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THE FEDERATIVE PACT AND MUNICIPAL PUBLIC POLICIES: COOPERATION, DECENTRALIZATION, AND EDUCATION FINANCING

Antonio Roberto Xavier[1], Gilson Adão Domingos Vieira[2], Fidel Cambundo Sanuca[3], Edmilson Alberto Matamba[4], Maria Alexandrina Da Silva da Luz[5], Karla Renata de Aguiar Muniz[6], Antenor Teixeira de Almeida Junior[7], Layer Leorne Mendes Júnior[8]

[1] Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil
Corresponding author: roberto@unilab.edu.br
[2]Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil
Corresponding author: gilsonadaodomingosvieira@aluno.unilab.edu.br
[3]Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil
Corresponding author: sanucafidel@gmail.com
[4]Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil
Corresponding author: edmilsonmatamba@gmail.com
[5]Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil
Corresponding author: alesilva040804@gmail.com
[6]Universidade Federal do Ceará, Brazil
Corresponding author: karlla.renata@hotmail.com
[7] Centro Universitário da Grande Fortaleza, Brazil
Corresponding author: antenorjunior@unigrande.edu.br
[8]Centro Universitário da Grande Fortaleza, Brazil
Corresponding author: leoene@unigrande.edu.br

Abstract

The main objective of this work is to investigate the level of cooperation, decentralization, and dialogue that exists between municipalities due to the federal pact. The 1988 Federal Constitution established the federal pact with a peculiarity: the so-called triune federalism, which recognizes the existence of three federative entities: the Union, the states, and the municipalities. Municipalities possess their own political, administrative, and financial competencies, but this decentralization also entails serious problems. Municipalities are autonomous, but many of them do not produce enough to sustain and develop themselves, and often municipal, state, and federal responsibilities are confused with the implementation of the National Education System. By the end of 2025, this scenario had changed, with the creation of a clear document outlining what each entity should do. This was linked to the new Fund for the Maintenance and Development of Basic Education and the

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Enhancement of Education Professionals, officially made permanent in 2020, and the mass participation in Education Development Arrangements and municipal public consortia, which led to a significant improvement in the Basic Education Development Index of several municipalities. From a methodological point of view, a Bibliographic and Documentary Review was used, this being a quantitative-qualitative research, of a basic nature and of a theoretical genre. The main results show that cooperation between municipalities is indispensable for public policies to take place and achieve their objectives based on the federative pact, since, as demonstrated; many municipalities have improved in development, especially regarding economies of scale applied to education.

Keywords: federal pact; cooperation, public policies, new Fundeb.

1. Introduction

Brazilian federalism presents a distinctive institutional design in which municipalities are constitutionally recognized as autonomous federative entities alongside the Union and the states. This triadic arrangement, consolidated by the 1988 Federal Constitution, expanded local political, administrative, and financial responsibilities and deepened the decentralization of public policies. In education, however, decentralization did not automatically generate equivalent local capacity for policy implementation. On the contrary, the transfer of responsibilities to municipalities often occurred in a context of unequal fiscal resources, heterogeneous administrative structures, and weak coordination mechanisms among levels of government. As a result, the democratization of authority was not always accompanied by a proportional redistribution of the institutional capacities necessary to guarantee educational equity and effectiveness.

This problem becomes even more relevant in the context of the new Fund for the Maintenance and Development of Basic Education and the Valorization of Education Professionals (Fundeb), made permanent by Constitutional Amendment No. 108/2020. The new Fundeb introduced important redistributive and performance-oriented innovations, especially through the Total Annual

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Student Value (VAAT) and the Annual Student Value by Results (VAAR). At the same time, new horizontal governance arrangements, such as Education Development Arrangements (ADEs) and intermunicipal public consortia, gained visibility as mechanisms capable of reducing administrative isolation and strengthening cooperation among municipalities. These changes raise a central analytical question: to what extent can educational improvement in a federative context be explained by the interaction between redistributive financing, intergovernmental coordination, and local institutional capacity?

This study contributes to the debate on Brazilian educational federalism by articulating, in a single analytical perspective, dimensions that are often treated separately in the literature: the redistributive logic of the new Fundeb, the role of horizontal cooperation among municipalities, and the evolution of educational outcomes measured by Ideb. Rather than claiming an entirely unprecedented contribution, the article seeks to advance the literature by integrating these dimensions into a common interpretive framework and by examining how financing, governance, and performance interact within the Brazilian federative pact.

From a theoretical point of view, the article adopts an integrated approach grounded in the dialogue between fiscal federalism, multi-level governance, and institutional capacity. In this perspective, educational outcomes are not treated as the product of funding alone or governance alone, but as the result of cumulative interactions among redistributive mechanisms, coordination arrangements, and the administrative ability of municipalities to transform resources into effective public action. Thus, VAAT is interpreted as the redistributive base of the system, ADEs as horizontal coordination mechanisms, and VAAR as a performance-inducing layer of accountability within the educational federal pact.

In substantive terms, the article is guided by the assumption that research in public policy should combine analytical rigor with social relevance, especially

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when addressing inequalities in access to and quality of basic education. The purpose of the study is therefore not merely descriptive, but analytical: to understand whether the institutional innovations introduced in Brazilian educational federalism are associated with more cooperative arrangements and better educational trajectories at the municipal level.

Accordingly, the general objective of this article is to investigate the level of cooperation, decentralization, and intermunicipal dialogue shaped by the Brazilian federal pact in the field of education. More specifically, the article aims: (i) to analyze the institutional and financial changes introduced by the new Fundeb; (ii) to examine the redistributive role of VAAT in municipal educational financing; (iii) to assess whether VAAR conditionalities have induced effective managerial improvements or merely increased bureaucratic requirements; and (iv) to estimate, through a Difference-in-Differences strategy, whether participation in ADEs is associated with changes in the evolution of municipal Ideb.

2. Methodology

Methodologically, the study combines bibliographic and documentary review with quantitative and qualitative analysis. This method was chosen for its analytical capacity in integrating positivist and phenomenological perspectives to deal with multifaceted phenomena, such as the impact of the federal pact and the new Fundeb (National Fund for the Development of Basic Education) on educational institutions. This research is basic in nature and has an explanatory aspect, supported by a subsequent descriptive phase, because it aims to identify determining factors and cause-and-effect relationships, such as the influence of ADEs (Education Development Arrangements) on the evolution of the IDEB (Basic Education Development Index). The technical procedures consist primarily

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of a comprehensive bibliographic review of secondary sources, such as books, theses, and articles, and a documentary review of primary sources, including official documents, laws, and technical reports.

According to Gil (2010), bibliographic research was fundamental for organizing the information necessary for the analysis of complex social phenomena, such as the dynamics of power and financing in basic education. The initial bibliographic search encompassed a selection of 1,020 works identified in databases, using descriptors related to federalism, the new Fundeb (National Fund for the Development of Basic Education), and ADEs (Academic Development Agencies). The selection process was meticulous and divided into three stages: 1. initial screening: 450 works were selected after filtering by thematic relevance of the titles; 2. comprehensive evaluation: the abstracts were analyzed, leaving 100 works that demonstrated greater argumentative quality and originality; and 3. final selection: of these, 17 academic works were retained to constitute the main theoretical basis due to their direct relevance to the study. The final corpus analyzed for this study consisted of 17 academic works (scientific articles, books, and theses), complemented by 11 primary sources (Federal Constitution of 1988, guidelines and bases laws, decrees, and technical notes from the Senate) and official data websites, such as QEdu. the bibliographic review followed explicit inclusion and exclusion criteria. Studies were included when they: (a) addressed Brazilian federalism, Fundeb, VAAT, VAAR, ADEs, intermunicipal cooperation or educational governance; (b) presented conceptual, legal, institutional or empirical relevance to the research problem; and (c) were available in full text. Studies were excluded when they: (a) were duplicated across databases; (b) addressed decentralization without connection to education financing or intergovernmental cooperation; or (c) presented merely tangential mention of the key concepts without analytical development. So the reduction from 1,020 initial records to 17 core studies thus followed a relevance-based screening process combining title analysis, abstract reading and full-text assessment

