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RANKINGS AND THE IDENTIFICATION OF INEQUITIES WITHIN THE BRAZILIAN FEDERAL UNIVERSITY SYSTEM

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ABSTRACT

International and national university ranking exercises have attracted increasing criticism in recent years, as observers question the integrity of the methodologies employed, the influence of rankings on institutional decision making, and ultimately the utility of the exercise. At the same time, for stakeholders *per se* rankings can have beneficial effects, particularly in enhancing institutional recognition, attracting top faculty and researchers, as aids to student choice and decision-making, and stimulating program improvement. Another important effect—which has drawn scant attention in the literature to date—relates to the impact of rankings exercises in exposing unintended quality related inter-institutional anomalies within university ecosystems. In this study, the role of rankings in this regard are examined in the specific case of Brazil, through an investigation of regional inequities in that country's publicly funded federal university network.
Keywords: Brazil, universities, rankings, post-secondary findings, regional inequities

In recent years, university rankings have become a multi-million-dollar enterprise, attracting the attention of a broad range of actors within the academic system, from parents and prospective students, to faculty, university administrators and even national and regional governments. Among ranking exercises, a relatively small number of players now dominate international markets, including the QS World University Rankings ([QS] 2018), the Times Higher Education ([THE] 2018) rankings, and the Academic Ranking of World Universities ([ARWU] 2018). These are joined by a plethora of national and specialist rankings sponsored by government,

newspapers and magazines, not-for-profit organizations, and occasionally governments.

Often, the specific objectives of these exercises vary. For the most part, however, comparative assessments of institutional quality—employing both qualitative and quantitative methodologies—remain the primary objective, touching on core activities and competencies within the academic enterprise. Typically, these will include teaching and learning, research productivity and impact, international engagement, community involvement, as well as factors linked to perceived reputation.

Given the competitiveness inherent in externally directed institutional assessments of quality, rankings and their sponsors have attracted more than their share of critics. Methods of data quality, data quality, analysis, and presentation are frequently cited in comparison and critique of rankings quality. Yet, the popularity of rankings persists, insofar as they can and do provide critical insight for prospective students into the relative quality of target institutions, help institutions themselves to attract top talent, and provide important comparative data to national ministries of higher education, as they seek to ensure transparency, accountability. and justify investments across higher education networks. With respect to this latter benefit, rankings also provide valuable means for stakeholders—and taxpayers—to test government claims with respect to system quality and accessibility. This is particularly true in regard publicly funded systems, where taxpayers and students would reasonably expect uniformity in terms of program offerings and especially quality, right across the entire system array.

This study examines precisely how rankings help expose such system anomalies in the case of the federally funded university network in Brazil, a country of some 210 million people. One of the largest of its kind in the world, the Brazilian federal network is shown to possess considerable variation in assessed quality across the nation's five principal regions. This study further identifies the key factors that underly and work to maintain these, within a centrally funded network that ostensibly relies on highly evolved funding formulas to ensure system fairness in resource distribution.

BACKGROUND

Assessments of university quality have a long history. It was not until the 1980s, however, that serious attempts at systematic institutional rankings at the national and international level began to emerge. Since that time, in academic circles at least, rankings organizations such as THE, ARWU, and QS have become international powerhouses, attracting broad attention across stakeholders and even the general public (Marope & Wells, 2013).

Perhaps unsurprisingly, given the sources of rankings exercises (frequently in commercial enterprise), the competition they engender among institutions, and even their presumed influence over student decision-making and stakeholder perceptions of quality—rankings exercises have attracted significant criticism. Much of this focuses on the types of data that are collected. For example, critics have argued that

rankers tend to choose variables and or data that are relatively easier to collect and quantify as compared with what might actually matter in assessing academic quality (Hazelkorn, 2013; Liu, 2013). Measures of institutional quality linked to the numbers of resident faculty with doctoral degrees, for example, which are relatively easy to calculate, are almost invariably included in ranking designs, while others, such as support services offered to students, the quality of campus amenities, or access to public transit, are not (Maxwell, 2018). Compounding this bias are efforts undertaken by institutions with deeper pockets—either on their own, or with the help of consultants—to mine and massage readily available quantitative data in ways that directly influence ranking scores (Maxwell, 2018; Marope & Wells, 2013). Others have criticized the use of qualitative factors, particularly those related to assessments of institutional reputation that are rooted in individual impressions and may have little or no bearing on quality (Anowar et al., 2015; Liu, 2013). Further, Nyssen (2018) has pointed to the complete exclusion of some variables, particularly those associated with university contributions to local economic development. Similarly, Ordorika and Lloyd (2013) discuss the relative omission of factors assessing the role of post-secondary institutions in community service and health care provision, particularly where community-based services are lacking.

