Factors Affecting Competitiveness in University Ranking Exercises: Lessons from Brazil

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ABSTRACT

In recent years, international and national university ranking exercises have become commonplace, serving a host of stakeholders and beneficiaries including students, institutions, and governments. As such, they have drawn increasing scrutiny from academics and other observers, many of whom have called into question the integrity of the methodologies employed, and thus the outcomes of the process. By contrast, relatively little attention has been paid to largely external factors that can affect a given institution's ability to compete within a given ranking exercise, such as their corporate status, geographic location, and/or access to resources. Building on previous work examining the impact of such "extraneous" factors, this study undertakes a quantitative analysis of the best-known university ranking exercise in Brazil to better understand the impact of such variables, both within other national contexts and well beyond.

Keywords: Brazil, competition, geography, rankings, universities

INTRODUCTION

The results of various international and national rankings of universities have been a source of interest and fascination for many years now—not only for prospective students, but university administrators, faculty, and even governments (see Marope & Wells, 2013). Among the best known and most respected of these include the Time Higher Education (THE, 2018) rankings, the Academic Ranking of World Universities (AWRU, 2018) published by Shanghai Jiao Tong University, and the QS World University Rankings (QS, 2018). In addition, there are a large number of both national and international university ranking exercises undertaken annually by government, media outlets and not-for-profit organizations.

At base, the objective of these various exercises is fairly uniform; that is, to provide a reliable assessment of institutional quality, both in absolute terms and comparatively across the post-secondary array. In pursuit of this aim, measurements employed in the ranking process have tended to focus on both quantitative and qualitative variables associated, for example, with success and innovation in teaching and learning, research productivity and awards, levels of internationalization, community/business interaction, as well as factors related to perceived reputation.

Among observers, the benefits of rankings have been widely recognized. Many argue that such exercises can and do provide useful comparative data for students contemplating program enrolment, and or/for faculty looking to secure positions at the "best" institutions (see for example, Hazelkorn, 2013, 2018; Buela-Casal et al., 2007). They are also seen as providing for enhanced transparency and accountability on the part of institutions, and as potentially assisting government planning and decision-making with respect to where to invest scarce public dollars (Marope & Wells, 2013).

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At the same time, rankings have drawn significant criticism. To some extent, such critiques point to technical issues and the quality of data – how it is collected, analyzed and presented (Anowar et al., 2015; Liu, 2013). The bulk of criticisms tend to focus, however, on issues related to methodology, and specifically what variables are included and excluded in ranking exercises. For example, most measures of quality tend to focus on standard outcomes associated with university education and research. By contrast, very little focus is placed on universities' role in society (aside from commercialization), their importance in regional development or nation-building, or the preservation of culture (see for example, Ordorika & Lloyd, 2013).

While such criticisms continue to be the source of ongoing debate, virtually all focus on the integrity of the ranking process itself. Few studies examine the potential impact on rankings of factors external to institutions. For example, very little research has been undertaken on relative differences in rank between institutions based on their corporate status (e.g., private versus public). The same can be said of ranking differences associated with levels of institutional funding, or geographic placement, despite the fact that it is painfully obvious that institutions in the wealthier Global North vastly outperform those in the South. Such an omission is largely replicated by examinations of rankings undertaken within national boundaries.

In order to address this deficiency, and thus to further investigate the nature and impact of such "extraneous" factors on university competitiveness, this study undertakes a quantitative assessment of post-secondary rankings in Brazil. With a relatively large, complex, and dynamic post-secondary system about which detailed information is broadly accessible and rankings are well established, Brazil provides an excellent case-study revealing the critical external dynamics that can affect an institution's relative quality assessment. Specifically, building on an emerging body of work authored by Anowar et al. (2015), Jöns and Hoyler (2013), and others, the study points to the importance of three factors influencing the primary measures utilized to determine rank: corporate status, geography, and access to resources. The results help us not only to better understand the situation in Brazil, but may also be applied to better comprehend other nationals as well as global patterns of university quality and the external factors that potentially affect these.

