

Review

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Post-Secondary Expansion and Quality in the Brazilian Federal University System

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Abstract: The expansion of tertiary education systems has assumed considerable importance worldwide, given the needs of underserved populations and its contribution to national and regional development. At the same time, few studies have examined the relative impact of system expansion, particularly with respect to its effects on system quality and performance. This paper examines the impact of post-secondary expansion within Brazil's federally funded university sector, which has grown substantially during the past two decades. Using data from both official and non-government sources, the study reveals significant disparities between more established and newer federal universities suggesting that in its initial phases at least, system expansion may not always deliver the quality promised.

Keywords: Post-secondary education; Brazil; university expansion

1. Introduction

A growing literature exists outlining the benefits of post-secondary expansion in both developed and developing countries, particularly within underserved regions and populations. The benefits of enhancing access to tertiary education are posited as manifold. These include broadening access to training and skills upgrading, the enhancement of local infrastructure, the expansion of innovation networks, and the promotion of economic development more broadly. While a number of studies have assessed the measure and scope of such contributions in the case of individual institutions and localities, relatively little has been written about broader attempts to expand whole post-secondary systems, particularly within the public realm. Nor are data always available that would

even allow for effective assessment of the outcomes of system expansion, particularly in terms of institutional quality and performance.

Brazil provides an excellent starting point to further explore the impacts of tertiary system expansion. The world's sixth most populous country and 11th largest economy, Brazil continues to face many challenges associated with serious income disparities across the country's rural-urban and regional divides.^[1] Levels of

¹ Brazil's population in 2025 was approximately 213 million and its Gross Domestic Product US\$1.7T. The United Nations Development Program (UNDP) has placed Brazil within the high development category, ranking it 84th out of 193 countries. According to the UNDP, Brazil has a GINI score of 52.0, rendering one of the most unequal countries on earth. By comparison, countries such as Denmark and Sweden both have GINI scores under 30 (UNDP, 2025).



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education are also far below the standards of the most developed nations. Brazilian students spend an average of 8.4 years in school as compared to 12 or more in Western Europe and North America (UNDP, 2025). To help address these inequities, Brazil has over the past quarter century made great strides in expanding educational access, and at all levels (Souza et al., 2019). Particularly noteworthy has been the expansion of tertiary education, especially within the federally funded public sector. Between 2000 and 2025, federal universities witnessed unprecedented growth, increasing in number from 39 to 69, and operating in all regions and states of Brazil (Neto and de Nez, 2021).

In this paper, we focus on the dimensions and the impact of this growth from an educational quality perspective. Using data from a variety of sources within and outside government, we examine institutional core indicators such as faculty qualifications, the quality of teaching, investments in graduate programming, and engagement in research and innovation, in order to better understand how system expansion has affected overall institutional performance. The study reveals significant disparities on many of these measures between more established and newer universities suggesting that enhanced access may not always mean quality access for the new populations that are served.

2. Perceived Benefits of University Expansion

The positive contribution of tertiary education to societal well-being across a variety of development contexts has been uniformly established within the literature. Whether in terms of promoting economic growth (Smith and Bagchi-Sen, 2012; Wjuniski, 2013), the creation of new knowledge and innovative practices (Fonseca and Neith, 2021; Oliveira Jr. et al., 2018), skills development and upgrading (Arbo and Benneworth, 2007; see also Benneworth and Fitjar, 2019), or their contribution to mitigating social challenges (Thomas and Pugh, 2020; Lesnieski and Trevisol, 2021), universities have long been seen as essential to societal well-being and growth.