Other observers have focused on issues associated with data analysis. Both Maxwell (2018) and Bekhradnia (2016) for example, have pointed to limitations attributed to the use of two-dimensional ordinal ranking scales that occlude potentially wide variations across key variables within institutions, or between them, including variations in the quality of specific programs. In a similar vein, Anowar et al. (2015) have pointed out that frequently rankings fail to give proper credit to participating institutions when top ranked programs or research projects and successes are shared across universities and or other organizations. Finally, Bekhradnia (2016) has questioned the use and choice of specific *weighting factors* in the calculation of ratings that may favor some variables over others (i.e., research over community service).

Despite such criticisms, rankings remain as popular as ever, and across a broad range of stakeholders. Most obvious among these are students—and their parents—who frequently foot the bill for educational services. Indeed, both have become savvy consumers, weighing costs of tuition and living expenses against the likely gains of an education at a *top-ranked* institution (Buela-Casal et al., 2007; Hazelkorn, 2013). This is as true domestically, moreover, as it is internationally, as the popularity of study abroad activities has continued to grow in recent years. As of 2018, over five million students were attending institutions outside their own country annually (OECD, 2020). In making value for money decisions about attendance at one of the world's tens of thousands of universities, rankings can and do provide a critical resource where other sources of information may be limited (Sowter, 2013).

Students and their families are not the only avid consumers of published rankings. Universities themselves participate not only in the provision of institutional data, but actively seek access to the products of rankings. For example, rankings are often used by institutions for the purposes of recruitment—whether directed to students, post-doctoral fellows, or even faculty who are keen for employment at

reputable institutions. Rankings are also attractive as measures of quality and performance assisting appeals for donations from alumni and community supporters, as well as governments (Buela-Casal et al., 2007; Hazelkorn, 2013; Sowter, 2013).

For their own part, governments have also shown increasingly proclivity to use rankings for various ends. In many countries, rankings can and do provide input regarding strategic investment decisions, particularly where universities may be used to ensure delivery of regional or national priorities linked to economic development, health care, or international leadership in research and teaching (Marope & Wells, 2013). Ostensibly, they can also be used as a test of governments' ability to deliver on national post-secondary education systems that ensure consistency across networks or systems, and thus presumably reasonable levels of quality for citizens, regardless of where people may choose to study. This is particularly important in the case of publicly funded institutions, where citizens may have well-founded expectations that universities that are funded by their national governments or by sub-national units would be of uniform or reasonably uniform quality, regardless of their location or client-base. As rough proxies of institutional quality, rankings would help to establish this. Interestingly, however, this is a seldom studied aspect of the benefits of rankings exercises.

As a partial remedy to this deficiency, this study focuses on regionally based variations in assessed quality within Brazil's federally funded system of universities, as revealed by country's premier national university rankings exercise. Although all 63 of the federally funded universities examined are supported centrally from the national budgeting process using a formula with uniform inputs, ranking data reveal serious discrepancies between institutions that largely follow geographic patterns of affluence that largely define the nation (Bacha, 2012). This study attempts to both catalog these differences and to offer an assessment of the underlying structural features of the system that seemingly work to ensure its continuance.

The Brazilian University System

While the origins of the Brazilian post-secondary education system can be traced to the time of the country's independence from Portugal in 1822, it was not until the middle of the 20th century that the first 19 universities were fully established (Nader, 2017; Steiner, 2007). Significant expansion was not to occur until nearly twenty years later, following the military coup of 1964 and the implementation of a dictatorial regime that lasted until 1985. Strongly authoritarian and technocratic, the military government invested heavily in rapid economic development and education, including universities. As a result, post-secondary enrollments began to increase quickly during the dictatorship, as did the number and types of institutions themselves. These included public state universities, smaller *faculties*, private institutions, and a growing cohort of universities and training centers funded directly by the federal government itself. Such growth largely continued following the collapse of the regime in 1985 and a resumption of democratic governance. Today, Brazil's post-secondary system is one of the largest in the world, with approximately eight million students enrolled in over 2500 institutions of all types (Balbachevsky,

2013; Del Vecchio & Santos, 2016; Diniz & Goergen, 2019; Ministry of Education [MEC], 2017; Stallivieri, 2006).

Of these, however, only 197 are deemed by the MEC as full-fledged *universities*, accounting for half of all enrollments, at just over four million (see Table 1). The majority of these in turn, some 108, are publicly funded, operating at the federal, state, and municipal level, and are tuition free. Entry, however, is dependent upon student scores on the national university entry exam, the *Exame Nacional do Ensino Médio* (ENEM). All other universities are private, operating either as for-profit enterprises, or denominationally based not-for profits. In either case, such institutions depend wholly on tuition and other fees.