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Regarding the time period, the bibliography covers a range from 1988 to 2025, encompassing everything from the historical milestones of redemocratization to the most recent discussions on the implementation of the new Fundeb (National Fund for Basic Education) and its financial projections. The research included publications entirely in Portuguese, ensuring a focus on national academic production and specific local legislation of Brazilian federalism. The databases consulted included: Google Scholar, Scientific Electronic Library Online (SciELO), and institutional repositories of Brazilian universities, resulting in an initial survey of 1,020 results. The analysis of the collected data followed the content analysis method, according to Bardin (2011), which consisted of coding the materials according to the established thematic axes. In the quantitative field, the statistical method of "Difference-in-Differences" (Diff-in-Diff) was used to isolate variables and explain whether entry into an Education Development Arrangement (ADE) causes an effective improvement in the Basic Education Development Index (Ideb). To estimate the causal effect of municipalities' participation in Education Development Arrangements (ADEs) on the evolution of the Basic Education Development Index (Ideb), the Difference-in-Differences (Difference-in-Differences – Diff-in-Diff) method was used. This empirical strategy is widely employed in public policy evaluations because it allows isolating the average impact of the treatment by comparing the temporal variation of the treated group in relation to an appropriate control group. Formally, the estimated model can be expressed by the following equation:

Where Y_{it}represents the result of interest (Ideb) of the municipality in period i; $Treat_i$ is an variable that assumes a value of 1 for municipalities participating in ADEs and 0 otherwise; $Post_i$ is a temporal dummy that identifies the period after joining the ADE; and the interaction term $(Treat_i \times Post_i)$ captures the average causal effect of the treatment. The parameter of interest is β_3, which estimates the impact of participation in ADEs on the Ideb, controlling for fixed structural differences between municipalities and for common shocks over time

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A central assumption for the validity of the Diff-in-Diff estimator is that of parallel trends, according to which, in the absence of treatment, treated and untreated municipalities showed trajectories similar to those of the IDEB (Basic Education Development Index) over time. To verify this assumption, graphical and statistical tests of pre-treatment trends were performed, comparing the evolution of the IDEB in the periods prior to adherence to the ADEs (Academic Development Actions). The results indicated an absence of statistically significant differences in the previous trends, supporting the hypothesis of parallel trends and, consequently, the causal validity of the model.

As a robustness strategy, the analysis was complemented by sensitivity checks designed to assess the stability of the estimated association between ADE participation and Ideb evolution. These procedures included pre-treatment trend verification, alternative temporal windows, and placebo specifications in which treatment timing was artificially reassigned in order to test whether similar effects would emerge in periods without effective intervention. Although these procedures do not eliminate all threats to internal validity, they strengthen confidence that the main findings are not merely the result of spurious temporal coincidence.

The estimates were obtained with robust standard errors, and the confidence intervals were calculated at the 95% level, ensuring adequate statistical inference about the estimated effect. For data processing and visualization, two main tools were used: R Studio, for creating statistical graphs and analyzing real metrics, and Google Notebook LM, which was employed as an auxiliary tool for cross-referencing quantitative and qualitative analysis between municipal data and quality indicators. Google NotebookLM was used strictly for textual synthesis and semantic cross-referencing between the bibliographic database and the Qedu indicators, facilitating the identification of large-scale qualitative patterns, without replacing the statistical analysis performed in R Studio.

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In addition to the baseline Difference-in-Differences specification, the empirical strategy incorporated control variables associated with municipal socioeconomic and administrative heterogeneity, including demographic variation, enrollment dynamics, and indicators of local structural capacity whenever available in the database. The purpose of these controls was not to eliminate all possible confounding factors, which is impossible in observational designs, but to reduce omitted-variable bias and improve comparability between treated and untreated municipalities. Therefore, the estimated coefficient for the interaction term should be interpreted as a conditional causal estimate under the assumptions of the model, rather than as definitive proof of full causality.

3. Results and Discussion

A major theoretical reference who extensively discussed the decentralization of education within the federal pact was Alberto de Mello e Souza. It will be interesting to demonstrate how the author discussed topics such as educational decentralization in Brazil at the end of the 20th century and compare it with contemporary metrics and discussions on the subject, which may provide us with a realistic view of what has been achieved. It is important to emphasize first that the political history of Brazil is marked by a pendulum swing between centralization and decentralization. The authoritarian period (1964-1985) concentrated power and resources in the Union, leaving states and municipalities as mere executors of central directives. Redemocratization reversed this logic, betting on decentralization as synonymous with democracy and efficiency. The premise was that local government, being closer to the demands of the population, would be better able to allocate resources efficiently.

> The resource allocation model in education remained practically unchanged in the 1980s, contributing significantly to the reduced efficiency of primary education and the maintenance of educational inequalities. However, contextual changes favored the performance of municipal education systems and greater autonomy in the

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> management of public schools. On the other hand, the lack of coordination between the federal government, states, and municipalities remains a fundamental obstacle in the pursuit of quality education (Souza, 1993, p. 1).

In his book “State Crisis and Educational Decentralization in Brazil: Resistance, Innovations, and Perspectives”, Alberto de Mello e Souza shows us that educational decentralization in Brazil occurred in an "induced" and often "traumatic" way. The federal government, holding the largest share of tax revenue, transferred responsibility for providing primary education (early years) and early childhood education to municipalities without ensuring that they had the fiscal base to support such expansion. The result was an accelerated municipalization of enrollments, but with heterogeneous quality. Several data and works from the Institute for Applied Economic Research (Ipea) show that, in the 1990s, municipalization was seen as a strategy to increase efficiency, but the lack of coordination between entities perpetuated profound regional inequalities.

> A social planner would utilize municipal public resources to maximize the improvement of the quality of life of their constituents. That is, tax collection and transfers of state and federal resources would finance the municipality's responsibilities in providing basic education, health, and other public services. However, municipalities are not equally efficient in transforming these resources into services for the population, which motivates us to estimate this efficiency and explain the sources of this difference. Furthermore, governments have other objectives besides benefiting their citizens. Municipal management can be affected by local institutional mechanisms, sectoral councils, external institutional auditors, and the electoral contest for local positions or in other spheres of government. Our objective is to investigate whether these issues affect the provision and efficiency with which municipal services are delivered (Motta; Moreira, 2007, p. 9).

This publication by Ipea, entitled Efficiency in Municipal Management in Brazil, among several other publications in the same repertoire, such as Government Expenditures on Education: 1986-1990, by Antonio Emílio Sendim Marques (1991), presents information generated by Ipea, but the data comes from various sources. For example, in Efficiency in Municipal Management in Brazil

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(Motta; Moreira, 2007), the data analyzed were consolidated from four distinct informational matrices: the municipal expenditure statistics from the Ministry of Finance (Finbra); the indicators of the Human Development Index (HDI), based on the 1991 and 2001 Censuses; the electoral records of the Superior Electoral Court (TSE); and, finally, the Basic Municipal Information Survey (Munic) from the Brazilian Institute of Geography and Statistics (IBGE). In this book, the authors created a table – which is not suitable for this work because it contains outdated data – that presents statistical data that generates very clear visual information, leading Motta and Moreira (2007, p. 19) to conclude that "[...] municipal management in Brazil presents economies of scale" and that "[...] municipal division leads to higher municipal spending", therefore, the smaller the number of municipalities, the lower the unit expenditure per municipality.

> [...] the same Constitution, in establishing the coexistence of federal, state, and municipal education systems, ended up maintaining the duality of the education networks, as it did not define the forms of integration that should exist. Furthermore, it insufficiently addressed the spheres of action and competence. Regarding the spheres of action, it was only expressed that municipal systems would primarily be responsible for primary education. Regarding the spheres of competence, only the role of the Union in providing technical assistance to states and municipalities was mentioned. Nothing was said about the forms of collaboration between the three education systems, allowing the damaging consequences of the existing model to continue (Souza, 1993, p. 1).3).

Therefore, although the Magna Carta brought a great innovation, this commentary by Souza (1993) makes a strong critique of the way it structured national education. The author conveys the idea that, although the law recognized the existence and power of different spheres, it failed to establish practical mechanisms for articulation between them. Municipal autonomy, guaranteed by Article 18 of the Constitution, is a non-negotiable value of the federative pact, but it can become an "autonomy of precariousness" when the municipality lacks technical and financial resources. Neighboring municipalities may have vastly different educational indicators simply because one hosts a large industry and the other is strictly residential or rural; in this case, the former pays a higher percentage of the Service Tax (ISS) and the share of the Tax on

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the Circulation of Goods and Services (ICMS), and the amount collected by the State is divided among the other municipalities through the Municipal Participation Fund (FPM) and Fundeb. The federal pact, therefore, is not just a legal contract, but an ethical commitment of territorial solidarity, in which the Union and the states must act in a supplementary and redistributive manner to guarantee a minimum standard of quality of education (Araújo; Freguete, 2017).