What is true of whole nations is equally true of sub-national units, according to researchers. In fact, increasing numbers of researchers have focused on the contribution of post-secondary education within local communities. Smith and Bagchi-Sen (2012) have characterized university expansion as critical

to regional growth, while Fonseca and Nieth (2021) refer to tertiary education as a “trigger” for local development. According to Porter (2007: 43-44), this is true insofar as regional post-secondary institutions have in many parts of the world served as major employers, real estate developers, incubators, and important sources of skilled labour. Garrido-Yserte and Gallo-Rivera (2010) have referred to such economic benefits in terms of “supply” and “demand” side effects, promoting on the one hand, the development of human capital and knowledge, and on the other, increased local expenditure. This is in addition to the more obvious contributions—cited liberally in the literature—related to local population growth, political engagement, the expansion of cultural offerings and quality of life more broadly (see Garrido-Yserte and Gallo-Rivera, 2010).

Without question, such presumed benefits have stimulated many national governments to adopt university expansion policies as a cornerstone within their regional growth strategies (Arbo and Benneworth, 2007). Thomas and Pugh (2020) point to governments’ expectations regarding the role of regional institutions in helping to address regional imbalances in employment and income levels. Other research has pointed to government objectives seeking to develop strong linkages between key post-secondary roles in advanced training and innovation, as well as the stimulation of local entrepreneurship (Sanchez-Barrioluengo, 2014; Benneworth and Fitjar, 2019). The European Union has even produced its own guide to help authorities develop policies that better connect post-secondary institutions to local development outcomes, focusing for example on the development of more effective partnerships (including both the public and private sectors), stressing impact and transformation in program development, best practice and information sharing, and expansion of the concept of innovation to include the social sciences and humanities as a mechanism to address societal challenges (EU, 2011).

A significant qualification to such expectations is that not all universities may in fact be purpose suited for these roles. Altbach (2007: 112) for example, has focused on the relative benefits of the “research university” in this regard. Here he is referring to institutions focused on excellence in advanced level training and research which offer the greatest potential

to deliver local benefit both on the demand (increased local investment) and supply sides, through the cultivation of intellectual and technology-based leaders and the generation of new knowledge that can drive innovation. These ideals, he maintains, moreover, are best developed and maintained through the public domain, as this is often the only source of capital large enough to fund and support the human and physical infrastructure required to realize these objectives (Altbach, 2007: 115, 119, 127).

3. University Expansion in Brazil

Brazil provides an excellent example of how these principles and expectations regarding expansion of tertiary education have driven government policy. From relatively modest beginnings, Brazil's post-secondary sector has grown markedly since the 1990s, with particular emphasis on increasing the number and the geographic distribution of federally funded research universities; in other words, institutions that according to Altbach, possess the best chances of contributing to national and regional development.

Such growth contrasts sharply with the relatively slow progression of tertiary education in Brazil during the better part of the last two centuries. Following independence from Portugal in 1822, early institutions focused on training in the professions—law, medicine, and engineering most notably (Nader, 2017, Steiner, 2007). It took the better part of 19th century and early 20th to establish even a modest network of university-level institutions (19 in all), over half funded by the federal government and the rest by religious institutions—primarily the Roman Catholic Church.

Only after the suspension of democracy and the establishment of Brazil's military government in 1964 did the country's modern university structure start to emerge. Strongly technocratic and focused on measures designed to propel Brazil into the ranks of "developed" nations, the ruling military invested heavily in tertiary education, through expansion of both public and private institutions (Souza et al., 2019). This growth largely continued following the return to democratic government in 1985, such that by the end of the 20th century, over 156 universities were operating in Brazil, with a total student enrolment of 1.8 million (MEC, 2000). Notably, over half of those enrolled were studying at public institutions, and more than half of

these again at the 39 federal universities established by this time. (MEC, 2000).

4. Assessing Growth in the Federal System

Brazil's 2001 Plano Nacional de Educação (National Education Plan) (Chaves, 2012) served to further strengthen the country's post-secondary sector (Vinhais, 2013) at the start of the 21st century. It was only with the election of the left-wing government of Luiz Inácio (Lula) da Silva in 2003 that serious investments began to be made across the educational spectrum. Significant funds were dedicated specifically to the expansion of the federal university system (see Aguilar & França, 2020; Coimbra et al., 2021), guided by the Lula government's 2007 "Programa de Apoio a Planos de Reestruturação e Expansão das Universidades Federais" (Financial Support Program for the Expansion and Restructuring of Federal Universities - REUNI) (Arruda and Gomes, 2015; Moro & Gisi, 2023).