Table 1: Universities by Type and Enrollment, 2016

Type of University	Number	Enrollment
Federal	63	1,083,050
State	40	547,181
Municipal	5	49,248
Private	89	2,642,613
Totals	197	4,322,092

Note: MEC, 2017: Tabela 4.01; MEC, 2018

Resources available to universities of different types vary significantly. Relying as they do on student tuition and fees, the finances of private institutions are largely dependent upon market conditions and enrollments. Public institutions are another matter, but even here, levels of support can vary significantly. State and municipal institutions are largely dependent on transfers from corresponding levels of government and thus linked to budgetary priorities and regional income levels.

For its part, the federal university system—the single largest component of the publicly-funded array—was designed to mitigate this challenge, through the creation of a centrally-funded model that would ensure a measure of uniformity across states and regions regardless of local conditions. As part of the broader post-secondary system, the federal network has been guided by a multiplicity of federal laws and directives guiding its operations (and those of individual institutions) since 1968, when the network was first established. These initial directives were reinforced by guarantees contained in Brazil's democratic Constitution of 1988, the 1996 *Lei de Diretrizes e Bases* (Law of Directives and Foundations) and subsequent pieces of legislation—all intended to promote the establishment of an elite cadre of public, educationally autonomous institutions supporting the pursuit of knowledge and training, research, and community outreach of the highest caliber (Moreira et al., 2018; Souza et al., 2019). In further fulfilment of this national objective, the Brazilian government undertook a significant expansion of the system in the last two decades. Between 2003 and 2010, in fact, the number of federal universities increased from 45 to 59. By 2018, a total of 63 institutions were in place across Brazil, with campuses in operating both within and increasingly outside state capitals (Reestruturação e Expansão das Universidades Federais [REUNI], 2021).

As part of the federal budgeting process, and to manage resource allocation, the federal government had established in 1994 an algorithmic funding allocation model for federal universities based a number of key performance variables (Reis et al., 2017). These include the number of students at an institution, the number of professors, quality of physical infrastructure, educational levels of faculty, research output, the number of courses taught, and graduation success rates, among others. A 2005 revision contained an amendment to include two additional elements linked to operational and infrastructure requirements, respectively, and in 2010, considered factors related to commercialization of patents, and student-professor ratios. Also included in the calculation are the results of assessments of educational quality managed by the MEC's National System of Post-Education Evaluation (Sistema Nacional de Avaliação de Educação Superior-SINAES), and the Coordinating Body for Graduate Training (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior-CAPES), which monitor the quality of graduate level courses and research (Nader, 2016; Tenório & Andrade, 200). Still and all, even in the view of the Ministry of Education itself, which oversees the process, Brazil's federal university funding distribution model remains overwhelmingly based upon quantitative indicators, with quality assessments accounting for only 10 percent of the model ('MEC estuda', 2019). It should be noted as well that aside from federal transfers, federal universities have limited powers of income generation from local sources. Historically, based on latest data available, such income has been limited to no more than approximately 3.5 percent of total revenues (Stallivieri, 2006).

Ostensibly, funding models such as these have at their base an intention to ensure transparency, accountability, and fairness. To a considerable extent as well, they are designed to encourage maintenance of performance levels within institutions and thus ensure that quality education can be maintained across the system, and within each of Brazil's five major regions and 26 states. Consequently, Brazilian citizens and particularly students, might expect a generally equivalent quality of education within the federal system regardless of where they choose to study. This is in fact clearly stated within Brazil's 1988 constitution, which establishes the obligation the State to ensure "access to the highest levels of instruction, of research and of artistic creation, subject to the ability of each citizen" (Moreira et al., 2018, p. 140).

As will be shown in the following sections, in the Brazilian context, this has not generally been the case. Based upon analysis of findings from Brazil's national university rankings, the study reveals significant disparities in institutional performance—and thus arguably educational quality—across the federal system, largely associated with regional income levels.

DATA AND METHODS

Data informing this study were secured from several sources. The rankings data cited above were secured from the Folha de São Paulo which publishes each year Brazil's leading comprehensive national University Rankings (Rankings Universitário da Folha—RUF). The variables used to determine the rankings, the methodologies

employed, all the underlying data, and the final rankings themselves are made publicly available, and are used here with the permission of the *Folha*. The ranking is restricted to educational organizations classified by the MEC as universities (*universidades*), and with slight variation, includes all of the institutions listed in Table 1, including the 63 within the federal system.

