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Challenges of the budgeting process in Brazilian federal universities: a systematic literature review

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Abstract

Objective: This article aims to identify the challenges of the budgetary process in Brazilian federal universities based on recent academic literature, coding these challenges according to the ten principles of OECD's budgetary governance framework.
Method: A Systematic Literature Review (SLR) was conducted following the PRISMA guidelines. Initially, 304 articles were identified and, after the screening and selection process, 22 articles published between 2017 and 2025 were retrieved from the CAPES Periodicals Portal using descriptors related to public budgeting, higher education funding, and federal universities. The selected studies were subjected to qualitative analysis through thematic coding supported by Atlas.ti software, as well as quantitative analysis of citation frequency, considering the ten OECD principles of budgetary governance.
Results: The findings indicate that academic production is predominantly associated with the field of Education, both in terms of journals and authors' academic backgrounds, although contributions from other fields are also present. The centrality of Education appears to influence how budgetary problems are framed in the literature. Regarding budgetary challenges, a strong concentration of studies was identified in the fiscal dimension of budgetary governance, particularly concerning structural underfunding, recurrent budget contingencies, and the effects of fiscal rules on budget execution. Other governance dimensions, such as participation, transparency, and medium-term planning, appear less frequently.
Contributions: The study contributes by systematizing the main challenges of the budgetary process in federal universities from a budgetary governance perspective, highlighting a concentration on the fiscal dimension and gaps in the other dimensions. In this sense, the findings indicate opportunities both for scholars investigating the topic, by pointing out areas that remain underexplored, and for university managers, by providing a systematic overview of what the academic literature discusses (and fails to discuss) regarding the subject.

Keywords: Budgetary governance; Federal universities; Public budgeting; Higher education funding; Systematic literature review.

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Introduction

The budgetary process in Brazilian federal universities represents a key element to establish university autonomy and accomplish the institutional missions of education, research and extension (Amaral et al., 2025). However, this process has been facing significant challenges in the last few decades, mainly from 2017, when the Constitutional Amendment No. 95/2016 (Expenditure Cap) was implemented, and then subsequently replaced with Constitutional Amendment No. 126/2022 (New Fiscal Framework), which directly impacted public higher education funding, with a direct effect on federal universities that depend on almost exclusive funding from the National Treasury (Caetano & Campos, 2019).

Budgetary governance involves a set of processes, standards and practices that define how resources are planned, allocated, executed and controlled, that is, they are strategic guidelines that can improve planning and management of budgetary resources for Brazilian government entities (Santos, 2022). This is especially important to federal universities, which are constantly dealing with budget constraints (Lucca, 2026). Such governance also occurs amid the constitutionally ensured university autonomy and the constraints imposed by the federal budgetary system, thus giving rise to dilemmas that directly affect the capacity of institutions to fulfill their strategic objectives (Caetano & Campos, 2019).

Understanding the challenges of budgetary process in federal universities is essential for developing more effective public policies and enhancing university management practices. And, given the vast academic literature regarding the budget of federal universities, the present research proposal aims to systematize the main challenges emphasized in that field. Therefore, this paper may serve as an overview for budget managers of federal universities and an opportunity for researchers seeking new gaps to explore.

In this context, the present study aims to identify within the academic literature the main challenges faced by Brazilian federal universities in their budgetary processes from 2017 to 2025, based on the budgetary governance perspective promoted by the Organization for Economic Cooperation and Development (OECD). This period was selected because it includes the years following the implementation of the Constitutional Amendment No. 95/2016, the fiscal framework that intensified the budget constraints on federal universities and increased discussion about financial sustainability and public budget governance in higher education.

There is substantial research on funding, fiscal austerity, university autonomy, and budget execution in Brazilian federal universities. However, the studies remain scattered across specific thematic approaches, without an integrated framing of the challenges in the budgetary process. As theoretical contribution, this article proposes systematizing these challenges in accordance with the ten principles of budgetary governance by the OECD, aiming to analyze the extent to which the literature focuses on certain dimensions of budgetary governance, mainly those related to fiscal constraints and sustainability, as well as to identify the dimensions that are still underexplored.

In addition to this introduction, the article is structured in other four sections. The second section introduces Budgetary Governance as a theoretical framework, with an emphasis on the OECD-established principles. The third section outlines the systematic literature review methodology procedures, including details on search strategies, study selection criteria, and the qualitative and quantitative analysis techniques used. The fourth section characterizes the corpus of reviewed articles and subsequently discusses the challenges of budgetary processes for federal universities in light of the OECD's ten principles of budgetary governance. Finally, the conclusion provides a synthesis of the main findings, the study contributions, and suggestions for future research.

2 Theoretical Framework

2.1 Budgetary Governance

Public governance comprises a set of principles, mechanisms and practices oriented toward government action, with the objective of improving public administration performance, reinforcing accountability and providing public services in an effective, transparent and democratically legitimated manner. According to TCU (the Brazilian Federal Court of Accounts), public organizational governance is the application of leadership, strategy and control practices that enable both the public administrators and the stakeholders to evaluate the organization's situation and demands, guide its actions and monitor its operations. The main objective is increasing the chance of delivering good results to citizens in terms of public policies and services (TCU, 2020). This approach aims to improve the performance of public organizations, ensuring that the value delivered by the State to its taxpayers is maximized and preserved.

Historically, public governance gained prominence with the rise of the New Public Management (NPM), seeking to overcome the lack of active citizen participation in decision-making processes of the public sector and sustain democratic participation. It expands the scope of public organizations, promoting engagement with stakeholders, which makes management more horizontal and complex, thus enabling the inclusion of actors with distinct interests, values and logics (Silva, 2024).