BACKGROUND

The history of comparative quality assessment in post-secondary education can be traced to at least 1900. While utilized sporadically throughout the 20th century, real interest in the process did not begin to seriously evolve until after 1980. Even then, it is only more recently that the now well-known THE, AWRU and QS rankings really began to achieve broad currency (see Marope & Wells, 2013).

A number of factors appear to have stimulated this surge. There is little question that part of the demand comes from students (and parents) for whom the burden of educational costs has unquestionably risen in recent years. Increasingly, both students and parents have become savvy consumers (Hazelkorn, 2013, 2018, pp. 72-73; Buela-Casal et al., 2007, p. 350), and have sought assurance that institutions can provide value for money through the prestige and opportunities that their degrees afford. Selection of prospective institutions internationally for study abroad purposes has also been a factor. The number of students pursuing education in whole or part in countries other than their own has grown tremendously in recent years, with over three million now pursuing studies abroad outside their own countries. With over 30,000 universities currently operating worldwide, rankings provide a very effective resource for making decisions on university destinations (Sowter, 2013, p. 56; See also Sowter et al., 2017).

For institutions as well, rankings have progressively increased in importance, in part as a response to principal drivers of change within the post-secondary system. Not only have they become an effective tool

for undergraduate recruitment (as per above), they serve as magnets for talent in the form of faculty, graduate students, and post-doctoral fellows—particularly as national and global competition for top performers in all three categories increases. They also provide a useful way of demonstrating relative quality to funders—whether they be in government, the private sector, or alumni as prospective donors (Hazelkorn, 2013, pp. 72-73; Hazelkorn, 2018; Sowter, 2013, p. 57; Buela-Casal et al., 2007, p. 350).

Last but not least, rankings have become useful tools for governments—at all levels—to assess their own efforts in building healthy post-secondary ecosystems with real impact, whether in terms of program quality, or the quality of research. Further, rankings help increase transparency and accountability in terms of institutional decision-making and investment, important objectives to both educational clients and taxpayers (Marope & Wells, 2013, pp. 12-15). Finally, rankings can provide useful parameters guiding government investment strategies, as institutions can be classified according to relative strengths in programs, research or other relevant areas and funded accordingly to further national or regional priorities (Hazelkorn, 2013, pp. 89-90; Buela-Casa et al., 2007, p. 350).

Such growing receptivity of rankings across sectors is at least in part linked to assurances of overall quality claimed by the rankers themselves. On this topic, however, there has been much debate within the literature. In some cases, criticism has focused on issues linked to data quality and data interpretation, such as the relative weighting of key variables (including the choice of weights), and or the use of two-dimensional ordinal ranking scales (Bekhradnia, 2016, pp. 9-10). Criticism has also been levelled at the use of reputational variables informed by “peer review” which some have argued is questionably based upon impressions of individuals that may or may not reflect underlying measures of quality (Anowar et al., 2015, p. 563; Liu, 2013, p. 33). Still other observers point to deficiencies in rankers’ overabiding focus on average institutional performance while failing to take into account differences across programs, which can vary greatly in quality (Maxwell, 2018). Similarly, some have pointed to difficulties in assigning institutional credit where programs or research projects are shared across institutions (Anowar et al., 2015, p. 563).

The selection of variables that are used to construct rankings scales has also been a subject of considerable concern. In this regard, it has been argued that rankings often fail to measure what really counts in assessing quality, in favour of emphasizing what is easily countable (Hazelkorn, 2013, p. 77; Liu, 2013, p. 33). For example, education quality measures related to percentages of faculty with Ph.Ds—which are primarily quantitative – receive relatively more attention in ranking design exercises than qualitative factors that might be more important to students, such as support services, campus amenities, or availability of transit (Maxwell, 2018). Such measures also tend to favour more established, better known institutions that are better able to “crunch the numbers” (Marope & Wells, 2013, pp. 12-15) or employ consultants to assist in “massaging” the data (Maxwell, 2018). Other studies have pointed to the relative exclusion of important variables altogether, such as those related to social impact and social development (Nyssen, 2018). Ordorika and Lloyd (2013, p. 211), for instance, discuss the broad omission of factors related to the critical role of universities in many countries in state-building, as well as important work they do in providing care and community service – particularly in the absence of other support agencies.