The ranking exercise itself is conducted in a manner like the major global rankings (such as THE or QS) and adapted to the Brazilian reality in ways similar to other national rankings such as Maclean's (Canada), the U.S. News and World Report (US), and the Guardian (UK). The classification of institutions is based upon five criteria: academic research (42%), quality of teaching (32%), market impact (18%), innovation (4%) and internationalization (4%). The specific measures utilized are presented in Table 2, and each institution was assigned a score on each variable. A final score was then calculated out of 100, based on the sum of the partial scores for each variable which hen serves as the basis for the institutional rankings, numbered from 1 to 196.

Table 2: Ranking Criteria and Weights, Ranking Universitário Folha (RUF), 2018

Criterion	Weight (%)
Research	**42**
Total publications	7
Total citations	7
Citations per publication	4
Publications per faculty member	7
Citations per faculty member	7
Publications in national journals	3
Funding per student	3
Percentage of faculty considered productive by CNPq	2
Theses per faculty member	2
Teaching	**32**
National poll of university faculty	20
Percentage of faculty with Masters or Doctorate	4
Percentage of full and part-time faculty	4
Average *Enade* score of entering students	4
Market	**18**
National poll of company HR professionals	18
Innovation	**4**
Number of patents registered	2
Studies in partnership with industry	2
Internationalization	**4**
International citations per faculty member	2
Percentage of internationally co-authored publications	2

Note: Folha, 2019b

This information was supplemented with additional data on each institution not available from the RUF, including geographic location and levels of per capita income, institutional budgets and expenditures, total and program enrollments, demographic characteristics of students and teaching staff, and qualifications of faculty. These were secured from a variety of sources including the Brazilian Federal budget, the Ministry of Education, and the federal statistical agency, the *Instituto Brasileiro de Geografia e Estatística* (IBGE). Taken together, the dataset formed a very rich portrait of both the ranked institutions themselves and ranking factors linked to measures of educational quality. To further assess the relationships between these various factors, the data were analyzed using SPSS.

While this study refers to the larger set, or subsets of institutions, the focus in the analysis remains the 63 institutions that form the Brazilian federal university system. It is important to note that these institutions represent the entire population of federal institutions, and not a sample of a larger group. Consequently, descriptive statistics and the results of various analyses presented here directly describe the situation of the federal network as it currently exists, obviating the need to apply inferential statistics such as measures of significance.

RESULTS

As a first step in the analysis, the author examined the 2018 RUF results focusing on differences in scores across university types, presented in Table 3. Notably, there are significant differences in rankings across categories of institutions largely related to sources of funding. Publicly funded institutions, whether at the federal or state level, generally outperform municipally supported or private institutions by a fairly wide margin, with federal universities posting scores significantly above their state counterparts.

Table 3: Mean Performance Scores by Institutional Type, 2018

Type of University	N	Mean Score
Federal	63	62.73
State	38	47.16
Municipal	6	25
Private	89	39.87
Total	196	

Note: Folha, 2019a

Table 4 presents a closer examination of the top 20 performing institutions across Brazil by score, revealing some notable trends. To begin with, and as expected, virtually all of the top performing institutions are publicly funded, with the exception of two private institutions—both linked to Brazil's Catholic Church. Second, despite their lower performance on average, several state institutions are represented, including in the very top rank, suggesting a wide variation in the rankings

performance of universities in this category. Third, most of the institutions listed tend be geographically clustered in Brazil's South and Southeast regions which, as shown in Table 5, are among the wealthiest in Brazil. The sole exceptions are the Universidade de Brasília, in Brazil's Federal District (located in the Central-West), the Universidade Federal do Ceará, the Universidade Federal de Pernambuco, and the Universidade Federal da Bahia (all located in the Northeast). Not one university in the Northern region of Brazil makes the list.

Table 4: Top 20 Institutions in RUF Ranking, 2018

University	Level	RUF Rank
Universidade de São Paulo (USP)	State	1
Universidade Federal do Rio de Janeiro (UFRJ)	Federal	2
Universidade Federal de Minas Gerais (UFMG)	Federal	3
Universidade Estadual de Campinas (UNICAMP)	State	4
Universidade Federal do Rio Grande do Sul (UFRGS)	Federal	5
Universidade Federal de Santa Catarina (UFSC)	Federal	6
Universidade Federal do Paraná (UFPR)	Federal	7
Universidade Estadual Paulista Julio de Mesquita Filho (UNESP)	State	8
Universidade de Brasília (UNB)	Federal	9
Universidade Federal de Pernambuco (UFPE)	Federal	10
Universidade Federal de São Carlos (UFSCAR)	Federal	11
Universidade Federal do Ceará (UFC)	Federal	12
Universidade do Estado do Rio de Janeiro (UERJ)	State	13
Universidade Federal da Bahia (UFBA)	Federal	14
Universidade Federal de Viçosa (UFV)	Federal	15
Universidade Federal Fluminense (UFF)	Federal	16
Universidade Federal de São Paulo (UNIFESP)	Federal	17
Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS)	Private	18
Pontifícia Universidade Católica do Rio de Janeiro (PUC-RIO)	Private	19
Universidade Federal de Goiás (UFG)	Federal	20