3.1. Cascading Federal Governance Model

In analytical terms, this study adopts an integrated perspective of multi-level governance in education, according to which educational outcomes are shaped by the interaction between fiscal equalization, institutional coordination and local state capacity. In this framework, VAAT operates as the fiscal equalization base of the system, since it reallocates federal resources toward municipalities with lower revenue capacity; ADEs function as horizontal governance mechanisms that reduce technical and administrative isolation among neighboring municipalities; and VAAR introduces an accountability layer by conditioning part of the federal complement on management and performance criteria. The central analytical argument, therefore, is that educational improvement does not result from financing alone, nor from governance alone, but from the cumulative interaction between redistributive funding, intermunicipal cooperation and performance-inducing rules.

This section of the review proposes a model that articulates financing, governance, and performance in a tiered manner. The model's foundation is fiscal equalization, ensured by the Total Student-Year Value (VAAT), which directs federal resources to school systems with low fiscal availability, contributing to greater equalization in the distribution of the Fundeb (National Fund for Basic Education). Upon this foundation rests horizontal governance, materialized in the Education Development Arrangements (ADEs), through

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which neighboring municipalities unite to plan jointly, integrate educational policies, and rationalize resources. The upper stage of the cascade is the Student-Year Value by Result (VAAR), which acts as an accountability mechanism, conditioning the Union's contribution on the fulfillment of conditions for improved management and the evolution of service and learning indicators with a reduction in inequalities. This model demonstrates that the equitable distribution of resources, horizontal cooperation, and accountability for results are inseparable components of the federal pact in education.

3.2. Collaboration and cooperation between federal entities

The 211° article of the Brasil Federal Constitution establishes that "The Union, the States, the Federal District and the Municipalities shall organize their education systems in a collaborative manner." This mandate is the heart of Brazilian educational federalism. The Law of Guidelines and Bases of National Education (LDB - Law No. 9,394/1996) details this cooperation, assigning to the Union the coordinating and redistributive function; to the states, priority in Elementary and Secondary Education; and to the municipalities, the focus on Early Childhood Education and Elementary Education. However, the materialization of this regime faces significant operational obstacles. The absence of clear regulation of the National Education System (SNE), a kind of "SUS of Education," creates gray areas regarding who is responsible for what, generating overlapping efforts or, worse, gaps in service. The National Education Plan (PNE 2014-2024) foresaw the creation of the National Education System (SNE) by 2016, a deadline that was not met, leaving the country without institutionalized cooperation norms that would shield educational policies from political-partisan fluctuations. This was a major challenge, as between 2014 and 2024, Brazil had three presidents with three different ideologies, so proposals from outgoing governments were forgotten and not continued. In contemporary times, especially during Lula's third term,

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the relationship between the federal pact and municipal public education policies has been marked by a change in this paradigm, since this institutional conflict has been replaced by a return to a collaborative regime. Decree No. 11,732, of October 18, 2023, established the Federation Council, which materializes the promise of shared governance, establishing a permanent forum where municipal demands, represented by nationalist entities, are debated directly with the Federal Executive, breaking with the institutional isolation of previous years.

> Article 1. The Council of the Federation is hereby established, a collegiate body linked to the Presidency of the Republic, intended to support the development and implementation of strategies aimed at sustainable economic development and the reduction of regional and social inequalities [...] through coordinated action between the Union, the States, the Federal District and the Municipalities (Brazil, 2023a).

The central government sought to institutionalize dialogue so that the Union not only "sends resources," but also coordinates an articulated national system. The greatest political advance in terms of collaboration was the resumption of formal negotiation channels between the Union, states, and municipalities, overcoming the previous disarticulation. For example, the Council of the Federation was created: established to be the main forum for dialogue, bringing together representatives of the Federal Government, governors, and municipal entities. Its objective is to process common demands and prevent policies from being designed in Brasília without listening to those who implement them on the ground, that is, the municipalities. During this period, there was a resumption of National Conferences; for example, the return of the National Education Conference (Conae) allowed municipalities to have an active voice in the construction of the new National Education Plan (PNE), ensuring that decentralization goals were agreed upon, not imposed.

During this period, legal milestones were achieved, such as the National Commitment to Literate Children Law, which was transformed into state policy, directly combating the influence of the government transition. This legislation

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not only transfers funds but also creates shared governance, as per Law no. 14,565/2023, which states "Article 1. The National Commitment to Literate Children is hereby established, in a collaborative regime between the Union, the States, the Federal District, and the Municipalities, with the objective of guaranteeing the right to literacy for all children."

Finally, the National Education System (SNE) was created at the end of 2025, with the government enacting laws and frameworks that consolidated it. This clearly defines "who does what," obligating the Union to have a more agile supplementary and redistributive role in assisting municipalities with less technical capacity. Unlike generic voluntary transfers, the Government invested in programs that require adherence and a joint work plan, such as the Full-Time School Program, the National Pact for the Recovery of Learning, and the new Growth Acceleration Program (PAC) for Education, which resumed stalled construction of daycare centers and schools in municipalities.

In Brazil, the practice of collaborative governance has oscillated between "cooperative federalism" and "inductive federalism." In the inductive model, the federal government designs programs (such as the “Programa Mais Educação” or “ProInfância”) and transfers voluntary resources to municipalities that adhere to federal rules. While this ensures some alignment, it is criticized for undermining local autonomy and imposing standardized ("one size fits all") solutions on a country of continental dimensions. True collaborative governance, as advocated by organizations like “Todos pela Educação” (All for Education), should be a two-way street, based on horizontal dialogue and the joint construction of solutions, and not merely on adherence to federal calls for proposals.

3.3. The funding revolution: the new Fundeb as an instrument of equity

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It is impossible to discuss political effectiveness without discussing public finances, because, ultimately, funding is the monetary translation of the federal pact. The approval of the new Fundeb (Constitutional Amendment No. 108/2020 and Law No. 14.113/2020) represents the greatest structural change in Brazilian education in recent decades, altering the logic of resource redistribution to favor the poorest municipalities. The new Fundeb enshrines public funding as a vector of federal equity. As stated in the new Fundeb guide prepared by the Directorate of Fund and Benefit Management (Digef), "[...] Fundeb acts as a redistributive tool for resources that allows entities to offer basic education starting from a minimum quality standard" (Brazil, 2020d, p. 4). In the same booklet, it can be noted that Constitutional Amendment No. 108/2020 increases the federal government's share from 10% to 23% of the total fund by 2026. In practice, this means a significant increase in the budget: from R$ 156.3 billion distributed in 2019 (Agência Câmara de Notícias, 2020) to approximately R$ 370.3 billion projected for 2026, as reported by the Ministry of Education (Brasil, 2025).

> With the new FUNDEB, the Union's contribution, which is currently 10% of the total sum of the 27 state funds (composed of state and municipal revenue in each state, plus the Federal District), will increase to 12% starting next year and will reach 23% in 2026. In this way, the government will significantly increase its participation in FUNDEB, which is fundamental to raising the amount invested per student in the poorest municipalities, but states and municipalities will continue to allocate more than 80% of the total resources of the fund (Muñoz Moreno, 2020, p. 7).

Therefore, as Muñoz Moreno (2020) points out, the projected federal participation value would increase from 10% to 23% in less than six years, reflecting how positively people viewed the new Fundeb and the need for its expansion. Ultimately, increasing the level of federal participation does not increase the level of dependence of municipalities on the Union; it is simply a form of equitable redistribution of the Union's tax revenues. In the long term, Fundeb will guarantee autonomy for municipalities. This Brazilian initiative is a major differentiator among its peers, although it is difficult to analyze other

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federal countries with the same characteristics as Brazil. Indeed, as pointed out by Vieira et al. (2026), among Portuguese-speaking countries, Brazil is the only one with a federal regime

3.3.1. VAAT as an efficient form of financial supplementation

The old Fundeb operated with a logic of supplementation focused on state funds that did not reach a minimum value. This generated distortions: poor municipalities located in rich states (which did not receive supplementation from the Union) were left without assistance. The new Fundeb introduced the hybrid concept of supplementation, highlighting the VAAT. The VAAT considers not only the basket of taxes that make up the fund, but all revenues linked to the maintenance and development of education (MDE) of the federated entity. This allows the Union to identify, with surgical precision, which education networks have the lowest investment capacity per student in Brazil, regardless of the state where they are located.

