in Brazil's budget changes from 2000 to 2021.

Figure 01 depicts the actual budget changes (vertical bars), the normal curve for this distribution (blue line), and the punctuation parameters for budget changes (vertical lines).

Figure 01. Distribution of actual percentage changes and punctuation parameters



Source: Elaborated by the authors.
Note: The normal curve was calculated based on all observations.

Results

The results are structured into three subsections, each corresponding to a subsection of the methodology. The first subsection presents descriptive results on budgetary expenditure execution and its changes from 2000 to 2021. The second subsection presents the L-Kurtosis indicator results overall, as well as by year

and policy domain. Finally, the budget punctuations for each year and policy domain are presented, along with the factors explaining these changes.

Descriptive analysis of expenditures and budget changes

Table 02 shows the percentage share of budgetary expenditures for 21 policy domains relative to total expenditures, along with the number of expenditure items in each domain, based on the adopted function and subfunction classification. The domain with the largest share of expenditures is labor, employment, and social security, with social security accounting for most of the federal government spending — most of which is mandatory. On the other hand, this domain does not have the highest number of expenditure items. Domains such as science, technology, and communications, as well as government and public administration, include a significant number of expenditure items despite accounting for a relatively small share of total expenditures. After the social security domain, the largest shares of expenditures are allocated to health, education, and social policy, respectively.

Figure 02 presents the trajectory of budgetary expenditures by policy domain in absolute and real terms over the analyzed period. After a decline in total expenditures in 2004, public spending expanded significantly across various policy domains, particularly in health, education, and social policy, which are heavily regulated by the 1988 Federal Constitution and its subsequent amendments. In addition to reflecting the rise in total expenditures driven by the economic growth of the 2000s, this expansion is directly tied to a series of social policy reforms implemented during the period — these reforms were introduced when the Workers' Party (PT) took office in the federal government in 2003. Generally classified as center-left, with a strong social-democratic orientation, the party's ideology partly explains the expansion of public spending during this period. The PT won four consecutive presidential elections, but in 2016, amid political and economic instability, then-president Dilma Rousseff was impeached and removed from office — a process many scholars consider a parliamentary coup (SINGER et al., 2016).

The distribution of percentage budget changes by policy domain during the analyzed period — the core focus of this article — is non-normal, indicating the presence of punctuations (see Figure 01). The budget change distribution

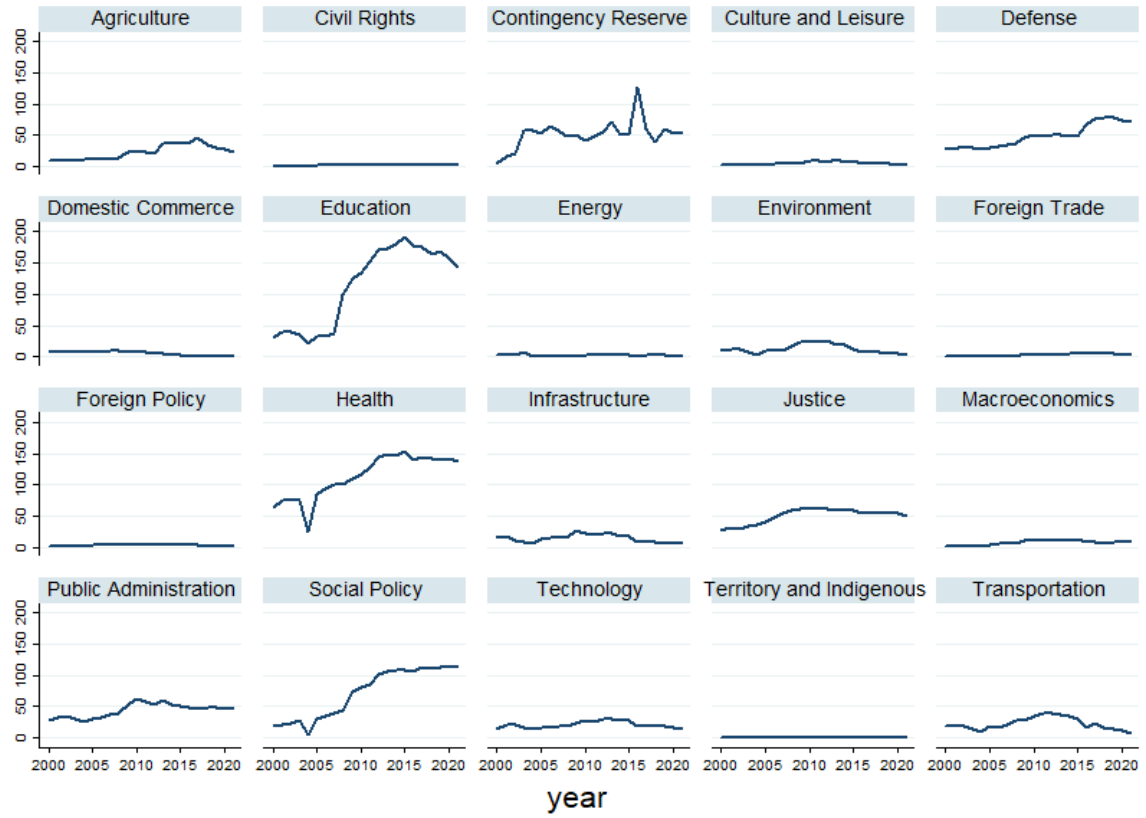
indicators in Table 03 confirm that the distribution is not normal. While the mean is 22.70%, the median is 8.19%, highlighting not only their discrepancy but also the significant gap between them. Similarly, the standard deviation of this distribution is 279.90%, indicating a high dispersion of values around the median. It is also important to note the maximum value in this distribution, which, while not necessarily representative of all observations, is exceptionally high.