During the years of the Lula government (2003-2011), and its successor led by Dilma Rousseff (2012-2018), investments in the federal university network grew from just over R\$8.8B to nearly R\$47.4B, a near six fold increase, and significantly higher than the rate of inflation over the period (SIOP, 2001; 2010; 2018). The institutional presence of the federal system itself nearly doubled, from 39 institutions in 2000 to 69 in 2020, with enrolments rising to over 1 million. These counted for over 34 percent of all university enrolments in Brazil, and for two-thirds of the public post-secondary system (MEC, 2001; 2020).

Where quantitatively, such numbers are surely impressive, the question becomes whether or not such dramatic increases are actually accompanied by the potential advantages envisioned by government policy. To date, research on this question is relatively sparse. Much of this work has focused relatively narrowly on the impact of the new federal campuses on local economies (Haas and Pardo, 2016). In this regard, Kureski and Rolim (2009) provide one of the earliest theoretical attempts to develop a methodology that effectively assists in making this calculation within a particular region or locality. Subsequent quantitative analysis by Vinhais (2013) analyzing the short term effects of federal expansion, points specifically to

relatively modest increases in household income in host municipalities (3.3 percent), and particularly smaller sized communities. Research by Barbosa et al. (2014), revealed short-term, but unsustained economic impacts in smaller municipalities, with larger centres more likely to experience long-term financial gain. Positive findings overall regarding the effects of new universities on host municipalities on income distribution were later confirmed in an extensive quantitative analysis conducted by Casqueiro et al. (2020). Niquito et al. (2018) largely support the finding that increases income per capita in host municipalities have occurred as a result of expansion, but also provide some additional insights of note. For example, they observe that host municipalities post lower rates of fecundity, likely associated with increasing family income and economic security. Interestingly as well, they reveal that contrary to what might be expected, levels of education within host communities have actually decreased, perhaps as newly trained skilled workers leave their communities to seek work in larger centres (Niquito et al., 2018: 387).

At least two other studies have focused on the impact of new federal university campuses in specific regional settings. The first, authored by Hoff et al. (2011) examined the establishment of Unipampa in the southern state of Rio Grande do Sul. Using questionnaires and bibliographic sources, they found that since its creation in 2008, Unipampa had contributed not only to increases in local salary levels but also associated increases in local spending, demand for housing and demand for services. Similar research by Krajevsk (2022) focusing on the newly formed Universidade Federal da Fronteira Sul, also in southern Brazil, reemphasized the role of new federal institutions in boosting income and demand, but also the quantity and quality of local infrastructure (See also Silva and Castro, 2015).

While the economic case for university expansion within the federal public sector seems largely to have been made, it is somewhat puzzling that such scant attention paid to the relative quality of these new institutions as critical components within the broader and more established national university network. This is especially important given the historic role of Brazil's federal universities as embodying the best of those characteristics defined by Altbach (2007) in his

assessment of the role of “research universities”.

To be sure, newer institutions are subject to the same quality standards as more established ones. These include collection of student and program performance data by the Ministry of Education, evaluation of graduate programming in particular through CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior—Agency for Support and Evaluation of Graduate Education), and student quality standards maintained through the federal university system's use of the country's standardized university entrance exam, the ENEM (Exame Nacional do Ensino Médio) (Guerra and Souza, 2020). While these and other measures have frequently been used to shed light on the performance of individual institutions, as yet no post-expansion analysis of system and or sub-system wide performance has been undertaken in Brazil.