Simulation studies conducted by the Federal Senate (2020), in its “Technical Budget Note No. 72/2020” and other subsequent notes from the Budget, Oversight and Control Consultancy (Conorf), indicate that the progressive implementation of VAAT (which will increase the Union's contribution to 23% by 2026) has unprecedented potential for reducing inequalities, as projections show that VAAT is capable of significantly reducing the dispersion of investment per student among Brazilian municipalities. Without VAAT, the difference between the municipality that invests the most and the one that invests the least could reach dozens of times; with the mechanism, this gap tends to close, guaranteeing a minimum standard of living for all schools, as demonstrated by the “Todos pela Educação” report (2020). As these reports have shown, by 2025, the estimate is that Fundeb will exceed 325 billion Brazilian reais. This massive volume of resources, if well managed, can transform the infrastructure of municipal networks.

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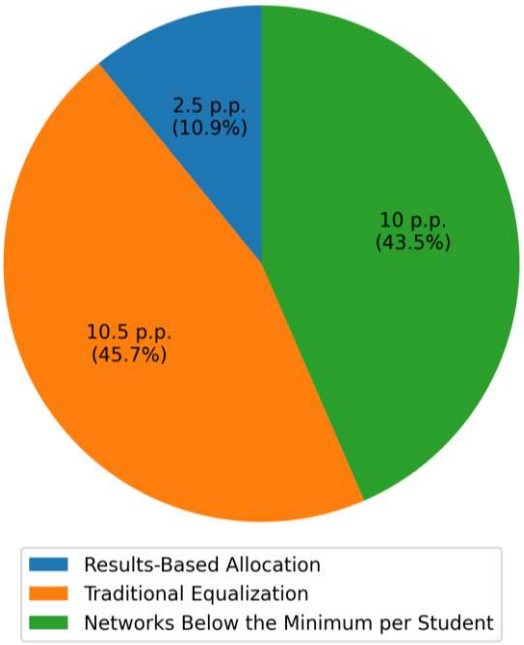
Chart 1 – Distribution of Federal Supplementation from the New Fundeb



Source: Prepared based on data from Agência Câmara Notícias (2020).

The Chart 1 shows the distribution of the federal supplement from the new Fundeb (2020), which totals 23 percentage points (pp) of tax revenue and transfers. It is divided into three main slices, with the following proportions and values: the largest slice, in orange (approximately 45.7%), has 10.5 pp and corresponds to the portion allocated to school systems that do not reach a minimum investment value per student (considering all resources linked to education). The second largest slice, in aquamarine (approximately 43.5%), has 10 pp, which refers to traditional equalization, that is, the transfer of resources to level down the state funds with the lowest VAAT value. Finally, the smallest slice, in dark blue (approximately 10.9%), has 2.5 pp. This is the portion conditioned on educational results: it will only be distributed to school systems that show improvement in service indicators, learning, and reduction of inequalities. The effects of this reform are already appearing in current equity indicators. Santos, C. Callegari and A. Callegari (2022) show that, in practice, up to 2022, the new Fundeb reduced the dispersion of VAAT among networks

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by 14% and increased the national minimum VAAT by 31% compared to the previous Fundeb.

> The simulations carried out following the methodology presented in the previous section reveal that the new supplementary funding model will result in greater equity in the financing of basic education in 2022. [...] From the point of view of the minimum funding standard, the lowest VAAT (Value Added Tax) in the country jumps from R$ 3,602.00 to R$ 4,708.00, in current values of 2019. In other words, the new supplementary funding reaches a larger number of municipalities, promoting an equalization of the financing conditions of all municipalities below this level (Santos; Callegari, C.; Callegari, A., 2022, p. 18).

Therefore, these authors, even in 2022, showed great optimism regarding the implementation of VAAT and its potential to reduce inequality and generate equity. The new Fundeb brought truly staggering numbers with the VAAT proposal; this was certainly the greatest measurable financial and quantitative innovation applied by Fundeb since 2020.

3.3.2. VAAR and conditionalities

The major innovation in the qualitative area of the new Fundeb is VAAR, which links the transfer of a portion of the resources (up to 2.5% of the Union's contribution) to the improvement of management and learning indicators, focusing on reducing inequalities. This mechanism inserts "results-based incentives" at the heart of the federal pact, but with important safeguards to avoid the elitization of schools. To receive VAAR, the municipality must meet prior management conditions, such as filling the position of school manager based on technical and merit criteria (ending purely political appointments), participating in national assessment exams (Basic Education Assessment System – Saeb), and reducing socioeconomic and racial educational inequalities. Preliminary data from 2024 on the productive sertão identity territory (Bahia) reveal that adherence to VAAR is neither automatic nor trivial. Many municipalities face technical difficulties in meeting bureaucratic conditions

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or in proving the evolution of indicators. This raises an important warning for research: the incentive mechanism may end up punishing the weakest municipalities, which lack the "state capacity" to meet the system's requirements, deepening the gap it was intended to close.

The complexity of the calculation and the need for precise data demand technical expertise from municipal secretariats, which many still lack (Santos; Callegari, C.; Callegari, A., 2022). Analysis of this work reveals that, despite increased resources, the fiscal scenario poses risks. Municipalities are extremely dependent on constitutional transfers (FPM, ICMS, and Fundeb). In many small municipalities, Fundeb represents more than 70% or 80% of the entire education budget. The authors also warn that the new fiscal framework (spending limits) may create tensions in the execution of the federal budget, jeopardizing the full complement of the Union's contribution in economic crisis scenarios. Furthermore, the earmarking of 70% of Fundeb for the payment of education professionals creates budgetary rigidity that, while valuing teachers, leaves little room for investment in infrastructure and pedagogical innovation should the fund's revenue suffer cyclical declines.

3.3.3. Quantitative analysis of VAAR in 2025

In 2025, all the Complementary Indicators (VAAR) were released by INEP. Based on this data, we can gain a holistic view of the importance and reach of VAAR and Fundeb among municipalities.

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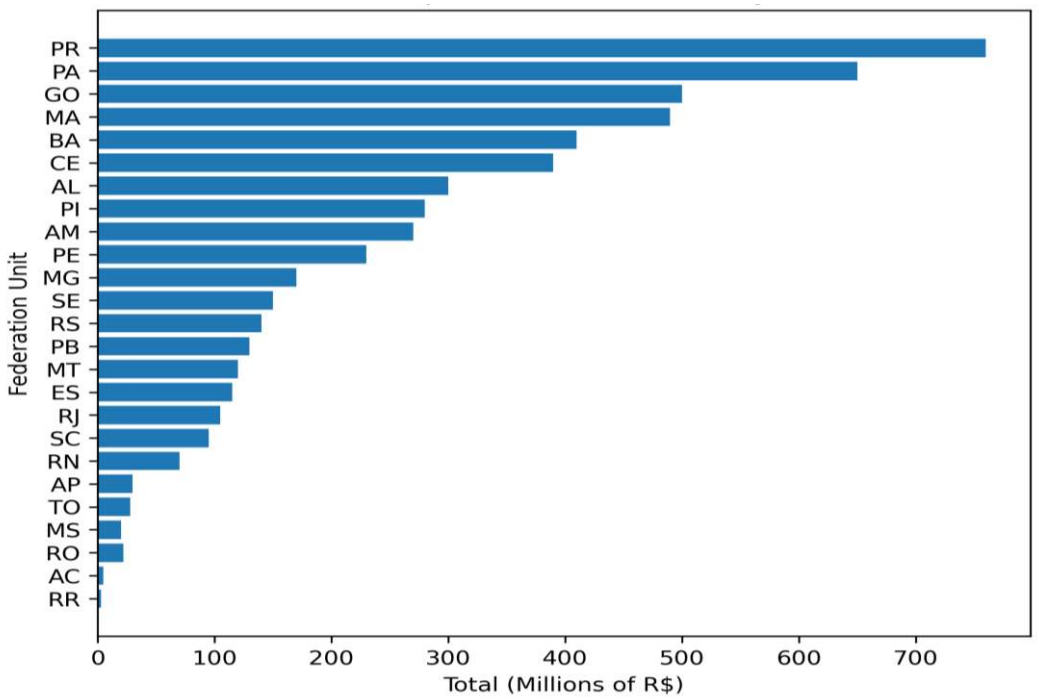
Chart 2 – Relationship of total investment by state in the period from 2025 by VAAR



Source: FNDE. Own elaboration (2025).