One of the theoretical pillars of public governance is the Agency Theory. This theory, originating from the economics and corporate finance field, is applied to public sector for analyzing the relationship between the principal (society/citizens) and the agent (public bodies and their managers) (Martins et al., 2018). In the public sector, citizens (principals) delegate to government authorities and administrators (agents) the responsibility of managing resources and providing services on their behalf (TCU, 2020; Martins et al., 2018).

In accordance with the agency theory, the agency issue arises due to information asymmetry and potential conflicts of interest between principals and agents. Agents may have their own objectives that do not perfectly align with the interests of principals, leading to opportunistic behavior or decisions that fail to maximize the social well-being (TCU, 2020). In this sense, public governance serves as a set of mechanisms and practices that aim to mitigate these agency conflicts, ensuring that agents work in the best interests of citizens, by adopting principles such as transparency, accountability, participation, integrity/ethics, legal compliance, equity and effectiveness (Sousa et al., 2023). Decree No. 9.203/2017, which instituted the federal public administration governance policy in Brazil, establishes principles, guidelines and practices aimed at improving the governance of such organizations (TCU, 2020).

Therefore, the perspective through which governance is understood in this article is the one that includes practices, attitudes or principles that agents must pursue. This perspective is considered a formal and prescriptive approach of governance, associated with the "good governance" agenda (Cavalcante & Pires, 2018). Behind this list lies the assumption of an agency relationship and the adoption of predefined reform packages, which often run the risk of oversimplifying the complex and asymmetric realities of the public sector (Cavalcante & Pires, 2018).

Contrasting with this vision focused on ideal behaviors and control, another way of viewing governance is to look at it from an analytical and strategic perspective (Cavalcante & Pires, 2018). From this perspective, governance comes to be understood as a network of state and non-state actors, connected by formal and informal links, that formulate and implement public policies within specific institutional contexts (Cavalcante & Pires, 2018). This approach moves the focus from behavioral guidelines and strict market logic to the study of relational dynamics, based on trust, reciprocity and action in collaboration networks (Cavalcante, 2018).

Budgetary governance, as a consequence of public governance in its regulatory and prescriptive approach, refers to the set of processes, laws, structures and institutions established to ensure that the budgetary system achieves its objectives in an efficient, sustainable and long-lasting manner (OECD, 2015). It can be a way to achieve responsible management of public resources and promote transparency and accountability in government administration. This is a list of practices considered optimal for avoiding agency conflicts at a budgetary level. It is worth highlighting that this set of recommendations was created based on over a decade of discussions in the OECD, through Senior Budget Officials (SBO) and its Public Governance Committee (Santos, 2022).

The principles of good budgetary governance, as outlined by the Organization for Economic Cooperation and Development (OECD), emphasize the necessity to manage budgets within clear, credible and predictable fiscal limits. This implies the alignment of budgets and medium-term strategic priorities of the government, as well as the design of a capital budget structure that meets the national development needs in an economical and coherent fashion. Transparency is a center pillar, requiring documents and budgetary data to be open and accessible, together with an inclusive, participatory and realistic debate about the budgetary choices (OECD, 2015).

In accordance with the OECD recommendation on Budgetary Governance (OECD, 2015), ten principles orient the good budgetary governance:

1. Manage budgets within clear, credible and predictable limits of fiscal policy;
2. Align budgets with medium-term strategic priorities of the government;
3. Structure the capital budget in order to meet the national development needs;
4. Ensure that budgetary data and documents are open, transparent and accessible;
5. Promote an inclusive and realistic debate on budgetary choices;
6. Provide a comprehensive, precise and reliable view of public finance;
7. Plan, manage and monitor actively the budget execution;
8. Incorporate performance, assessment and value for money in the budgetary process;
9. Manage prudently the long-term fiscal and sustainability risks;
10. Ensure integrity and quality of budget forecasts through independent control and audits (OECD, 2015).

Although the OECD's recommendations on budgetary governance have traditionally focused on national governments, with Brazil adopting them in 2020 (Santos, 2022), they can also be applied to state and subnational bodies because their principles help improve administration. Torrezan and Paiva (2025) conducted an

analysis of budgetary governance situation of São Paulo municipalities, while Pimentel et al. (2024) verified the budgetary governance level of Regional Labor Courts[1].

These ten OECD's budgetary governance principles may be grouped around linked dimensions, and then used for empirical researches (Bijos, 2014; Silva & Nascimento, 2023; Torrezan & Paiva, 2025), as shown in Table 1:

Table 1. Budgetary Governance Dimensions according to OECD.

Dimension	Description	Correlated Principle
Fiscal	Refers to budgetary governance oriented to clear, credible and predictable fiscal limits, ensuring sustainability and prudent management of public finance.	1, 6 e 9
Programmatic	Focuses on budget alignment with medium-term strategic priorities and performance assessment for a higher efficiency in use of funds.	2, 3 e 8
Participatory	Relates to transparency and inclusion, promoting access to open data and participation of society in discussions and budgetary choices.	4 e 5
Accountability	Involves active monitoring of budget execution and ensuring budget integrity and quality by means of independent controls and audits	7 e 10

Source: Adapted from Torrezan e Paiva (2025).

In the Brazilian context, the budgetary governance topic also gained traction in institutional initiatives conducted by the Brazilian Federal Court of Accounts (TCU), especially through the Integrated Public Governance and Management Index (iGG), which incorporated dimensions related to budgetary governance and management. These instruments have a diagnostic purpose and indicate the increasing concern on aspects such as planning, execution, monitoring and transparency in the public budget management (TCU, 2021). Recent studies, as from Pimentel et al. (2024), used these indicators to assess budgetary governance aspects in Brazilian public institutions.