Table 02. Descriptive analysis of budget allocations by policy domain

Policy domain	Share of total expenditure	Number of expenditure items
Macroeconomics	0.61%	256
Civil rights, political rights, liberties, and minorities	0.15%	276
Health	8.85%	392
Agriculture, livestock, and fisheries	1.75%	211
Labor, employment, and social security	51.95%	1017
Education	8.83%	442
Environment	1.01%	407
Energy	0.19%	276
Transportation	1.77%	261
Judiciary, justice, crimes, and violence	3.95%	464
Social policy	5.60%	346
Housing, infrastructure, and land reform	1.15%	469
Banking system, financial institutions, and domestic commerce	0.46%	297
Defense, armed forces, military, and warfare	3.79%	209
Science, technology, and communications	1.63%	1927
Foreign trade, imports, and exports	0.20%	45
International affairs and foreign policy	0.28%	350
Government and public administration	3.43%	1316
Territory, indigenous peoples, and natural resources	0.01%	60
Culture, sport, and leisure	0.38%	432
Contingency reserve	4.02%	35
Total	100%	9488

Source: Elaborated by the authors.

Figure 02. Trajectory of Brazil's budget expenditures by policy domain (2000-2021).



Source: Elaborated by the authors.
Notes: (1) to enhance data visualization, the figure excludes the 'Labor, employment, and social security' domain, which is available in the Appendix A; (2) for analysis of absolute values, see Appendix B; (3) values in billions of reais.

Table 03. Descriptive measures of the percentage budget changes in Brazil (2000-2021)

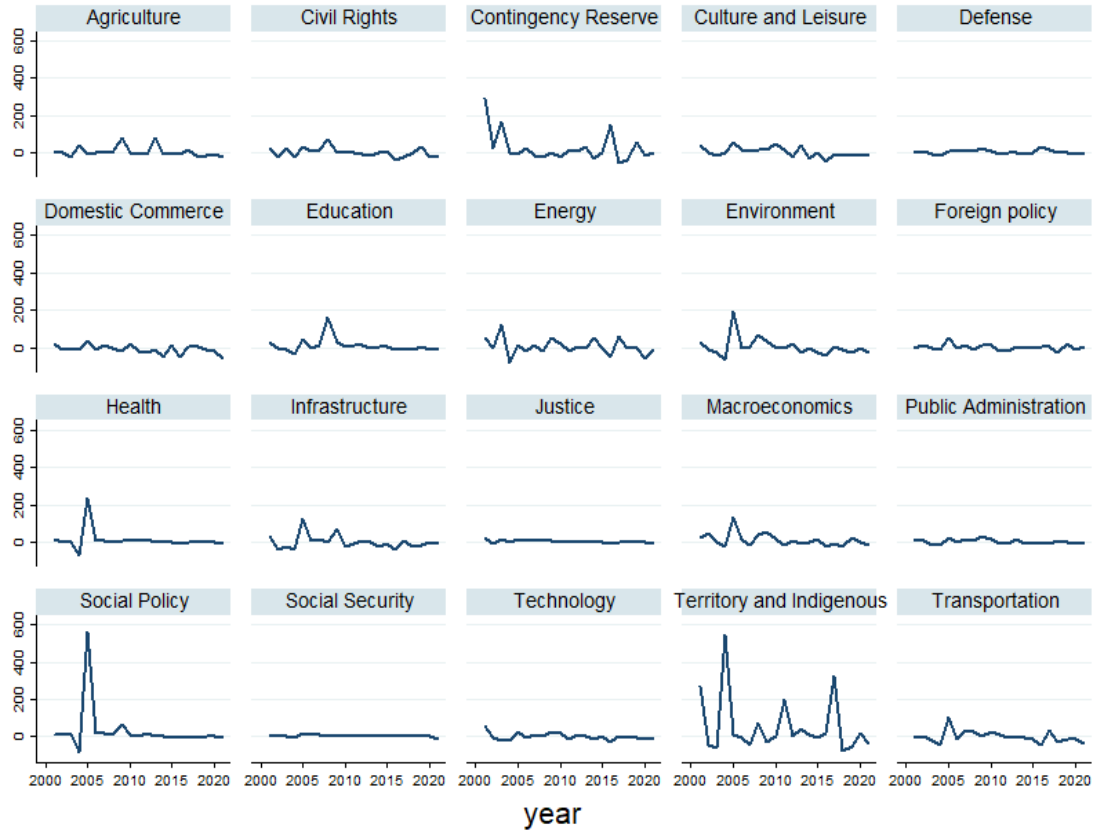
Indicator	Real year-on-year changes
Mean	22.70%
Median	8.19%
Standard Deviation	279.90%
Maximum	5771.20%
Minimum	-84.10%
Number of observations	441

Source: Elaborated by the authors.

Figure 03 below shows that the level of budget change varies across policy domains. While domains such as health, education, environment, social assistance, territorial policy, and contingency reserve exhibit sharp peaks in budget changes, sometimes exceeding 200%, others — such as social security (retirement and labor

policies), justice, defense, commerce, technology, and public administration — show a more stable pattern with lower budget changes. This may be because the first group of policies is more sensitive to government priorities, while the second group is less influenced by these preferences and tends to be less visible to society.

Figure 03. Percentage changes by policy domain (2001-2021)



Source: Elaborated by the authors.
Notes: (1) to optimize the visualization of other domains, the figure excludes the 'foreign trade' domain, which is available in Appendix A; (2) for analysis of absolute values, see Appendix B.