That post-secondary ranking exercises per se could be improved through greater attention to debates such as these effectively goes without saying. What is still largely missing within the literature, however, is a broader discussion of how measures used in rankings (and hence perceptions of quality) may themselves be affected by external factors well beyond institutional control or oversight. Anowar et al. (2015, p. 563) for example, point to the relative impact of access to resources on institutional performance. Within the

main global rankings exercises cited earlier, the most glaring impact of such disparities is plainly evident in the relatively low rankings of institutions in developing countries that have less access to funding. Further, Jöns and Hoyler (2013, p. 46) argue for the importance of geography in assessing the distribution of university rankings. There is a clear discrepancy in ranking performance, they argue, between the global North and South, reflecting both "uneven representation of different cultural contexts [and] the significant influence of deep-seated asymmetries in the global economy on higher education" (Jöns & Hoyler, 2013, p. 50). Pusser and Marginson (2013, pp. 558-560) move beyond this to consider the influence of global power in ranking exercises. In their view, ranking systems become a mere reflection of what drives conceptions of quality in the world's most influential post-secondary system—i.e., the United States. All others, but particularly those operating in non-Western, non-English contexts, engage in a futile exercise of "catch-up" driven almost exclusively by the rules of the game that are defined elsewhere.

Such research points to some relatively obvious macro-level tendencies related to the factors that may well drive rankings. For example, institutions with more limited resources may certainly be less able to develop attractive programming that increases enrolment, and/or to attract facilities, equipment, and talent in the form of researchers and trainees. Post-secondary schools in more remote locations may find it difficult to engage meaningfully and or to benefit from international networks. National policies and selective government funding may favour certain kinds of post-secondary growth and expansion, while at the same time limiting the possibility for institutions to compete effectively with peer institutions domestically or in other countries.

While the emerging body of research focusing on such external factors is encouraging, what is still largely missing to this point is precisely how such factors operate in real time to produce specific ranking outcomes in specific contexts. To shed further light on this challenge, we turn to the case of Brazil.

THE BRAZILIAN UNIVERSITY SYSTEM AND QUALITY ASSESSMENT

The Brazilian post-secondary education system dates at least to the time of its independence from Portugal in 1822. Owing to the country's reliance on commodity production and slow rate of development, however, expansion of the university system remained extremely limited until the modern era, with only 19 universities in place by the 1950s (see Nader, 2016; Steiner, 2007).

Significant expansion of the post-secondary system occurred following Brazil's 1964 military coup and the installation of authoritarian government lasting just over 20 years. Under the military, university structure and governance were reformed, accompanied by significant new investments facilitated by a rapidly growing industrial economy. Consequently, enrolments grew rapidly, from just 93,000 in 1960, to 425,000 in 1970, to over 1 million by 1975. In addition, a new national organization was established to support graduate education, the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), as well as research funding agencies CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico), and the Financiadora de Estudos e Projetos (FINEP). These early investments set the stage for further growth following the return to democracy in Brazil in 1988, resulting in a system that now includes nearly 2500 post-secondary institutions with a total enrolment of just over 8 million (Balbachevsky, 2013; MEC, 2017). Still and all, overall post-secondary participation rates for 25-64 year-olds are relatively low by OECD standards (at 12 percent for Brazil versus nearly 50 percent for OECD countries). In addition, as a middle income country, current Brazilian investments of approximately $US28B remain far lower than the OECD average (Nader, 2016, p. 64). As a federation, there are distinct

differences as well in levels of wealth across Brazil's regions, resulting in serious imbalances in access to institutional funding in the form of tuition, ancillary fees, and/or state transfers.