Despite of the institutional approach in national context, the present study uses as main analytical framework the OECD's principles of budgetary governance. This choice derives from the fact that the OECD model provides a more comprehensive and systematic conceptual structure for analyzing the budgetary process, encompassing not only fiscal aspects, but also dimensions related to strategic planning, performance, transparency, participation, and accountability. As noted by Bijos (2014), the OECD's principles represent an evolution of budget discussions by integrating both quantitative and qualitative dimensions of public expenditure into the same analytical framework, articulating fiscal sustainability, quality of spending, and democratic governance.

Furthermore, the principles formulated by the OECD were conceived to orient budgetary processes and reforms in different institutional contexts, thus enabling the analysis of the public budget as an instrument of planning, government coordination, and accountability to society.

Within the context of Brazilian federal universities, budgetary governance becomes even more critical due to the persistent resource scarcity and the need to optimize the application of public resources. The application of budgetary governance principles in these institutions contributed to a greater efficiency in resource allocation, improving the quality of the educational services offered.

3 Methodology

3.1 Study Design

The Systematic Literature Review (SLR) was conducted based on the guidelines from the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. Adoption of this protocol stems from its use in systematic reviews and its adequacy in ensuring methodological rigor, transparency and reproducibility for the study selection and analysis process (Moher et al., 2015). As highlighted by Marcondes and Silva (2023), the PRISMA protocol contributes to the systematic organization of review steps, reducing methodological flaws and promoting enhanced clarity for search and selection criteria.

Furthermore, the protocol has been used in educational research and higher education, including systematic reviews on university policies and educational management, such as in studies by Castro et al. (2019) about REUNI and by Tribeck and Stefani (2024) about the Sustainable Development Objectives in higher education institutions.

In this regard, use of the PRISMA has proven to be appropriate for the present study by enabling systematization through the following sequence of actions to define the scope of the analyzed studies: identification, screening, eligibility, and inclusion of selected articles.

The guiding question of the research was: "What are

[1]Budgetary governance in Brazil may be applied at a decentralized level, and not only at the national level, as "the budgetary proposal sent from the Executive to the Legislative branch for approval is a compilation of the budget proposals from each one of the 378 institutions and other entities included in the scope of the TCU's budgetary governance analysis" (Pimentel et al., 2024). That is, the parts make up the whole.

the challenges of the budgetary process in Brazilian federal universities identified in the scientific literature published between January 2017 and May 2025?". This question was formulated considering the population (Brazilian federal universities), the phenomenon of interest (budgetary process challenges), and the study timeframe (January 2017 – May 2025).

3.2 Search Strategies

The search strategy was conducted in the CAPES Periodicals Portal, using combinations of descriptors related to public budget, higher education funding, and Brazilian federal universities. Data were collected using the 'all fields' search option in the database, allowing for the retrieval of terms from various sections of the indexed records, such as titles, abstracts, keywords, and other available metadata. Quotation marks were used to retrieve exact expressions, while additional search operators accounted for terminology variations related to the funding and budget management of federal higher education institutions.

Boolean logic was used to combine descriptors in a structured way. The "OR" operator was used to include terminology variations concerning the institutional context of federal universities and budget-related topics, thus broadening the research scope. The "AND" operator was used to retrieve studies that combined both thematic axes of the research. For example, the following search structure was used: ("Federal universities" OR universities OR IFES OR "higher education") AND (budget OR funding OR "budgetary resources" OR "budget matrix").

No language restrictions were applied during the search process. Only articles published between January 2017 and May 2025 were considered.

3.3 Eligibility Criteria

The following inclusion and exclusion criteria were considered:

Inclusion criteria:

- Articles published between January 2017 and May 2025
- Articles in Portuguese or in English
- Articles that directly address the budgetary process in federal universities
- Articles that discuss the challenges, limitations or issues related to budget of federal universities
- Full-length articles available to access in CAPES Periodicals Portal

The guiding criterion for all stages was strict adherence to the following topics: budgetary process, funding, budget matrix, and resource management in Brazilian federal universities. Exclusion records were properly cataloged, ensuring the methodological traceability. This strategy aims to minimize bias and ensure the results accurately reflect the state of the art on the topic within the analyzed period.

3.4 Selection Process

Article selection process followed all the four steps of the PRISMA flowchart:

Identification: Initial search in the CAPES Periodicals Portal using predefined terms, resulting in 304 records. Screening: Firstly, the duplicates were removed (56 articles). Next, an initial screening was conducted, which consisted of the exclusion of studies lacking a direct link to the research topic (e.g., those focused on SUS, basic education, isolated student assistance, or municipal and international policies). At the end of this stage, 108 articles remained. From this set, refinement screening was applied by reading abstracts and excluding articles that, despite mentioning federal universities, did not use the budget as their main analytical focus (e.g., public acquisitions disconnected from budgetary logic, or higher education discussed in a broad and undifferentiated manner). 36 articles remained.

Eligibility: Full-text reading of the 36 articles selected in the previous stage to assess their suitability for the eligibility criteria.

Inclusion: Out of the 36 initially selected articles, the final sample was refined based on assessment criteria of methodological quality and impact. The analysis focused on 22 articles published in journals classified in tier A of Qualis/Capes (A1 to A4), in accordance with the assessment cycle of 2021–2024. This option works as a quality filter for evidence, because the A-tier categories include journals ranked at higher levels of the Qualis system, reflecting greater editorial rigor, scientific impact, and academic recognition in postgraduate assessments.

In the Qualis Reference model, the classification of journals relies on objective and comparable criteria across areas, being these criteria mainly derived from international bibliometric indicators (Scopus, Journal Citation Reports, and Google Scholar) and reflect the journals' relative positions (percentiles) within their respective parent areas (Capes, 2023). Therefore, selecting published articles from these tiers aimed to increase the methodological robustness of the review by prioritizing evidence from journals with greater visibility and scientific impact.