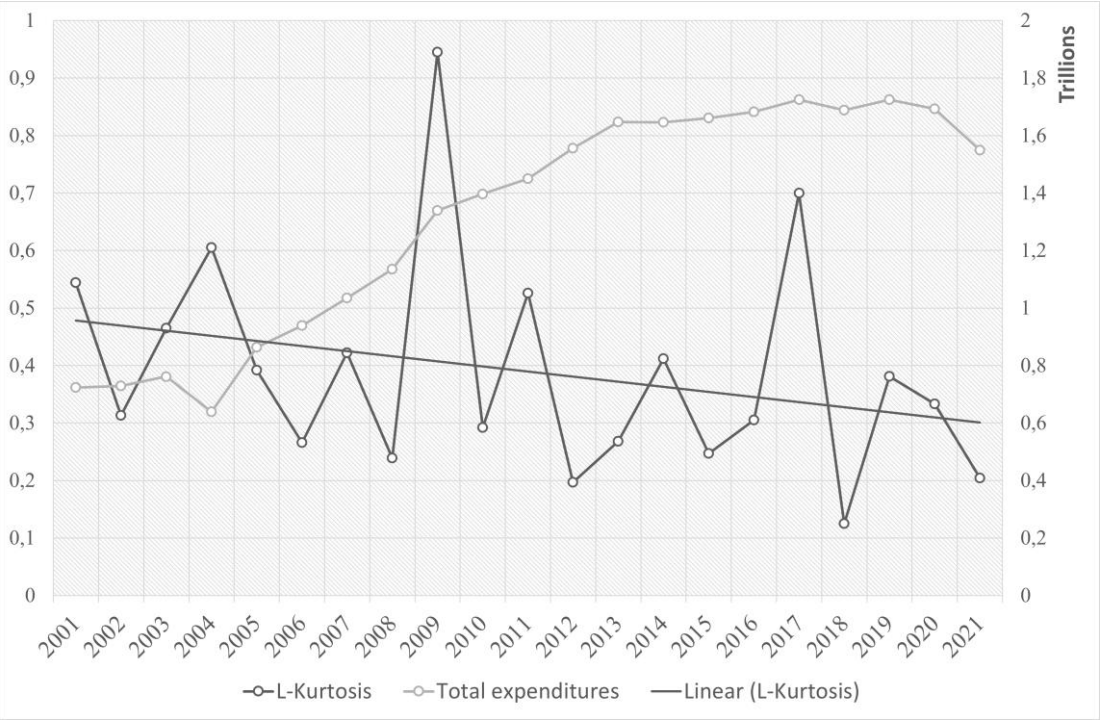
Analysis of L-Kurtosis indicators

Finally, Figure 04 displays the L-Kurtosis indicator for the percentage budget changes across the analyzed years. The average L-Kurtosis value from 2000 to 2021 is 0.657, which could be considered high compared to values observed in other countries. This indicator suggests that Brazil's budget is marked by a high number of punctuations. When analyzed alongside the projection in Figure 01, the

distribution of budget changes can be classified as leptokurtic, meaning it is less flattened than a normal distribution.

The L-Kurtosis indicator fluctuates across the analyzed years. The two years in which the L-Kurtosis indicator exceeds the average are 2009 and 2017. In 2009, following the 2008 financial crisis, the most significant budget change occurred in the foreign trade, imports, and exports domain — this year and domain recorded the highest budget change of the entire period (5,771.2%), significantly influencing the elevated value of the indicator. Notably, excluding this single budgetary variation would lower the L-Kurtosis indicator to 0.444, which, while still high, is significantly lower than the value that includes all budget changes. On the other hand, 2017 followed the ousting of then-president Dilma Rousseff, a period of significant political, economic, and institutional instability in the country. Furthermore, 2017 marked the first year of the spending cap policy, which introduced a new fiscal framework in Brazil. Enacted through Constitutional Amendment Nº 95/2016, this policy froze public spending in real terms for 20 years, capping primary expenditures at 2016 levels and significantly affecting the budget for various sectoral policies.

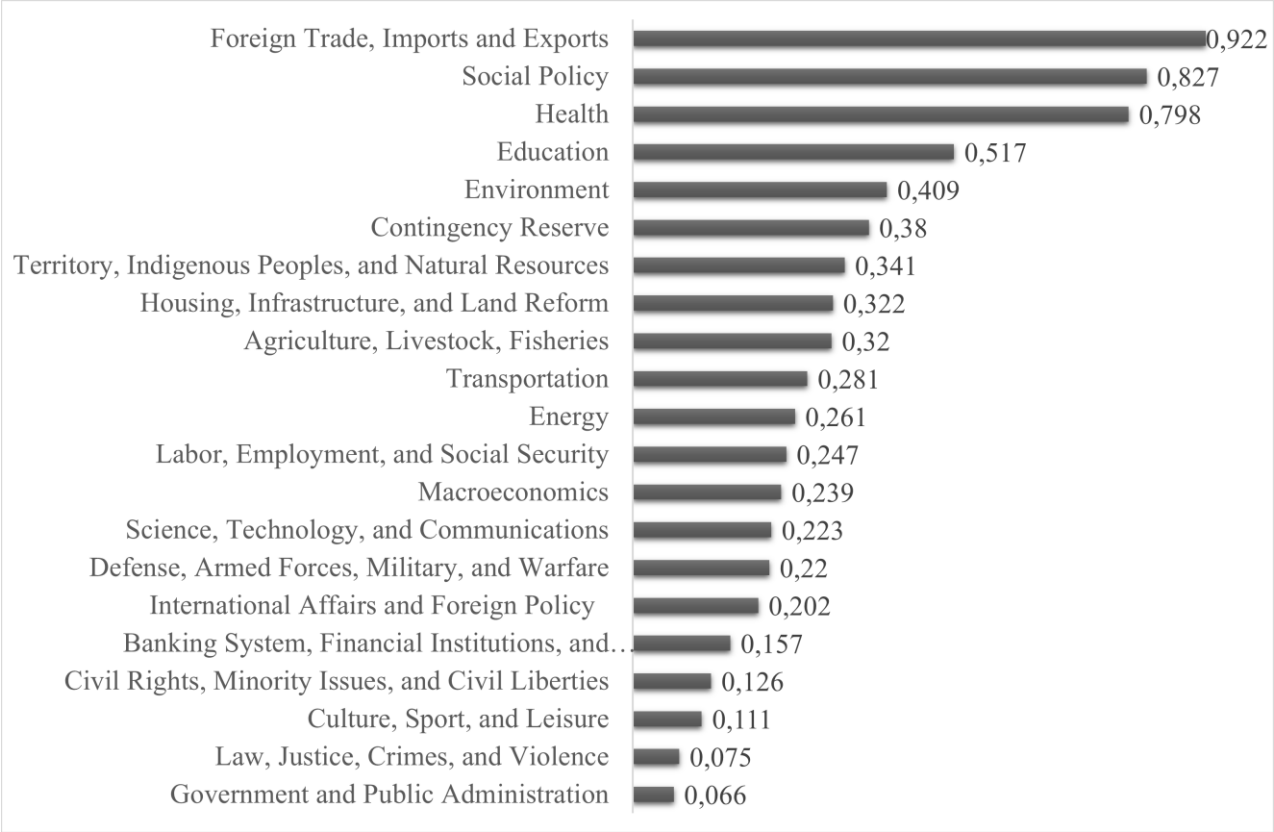
Figure 04. L-kurtosis indicator and total budget expenditures in Brazil (2000-2021)



Source: Elaborated by the authors.
Note: Total expenditure values are expressed in trillions of reais. The L-Kurtosis indicator was calculated based on budget changes across all domains for each year.