5. Data Sources

In order to address this issue, this study reviews a plethora of relevant quality-linked performance data from both government and unofficial sources. The primary source of information informing this investigation were drawn from the Ministry of Education (MEC) and its associated organs, such as the Instituto Nacional de Estudos e Pesquisas Educacionais (National Institute of Educational Studies and Research—INEP). Also included here are data from Brazil's primary funder of graduate education, CAPES. As CAPES undertakes evaluation of graduate programs as opposed to whole institutions, average performance scores across all programs offered by institutions are used here. All such data are publicly available and are accessible through web links cited throughout the text and in the references section.

Other institutional quality measures were sourced from Folha newspaper's authoritative “Ranking Universitário Folha” (RUF). Informed by real time data provided by government, institutions, and alumni sources, these annual rankings provide unique insight into university quality in Brazil on par with many international ranking exercises, such as the QS and Times Higher Education surveys (Ávila Soares 2022). Specific sources utilized in determining institutional scores and rankings, as well as the methodologies employed, may be sourced at RUF (2025). The 2023 RUF data cited here are used by permission granted the

author by the Folha.

Data analysis described in the sections which follow was exclusively undertaken by the author using IBM's Statistical Package for the Social Sciences (SPSS). Any errors or omissions in the data or its presentation rest solely with the author.

6. Results

As outlined earlier, expansion of the federal university

network in Brazil after 2000 has been nothing less than dramatic. Where in that year some 39 institutions were operating in all of Brazil's 26 states and the Federal District, that number grew to 69 by 2020. Using the data sourced as indicated in the previous section, the analysis conducted here seeks to compare performance of the newest institutions—those created since 2000—with that of pre-existing, more established federal universities.

Table 1. Correlations Across Select Performance Indicators for Federal Universities in Brazil

Indicator		Location in State	Year of Establishment
Percentage of faculty teaching at graduate level	Pearson Correlation	.314	-.480
	Sig. (2-tailed)	.009	<.001
	N	69	69
CAPES Score	Pearson Correlation	.282	-.492
	Sig. (2-tailed)	.021	<.001
	N	67	67
Percentage of faculty with Ph.Ds	Pearson Correlation	-.088	-.268
	Sig. (2-tailed)	.471	.026
	N	69	69
Folha Ranking Score--Teaching	Pearson Correlation	.295	-.677
	Sig. (2-tailed)	.015	<.001
	N	68	68
Folha Ranking Score--Research	Pearson Correlation	.325	-.663
	Sig. (2-tailed)	.007	<.001
	N	68	68
Folha Ranking Score (/100)	Pearson Correlation	.397	-.698
	Sig. (2-tailed)	<.001	<.001
	N	68	68

Sources: MEC (2023); CAPES (2022); RUF (2023)

An examination of associations across a number of key variables using 2024 data suggests some considerable variation in this respect. These are summarized in **Table 1**. For example, an institution's year of establishment is negatively and significantly correlated with the percentage of faculty with Ph.Ds, with a score of $-.268$, suggesting that students enrolled at newer institutions are less likely to be taught by the most qualified university instructors. The relationship between year of establishment and the percentage of faculty involved in graduate education is even more striking, with a score of $-.480$, pointing to a dearth of such programming for institutions created after 2000. Equally striking are differences in the quality of graduate programming between older and newer institutions, as measured by the CAPES score. Here the

correlation between the average institutional CAPES scores and year of establishment is $-.492$, suggesting that students would be much more likely to find more highly rated graduate programming at Brazil's older, more established federal institutions.

Table 1 also reveals a significant negative relationship between year of establishment and location within one of Brazil's 26 state capitals, with a correlation of $-.435$, largely confirming that post-2000 federal system expansion has largely focused on more underserved areas of the country (i.e. outside major urban agglomerations). Importantly, there appear minimal differences in qualification of faculty between institutions located within and outside state capitals, with a correlation of $-.88$. If anything, the negative correlation suggests that institutions outside state

capitals are likely to have slightly higher proportions of faculty with doctoral degrees than in the larger centres. This may be possibly a result of the tightening of the market for university faculty positions overall in Brazil, rendering appointments at smaller, more remote institutions more attractive to candidates. At the same time, the positive correlations for both variables associated with the quality of graduate education—the percentage of faculty engaged in graduate education and the institutional average CAPES score—at .314 and .282, respectively—suggest that institutions outside state capitals are at a relative disadvantage compared to their counterparts in state metropolises.