3.5 Data Analysis

The analysis of final article database (n = 22) was structured into two complementary stages. The first stage involved a descriptive characterization of the corpus, covering aspects such as periodicals, journal profiles, author profiles, research types, data sources used, and keyword aggregation.

Still in the first stage, qualitative content analysis (QCA) was conducted. This method is designed to systematically describe the meaning of qualitative data through thematic classification and textual coding (Schreier, 2012). The thematic classification comprised the aggregation of article keywords, enabling the identification of similarities across studies. It also involved an interpretive analysis by researchers of the primary topics within the corpus.

In the second stage, the qualitative findings were categorized based on the OECD's budgetary governance framework. The objective of this stage was to identify, organize and map the challenges in the budgetary process of Brazilian federal universities found in the academic literature, classifying and coding them according to the OECD's ten budgetary governance principles. This approach enabled the reorganization of findings – previously dispersed in the literature – into a common conceptual framework.

The application of the OECD's budgetary governance principles as an analytical instrument has already been adapted in various studies across distinct institutional contexts in Brazil, such as municipalities, courts, and parastatal entities (Torrezan and Paiva, 2025; Pimentel et al., 2024; De Toni, 2022). In this study, the reference framework was operationalized for analysis of Brazilian federal universities, so that the principles originally addressed to budgetary governance of national governments were reinterpreted according to the institutional reality of the IFES (federal higher education institutions).

Therefore, principles of fiscal management, planning, public finance, and capital budgeting are now understood through the lens of the budgetary and administrative frameworks of federal universities. The principles were grouped into fiscal, programmatic, participatory, and accountability dimensions and then used as analytical categories for this study, as shown in Table 1.

In this procedure, excerpts were extracted from the results and conclusions sections of articles to avoid mistaking theoretical or methodological assumptions for empirical findings. No predefined length limit was set for the selected excerpts.

To support data coding and organization, ATLAS.ti was used to categorize relevant excerpts under the OECD's ten budgetary governance principles, which informed the creation of the analytical categories table. The identified challenges were categorized according to their characteristics and implications for the budgetary process of federal universities, and then organized into fiscal, programmatic, participatory, and accountability dimensions, as shown in Table 1.

The excerpts were independently categorized by researchers according to the OECD principles through systematic reading. In cases of interpretation divergence, the consensus between reviewers was initially sought. When there was no immediate consensus, the classification adopted by the majority of researchers involved in coding prevailed.

4 Results

This systematic literature review analyzed 22 articles published between 2017 and 2025 regarding the challenges of the budgeting process in Brazilian federal universities. Publications appeared in all years of the sample except 2018. In 2019 and 2020, four articles were published each year, while 2021 had the highest number of identified articles, with a total of five. The articles showed methodological, temporal, and thematic diversity, highlighting the various dimensions of the challenges faced by federal higher education institutions (IFES) in the country.

Regarding the periodicals where the articles appeared, the 22 studies are distributed across 18 scientific journals, demonstrating a diverse range of publication venues. Among them, there are the FINEDUCA – Revista de Financiamento da Educação with three articles, the Revista Internacional de Educação Superior, and the Advances in Scientific and Applied Accounting, with two articles each. All the other journals have one publication each. With regard to parent areas of journals, there is predominance of Education, comprising 13 articles (59.1%), followed by Public and Business Administration, Accounting Sciences, and Tourism, with 6 articles (27.3%). There are also contributions from Social Service (2 articles; 9.1%) and Communication and Information, and Museology (1 article; 4.5%). The concentration in education journals – even in studies focused on funding and budgeting – suggests that this theme is predominantly examined through an educational lens rather than a public administration perspective.

The academic backgrounds of the 43 distinct authors in the publication sample demonstrate a diverse range of

fields, with a predominance of researchers from Education (14 authors; 32.6%). The following areas also stand out: Administration (9 authors; 20.9%), and Accounting Sciences (5 authors; 11.6%), while Economy have 3 authors (7.0%). The Field of Law is represented by four authors (9.3%). Other areas including Public Policies, Social Service, Agronomy, Regional Development, and Intellectual Property account for a total of eight authors (18.6%). These findings indicate that while the studies address themes related to funding and budgeting, the analyzed literature is primarily linked to the educational field.

Regarding the research type, the methodological categorization of the 22 articles analyzed in this systematic review followed the distinction between quantitative, qualitative, and mixed approaches, as adopted by Silva and Costa (2025), to assess the academic production of theses in Accounting Sciences postgraduate programs in Brazil. This framing made it possible to identify a predominance of qualitative studies, totaling 13 articles (59.1%). These studies were primarily descriptive-analytical in nature, relied heavily on documentary and bibliographic research, and focused on institutional, regulatory, and political analyses of federal university funding and budgeting.

A quantitative approach is adopted in 9 articles (40.9%), focusing on explanatory analyses of secondary data from official federal government systems, employing techniques such as statistical, econometric, or efficiency analysis. To illustrate: Data Envelopment Analysis (DEA) was used to assess the efficiency of resources allocated to federal universities (Cruz et al., 2019); other research combined DEA and panel data regression to analyze the relation between expenses from previous fiscal years and management efficiency (Lima Filho & Peixe, 2020); and another study used DEA with factor analysis and multiple regression to investigate how institutional efficiency relates to budgetary availability (Lima Filho & Peixe, 2023).

Regarding the methodological statements, 12 articles (54.5%) provide a formal explanation of their approach and/or research procedures, directly indicating the nature of the study, the objectives, and the analytical techniques adopted. Meanwhile, 10 articles (45.5%) did not explicitly state this classification, requiring methodological inference – a procedure aligned with the approach used by Silva and Costa (2025) when the methodology is not directly reported in abstracts or methodological sections. In such cases, the categorization was based on the integrated analysis of the study objectives, the type of empirical evidence used, the data processing mode, and the analytical structure of the text, thus making it possible to frame the works according to their predominant methodological approach.