Figure 05 shows that the L-Kurtosis indicator varies across different policy domains. The domains with an L-Kurtosis indicator above the average include foreign trade, imports, and exports; social policy; and health. Although not exceeding the average, the education domain also shows a high L-Kurtosis level. Except for the foreign trade domain, the highest kurtosis levels are observed in social policy, health, and education, respectively. As previously mentioned, these three policy domains were central to the social policy reforms launched in 2004 by the Workers' Party (PT).

Figure 05. L-kurtosis indicator by policy domain in Brazil (2000-2021)



Source: Elaborated by the authors.
Note: The L-Kurtosis indicator was calculated based on budgetary changes across all years for each domain.

Key changes in each domain included the creation of the Unified System of Social Assistance (SUAS), which expanded federal efforts in social assistance, the implementation of the Bolsa Família cash transfer program, and increased funding for the Continuous Cash Benefit program (BPC) (PAIVA et al., 2016). In the health policy domain, significant developments included increased transfers to subnational entities

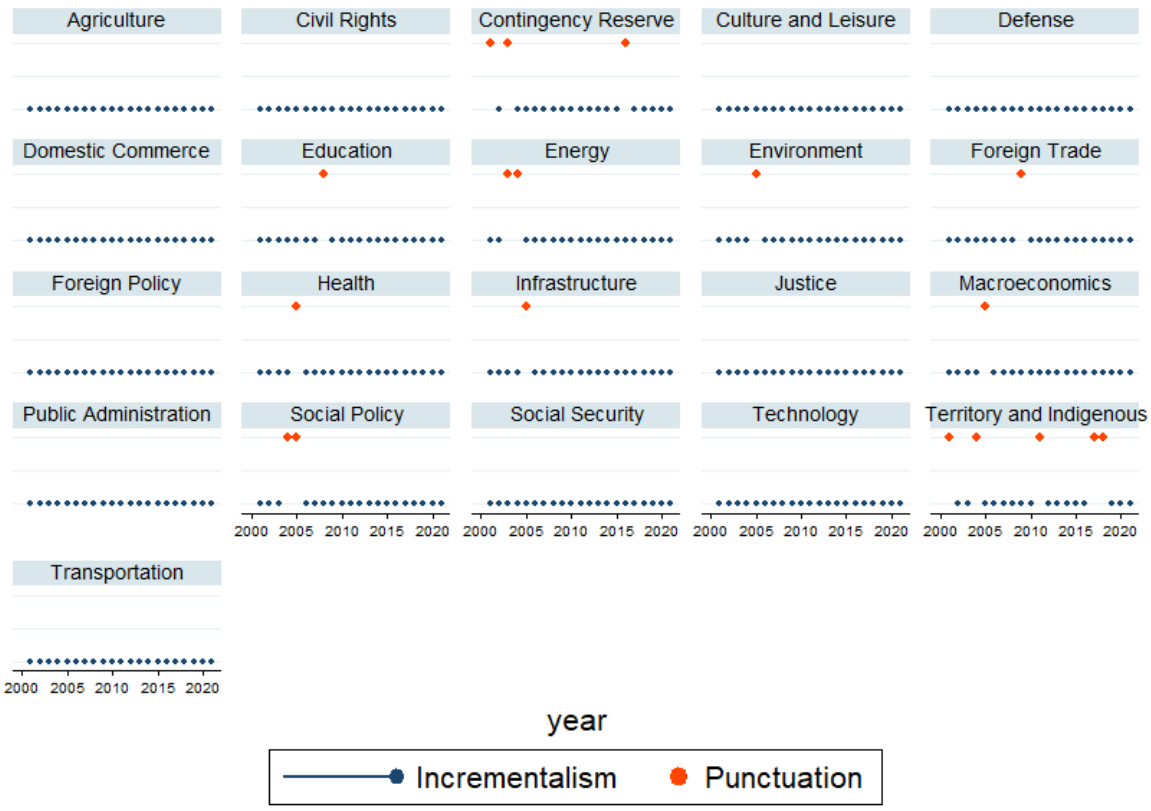
through the Primary Healthcare Funding (PAB) (MACHADO, 2023). The creation of programs such as Mais Médicos, aimed at bringing doctors to underserved and remote areas of Brazil, and the approval of Complementary Law Nº 141/2012 and Constitutional Amendment Nº 86/2015, which organizes the rules for allocating public funds to health (LEVI, 2016). In education, key developments included increased funding for basic education, transfers to subnational entities through the Fund for the Maintenance and Development of Basic Education. And the Valorization of Education Professionals (FUNDEB), established in 2006, gradually implemented until 2009, and reformed in 2020. Other notable initiatives included the program for expanding federal public universities (Reuni) and student financing programs for private universities (Prouni and FIES), among others.

Analysis of budget punctuations

The analysis of the distribution of budgetary changes in Brazil from 2000 to 2021 reveals 18 punctuations in the public budget trajectory, distributed across 10 policy domains and 10 different years, as shown in Figure 6. Most domains have only one or two punctuations, whereas the 'contingency reserve' domain has three, and the 'territory, indigenous peoples, and natural resources' domain has five.

The analysis of these domains suggests varying levels of government attention: high attention to health, education, social policy, and contingency reserve; medium attention to infrastructure and macroeconomics; and low government attention to the environment, energy, foreign trade, and territorial policies (BRASIL et al., 2023). Therefore, the level of government attention — reflected in a domain's share of total expenditures — is not a factor in explaining these high-magnitude budget changes, which may occur in domains with both low and high budgetary expenditures.