From the analysis of Graph 2, we can see that the distribution of VAAR in 2025 reveals that, although the state with the highest revenue was Paraná, there is still a significant concentration of resources in states in the North, Northeast, and Midwest regions, such as Pará, Maranhão, Goiás, Bahia, and Ceará, which receive intermediate to high amounts. This demonstrates the mechanism's focus on historically underfunded regions, aligning with the objective of reducing regional inequalities in basic education, which has been affirmed and anticipated by the various authors analyzed and mentioned here since the year this policy was implemented.

States like Maranhão and Bahia, known for high poverty rates and low educational performance, appear among the main beneficiaries, suggesting that VAAR is truly functioning as an equity instrument, transferring more resources to where there is a greater need for improvement in indicators such

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as childcare enrollment rates and reduction of racial and socioeconomic disparities. In total, by 2025, approximately 65.5% of federative entities met the VAAR conditionalities, resulting in a distribution that prioritizes networks with evidence of progress, but still excludes many (approximately 35% did not qualify). However, the graph also demonstrates limitations: the distribution is not purely based on poverty or need, but on relative performance.

Southern and Southeastern states, such as São Paulo, Minas Gerais, and Rio de Janeiro, receive average to low values, reflecting their greater local fiscal capacity and possibly smaller margins for measurable "improvements," since they start from higher bases. This illustrates how VAAR encourages accountability, but it can perpetuate cycles in which already advanced networks struggle to show incremental gains, while precarious networks receive incentives to evolve, as demonstrated by Peres, Capuchinho, and Limonti (2024).

One curious point is that Paraná leads the ranking with the largest volume of VAAR (Value Added Tax) allocated to its municipalities, with a total value of R$ 761,118,885.58, which is a disproportionate amount for a state in the South, relatively developed and with better educational indicators compared to regions like the Northeast. This is intriguing because VAAR is performance-based, suggesting that Paraná may have many municipalities that have demonstrated significant improvements in indicators, possibly due to effective state educational management policies or higher student enrollment in critical stages such as early childhood education.

Another interesting point is the low ranking of Amazonian states, such as Roraima and Acre, which receive almost nothing despite extreme logistical and socioeconomic challenges. This may indicate flaws in monitoring capacity or in the presentation of data for the conditionalities, highlighting a possible "penalty" for entities with weak administrative systems; fieldwork would most likely

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resolve this doubt. Furthermore, the graph demonstrates a very interesting reality: the color gradation visually reinforces the inequality: the "top 5" (Paraná, Pará, Maranhão, Goiás, and Bahia) concentrate the majority of the resources, which raises questions about whether VAAR is truly distributing benefits evenly or if it favors states with larger student populations. There is nothing about Published works in this field also highlight a gap in research, which is quite normal, since we are talking about a relatively new policy that has been little explored by researchers.

From this perspective, VAAR, therefore, represents an advance in Fundeb by linking resources to results. D. Soares, T. Soares, and Santos (2023) argue that Fundeb is clearly a policy inspired by international models such as the No Child Left Behind program in the United States or conditional programs in Latin America, but it still faces challenges in practice. In the Brazilian case, VAAR supplementation can generate "perverse effects," such as an excessive focus on standardized tests to the detriment of holistic education, and it does not sufficiently address structural inequalities, such as a lack of infrastructure in remote regions.

According to Teixeira (2018), although VAAR aims to reduce educational inequalities, its implementation in 2025 showed that only 65.5% of entities met the racial and socioeconomic conditionalities, revealing a gap between intention and execution, especially in small municipalities that lack the technical capacity to monitor indicators.

> However, in consultations carried out in the first half of 2022 on the electronic portal of the National Institute of Educational Studies and Research Anísio Teixeira, a federal agency responsible for the Ideb and linked to the Ministry of Education (Inep/MEC), no official document was found that directly associates the adopted quality concepts with any international experience. On the other hand, in an interview given to journalist Marta Avancini, published in Revista Educação on September 10, 2011, the mentor of the methodology adopted by the indicator, Reynaldo Fernandes, who at the time was president of Inep/MEC, reported that its development was inspired by

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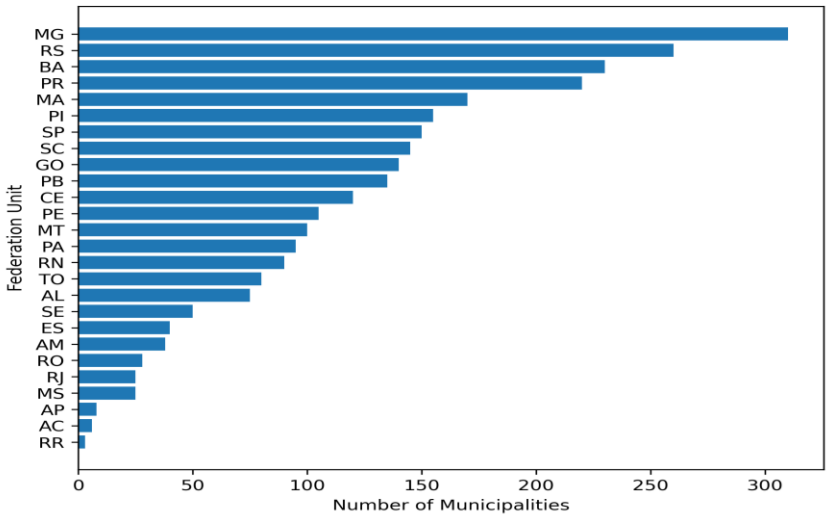
> international experiences. Fernandes cites the American law known as No Child Left Behind (NCLB) as a successful action for improving the school performance of students in that country (Soares, D.; Soares, T.; Santos, 2023, p. 4).

In other words, although created to address a need, the implementation of VAAR also poses a challenge for some municipalities, as the conditions for financial release depend on data from INEP, which may be biased or incomplete in municipalities that are more administratively disorganized, leading to unfair exclusions. This is fully illustrated in Graph 2, which shows a concentration in states like Paraná, which may have better data systems, versus the underrepresentation of states like Acre.

Chart 3 – Number of municipalities covered by VAAR by federative unit in 2025



Source:FNDE Own elaboration (2025).

Compared to the previous graph, which showed the total financial volume transferred per state, a notable asymmetry emerges. While investment is concentrated in states in the North and Northeast (since Pará and Maranhão have high values, despite having few municipalities), the number of municipalities benefiting favors the South and Southeast. As can be observed, Minas Gerais and Rio Grande do Sul have hundreds of entities, but average

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and low values in total investment. This demonstrates that the VAAR, although aiming for equity, can generate paradoxical effects: states with more municipalities distribute resources in a more dispersed way, but with smaller amounts per entity, while less fragmented regions like Pará concentrate funds in a few municipalities, potentially widening intra-regional inequalities. This discrepancy reveals limitations in the mechanism, because the VAAR has acted as a beneficiary of the most organized networks and ignores local contexts of vulnerability, exacerbating federal inequalities instead of mitigating them.

3.4. Innovations in inter-federative governance: ADEs and consortia

When we talk about financing, we are talking about the fuel necessary for the implementation and effectiveness of any public policy; however, governance is the engine of these policies. When everyone knows exactly what they should or should not do, the risk of errors decreases and the organization, or system, becomes more efficient. As has already been demonstrated, failures in vertical coordination (federal government-municipalities) gave rise to an innovative model of governmental organization based on horizontal coordination (municipality-municipality), which improves cooperation and dialogue practices.