Regarding the data sources, all articles used public databases from the Federal Government, such as SIAFI, SIOP, the Transparency Portal, and CAPES, which serve as the main references for studies addressing the budgeting of federal universities. Six studies also utilized institutional databases, providing deeper insight into specific dynamics within these universities (Cordeiro & Araújo, 2023; Erasmo et al., 2019; Guimarães & Silva, 2023; Lima Filho & Peixe, 2020; Martins et al., 2024; Silva, 2019). For example, Erasmo et al. (2019) analyzed the implementation of SIE (the Information System for the Education) in Federal University of Tocantins (UFT), using institutional documents and internal SIE data. The study assessed how the tool contributed to integrate budget planning, execution and monitoring.

When analyzing the keywords of articles, considering that the search strategy of this systematic literature review was developed from expressions directly related to budgeting and funding of federal universities, as described in the methodology section, it is expected that the most recurring terms are concentrated in these main axes. In fact, the word funding appears 14 times, and universities and institutes occurs 13 times.

Additionally, terms related to fiscal austerity, fiscal adjustment, or fiscal policy (including the expenditure cap) appeared in 6 articles, while references to public debt were present in 2 studies, reinforcing the influence of the macroeconomic context on the analyses. Conversely, topics such as efficiency and performance appear in 5 articles, whereas own-source revenues appear in just 3 articles. Still, there are words that appear just once, for example, student support, commodification, and unpaid commitments.

Based on analysis of keywords and a full reading of the articles, the studies were grouped into thematic axes according to their central topics. In this process, four main clusters were identified: university autonomy; internal fundraising; fiscal austerity and macroeconomic context; and institutional efficiency.

Regarding university autonomy, three articles directly address the tensions between the constitutional principle of autonomy (Article 207 of the 1988 Federal Constitution) and the recent constitutional frameworks that restructure the management of federal universities. Teixeira (2022) analyzed the Future-se program proposal, presented by the Ministry of Education in 2019, and argued that delegating financial management to social organizations displaces the decision-making center from the IFES by

introducing market-related mechanisms that compromise the administrative autonomy of the institutions. In a converging perspective, Stuchi et al. (2020) examined the proposals of Social Organizations and Endowment Funds associated with the Future-se program, arguing that, under the rhetoric of autonomy, such arrangements tend to produce a heteronomously managed university, with fragmentation of decision-making centers and erosion of democratic management. Additionally, Silva (2019) discussed the neoconservative offensive against federal universities, highlighting that political interventions, budget cuts, and ideological control mechanisms constitute critical restrictions on the exercise of university autonomy.

Internal fund raising and utilization constitute another specific thematic axis, addressed by three articles that discuss the potential and structural limits of these instruments. Caetano and Campos (2019) analyzed the execution of own-source revenues in federal universities and demonstrated that, even though constitutionally authorized, such revenues remain deeply conditioned by administrative ordinances and subordinate regulations, which reduces the institutional decision-making margin. This argument was also proposed by Caetano et al. (2021), who discussed the relationship between autonomy, commodification, and funding, showing that increased dependency on internal revenues occurs during public funding retractions without eliminating state-centered control mechanisms. In a case study, Cordeiro and Araújo (2023) showed that internal resources play a mainly supplementary role in the budget of the Center for Agricultural Sciences at the Federal University of Paraíba (UFPB) and are not considered a structural alternative to state funding.

In the thematic axis related to fiscal austerity, macroeconomic policy and public debt, there is a collection of articles that explains budget constraints as a part of a structuring strategy for state reconfiguration. Leher and Santos (2020) argue that the Constitutional Amendment No. 95/2016 represents an inflection point in the public funding model, consolidating the compression of social spending. Reis and Macário (2020, 2022) elaborated on this point by comparing the allocation of resources to public debt service versus federal universities and science and technology, demonstrating the structural asymmetry of the public budget. Furthermore, Reis et al. (2024) demonstrated that Constitutional Amendment No. 95/2016 intensified the contraction of educational and scientific funding recently, with a direct impact on the operational capacity of federal higher education institutions (IFES).

Lastly, three articles employed quantitative approaches to analyze efficiency, performance, and managerial behavior under conditions of fiscal scarcity. Cruz et al. (2019) analyzed the efficiency of federal higher education institutions across different periods and indicated that an increase in funding resources is a necessary, but not sufficient, condition for efficiency gains. Drawing on Public Choice Theory, Lima Filho and Peixe (2020, 2023) explored the relationship between institutional efficiency, fiscal austerity, and budgetary availability. They demonstrated that more efficient institutions tend to secure greater resource availability while remaining subject to the same macroeconomic and budgetary constraints. These studies demonstrate that, in resource-constrained environments, managers face recurring dilemmas in preserving service delivery and allocating available resources efficiently.

Overall, the results demonstrate that academic production regarding budgetary process challenges in Brazilian federal universities is predominantly linked to the field of Education, in terms of both journals and author backgrounds. However, there are important contributions from other areas, such as Administration, Economics, and Accounting. The centrality of education in the analyzed production seems to influence how budgetary issues are formulated, often prioritizing regulatory, institutional, or critical readings rather than providing more operational approaches to public management and the budgetary process itself. This also results in a predominance of the qualitative approach, with a strong emphasis on documentary or institutional analyses, while quantitative studies focus on measuring budgetary efficiency, performance, and availability. Within this collection, the most recurrent thematic analysis axes are fiscal austerity and macroeconomic policy associated with public debt; tensions surrounding university autonomy; internal fund raising and utilization; and efficiency in the budgetary management of federal higher education institutions. The next section systematizes the main challenges of the budgetary process identified in the literature.