Note: Folha, 2019a

A review of institutional scores for state and federal institutions within the entire RUF listing (see Table 5) provides further insight into differences across public institutions and regions. As expected, for almost every region of Brazil, federal

institutions outscore state universities, and by a fairly wide margin (see Table 6). The sole exception is the Southeast, where these two institutional types are essentially tied. It comes as little surprise, consequently, that the only state universities making the top 20 list come from this region, with three from the state of São Paulo alone.

Table 5: Regional Population Distribution and GDP per Capita, 2018

Region	GDP/Capita	Population (%)
North	R$19,204	18,182,253 (9)
Northeast	R$15,905	56,760,780 (27)
Central-West	R$39.312	16,085,885 (8)
South	R$36,312	29,754,036 (14)
Southeast	R$38,544	87,711,946 (42)
Total		208,494,900 (100)

Note: IBGE, 2019a: 9; IBGE, 2019b

Table 6: Mean Performance Scores for Federal and State Universities by Region, 2018

Region	Federal		State	
	N	Score	N	Score
North	10	40.74	5	21.54
Northeast	18	57.27	14	41.80
Central-West	5	72.9	3	38.91
South	11	68	9	53.88
Southeast	19	74.48	7	73.87
Total	63		38	

Note: Folha, 2019a; IBGE, 2019b

In some measure, these variances may be explained by differences in levels of funding to each type of institution in different regions of Brazil. As Table 7 reveals, per student funding provided by state governments in nearly all regions is considerably less than that provided by the federal government. The sole exception is Brazil's Southeast region, where funding levels for state universities exceed that provided to federal institutions and are nearly three times state funding levels exhibited for the North, Northeast, or Central-West.

Table 7: Mean Funding per Student at Federal and State Universities by Region, 2018

Region	Federal		State	
	N	Mean funding per student (R$)	N	Mean funding per student (R$)
North	10	27,066	5	18,008
Northeast	18	35,292	14	20,585
Central-West	5	29,508	3	19,209
South	11	49,525	9	36,256
Southeast	19	44,538	7	52,413
Totals	63	38,970	38	36,658

Note: GEOCAPES, 2017; MEC, 2018; INEP, 2019

For state universities then, the association between levels of state support for public higher education and performance on the RUF ranking is relatively clear. Arguably, states in wealthier regions of the country are well able to sustain elevated levels of operational and capital funding that provide a better quality of education for students, resulting in higher RUF scores.

Albeit less dramatically, as well as unexpectedly, this same argument also seems to hold in the case of federally funded institutions. As Tables 6 and 7 show, variations in RUF performance across federal institutions and regions are almost completely aligned with levels of federal funding per student; in other words, federal institutions in regions with higher levels of per student funding generally perform better than those in regions with lower funding. Referring back to Table 5, it is equally evident that these are the same regions with the lowest levels of income per capita. By contrast, the institutions located in the wealthiest regions of Brazil, with the highest levels of per student funding, perform best in the rankings.

This is a surprising result, given that unlike state universities, which depend on state-level resources, federal universities are part of one national network, and therefore should have equitable access to transfers from the federal treasury, regardless of where they are located. Yet, this is not the case, a fact that was publicly recognized as recently as 2019 by then Secretary of Higher Education at the MEC, Arnaldo Lima, Jr. Responding to a question regarding the need for supplementary funding at Brazil's federal universities, he positioned the main challenge with the system as one of equity: "We have an expenditure of R$75k per student at UNIFESP and UFRJ against R$30k in universities in the North and Northeast. It's not a question of going against UFRJ but going in favor of those who need more" ('MEC estuda', 2019). The question he deftly avoided, concerns why this should be so.

The answer lies in an essay dating to 1990, during the early days of the development of the federal funding model that now determines allocations. According to Paul and Wolynec (1990), the funding model was contemplated as a *one size fits all* proposition, imposing a rigidity that did not take account of regional

differences and circumstances" (p. 3). The natural consequence was a regional pattern of inequality in funding—and performance, as clearly reflected in the RUF scores.