Table 1 also presents another series of correlations related to institutional quality that were drawn from the 2024 Rankings da Folha exercise. First of all, the **Table** reveals a strong and negative correlation between the overall Folha ranking score and an institution's year of establishment. This is replicated as well for both ranking scores related specifically to the quality of teaching and research. A similar but somewhat moderated trends for rankings scores and location in state capitals is also in evidence. Here, overall ranking scores, as well as scores for teaching and research, are all positively associated with an institution's presence in state capitals.

Table 2. Location of Federal Universities Established since 2000

Region	In State Capital	Outside State Capital	Total
North	2	2	4
North-East	1	10	11
Central-West	0	4	4
South-East	0	6	6
South	2	3	5
Total	5	25	30

Source: MEC (2023); Niquito et al. (2018)

In order to better understand these dynamics, **Tables 2** and **3** provide broader insight into contours of federal system expansion itself, with respect to both geography and institutional scope. With respect to the former, **Table 2** shows that the post-2000 expansion has touched all of the five main regions that make up the country.² At the same time, over twice as many new institutions are located in the North-East as in other

regions, largely reflecting the region's population and historically underserved status within the federation. The **table** also provides data regarding the distribution of the new institutions within and outside state capitals. In the North and South regions, the locational split between the two is roughly even, while institutions outside state capitals predominate in the North-East, Central-West and South-East.

Table 3. Types of Federal Universities Established since 2000

Region	New Build	Federal University	Existing Institution	Total
North	0	3	1	4
North-East	3	6	2	11
Central-West	0	4	0	4
South-East	1	0	5	6
South	3	0	2	5
Total	7	13	10	30

Source: MEC (2023); Niquito et al. (2018) ; Institutional websites.

² Brazil is composed of 5 macroregions, each encompassing from three to nine states. The Federal District is part of the Central-West region. There is considerable disparity between the poorest two regions—the North and the North-East, and the more prosperous Central-West, South-East and South

regions. In 2020, family incomes per month in the North and North-East were about 70 percent of the national average of R\$1380 (R\$1 is worth approximately US\$.20). In all other regions, family incomes exceeded the national average by from 12 to 19 percent (IBGE, 2020).

Table 3 examines the origins of the new institutions themselves, which fall into one of three categories (see Niquito, et al., 2018). As **Table 3** demonstrates, of the 30 institutions established since 2000, nearly half (n=13) were created as spin-offs from existing federal universities within the same region, and virtually all of these in the North, North-East and Central-West. The second largest contingent (n=10) were created as a result of the elevation of existing post-secondary institutions to the status of “university”, predominantly in the South-East and South. Some of these had roots extending well back in the previous century. Finally, only seven were essentially greenfield new builds, six of which were established in the North-East and South regions of Brazil.

When this complexity of origin is reapplied to a consideration of some of the key performance variables

considered in **Table 1**, an interesting pattern emerges. **Table 4** assesses the relative performance of each “type” of newer institution through a comparison of means with overall system averages. To begin with, the **Table** reveals clear differences between the three types of new institutions in terms of the percentage of faculty with Ph.Ds. Both new builds and institutions which secured elevated status after the year 2000 approximate or exceed the national mean of 83 percent. For federal university spin-offs, the number is much lower at 76 percent. Regarding faculty who are teaching at the graduate level, percentages are lower across the board, but here again, with a much lower percentage posted for federal university spin-offs, at 35 compared to the national mean of 55 percent. This is reflected as well in CAPES ratings, which are highest and closest to the mean for status elevated institutions.