From the outset, the 1988 Constitution established the federal pact with this decentralizing spirit; however, this horizontal coordination has been refined over time through state policies and programs, as is the specific case of the ADEs (Education Development Arrangements), whose proposal was formalized by the National Education Council (CNE) through Resolution CNE/CEB No. 1/2012, which established the guidelines for the collaborative regime through ADEs; another specific case is consortia, which were created by the Public Consortia Law (2005): Law No. 11.107/2005, a fundamental legal framework

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that regulated the contracting of public consortia in Brazil, providing legal security for federated entities to associate themselves.

3.4.1. The ADEs

The ADEs (Agency for Development and Cooperation) represent the vanguard of territorial cooperation in Brazil. Unlike public consortia, which require the creation of a new intermunicipal autonomous entity with legal personality (which brings bureaucracy and costs), ADEs are more flexible network governance models, based on territoriality and the political will to cooperate, as is the case with the Northwest Paulista ADE. This arrangement is considered by several scholars to be one of the most mature in the country, involving 65 municipalities in the interior of São Paulo. The ADE operates through thematic working groups that bring together technicians from various municipal secretariats. They identify common problems, such as difficulties in training mathematics teachers in the early years, and seek joint solutions.

The greatest reported gain is the breaking of pedagogical isolation. Municipalities with 3,000 or 5,000 inhabitants, which would never be able to hire leading training institutes, are able to do so as a group (Godoi; Breyer, 2012). The institutionalized “dialogue” creates a community of practice where the secretary of one municipality learns from the mistakes and successes of their neighbor. According to Abrucio and Ramos (2012), territorial associativism through ADEs (Education Development Arrangements) is capable of breaking the pedagogical isolation of small municipalities, which, alone, would not have the scale to implement certain policies. The ADE allows the breaking of pedagogical and administrative isolation by institutionalizing dialogue. The secretary of education ceases to be a “lone figure” in decision-making and begins to share dilemmas and solutions with their neighbors because, in the end, horizontal cooperation

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forms what is calledA community of practice is an environment that enables collective learning through the exchange of experiences.

In this way, the failures of one city serve as a lesson for others, while successful practices are replicated, resulting in better optimization of public resources.All of this is because the governmental structure of the ADEs (Education Development Arrangements) is lean and not hierarchically rigid. Often, these arrangements are also supported by private partners or institutes, such as the Instituto Positivo or the Comunidade Educativa Cedac, which act as external "executive secretariats," ensuring the continuity of actions even when there is a change of mayors. This demonstrates the importance of the third sector in stabilizing the local federative pact.

For these and many other reasons, the creation of ADEs has been boosted in recent years, according to official data from the Instituto Positivo published in the book by Segatto, Grin and Abrucio (2023), where the authors discuss Education Development Arrangements: what can we learn from their trajectories? In 2021, there were already about 13 ADEs "implemented and consolidated"; in 2023, Brazil already had 15 ADEs, encompassing more than 225 municipalities working collaboratively and reaching more than 414,000 children in Basic Education through cooperative work.

The 15 arrangements were distributed across eight states: Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Mato Grosso, Bahia, Maranhão, and Piauí (Segatto; Grin; Abrucio, 2023). It is important to note that, in 2025, the number of ADEs rose to 23, as shown on the official website of the Intermunicipal Collaboration Network in Education; however, due to the lack of a new updated book from the Instituto Positivo, there is no compiled and complete data provided that could foster a more recent analysis. The 2023 data, however, will be sufficient to convey the functionality and challenges of the ADEs in Brazil. As highlighted by Segatto, Grin, and Abrucio (2023), municipalities belonging to the

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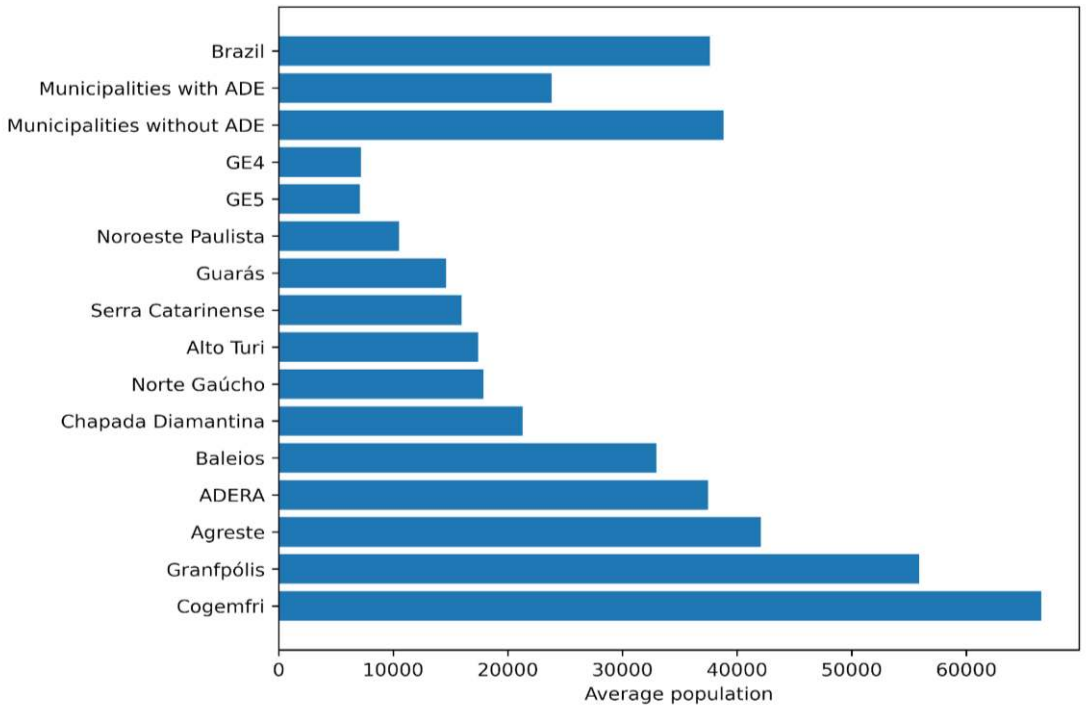
ADEs tend to show more consistent progress in the IDEB (Basic Education Development Index) than municipalities outside these arrangements.

The causal hypothesis is that cooperation generates positive "peer pressure": no mayor wants to be the "laggard" in the region, which encourages investment and improved management. A very positive point highlighted in almost every work was that the arrangement managed to keep the educational agenda active even during turbulent election periods, proving that the institutionalization of cooperation is an antidote to administrative discontinuity (Segatto; Grin; Abrucio, 2023). An interesting fact in this work is that the first Education Development Arrangement (ADE) was created by municipalities in Bahia: "In 2000, the first Education Development Arrangement was created in the Chapada Diamantina region (BA)" (Segatto; Grin; Abrucio, 2023, p. 22), however, currently ADEs are mostly from states in the Central and Southern regions.

Chart 4 – Average population per ADEs



Source: Instituto Positivo based on SNIS/IBGE (2020).

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This graph, created by the authors during the book's development, aimed to analyze the relationship between the number of ADEs (Areas of Special Development) and the average population of municipalities. It is important to highlight that the average population per municipality in Brazil is very low, generally not exceeding 50,000 inhabitants (Segatto; Grin; Abrucio, 2023). A notable aspect of the graph is that only two ADEs are above this value.

> These figures show that most municipalities participating in this type of cooperation include those with smaller populations that fall into the following population ranges: a. 5,000 to 10,000 inhabitants (two ADEs); b. 10,000 to 20,000 inhabitants (five ADEs); c. 20,000 to 50,000 inhabitants (four ADEs); d. over 50,000 inhabitants (two ADEs). It is worth noting that municipalities with up to 20,000 inhabitants represent 70% of the total in Brazil, and those with up to 50,000 inhabitants represent 89% of the total. In this sense, the smaller municipalities, with populations of up to 50,000 inhabitants, make up the vast majority of those participating in ADEs (Segatto; Grin; Abrucio, 2023, p. 63).

The excerpt from Segatto, Grin, and Abrucio (2023) offers crucial empirical validation for the theory of ADEs itself. By demonstrating that massive adherence occurs in small municipalities, it confirms that intermunicipal cooperation is not merely a management option, but an administrative survival strategy, because, ultimately, institutional fragility is the main driver of adherence to ADEs. Larger municipalities, with greater state capacity and their own revenue, tend to act in isolation, while smaller ones seek in association the economies of scale that they lack individually.