In terms of its composition, the system is extremely diverse. As Table 1 shows, of the 2407 post-secondary institutions listed by the federal Ministério da Educação (MEC) (MEC, 2017), 197 are classified as "universidades" (universities)—that is, organizations primarily engaged in teaching and research. Another 166 are classed as smaller and academically more focused "centros universitários" (university centres), and the largest single group deemed to be "faculdades" (Faculties) or primarily teaching institutions focused on a range of specific career outcomes. Just over half of all universities are publicly funded (federal, state and even municipal level) and are tuition free. Entry, however, is extremely competitive, subject to scores on the national entry exam (the Exame Nacional do Ensino Médio—ENEM). The remainder are private (for profit and not-for-profit) and fee-based. The centros universitários and faculdades are overwhelmingly private and fee-based, with the latter offering full or part-time study catered to adult learners and the burgeoning population of younger Brazilians looking to expand marketable credentials (McCowan, 2004).

For their part, enrolments (see Table 2) tend to remain clustered in more traditional universities, which at just over 4 million, account for over half of post-secondary students. Approximately 2.1 million students attend faculdades, and another 1.4 million centros universitários. Across all three categories, private institutions predominate, attracting approximately three-quarters of enrolments. This distribution is far less skewed when one considers only the 197 institutions classed as universidades. As Table 3 shows, Public institutions at all levels (federal, state, and municipal) attract some 40 percent of enrolments, versus 60 percent for private schools.

Table 1

Post-Secondary Institutions in Brazil by Type, 2016

Type of Institution	Public	Private	Totals
Universidade	108	89	197
Centro Universitário	10	156	166
Faculdade	138	1866	2004
Other	40	n.a.	40
Totals	296	2111	2407

Source: MEC, 2017: Tabela 1.01

Table 2

Post-Secondary Enrolments in Brazil by Institutional Type, 2016

Type of Institution	Public	Private	Totals
Universidade	1,679,479	2,642,613	4,322,092
Centro Universitário	22,708	1,392,439	1,415,147
Faculdade	123,299	2,023,571	2,146,870
Other	164,592	n.a.	164,592
Totals	1,990,078	6,058,623	8,048,701

Source: MEC, 2017: Quadro Resumo, Tabela B

Table 3

Universities by Type and Enrolment, 2016

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

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

With the exception of state-funded universities, all post-secondary institutions in Brazil are subject to the regulatory oversight of the MEC (Balbachevsky, 2013), regardless of where they receive their funding. MEC is also responsible for collection, analysis and cataloguing of data on all aspects of post-secondary governance and operations, and importantly, monitoring of quality. The latter is undertaken through the Sistema Nacional de Avaliação de Educação Superior (SINAES), which routinely evaluates post-secondary institutions, programs of study, and student performance, reported through its Índice Geral de Cursos Avaliados da Instituição (IGC). For its part, graduate programming is evaluated through CAPES (Nader, 2016, pp. 14-16; Tenório & Andrade, 2009, pp. 38-43). Overall quality is assessed on a 1-7 scale, with ratings of 6 and 7 representing world-class offerings (Steiner, 2007). Generally speaking, institutions that score highest on these scores are federally and state-funded universities.

While the SINAES and CAPES assessments provide significant insight on program quality, overall rankings of post-secondary institutions – primarily universities – are typically left to third-party organizations. To some extent, information relative to rankings can be gleaned from the global ranking exercises cited earlier. The Times Higher Education 2017 rankings, for example, include a total of 21 Brazilian universities, with three institutions (two state and one federal) in the top 600. QS (2018) ranks the same combination of three institutions in the top 400 (Nader, 2016, pp. 18-19). A far more extensive exercise, providing a detailed ranking of Brazilian universities has been conducted since 2012 by the Folha group of newspapers, and is referred to as the Ranking Universitário Folha (RUF) (Folha, 2019).