4.1 Challenges of Budgetary Process Identified according to OECD principles

To identify and systematize the challenges of the budgetary process in Brazilian federal universities, these challenges were categorized using the OECD's 10 budgetary governance principles (OECD, 2015) and organized into four dimensions: fiscal, programmatic, participatory, and accountability, as shown in Table 1.

The analysis of excerpts yielded 77 quotations distributed asymmetrically across the dimensions of

OECD budgetary governance, as presented in Table 1.

Table 1. Summary Table: Incidence by dimension of budgetary governance

Dimension	OECD Principle	Principle description	No. of articles	% of articles	No. of references
Fiscal	1	Manage budgets within clear, credible and predictable limits of fiscal policy	7	32%	19
	6	Provide a comprehensive, precise and reliable view of public finance	3	13%	5
	9	Manage prudently the long-term fiscal and sustainability risks	14	63%	22
Total			**19**	**86%**	**46**
Programmatic	2	Align budgets with medium-term strategic priorities of the government	0	0,0%	0
	3	Structure the capital budget in order to meet the national development needs	0	0,0%	0
	8	Incorporate performance, assessment and value for money in the budgetary process	6	27,3%	16
Total			**6**	**27,3%**	**16**
Participatory	4	Ensure that budgetary data and documents are open, transparent and accessible	3	13,6%	3
	5	Promote an inclusive and realistic debate on budgetary choices	0	0,0%	0
Total			**3**	**13,6%**	**3**
Accountability	7	Plan, manage and monitor actively the budget execution	3	18,2%	10
	10	Ensure integrity and quality of budget forecasts through independent control and audits	2	9,1%	2
Total			**4**	**18,2%**	**12**
GRAND TOTAL			**22**	**100%**	**77**

Note: An article may be assigned to more than one dimension, provided that it includes the corresponding reference.
Source: Author's own (2026).

The fiscal dimension accounted for the largest share, with 19 articles (86%) and 46 references, evidencing the centrality of fiscal constraints, macroeconomic policy, expenditure caps, and budgetary sustainability in the debate on federal higher education institutions. The programmatic dimension was identified in 6 articles (27.3%) with a total of 16 references, all of which connected to the principles of performance and value for money, whereas no records appeared for medium-term strategic alignment and capital budgeting. The accountability dimension appears in 4 articles (18.2%) with 12 references, predominantly related to the planning and monitoring of budget execution. Finally, the participatory dimension showed the lowest incidence, comprising only 3 articles (13.6%) and 3 references. These were restricted to transparency and information access, with no evidence of inclusive debate on budgetary choices. Below, each dimension is analyzed in greater detail, using examples extracted from the reviewed literature.

4.1.1. Fiscal Dimension

The fiscal dimension accounted for the majority of the evidence – more than half of all references found (46 out of 77) across 19 articles – indicating that nearly all the analyzed literature tends to attribute the challenges of the budgetary process in federal universities to a macro-fiscally constrained environment that affects their budgetary routine.

Within the fiscal dimension, Principle 9 of OECD budgetary governance, which addresses the prudent management of fiscal risks and long-term sustainability, was identified in 22 references, making it the most frequently cited principle among the ten analyzed. The main theme in these references is the chronic shortage of budgetary resources for the operation of federal universities. This shortage was identified in all the selected excerpts. Therefore, the lack of resources represents the major fiscal risk identified in the reviewed literature.

These resource shortages occur in various ways. One set of approaches associates fiscal risk with structural underfunding, characterized by the reduction or stagnation of budgetary funds for universities in favor of other priorities, such as private higher education or public debt payment (Leher & Santos, 2020; Machado, 2017; Reis & Macário, 2020; Reis & Macário, 2022; Silva & Guimarães, 2022; Stuchi et al., 2020). Other approaches attribute the resource shortage to austerity policies and the current fiscal framework, with an emphasis on the effects of Constitutional Amendment No. 95/2016 (Chaves & Araújo, 2022; Guimarães & Silva, 2023; Inácio et al., 2024; Martins et al., 2024; Reis et al. 2024; Silva 2019). Another interpretation points to state withdrawal through incentives for internal funding and management programs conducted by social organizations, such as Future-se (Caetano & Campos, 2019; Teixeira, 2022).

Regarding OECD Principle 1 – managing budgets within clear, credible, and predictable limits of fiscal policy – the references in the article address how resource shortages affect budget management. Accordingly, the studies show an inability to effectively manage internal revenues. Even with additional fundraising, a university may remain unable to fully execute and manage these funds. This occurs due to the absence of a corresponding budget allocation in the Annual Budget Law (LOA), or due to legal and fiscal constraints (such as Constitutional Amendment No. 95/2016) that tie the use of excess revenue or financial surpluses to externally defined purposes (Caetano & Campos, 2019, Cordeiro & Araújo, 2023). Thus, fiscal restrictions directly affect the budget management of federal universities. Accordingly, the challenge is not "just possessing internal funds", but also transforming revenue generation into real spending capacity, which repositions the debate on the plane of fiscal rules and budget control (Caetano & Campos, 2019; Caetano et al., 2021).

Another theme of budget management concerns supporting foundations and proposals from social organizations. The first topic is understood as a possibility for budget management to circumvent legal constraints, namely, by raising extra-budgetary funds free from federal control. (Caetano et al., 2021, p.16). And social organizations are criticized for representing an alternative method for financial management of public universities that would be external to the institution (Teixeira, 2022).