Figure 06. Occurrences of incrementalism and punctuations in policy domains by year (2001–2021)



Source: Elaborated by the authors.

Table 04 shows that of the 18 observed punctuations, 15 reflect positive changes due to increased expenditures, while 3 represent negative changes. It is also observed that in all consecutive punctuations, the second punctuation seeks to restore expenditure levels to those of the preceding punctuation. For example, the second punctuation in the energy domain, which took place in 2004, aimed to restore expenditure levels to those of 2002, the year before the first punctuation in this domain (2003) — it is worth noting that the 2003 punctuation followed an energy crisis that led to a blackout in the early 2000s (FREITAS, 2005). This same pattern appears in the positive punctuation in the health policy domain in 2005, where the expenditure increase sought to restore expenditure levels to those of 2003 — although the decline in the health budget in 2004 does not technically qualify as punctuation.

The year 2005 also recorded the highest number of punctuations, with a total of five, spanning the domains of macroeconomics, health, environment, social policy,

and housing and infrastructure. Although 2005 was not technically the first year in which the new government (Lula's first administration) formulated the federal budget, the 2005 budget was drafted in 2004, the administration's second year in office. As suggested in the literature, governmental transitions create favorable conditions for policy change and the redefinition of priorities (KINGDON, 2003). The domain with the highest number of punctuations is 'territory, indigenous policies, and natural resources', which also has five punctuations distributed across various years and governments within the analyzed period. These results highlight the domain's sensitivity to budget changes, suggesting that domains receiving less government attention may be more vulnerable to changes than others. Furthermore, indigenous, territorial, and natural resource policies are often highly contested and frequently serve as a focal point for various forms of conflict (SILVA, 2018, 2017).

In some policy domains, the factors explaining their punctuations is relatively straightforward, while in others, they are less clear and may result from multiple cumulative factors. This is the case for the education domain, which recorded a punctuation in 2008 during a period of educational reforms focused on expanding access to higher education, changes in the basic education funding model through Fundeb, and economic growth with rising public revenues.

The analysis of the punctuations also suggests that contextual factors, both domestic and international, help explain the identified punctuations. Domestically, the contingency reserve showed punctuations in 2003, the first year of a new government, and in 2016, a year of significant political and economic instability that led to the ousting of President Dilma Rousseff. These two factors suggest that in contexts of uncertainty or instability, the lack of definition in resource allocation for certain policy domains increases significantly, leaving these allocations to be decided during budget execution. In the international context, the foreign trade domain's punctuation in 2009 stands out, caming directly after the global economic crisis of 2008. While this crisis cannot be identified as the explanatory factor for the punctuation, it is reasonable to assume that the government increased expenditures in the domain to address its effects. However, this issue requires further investigation, particularly since expenditures in this domain remained at 2008 levels until after 2010.

Table 04. Summary of budget punctuations from 2001 to 2021

Domain	Year	% of change	Domain	Year	% of change
Macroeconomics	2005	133%	Foreign trade	2009	5771%
Health	2005	240%	Territory	2001	269%
Education	2008	165%		2004	550%
Environment	2005	195%		2011	203%
Energy	2003	125%		2017	323%
	2004	-79%		2018	-73%
Social policy	2004	-84%	Contingency reserve	2001	290%
	2005	564%		2003	168%
Housing and infrastructure	2005	129%		2016	155%

Source: Elaborated by the authors.

Conclusion

This article examined the dynamics of Brazil's budget distribution using the theoretical and methodological framework of Punctuated Equilibrium Theory (PET), developed by Frank Baumgartner and Bryan Jones (1993). Using a 22-year budgetary database, this study traced the trajectories of various Brazilian expenditures across policy domains from 2000 to 2021, calculated L-kurtosis indicators, and identified both incremental and punctuated budget changes.

This study engages significantly with analyses of budgetary governance, recognizing that Brazil's federal budget operates within a robust institutional framework — with rules protecting expenditures, as analyzed by Wildavsky (1969) — while also being shaped by intense executive-legislative conflicts and shifting government preferences and priorities, resulting in frequent changes in government programs. Both institutional norms, which facilitate the incremental growth of expenditures, and political instability, which leads to frequent punctuations, are key factors examined in this analysis.

The results reveal markedly different trajectories among social policies such as education, health, social security, and infrastructure-related domains. The average L-kurtosis indicator from 2000 to 2021 is 0.657, indicating that Brazil's budget

experiences a high frequency of punctuations — significantly more than other democratic countries analyzed in the CAP project, including both developed and developing nations. However, contextual analyses suggest that this result is not directly driven by Brazil's democratic conditions but by the implementation of social program reforms in recent years and their subsequent backsliding. Since the enactment of the 1988 Federal Constitution, Brazil's overall public budget has fluctuated significantly due to adjustments in fiscal and monetary policies, alongside major sectoral reforms aimed at creating unified health and social assistance systems with federative funding, the establishment of dedicated funds for financing basic education, and various other programmatic changes across different policy areas. Many of these reforms were implemented between 2003 and 2013, a period when the federal budget was managed by left-wing parties. In the past six years, policymaking has been led by center-right and right-wing parties, which have introduced new fiscal and economic reforms, partially altering the rules and policy systems established since the enactment of the Federal Constitution. These results suggest that while Brazil's federal budget is highly rigid and institutionally constrained, the ideological orientation of governments plays a role in shaping budgetary priorities and driving subsequent changes.

The L-kurtosis values and budget punctuations observed in the Brazilian case highlight the need to expand the geographical application of Punctuated Equilibrium Theory beyond Northern Hemisphere countries. While many studies, both domestic and comparative, have applied PET, analyses incorporating diverse geographical contexts such as Latin America remain scarce despite the region's political, economic, and social specificities offering insights into L-kurtosis indicators and enabling the development of new analytical and regional categories beyond those already established in the literature.