Data from the 2018 Higher Education Census (*Censo da Educação Superior*)—the same source that is used to inform the federal funding algorithm—provides insight into precisely how the model works to the advantage of some regions over others. Table 8 presents an analysis of three critical performance variables. In the case of all three—specifically, levels of graduate enrollment, the percentage of faculty with advanced degrees, and the percentages of faculty engaged in research, respectively--federal universities in Brazil's North and Northeast regions demonstrate serious deficiency as compared to other, more prosperous regions in Brazil. With respect to graduate enrollment, masters and doctoral students represent less than 13 percent of the total student body. In the Southeastern and Southern states, graduate enrollments are more than double those in the North. Similar disparity is exhibited in the percentage of faculty with Ph.Ds. Where only about two-thirds or less of teaching staff at Northern and Northeastern institutions have earned doctoral degrees, this number reaches 80 and 84 percent respectively in the South and Southeast. Research performing faculty are similarly far more prevalent in the southern regions of Brazil than in the two northern regions. In sum, insofar as lower performance on these items is associated with some regions over others, their incorporation into the federal funding formula leads to obvious inequities across regions.

Table 8: Research Engagement Indicators (in percentages), 2018

Region	Graduate enrollment	Faculty with Ph.D.	Faculty active in research
North	9	56	30
Northeast	13	69	44
Central-West	15	72	53
South	18	80	57
Southeast	17	84	70

Note: GEOCAPES, 2017; MEC, 2018, INEP, 2019

These findings, in turn, point to the existence of a negative funding and performance loop affecting disproportionately institutions in the poorest regions of Brazil. On one hand, factors such as the absence of graduate programming and highly qualified faculty activity engaged in research seriously limit an institution's ability to score well within the federal funding algorithm. On the other, without sufficient funding, they are consequently unable to create new programs that attract top graduate students, nor to attract more highly qualified personnel that can influence not only RUF rankings, but future funding itself.

That is not to say that the system is immutable, as some movement has occurred. In fact, federal government funding allocation data for the years that the RUF ranking has been in existence (2012-2018) do show some modest levels of improvement in recent years. Specifically, as shown in Table 9, the increase in funding for federal universities in the North and Northeast has generally exceeded the national mean of

70 percent (not accounting for inflation). By contrast, funding for institutions in the other regions of Brazil has grown at a more modest rate, and all below the mean.

Table 9: Government Allocations to Federal Universities by Region, 2012 and 2018

Region	Allocation 2012 (R$)	Allocation 2018 (R$)	Increase (%)
North	2,199,246,130	3,814,191,723	73
Northeast	7,313,524,913	12,973,073,640	77
Central-West	2,996,820,956	4,928,528,803	64
South	5,235,150,373	8,848,348,555	69
Southeast	9,622,274,072	15,927,408,977	66
Totals	27,367,016,444	46,491,551,698	70

Note: Orçamento, 2013, 2019

At the same time, this appears to have had little direct effect on relative standings in the RUF rankings, as Table 10 reveals. Over the same six-year period, the average increase in overall scores for universities in the wealthier regions of Brazil has generally exceeded those posted for institutions elsewhere. Clearly, institutions in the North and Northeast have a considerable distance to go as yet before the slow cycle of gradual institutional upgrading and concomitant modest relative increases in federal funding can fundamentally alter the current structure of inequity.

Table 10: Mean Change in Performance Score, Federal Universities by Region between 2012-2018

Region	N	Mean Change
North	10	11.46
Northeast	18	14.73
Central-West	5	17.96
South	11	19.88
Southeast	19	20.08
Total	63	16.98

Note: Folha, 2019a

DISCUSSION

Over the last few decades many state and local governments have dramatically reduced funding for higher education. This has resulted in tuition inflation and a surge in student loan debt. Many states, including Florida, have also shifted the funding for undergraduate students away from need-based aid toward merit-based scholarships. These merit-based awards disproportionately benefit students who come from the highest SES households (Binder & Ganderton, 2004; Borg & Borg, 2007; Cornwell & Mustard, 2007; Heller, 2006; Stranahan & Borg, 2004). Florida Bright Futures

scholarships represent the greatest share of state grant aid for undergraduates, yet only half of the students entering college in Florida meet the qualifications. One could argue that FBF scholarship recipients enter college with greater academic abilities, based on their high school grades and SAT or ACT scores, as well as greater financial resources, based on receiving the scholarship awards as well as higher household incomes, on average. Do these advantages result in FBF scholarship recipients leaving college with lower student debt burdens? Based on our research, the answer to this question is, "It depends."