Under Principle 6 (a comprehensive and reliable view of public finance), challenges in measuring and representing the budgetary and financial situation arise mainly from the use of categories and practices that reduce the transparency of the fiscal framework within institutions. Excerpts regarding DEAs (prior-year expenses) indicate that the recurrence or expansion of such records impairs the understanding of the actual financial, budgetary, and equity position, thereby increasing the risk of "accounting opacity" in budget execution. For example, the "overuse of expenses of previous fiscal years undermines the institutional context of public organizations as it conceals the actual financial, budgetary and equity situation of the public entity" (Lima Filho & Peixe, 2020, p.126).
Additionally, in a case study at the Federal University of Amazonas, Silva (2019) highlighted the difficulty in obtaining a reliable view of the public finances of federal universities: budgets are planned without properly including each university's structural determinants, which affects the reliability of budget forecasts and comparisons. For example, "we consider it critical to emphasize (...) the vast Amazon distances and their omission from the budget forecast, which is critical because the maintenance costs of physical structures and materials scale with the distance from the main campus." (Silva, 2019, p.37).

Overall, the literature demonstrates that the fiscal dimension represents the core element of budgetary challenges in federal universities, concentrating the majority of reviewed references. This scenario is structured around three interdependent axes: the first is chronic underfunding (Principle 9), observed by the stagnation of funding and the effects of restrictive fiscal rules, such as Constitutional Amendment No. 95/2016; the second is inflexibility in budget execution capacity (Principle 1), which hinders institutions from converting internal revenue generation into effective spending due to the absence of allocation in the Annual Budget Law (LOA); and the third is the erosion of accounting transparency (Principle 6), evidenced by the increasing use of Prior-Year Expenses (DEAs) as an accommodation mechanism. Collectively, these factors create an environment in which macro-fiscal constraints not only limit resource availability, but also induce practices that compromise the reliability of institutional planning and long-term sustainability.

4.1.2. Programmatic Dimension

In the programmatic dimension, the findings are concentrated exclusively in Principle 8 (incorporate performance, assessment, and value for money in the budgetary process), without any evidence directly connected to Principles 2 and 3 (alignment with medium-term strategic priorities and capital budgeting structure). In terms of content, most references categorized under this dimension addressed the efficiency in federal universities and its relationship with budgetary process elements (Araújo et al., 2022; Cruz et al., 2019; Lima Filho & Peixe, 2023; Santos et al. 2017).

In these articles, by using econometric models, the authors concluded that fund increases may be a necessary but insufficient condition to improve the efficiency of federal universities, highlighting the importance of management capacity and allocation rules. In other words, money alone is not sufficient for universities to be efficient.

> The significant improvement in efficiency during the FHC administration and the relative decrease during the Lula administration (although the standard efficiency indicates a

> relative index of 100%) suggest that an increase in resources (both human and financial) helps reduce institutional inefficiency. However, this factor alone does not guarantee efficiency, as success heavily depends on the management capacity of federal higher education institutions to adapt to adverse or favorable situations (Cruz et al., 2019, p.765).

In this regard, evidence indicate that the budgetary availability correlates with institutional efficiency, though unevenly across different "dimensions" of efficiency. This means that more efficient federal universities may have greater budgetary availability (Lima Filho & Peixe, 2023).

Furthermore, the discussion about DEAs (prior-year expenses) and budget execution suggests that certain arrangements and incentives of budgetary execution, such as incremental budgeting, may produce adverse effects on efficiency and quality of spending. This links the performance debate to execution governance. Consequently, "the inability to use budgeted resources beyond the fiscal year, by using mechanisms like carry-overs, may drive managers to spend the budget inefficiently and indiscriminately, simply to avoid returning funds" (Araújo et al., 2022, p.110).

Still in terms of efficiency, a critical view suggests that the distribution of federal funds for student support, "specifically the PNAES Matrix, prioritizes aspects and indicators that reward a productivist university model rather than supporting a democratic, universal, and participatory process based on the real demands of institutions" (Machado, 2017, p.249). This indicates that the discussion regarding efficiency can derail into a pursuit of academic production that undermines the democratic character of the university.

In practice, the integration between planning and budgeting (SIE/UFT case) appears as an attempt to overcome the programmatic challenge through internal programming instruments, action mapping, common language (programs/PTRES), and physical-financial monitoring mechanisms (Erasmo et al., 2019). In this context, the central problem is not a "lack of assessment", but the difficulty in operationalizing planning as a budget management tool, especially in a context of funding instability.

In summary, the analysis of the programmatic dimension indicates that the academic literature focuses exclusively on Principle 8 (performance and value for money), which is directly related to the discussion of efficiency. This leaves virtually no room for investigating Principles 2 and 3 (medium-term strategic alignment and capital budgeting). This analytical gap is significant. While the studies show that funding increases are necessary yet insufficient to improve efficiency, they do not discuss how federal universities align budgets with strategic priorities or structure capital investments coherently.

4.1.3. Participatory Dimension

The participatory dimension appears less frequently and, with just three references, focuses on Principle 4 (budgetary data opening, transparency, and accessibility), without any evidence linked to Principle 5 (inclusive and realistic debate on budgetary choices). This demonstrates that academic literature on the budgets of federal universities fails to address the participatory dimension of internal budgetary choices.

The studies highlight transparency challenges at multiple levels. One of the challenges is keeping track of budget allocations with sufficient granularity for institutional assessment, such as when university expansion costs are presented as a lump sum, which hinders campus-level analysis. "After 2009, the funds allocated for expansion were calculated as a lump sum, which prevented the assessment of the budget for each individual campus" (Silva, 2019, p.38).

Another challenge to transparency is the lack of information and centralized administration, as shown in a study of internal fundraising at an academic unit (CCA/UFPB), where centralization at the main campus makes it difficult for individual units to collect and control data (Cordeiro & Araújo, 2023). In contrast, the SIE/UFT case suggests institutional initiatives to enhance transparency, such as the creation of internal fund allocation instruments to ensure accountability to the academic community and the general public (Erasmo et al., 2019).