Drawing from the public budgeting literature, we believe that a close examination of the economic, political, and institutional contexts is essential to understanding the high frequency of budgetary punctuations in Brazil. Brazil, compared to other countries analyzed through PET, is a relatively young democracy still consolidating its formal rules. The 1988 Federal Constitution, drafted with broad social participation after a prolonged dictatorship, sought to address the expectations

of several social groups. Since the enactment of the 1988 Constitution, Brazil has implemented a series of economic reforms and adjustments over the past 30 years to achieve monetary and fiscal stabilization, addressing challenges such as hyperinflation, high federal and subnational debt, international crises like the 2008–2009 financial crisis, and the 2020 pandemic.

Therefore, since democratization, Brazil has experienced major political, economic, and institutional shifts driven by competition between distinct — sometimes opposing — power groups, shaping budgetary structures and resources and leading to changes in budget expendtures and rights over the years. This pattern of instability is not unique to Brazil but is also a characteristic of other countries, particularly in Latin America. By applying PET with theoretical and methodological rigor to examine the dynamics of budget distribution in democratic Brazil, this study contributes to the theory's regional expansion by introducing new values and interpretations. Additionally, it bridges the Brazilian domestic debate with recent and emerging literature in the field of policy analysis.

Furthermore, this study establishes a research agenda on budgetary and policy changes in Brazil by identifying the policy domains and periods where high-magnitude budget changes are concentrated. This enables sectoral studies to delve deeper into the explanatory factors and contexts associated with these changes. The study also lays the groundwork and provides key elements for conducting comparative studies with other countries. Brazil's federal context, where subnational entities hold fiscal and administrative autonomy, also offers valuable opportunities for subnational research using the theoretical and methodological frameworks explored in this study.

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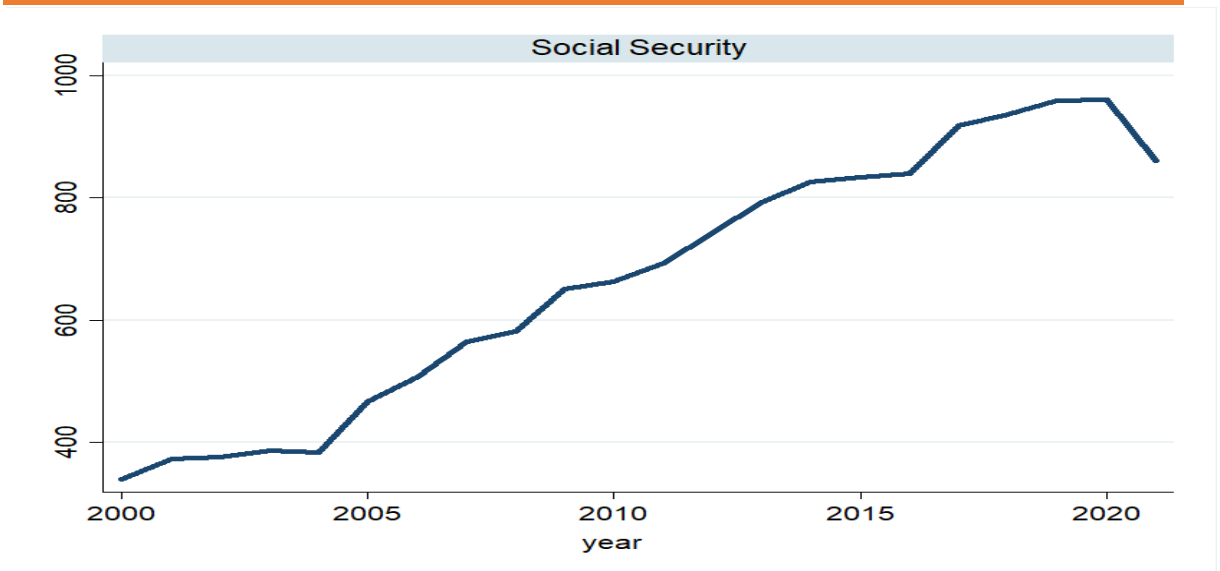
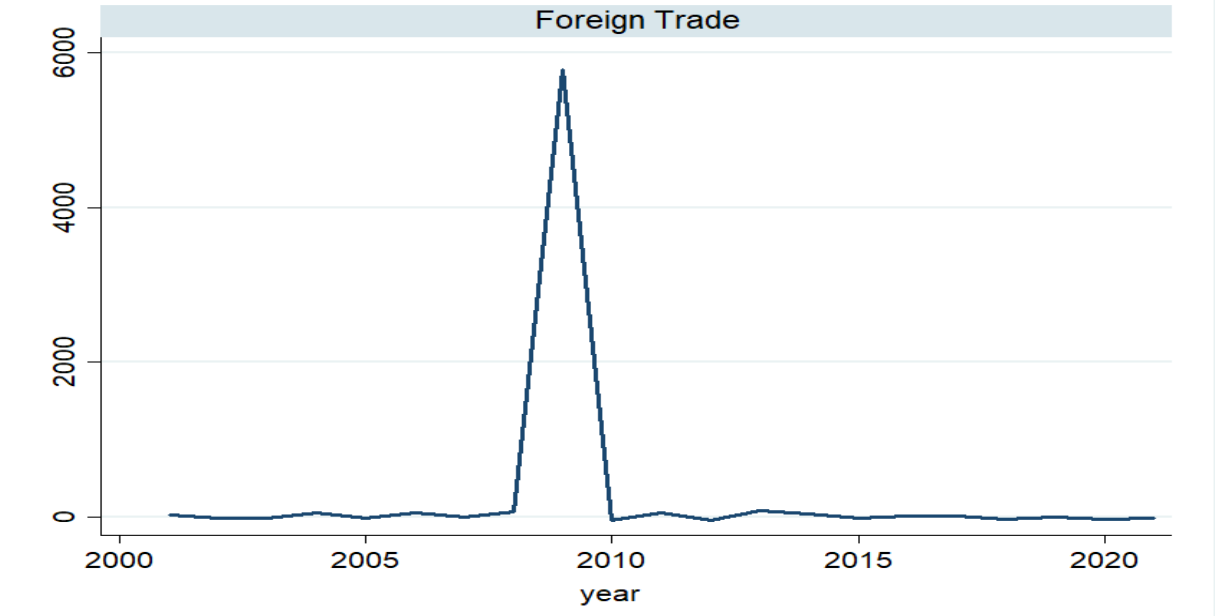
Appendix A

Figure 07. Trajectory of Brazilian budgetary expenditures on social security (2000-2021).