This data is crucial evidence against the isolationist federalism model because it shows that, without horizontal cooperation, these "smaller localities" would be doomed to inefficiency, reinforcing the argument that the Brazilian federal pact depends on intermediate governance mechanisms to mitigate regional inequalities. This assertion has been made since the 1990s by authors such as Alberto de Mello e Souza, but it is not entirely surprising, as the trajectory of ADEs (Agricultural Development Agencies) in Brazil begins with pioneering

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experiences, such as that of Chapada Diamantina, in Bahia, which started in the late 1990s and evolved into a flexible pact involving governments and social entities focused on collective diagnoses and pedagogical actions (Segatto; Grin; Abrucio, 2023).

This origin, without the specific nomenclature of ADE, highlighted the need for collaboration to overcome challenges such as teacher training and performance evaluation in municipalities with low state capacity, later expanding with the regulation by the National Education Council in 2011, which has driven, to date, the creation of more than 20 arrangements involving approximately 300 municipalities, according to Abrucio and Ramos (2012).

Exhaustive research was conducted to gather sufficient data to make a comparison or correlation between the ADEs and quality indicators, specifically with the Municipal Human Development Index (HDI-M) and the IDEB, according to Segatto, Grin and Abrucio (2023). The ADEs operate in territories with low HDI-M, such as in Chapada Diamantina, where the average of 0.625 in 2000 was lower than the national average (0.766), reflecting limitations in income, longevity and education that perpetuate cycles of exclusion.

In this scenario, flexible institutional arrangements allow for collaboration with civil society organizations, such as universities and foundations, to import knowledge that does not exist locally, strengthening pedagogical and management policies, as observed by Abrucio and Ramos (2012) when emphasizing the importance of articulated systems to universalize access and equity. Critically, although the ADEs mitigate internal asymmetries, as in the Northwest Paulista region with IDEBs above 6.0 in many municipalities (Godoi; Breyer, 2012), they face limitations in contexts of high heterogeneity, where the lack of vertical support from states and the Union perpetuates inter-regional inequalities, demanding more integrated governance to transform local diagnoses into systemic advances.

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In general, ADEs (Areas of Special Development) have been drivers of signs of development and well-being. Based on the website of the Intermunicipal Collaboration Network in Education, we accessed the updated list (until 2026) of municipalities that are part of an ADE and cross-referenced this data with Qedu data on IDEB (Basic Education Development Index) from 2009 to 2023, using the Google Notebook LM data analysis tool. We observed that, on average, municipalities currently part of an ADE showed a marked increase in IDEB between 1.5 and 3.0points, while those municipalities that are not currently part of any ADE have experienced moderate growth of between 1.0 and 1.8 points. The specific case of ADE GE5, which includes cities such as Várzea Grande, Barra d'Alcântara, and Francinópolis, where its headquarters are located, has impressive and paradigmatic results, given that most of its municipalities that had a low IDEB score experienced an exponential leap. For example, the IDEB score for the initial years of Francinópolis jumped from 3.4 in 2009 to an impressive 6.5 in 2023.1 (Qedu). This result far exceeds the national average and places the municipality, located in the semi-arid region, at a level of excellence.ADEs have demonstrated the potential to contribute to reducing inequalities and improving educational indicators in municipalities, especially when associated with contexts of institutional cooperation and local administrative capacity, although such results should be interpreted in light of concomitant contextual and policy variables.

$$Y_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 Post_t + \beta_3 (Treat_i \times Post_t) + \varepsilon_{it}$$

3.4.2.Parallel Trend Testing Model

To estimate the effect of Education Development Arrangements (EDAs) on the IDEB (Basic Education Development Index) and to test the assumption of parallel trends, the following model with three periods (pre-treatment 1, pre-treatment 2, post-treatment 1 and post-treatment 2) is used, as illustrated in the methodological section. The basic formula used was:

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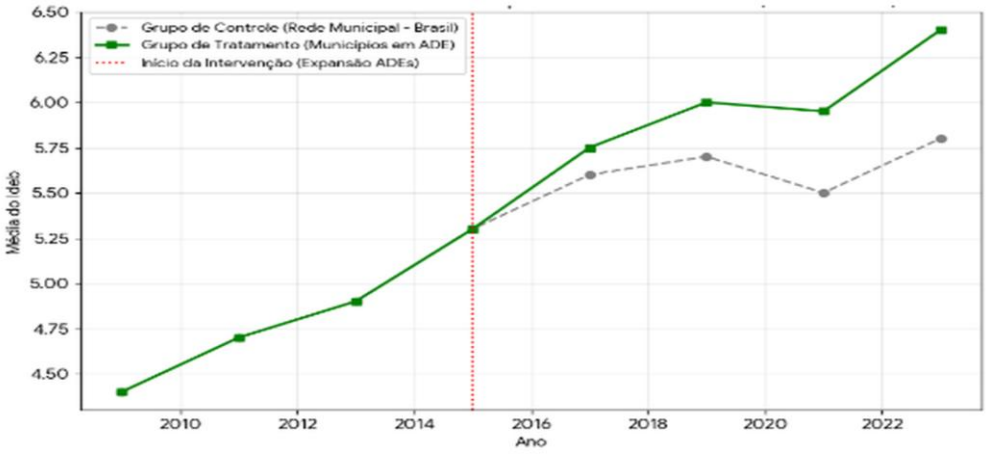
Where Y_{it}represents the result of interest (Ideb) of the municipality in period i; $Treat_i$ is an variable that assumes a value of 1 for municipalities participating in ADEs and 0 otherwise; $Post_i$ is a temporal dummy that identifies the period after joining the ADE; and the interaction term ($Treat_i \times Post_i$) captures the average causal effect of the treatment. The parameter of interest is β_3, which estimates the impact of participation in ADEs on the Ideb, controlling for fixed structural differences between municipalities and for common shocks over time

Chart 5 – Diff-in-Diff: Parallel Trend Test



Source: INEP. Own elaboration (2023)

As demonstrated in Graph 1, the parallel trends test confirms that in the pre-intervention period (2009-2015), the trajectories of the treatment group (municipalities in ADE) and the control group (average of the municipal network) were statistically similar. The divergence observed from 2017 onwards corroborates the hypothesis that horizontal cooperation generates superior marginal gains in the IDEB (Basic Education Development Index).

3.4.3. Intermunicipal public consortia

Consortia (Law No. 11.107/2005) are more robust legal instruments that allow for the joint management of public services, as in the case of ADEs (Areas of Economic Development). The main advantage of consortia is economies of scale; for example, a consortium can conduct a single bidding process for the purchase of school meals for ten cities, obtaining significantly lower prices than

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each municipality could achieve alone. The Greater ABC Intermunicipal Consortium is a paradigmatic example (Grin; Segatto, 2021), where its Technical Chamber of Education functions as a regional "mini-ministry," discussing everything from a unified school calendar to digital inclusion policies. This facilitates the lives of families who live in one city and work in another, creating metropolitan citizenship. However, the biggest problems with consortia are precisely the bureaucratic complexity and the need for legislative approval in all municipal chambers, which constitutes barriers to entry. Furthermore, a municipality's default can compromise the consortium's cash flow, requiring constant financial and political engineering.

In substantive terms, the estimates suggest that municipalities participating in ADEs experienced higher average gains in Ideb than those observed among non-participating municipalities during the analyzed period. The pre-treatment trend tests and the Diff-in-Diff estimates support the interpretation that intermunicipal cooperation is associated with positive educational trajectories; however, these findings should be understood as strong conditional evidence rather than as definitive proof of unrestricted causality. The magnitude of the observed effect indicates that ADEs may contribute to the improvement of municipal educational performance, especially when combined with redistributive financing and local administrative capacity.

3.5. Limitations and Boundary Conditions

This study presents important limitations that must be considered when interpreting its findings. First, although the Difference-in-Differences strategy improves analytical rigor, the observational nature of the data does not allow full control over all intervening variables. Factors such as student migration, concurrent state-level educational policies, heterogeneous municipal administrative capacity, and direct investments outside the Fundeb logic may also have influenced Ideb trajectories. Second, the quantitative analysis is

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based predominantly on secondary aggregated data, which limits micro-level validation of causal mechanisms. Third, the Brazilian federative and legal context gives the study high national relevance, but also restricts the immediate external generalization of the findings to other federations with different institutional architectures. For these reasons, the conclusions of this article should be interpreted as evidence of strong associations under controlled assumptions, rather than as exhaustive demonstrations of isolated causality.