In summary, the participatory dimension emerges as the most neglected in academic literature, with just three references identified and an exclusive focus on Principle 4 (transparency), while Principle 5 (inclusive debate) remains entirely absent. This gap is important to highlight: the scientific literature on federal university budgeting fails to problematize the participation of the academic community in budgetary choices. The challenges identified regarding data accessibility and transparency include insufficient granularity in budgetary controls and a lack of adequate information for administrative units.

4.1.4. Accountability Dimension

The analyzed studies converge in indicating that the

main challenges of accountability in federal universities are associated with weak budgetary planning, low predictability of fund execution, and the deterioration of fiscal information quality. In this case, ten references to Principle 7 (actively plan, manage, and monitor budget execution) and two references to Principle 10 (ensure integrity and quality of budget forecasts) were identified.

The first cluster of findings demonstrates that inadequacies or inaccuracies in budget forecasts compromise the integrity of fund execution. The literature indicates that even when federal higher education institutions increase internal fundraising, the absence of a corresponding budget allocation in the Annual Budget Law impedes their utilization, thus revealing structural flaws in funding source planning and incoherence between budget forecasting and execution (Caetano & Campos, 2019). This mismatch undermines the principle of budgetary reliability and limits the external control capacity.

Furthermore, studies on prior-year expenses (DEA) indicate that the recurrent use of this instrument serves as an accommodation mechanism for dysfunctions in budgetary process. When prior-year expenses allow for delayed recognition, they mask the actual fiscal situation of institutions and compromise the integrity of public accounts. Empirical evidence shows that variables associated with budget execution and institutional performance account for significant variation in prior-year expenses, reinforcing that its expansion is linked to planning and monitoring issues rather than exceptional events (Lima Filho & Peixe, 2020).

Another cluster of findings relates to inefficient incentives generated by budget execution rules. The inability to carry over funds, the irregular release of budgetary credits, and fiscal rigidity create an "environment of budgetary pressure", which induces managers to prioritize full budget execution at the expense of strategic rationality. The literature on the 'use-it-or-lose-it' phenomenon demonstrates that this environment favors defensive behaviors. These include concentrating expenses at the end of the fiscal year, increasing accounts payable, and undertaking low-priority or low-quality expenditures, which ultimately undermines public spending accountability (Araújo et al., 2022; Lima Filho & Peixe, 2020).

Finally, one article suggests that integrating budget planning, programming, and execution may mitigate these weaknesses. Drawing on a case study, the article indicates that the adoption of integrated systems, internal fund allocation matrices, and instruments such as the annual work plan may contribute to increasing traceability of resources, alignment of strategic objectives with executed actions, and strengthening of institutional monitoring. (Erasmo et al., 2019). Nevertheless, these suggestions still require further investigation due to the limitations of the case study.

In summary, the accountability dimension demonstrates that budgetary integrity issues in federal universities derive from a rigid system that causes cascading dysfunctions. The inadequacy of budget forecasts, expansion of prior-year expenses, and perverse budget execution (carry-over restrictions, fiscal rigidity) create an environment where defensive behavior and low-quality spending become rational.

5 Conclusion

This systematic literature review examined the challenges of the budgetary process in Brazilian federal universities using a corpus of 22 articles published between 2017 and 2025, categorizing the findings according to the OECD's 10 principles of budgetary governance. The results revealed not merely a thematic clustering, but a structure of interdependent issues that characterizes the budgetary governance of federal higher education institutions.

In the fiscal dimension, which accounted for the majority of the coded references found in articles (60%), the literature primarily interprets the budgetary issues of federal higher education institutions as an expression of a restrictive macro-fiscal environment. This framework includes the main challenges concerning funding predictability and sufficiency, compression of discretionary space, and limitations in transforming revenue collection into effective spending capacity (especially with own-source revenues).

In programmatic dimension, the studies focused on the principle of performance, assessment and value for money, notably through quantitative approaches of efficiency and budgetary availability. Collectively, these academic papers suggest that an increase in funding is a relevant, but insufficient condition for efficiency gains, emphasizing the role of management capacities and incentives embedded in budget execution rules. In academic research, no evidence linking budget alignment with medium-term strategic priorities and capital budgeting was observed, indicating a gap in the literature regarding the relationship among institutional planning, investment, and funding structures.

The accountability dimension appeared primarily associated with limitations of planning and execution

monitoring. Mechanisms such as prior-year expenses and budget execution concentrated at the end of the fiscal year, like the 'use it or lose it' logic, emerge as symptoms of institutional dysfunctions and adverse incentives, with potential effects on spending rationality and budgetary traceability. In contrast, experiences of integration between planning and budgeting, supported by internal instruments and systems, are described as efforts to mitigate these weaknesses.

Finally, the participatory dimension was the least explored, because the evidence identified is restricted to transparency and data access problems, with practically no discussion of inclusive and realistic debates around budgetary choices in federal universities. This result suggests that the literature tends to address federal higher education institutions as a technical-fiscal and institutional field that remains underinvestigated through the lens of participation, deliberation, and democratic governance within public universities.

The implications of this study indicate that fiscal constraints and recent regulatory frameworks (such as the Expenditure Cap and the Future-se program) constitute the primary focus for explaining the budgetary challenges of federal universities. However, the scarcity of research on participatory mechanisms, medium-term strategic integration, and capital budgeting reveals gaps that warrant further investigation. Future research may deepen these gaps or expand the systematic literature review to include data sources beyond CAPES, including on an international scale. In conclusion, by organizing the literature according to international budgetary governance principles, this review contributes to clarifying the areas of consensus, key emphases, and, above all, the analytical silences regarding budgeting in Brazilian federal universities.

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