Source: Elaborated by the authors.

Figure 08. Percentage changes in the foreign trade domain (2001-2021)



Source: Elaborated by the authors.

Appendix B

Table 05. Approved expenditure values in the federal budget between 2000 and 2021 (Values in billions - BRL)

Major Topic	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Overall total
Agriculture	9.2	10.3	10.3	8.1	11.3	10.6	10.9	12.2	12.8	23.3	24.3	22.7	21.1	37.8	35.8	37.6	37.0	45.1	33.9	30.1	27.6	22.3	494.4
Civil Rights	1.0	1.2	0.9	1.1	0.9	1.2	1.3	1.6	2.7	2.8	3.1	3.1	2.9	2.6	2.7	3.0	2.0	1.6	1.7	2.3	1.8	1.4	43.0
Contingency reserve	4.4	17.0	21.1	56.6	56.5	52.4	65.4	57.0	47.2	50.1	40.8	48.1	54.1	71.0	50.2	49.8	127.4	59.0	38.5	60.2	53.1	53.6	1133.6
Culture and Leisure	1.6	2.2	2.2	1.9	2.0	3.2	3.8	4.1	4.9	5.6	8.3	9.6	7.7	11.1	7.9	8.2	4.9	4.6	3.9	3.5	2.9	2.5	106.7
Defense	29.0	28.7	31.8	30.5	26.7	30.4	32.4	35.1	37.5	47.0	51.4	49.4	50.2	49.6	48.0	48.2	66.3	76.4	77.5	77.7	74.6	70.6	1069.1
Domestic Commerce	7.6	9.4	8.3	8.3	7.3	9.8	8.7	9.9	9.7	8.0	9.4	7.9	5.7	5.2	2.7	3.1	1.5	1.6	1.7	1.6	1.2	0.5	129.4
Education	31.8	40.5	39.4	35.9	22.6	33.2	33.3	37.5	99.7	125.7	135.3	151.7	171.7	172.5	179.6	192.6	178.0	176.1	165.1	168.3	157.0	143.0	2490.6
Energy	2.2	3.4	3.3	7.4	1.5	1.7	1.4	1.6	1.3	2.0	2.5	2.1	2.2	2.2	3.5	3.3	1.7	2.7	2.6	2.5	1.1	1.0	53.4
Environment	10.4	13.2	12.3	8.9	3.3	9.8	9.9	10.6	17.9	24.3	24.0	22.8	26.9	19.0	18.5	13.3	8.2	8.6	7.4	5.5	5.3	3.9	284.0
Foreign Policy	2.4	2.4	2.7	2.7	2.4	3.6	3.5	4.1	3.7	4.2	4.9	4.0	3.4	3.6	3.4	3.2	3.3	3.4	2.6	3.1	2.8	2.9	72.6
Foreign Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	5.4	3.1	4.5	2.4	4.3	6.1	5.0	5.6	6.1	4.4	4.4	3.1	2.6	57.3
Health	64.9	74.7	76.4	76.5	24.9	84.5	93.4	100.6	101.4	110.4	117.8	128.8	145.0	148.8	146.9	153.2	140.2	143.4	143.0	140.9	142.0	137.2	2495.1
Infrastructure	14.7	19.0	12.1	9.5	6.0	13.8	14.6	16.8	16.6	28.2	21.4	20.4	22.6	23.2	18.1	17.0	9.8	10.9	8.3	6.9	7.1	6.8	323.6
Justice	26.6	32.4	29.6	34.5	35.3	41.8	47.0	54.7	59.4	62.7	64.6	62.5	60.9	59.0	59.6	59.0	55.6	54.1	56.0	54.2	54.0	51.0	1114.7
Macroeconomics	1.5	1.9	2.7	2.7	2.2	5.1	6.0	5.3	7.5	11.5	13.6	11.3	11.8	11.2	11.2	12.8	9.8	9.4	7.5	9.3	9.1	7.6	171.2
Public Administration	28.5	32.9	35.7	29.6	25.6	31.0	32.4	36.7	39.6	52.5	63.0	57.3	52.3	59.3	53.9	50.5	49.3	46.5	49.7	48.8	45.4	45.7	966.5
Social Security	338.9	372.0	376.0	386.0	382.9	465.9	507.5	565.1	581.9	650.1	662.6	692.5	743.2	792.2	826.8	833.2	839.1	918.4	936.0	958.8	961.4	861.4	14651.8
Social Policy	19.1	21.3	23.5	27.7	4.4	29.2	34.4	40.4	44.2	73.1	81.3	84.8	102.0	107.3	108.8	108.5	105.2	112.5	111.9	114.0	114.5	112.2	1580.5
Technology	14.1	22.0	21.1	17.1	13.5	17.7	16.9	19.2	19.4	24.1	29.0	25.7	29.6	29.9	27.0	27.2	19.5	19.9	19.2	18.1	16.0	14.1	460.3
Territory and Indigenous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.8	0.2	0.1	0.1	0.1	2.6
Transportation	19.2	17.7	18.0	14.9	8.9	18.4	15.8	21.7	27.6	27.8	34.9	39.6	39.4	36.5	34.8	31.4	17.5	23.1	16.4	14.0	12.7	8.4	498.7
Total Geral	627.0	722.4	727.7	760.2	638.4	863.6	938.6	1034.1	1135.1	1339.0	1395.6	1448.9	1555.3	1646.6	1645.8	1660.2	1681.8	1724.5	1687.7	1724.4	1692.9	1549.0	28199.0

Source: Research data, elaborated by the authors.
Note: Values in billions of reais, adjusted to 2021.