One of the advantages of our data is that over the period that our data were collected, all Florida Bright Futures Scholarship recipients were required to submit a FAFSA application; therefore, our data include a much broader income distribution since many high-income households that would not normally submit a FAFSA application did so in order to receive the scholarship. One factor that determines the answer to this question is the overall debt level that students accumulate by the time they graduate. For example, there is no significant difference in the amount of debt accumulated by FBF recipients and non-recipients in the lowest and highest ends of the debt distribution (the 10^{th}, 25^{th} and 90^{th} quantiles of overall student debt levels). However, among students in the upper mid-range of the debt distribution (the 50^{th} and 75^{th} debt quantiles), FBF recipients accumulate significantly *more* loan debt than otherwise equal non-recipients. In this case, the author suggests that the FBF scholarship creates an education-specific income effect inducing students to spend more on all goods including higher education when they receive the award. Our results also show that the Florida Pre-Paid College Plan, a similar in-kind higher education subsidy, has a comparable effect. Students that have pre-paid college tuition plans increase their educational investment by borrowing more than similar students without the pre-paid plans.

Household income is another factor that affects the debt accumulated by FBF scholarship recipients versus non-recipients. The author found that FBF recipients from higher income households choose to borrow more for college than FBF recipients from lower income households. FBF recipients from lower income households may have access to need-based scholarships, whereas students from higher income households do not. It may also be that FBF recipients from higher income households have expectations of a more expensive college experience that includes living on campus, studying abroad, and participating in campus social life, which requires more borrowing. Whatever the reason, this study's results show that even though merit-based scholarships are disproportionately received by higher income students, they have not disproportionately improved the debt burdens of these students relative to their lower income counterparts.

The author also examined the borrowing behavior of FBF recipients in response to changes in the FBF award amounts. The results show that students from lower income households ($55,000 and below) in the bottom half of the debt distribution (below the 50th quantile) did *not* significantly change their debt levels in response to additional FBF award amounts; however, the lower income ($55,000 and below) students in the top half of the debt distribution (50^{th} quantile and above) did significantly reduce debt as award amounts increased. Students from the highest

income households ($100,000) in the upper midrange of the debt distribution (50th and 75th debt quantiles) actually *increased* their student debt levels as their FBF awards got larger.

In summary, the model predicts that FBF recipients accumulate higher debt, on average, than similar students who did not receive the award. However, for students from the lowest income households and with the highest levels of debt, the FBF scholarship award does reduce the overall amount of debt they accumulate. This means that FBF scholarship recipients are at no significant advantage relative to non-scholarship recipients when it comes to student debt accumulation for students from high income households. However, in the specific case of low-income students with the highest debt levels, they do receive significant debt relief from their FBF scholarships.

The policy implications of this research are straight-forward. If states wish to use their merit scholarship programs to help reduce student debt burdens, they should target those scholarships at lower income households, perhaps by giving higher awards to low-income students and lower awards to high-income students.

REFERENCES

Academic Ranking of World Universities (ARWU). (2018). World university rankings. http://www.shanghairanking.com/arwu2019.html.

Bacha, E. (2012). *Belíndia 2.0: Fábulas e ensaios sobre o pais dos contrastes*. Civilização Brasileira.

Balbachevsky, E. (2013). Academic research and advanced training: Building up research universities in Brazil. In J. Balán (Ed.), *Latin's America's new knowledge economy: Higher education, government and international collaboration*. AIFS Foundation and Institute of International Education.

Bekhradnia, B. (2016). *International university rankings: For good or ill?* HEPI Report 89. Higher Education Policy Institute.

Buela-Casal, G., Gutierrez-Martinez, O., Bermudez-Sanchez, M., & Vadilla-Munoz, O. (2007). Comparative study of international academic rankings of universities. *Scientometrics*, *71*(3), 349-365.

Del Vecchio, A, & E. Santos, E., Eds. (2016). *Educação superior no Brasil: Modelos e missões institucionais*. Editora Flutuante.

Diniz, R. V., & Goergen, P. L. (2019). Educação superior: Panorama da contemporaneidade. *Avaliação*, *24*(3), 573-593.

Folha de São Paulo. (2019a). Ranking Universitário Folha. http://ruf.folha.uol.com.br/2018/o-ruf/ranking-universidades

Folha de São Paulo. (2019b). Como é feito o Ranking Universitário Folha. http://ruf.folha.uol.com/br/2019/noticias/com-e-feito-o-ranking-universitario-folha.shtml

GEOCAPES. (2017). "Distribuição de discentes de pós-graduação no Brasil por IES." https://geocapes.capes.gov.br./geocapes

Hazelkorn, E. (2013). World-class universities or world-class systems? Rankings and higher education policy choices." In P. Marope, P. Wells & E. Hazelkorn

(Eds.), *Rankings and accountability in higher education: Uses and misuses* (pp. 74-94). UNESCO Publishing.