Table 4. Performance Indicators of Federal Universities Established since 2000

Indicator	National Mean	New Build	Federal University	Existing Institution
<i>Personnel</i>				
Percentage of faculty with Ph.Ds	83	86	76	85
Percentage of faculty teaching at grad level	55	49	35	47
<i>Quality</i>				
CAPES Score	4.0	3.5	3.6	3.8
Ranking Score Overall	63.3	46.5	33.7	60.9
Ranking Score Teaching (/32)	21.8	17.1	13.1	21.5
Ranking Score Research (/42)	28.2	22.6	14.8	29.6
Ranking Score Innovation (/4)	2.4	1.8	1.5	2.3
Ranking Score Market (/18)	9.0	2.8	4.4	5.0

Sources: MEC (2023); CAPES (2022); RUF (2023)

In terms of quality measures linked to the Folha rankings, a similar pattern emerges. Here we examine performance in four distinct respects. These include not only teaching and research, but two additional variables as well. The first seeks to measure an institution’s ability to capitalize on innovation, measuring by rates of licensing and patenting of invention, while the other seeks using employer surveys to measure the degree to which an institution’s graduates are preferred as prospective new hires.

Of the three types of new universities, only the status elevated institutions approximate national averages, with respect to overall score and scores for teaching, research, and innovation. Both new builds, and particularly federal university spin-offs find themselves

much lower on the scale on all four measures. The one exceptional category is that which measures the fit between university offerings and the needs of prospective employers. In all cases, scores are half or less of the national mean, with the lowest scores posted for new builds. Notably, however, both spin-offs and upgraded institutions fare better on this category than new builds, likely due to their pre-existing presence within the communities they now serve as universities.

7. Conclusion

While fairly limited in scope, the analysis conducted here reveals a pattern of performance that clearly differentiates newer institutions from those existing prior to 2000. While the process of expansion itself

appears to have been substantially achieved, supported by billions of Reais in new funding and as evidenced by the presence of the new universities themselves outside of major population centres, questions remain as to the real value of such expansion to the new populations that are served by them.

It is equally true that not all types of institutions have achieved the same level of success in terms of their contribution in service of their host localities. As to why this is so is beyond the scope of the present examination. Nevertheless, at least come conjecture may be offered at this point.

Certainly It would appear that expansion has best served to enhance quality access for students where newly created universities were the result of institutional upgrading. Of the 10 that fall into this category, many were founded in the early half of the 20th century, with at least three dating to before 1920. Operating as federal “centres”, “faculties”, or “institutes”, such institutions already maintained in good measure functioning programs in specific areas that were well subscribed and managed by a faculty cohort already well established and often engaged in research. In this regard, they were well prepared for the challenges of institutional upgrading, and effectively prepared to hit the ground running.

Presumably, those institutions spun off from existing universities, most often within the same state, appear to have been less successful in this regard. This may be due to the fact that, operating essentially as satellites to main campus located sometimes hundreds of kilometres from state capitals, they were focused primarily on undergraduate teaching, and much less so, research. They were much less prepared to assume roles of “research universities” as characterized by Altbach (2007). It is also possible as well that existing cohorts of faculty may well have been “culturally formed” by the time they were spun out from their host institutions. In this context, expectations regarding faculty performance, a desire to engage in research or graduate teaching may have already been established and less mutable than in other contexts.

As the data reveal, in many cases, the quality ladder has been the most difficult to climb in brand new institutions. Obviously, it takes time to build campuses and facilities, contract faculty and build programs where none previously existed. At the same time, the

potential in such institutions for innovation and growth in ways that best align with the needs of the localities in which they are located are clearly present. This represents an area of true promise for these institutions in the months and years ahead.

Of course, only further research in the field can confirm these notional explications and help guide future development of Brazil’s newest federal institutions. There is no question that it takes time to build, operate and fully develop new research universities, regardless of their institutional origin. That, furthermore, will require continued focused investments and consistent monitoring by federal authorities, specifically through the kind of measures that were applied in this study. Hopefully this initial, more quantitatively` oriented examination can help the stage for the more in-depth investigation and analysis required to help guide this process.

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