Table 06. Percentage changes in budgetary values by year and policy domain (2001-2021)

Major Topic	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Agriculture	12.1%	-0.5%	-20.9%	39.2%	-5.6%	2.6%	11.8%	4.8%	82.4%	4.1%	-6.7%	-6.8%	79.2%	-5.3%	4.9%	-1.6%	22.0%	-24.8%	-11.2%	-8.4%	-18.9%
Civil Rights	27.0%	-24.9%	22.8%	-19.4%	33.3%	9.8%	18.8%	69.5%	4.0%	13.5%	-0.2%	-6.3%	-11.2%	1.7%	14.3%	-35.6%	-17.4%	4.7%	36.9%	-21.3%	-24.1%
Contingency reserve	290.4%	24.3%	168.2%	-0.2%	-7.3%	24.9%	-12.8%	-17.3%	6.3%	-18.6%	17.9%	12.3%	31.3%	-29.3%	-0.8%	155.9%	-53.7%	-34.7%	56.4%	-11.8%	0.9%
Culture and Leisure	38.3%	0.3%	-12.8%	5.8%	56.0%	19.2%	7.7%	20.0%	14.9%	48.0%	15.0%	-19.1%	43.9%	-29.1%	4.5%	-41.1%	-5.8%	-14.8%	-10.5%	-17.0%	-12.0%
Defense	-1.0%	10.7%	-4.0%	-12.3%	13.5%	6.7%	8.2%	7.0%	25.3%	9.4%	-3.9%	1.7%	-1.2%	-3.2%	0.3%	37.6%	15.2%	1.4%	0.2%	-4.0%	-5.4%
Domestic Commerce	24.7%	-11.5%	0.0%	-12.5%	34.2%	-11.4%	14.3%	-2.1%	-18.0%	18.2%	-16.0%	-27.6%	-10.0%	-47.8%	17.0%	-52.4%	9.3%	5.3%	-10.0%	-20.5%	-55.7%
Education	27.2%	-2.5%	-9.0%	-37.0%	47.1%	0.2%	12.6%	165.7%	26.1%	7.7%	12.1%	13.1%	0.5%	4.1%	7.3%	-7.6%	-1.1%	-6.2%	1.9%	-6.7%	-8.9%
Energy	52.2%	-4.0%	125.9%	-79.9%	15.3%	-17.7%	10.8%	-15.9%	54.8%	23.0%	-16.7%	6.5%	0.2%	56.4%	-5.9%	-49.8%	62.7%	-3.3%	-3.2%	-56.6%	-9.7%
Environment	26.6%	-6.7%	-27.9%	-62.7%	195.5%	0.6%	7.6%	68.6%	35.7%	-1.1%	-4.9%	17.8%	-29.4%	-2.5%	-28.5%	-38.3%	4.9%	-13.6%	-26.0%	-4.1%	-26.5%
Foreign Policy	-0.1%	14.1%	-1.4%	-10.8%	51.2%	-2.8%	16.1%	-8.7%	13.0%	16.2%	-18.7%	-14.4%	3.9%	-4.8%	-5.3%	2.1%	5.0%	-23.0%	17.8%	-10.7%	5.2%
Foreign Trade	21.8%	-18.8%	-11.1%	51.0%	-17.3%	57.1%	-4.9%	62.5%	5771.2%	-43.1%	47.4%	-47.5%	80.1%	41.7%	-17.0%	11.7%	8.3%	-27.3%	-0.7%	-29.9%	-15.4%
Health	15.1%	2.3%	0.1%	-67.5%	240.1%	10.5%	7.8%	0.8%	8.8%	6.8%	9.3%	12.7%	2.6%	-1.3%	4.3%	-8.5%	2.3%	-0.3%	-1.4%	0.8%	-3.4%
Infrastructure	29.5%	-36.4%	-21.3%	-36.6%	129.3%	5.5%	14.8%	-0.7%	69.4%	-24.0%	-5.0%	10.9%	3.0%	-22.0%	-6.6%	-42.4%	11.3%	-23.5%	-17.5%	3.4%	-4.4%
Justice	21.9%	-8.6%	16.6%	2.2%	18.5%	12.2%	16.5%	8.7%	5.6%	2.9%	-3.2%	-2.5%	-3.2%	1.2%	-1.1%	-5.8%	-2.5%	3.4%	-3.2%	-0.3%	-5.5%
Macroeconomics	24.3%	45.4%	0.3%	-20.5%	133.8%	17.2%	-11.6%	41.5%	54.3%	18.0%	-17.0%	4.8%	-5.2%	0.2%	14.3%	-23.3%	-4.1%	-20.6%	24.2%	-2.2%	-16.0%
Public Administration	15.5%	8.7%	-17.2%	-13.4%	21.1%	4.4%	13.2%	7.9%	32.6%	20.0%	-9.1%	-8.7%	13.4%	-9.0%	-6.3%	-2.4%	-5.6%	6.8%	-1.8%	-7.0%	0.7%
Social Security	9.8%	1.1%	2.7%	-0.8%	21.7%	8.9%	11.3%	3.0%	11.7%	1.9%	4.5%	7.3%	6.6%	4.4%	0.8%	0.7%	9.5%	1.9%	2.4%	0.3%	-10.4%
Social Policy	11.5%	10.2%	17.7%	-84.1%	564.7%	17.7%	17.6%	9.3%	65.6%	11.2%	4.3%	20.3%	5.1%	1.4%	-0.3%	-3.0%	6.9%	-0.6%	2.0%	0.4%	-2.0%
Technology	56.6%	-4.5%	-18.9%	-20.8%	30.7%	-4.4%	13.8%	0.9%	24.4%	20.2%	-11.4%	15.0%	1.3%	-9.8%	0.6%	-28.4%	2.5%	-3.7%	-5.8%	-11.7%	-11.6%
Territory and Indigenous	269.2%	-44.9%	-56.8%	550.2%	11.8%	-5.3%	-42.5%	72.0%	-23.7%	5.0%	203.0%	2.6%	46.7%	14.1%	-7.0%	16.9%	323.7%	-73.6%	-48.4%	18.6%	-37.1%
Transportation	-7.5%	1.6%	-17.1%	-40.3%	106.4%	-14.4%	37.5%	27.3%	0.8%	25.5%	13.4%	-0.5%	-7.3%	-4.7%	-9.8%	-44.3%	32.4%	-28.9%	-14.9%	-9.0%	-34.1%

Source: Research data, elaborated by the authors.