An additional limitation concerns effect heterogeneity. The present analysis did not fully disaggregate the estimated effects by region, municipal size, or administrative capacity, which means that the positive association identified for ADE participation may not be uniform across all territorial contexts. Future studies may refine this agenda by comparing small and large municipalities, poorer and richer regions, and distinct levels of bureaucratic capacity.

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4. Conclusion

After an exhaustive analysis of data and literature, this research shows that strengthening municipal education in Brazil depends less on the discovery of new pedagogical "silver bullets" and more on the institutional engineering of cooperation. The 1988 federal pact decentralized the execution of educational policies, transferring responsibilities to municipalities, but the 2020 pact, that is, the new Fundeb (National Fund for the Development of Basic Education), and the ADE (Education Development Arrangements) movements are attempting to decentralize collective intelligence and equalize funding, promoting more horizontal and equitable governance. This research, by investigating the level of cooperation, decentralization, and dialogue among municipalities in the context of the federal pact, reveals that, despite significant advances, structural challenges persist that demand a more robust articulation between federated entities to mitigate regional and socioeconomic inequalities.

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The initially proposed objectives were largely met, both the general and the specific ones. The general objective of investigating the level of cooperation, decentralization, and dialogue among municipalities due to the federal pact was achieved through an integrated analysis that demonstrated how the Brazilian triune federalism, although innovative, generated asymmetries in the capacity to implement educational policies.

Specifically, we demonstrate the changes and advancements of the new Fundeb, highlighting its redistributive impact: the increase in federal supplementation from 10% to 23% by 2026 raised the education budget to approximately 370.3 billion reais projected, with the VAAT reducing the dispersion of per capita investment by up to 14% among municipal networks, as evidenced by simulations from the Federal Senate (2020) and studies by Santos, C. Callegari and A. Callegari (2022). Furthermore, we measured the financial impact of VAAT, showing that it directly benefited poor municipalities in rich states, guaranteeing a minimum quality floor that the old Fundeb did not achieve.

We also examined the VAAR's conditionalities, revealing that, in 2025, it induced improvements in management in states such as Paraná, Pará, and Maranhão, with distributions concentrated in underfunded regions, although it generated excessive bureaucratization in entities with low technical capacity.The results obtained through the Difference-in-Differences model indicate that the participation of municipalities in Education Development Arrangements (EDAs) has a positive and statistically significant effect on the evolution of the IDEB (Basic Education Development Index).

In substantive terms, the estimates suggest that municipalities participating in ADEs experienced significantly higher average gains in the IDEB (Basic Education Development Index) than those observed in non-participating municipalities, with increases ranging approximately between 1.5 and 3.0 points over the analyzed period. These results remain consistent after verifying the

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assumption of parallel trends in the pre-treatment period, indicating that the estimated effects can be interpreted as a causal impact of institutionalized intermunicipal cooperation. The data suggest that ADEs have the potential to boost indicators of educational development, especially regarding the evolution of the IDEB, although the identification of full causality depends on controlling for intervening variables, such as concurrent state policies, local socioeconomic characteristics, and the administrative capacity of the municipalities.These results were corroborated by primary data from Inep (2025), Qedu and reports from Todos pela Educação (2020), confirming that bottom-up horizontal cooperation can mitigate the limitations of federal verticality.

The methodology used was highly effective, as it combined positivist and phenomenological perspectives for a holistic analysis. The explanatory phase, anchored in the Diff-in-Diff approach, allowed for the identification of causal relationships between variables such as adherence to ADEs (Academic Development Agencies) and improvements in the IDEB (Basic Education Development Index), isolating external factors and providing robust evidence on the impact of federative cooperation. Complementarily, the descriptive phase detailed the fiscal scenario, using secondary data from sources such as Ipea (Institute for Applied Economic Research), the Senate, and Inep (National Institute for Educational Studies and Research), while the literature review was based on several classic and contemporary authors who only reinforced what the data evidenced. This methodological integration was crucial to uncovering complex dynamics, such as those of power and financing, that determine educational inequalities between rural and urban municipalities. Without this hybrid approach, the research would have been limited to superficial descriptions, ignoring the qualitative "whys" behind the numbers, such as the persistence of service gaps due to the absence of a fully-fledged National Education System (SNE) by 2025.

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However, we encountered significant difficulties throughout the research inherent to the methodology itself. For example, when analyzing the evolution of the IDEB (Basic Education Development Index) in municipalities inside and outside ADEs (Areas of Economic Development), it is not guaranteed that the results constitute absolute causal evidence, as the improvement in the indicator may be associated with other uncontrolled variables, such as private investments, population migrations, or parallel state policies. Although we applied the Diff-in-Diff method to mitigate biases, the analysis focused exclusively on the relationship with ADEs, without exploring multifactorial interactions, which demanded an exhaustive effort in collecting and processing data from thousands of municipalities. Furthermore, consolidating older authors, such as Motta and Moreira (2007) and Souza (1993), with contemporary authors, such as Muñoz Moreno (2020), was challenging due to conceptual and contextual evolutions, requiring a critical synthesis to avoid anachronisms. There was no single, comprehensive theoretical framework that encompassed all phenomena, such as the federal pact, the new Fundeb, VAAT, VAAR, ADEs, and consortia in an integrated way, which forced us to resort to key authors for each topic. This bibliographic fragmentation, while making this article unique by proposing a systemic view, highlighted the scarcity of holistic works in the Brazilian literature on educational federalism.

The contributions of this research advance the thematic area of Public Administration, particularly in the working group on educational policies and federative governance, by offering a novel analysis that integrates financing, cooperation, and dialogue in the municipal context. The study provides practical tools, such as recommendations for adherence to the VAAR without excessive bureaucratization and strategies to strengthen ADEs, promoting more efficient and equitable administration. More broadly, it contributes to the debate on cooperative federalism in Brazil, emphasizing that educational equity is not only a budgetary issue, but also an ethical and territorial one, aligning with the Sustainable Development Goals (SDG 4) of the United Nations (UN).

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Despite methodological care and the use of Difference-in-Differences models, this research acknowledges threats to internal validity that may influence the observed results. An important factor is the migration of students between school systems. The recent economic crisis led almost one million students to leave private schools and enroll in public schools, substantially altering the profile of municipal enrollments. For example, in Tocantins, municipal enrollment increased from 29,000 students in 2019 to 42,000 in 2021. This dynamic may inflate the IDEB (Basic Education Development Index) of some municipalities without this directly resulting from actions by the ADEs. Another threat relates to direct state investments. When estimating state spending on education, studies such as that of INESC consider state and municipal enrollments together, since state investments also benefit students in municipal school systems. Thus, state teacher training programs, curriculum reforms, or infrastructure can have a positive impact on the IDEB (Basic Education Development Index), confusing the attribution of causality to ADEs. Finally, it is acknowledged that other contextual variables (local administrative capacity, competing federal policies, and macroeconomic shocks) may interfere with the results. Therefore, the effects found in this research should be interpreted as strong correlations under controlled conditions, and not as definitive proof of causality. It is recommended that future studies incorporate additional data, track student mobility, and measure state and federal investments to reinforce the causal validity of the findings. The main regression estimates are summarized in a synthetic table reporting coefficients, robust standard errors, significance levels and 95% confidence intervals, allowing direct assessment of both direction and magnitude of the estimated effects.

It is also suggested to further examine aspects such as the longitudinal impact of VAAR on racial and socioeconomic indicators, incorporating multifactorial variables into the Difference-in-Differences (Diff-in-Diff) model to enhance causal robustness. Furthermore, comparative research between ADEs and intermunicipal consortia could explore hybrid governance models, while

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qualitative ethnographic analyses in vulnerable municipalities could reveal local narratives about cooperation. Addressing these challenges reinforces the federal pact as an instrument of inclusion, ensuring that every Brazilian child, regardless of geographic origin, has access to a transformative education.

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Author Responsibility Statement

All authors must have made substantial contributions to the conception, design, execution, or interpretation of the study. The corresponding author is responsible for ensuring that all authors approve the final version of the manuscript and agree to its submission to JIRRS.