Hewitt, W. E. (2021). The factors affecting competitiveness in university ranking exercises: Lessons from Brazil. *Journal of Comparative & International Higher Education*, *13*(2), 23-37.

Instituto Brasileiro de Geografía e Estatística. (2019a). Sistema de contas regionais: Brasil 2016. http://biblioteca.ibge.gov.br/visualização/livros/livro1619_informative.pdf.

Instituto Brasileiro de Geografía e Estatística. (2019b). Estimativas da população residente no Brasil e unidades da Federação com data de referência em 1 de Julho de 2018. ftp://ftp.ibge.gov.br.Estimativas_de_Populacao/Estimativas_2018/estimativa_dou_2018_20181019.pdf.

Instituto Nacional de Estudos e Pesquisas Educacionais. (2019). https://inepdata.inep.gov.br

Marope, M., & Wells, P. (2013). University rankings: The many sides of the debate. In P. Marope, P. Wells and E. Hazelkorn (Eds.), *Rankings and accountability in higher education: Uses and misuses* (pp. 7-19). UNESCO Publishing.

Maxwell, D. (2018). The problem with university rankings. *SI News*, 28 November. http://www.studyinternational.com/news/the-problem-with-university-rankings/

"MEC estuda mudar distribuição de recursos para universidades federais." (2019, August 19). *O Estado de São Paulo*. https://educacao.estadao.com.br/noticias/geral,mec-estuda-mudar-distribuicao-de-recursos-para-universidades-federais,70002973204

Ministério da Educação (MEC). (2017). *Censo da educação superior, 2016: Principais resultados. Tabela 1.01.* Diretoria de Estatísticas Educacionais.

Ministério da Educação (MEC). (2018). Cadastro nacional de cursos e instituições de educação superior. http://emec.mec.gov.br.

Moreira, L., Moreira, L., & Soares, M. (2018). Educação superior no Brasil: Discussões e reflexões. *Educação por Escrito*, *9*(1), 134-150.

Nader, H. B. (2017*). Estudo comparado sobre ensino superior no Brasil, Europa e Estados Unidos*. Report. Conselho Nacional de Educação.

Organization for Economic Cooperation and Development (OECD). 2020. Growth in international or foreign enrolment in tertiary education worldwide (1998 to 2018), Figure B6.1. https://www.oecd-ilibrary.org/sites/974729f4-en/index.html?itemId=/content/component/974729f4-en

Orçamento da União. (2019). Exercício Financeiro de 2019. Volume V.

Orçamento da União. (2013). Exercício Financeiro de 2013. Volume V.

Paul, J., & Wolynec, E. (1990). *O custo do ensino superior nas instituções federais*. Documento de Trabalho. Núcleo de Pesquisas sobre Ensino Superior. USP.

QS World University Rankings. (2018). Top global universities. http://www.topuniversities.com/university-rankings/world-university-rankings/2018

Reis, C., Adrial Rodriques de Oliveira, A., Ramos Silveira, & S., Silveira Cunha, N. (2017). Modelo orçamentario das universidades federais: Fatóres motivadores e

inibidores de sua institucionalização. *Revista de Administração da UFSM*, *10*(6), 1081-1100.

Reestruturação e Expansão das Universidades Federais (REUNI). (2021). http://reuni.mec.gov.br/o-que-e-o-reuni

Souza, D., Miranda, J., & Souza, F. (2019). Breve histórico acerca criação das universidades no Brasil. *Educação Pública*, *19*(5), 1-8.

Sowter, B. (2013). Issues of transparency and applicability in global university rankings. In P. Marope, P. Wells and E. Hazelkorn (Eds.), *Rankings and accountability in higher education: Uses and misuses* (pp. 56-68). UNESCO Publishing.

Stallivieri, L. (2006). *O sistema de ensino superior do Brasil: Characteristicas, tendências e perspectivas.* Report. Universidade de Caxias do Sul.

Steiner, J. (2007). *The Brazilian research universities*. Unpublished manuscript. Instituto de Estudos Avançados da Universidade de São Paulo.

Tenório, R. M., & Andrade, M. (2009). A avaliação da educação superior no Brasil." In J. Lordelo & M. Dazzani (Eds.), *Avaliação educacional: Desatando e reatando nós* (pp. 31-55). EDUFBA.

Time Higher Education (THE). (2018). World University Rankings. http://www.timeshighereducation.com/world-university-rankings/2018/world-ranking.

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