DATA AND METHODS

Data from the RUF 2018 university ranking form the core basis for the analysis conducted in this study. The manifest rankings, underlying data, and methodology employed in the RUF exercise are made publicly available, and are used here with the permission of its authors. The annual ranking is restricted to institutions classified by MEC as universidades (n=196). It is conducted in a manner similar to the major global rankings discussed earlier, and adapted to the Brazilian context, much in the same way as other national rankings of this type – such as Maclean's (Canada), the U.S. News and World Report (U.S), and the Guardian (U.K). The classification of institutions is based upon five criteria: academic research (42%), quality of teaching (32%), market impact (18%), innovation (4%) and internationalization (4%).

Table 4

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 journal	3
Funding per student	3
Percentage of faculty considered productive by CNPq	2
Thesis 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

Source: Folha, 2019b.

Specific measures include primarily quantitative and limited qualitative measures, as summarized in Table 4. Each university in the ranking is assigned a score on each of these variables. The scores are then tallied to provide a final score out of 100. These final scores thus provide the basis for a numbered ranking from 1 to 196.

Obviously, these classifications and weightings share the same shortcomings as other global and local rankings, as discussed earlier (see Nader, 2016). For the most part, however, they have achieved a level of

confidence within the Brazilian context, in part owing to the level of transparency provided by the report's sponsor. As a basis for further comparative analysis in the Brazilian context, however, they constitute an arguably reliable resource. As Nader quotes Brazilian philosopher and newspaper columnist Hélio Schwartsman, "taken in isolation, all of the indicators used in the RUF are imprecise, sometimes even problematic; taken together it is hoped however that they provide a reasonable portrait of the strong and weak points of each institution" (Nader, 2016, p. 22).

The data described above were extracted by the RUF 2018 national ranking database by the author and analyzed using SPSS. The analysis is largely based on descriptive statistics of a range of variables, some of which were contained in the database itself, and some which were derived from other sources. Variables taken from the RUF 2018 database included numerical rankings, overall raw scores and scores for each of the ranking criteria, geographical location, and corporate status for each institution in the population. These factors were further supplemented with other variables created using a range of background data on each institution gleaned from government statistical sources—including the MEC, and the Instituto Brasileiro de Geografía e Estatística (IBGE). These provided more detailed information on corporate status, funding source, location, population, and income per capita by state and geographic region (North, North-East, Central West, South and South-East).

For purposes of analysis, it is important to note that the institutions ranked in the RUF (presented in Table 5) represent not a sample, but the entire population of MEC-defined universidades in Brazil as summarized in Table 3. Overall, there are only slight variations between the two listings – in the total (196 versus 197) and across the state and municipal categories (n=2) – likely associated with a misallocation or recent change in status. Descriptive statistics and analytical trends discussed below therefore directly describe population attributes as they exist, without the need for statistical measures or more sophisticated methods designed to make inferences about population attributes.

Table 5

Institutional Type (RUF)

Type of University	N	%
Federal	63	32
State	38	19
Municipal	6	3
Private	89	45
Total	196	100

Source: Folha, 2019a.

RESULTS

We began by examining the broad characteristics of the top ranked universities in the RUF exercise, and the concordance of this list with other ranking exercises outside Brazil. Table 6 provides a listing of the RUF's 20 top ranked institutions in 2018, compared with the Brazilian national ranking outcomes published by the THE, ARWU, and QS, respectively that same year. Of the approximately 1000 universities assessed by each organization, the THE list included 32 Brazilian universities, QS 23 institutions, and ARWU, 22. Although in many cases only ranges of scores are presented (as the numbers are based upon

the public data made available by these organizations) a casual glance suggests general concordance in terms of placement, with possibly the notable exception of the Universidade Federal de São Paulo. Arguably then, and at the top end of the list, the RUF rankings are at very least comparable with the assessments of the larger organizations' rankings exercises.

Table 6

Comparative Rankings of RUF Top 20 Universities (2018)

		Ranking			
University	Status	RUF (196)	THE (32)	ARWU (22)	QS (23)
Universidade de São Paulo (USP)	State	1	1	1	1
Universidade Federal do Rio de Janeiro (UFRJ)	Federal	2	4-10	3	2-4
Universidade Federal de Minas Gerais (UFMG)	Federal	3	4-10	9	5-6
Universidade Estadual de Campinas (UNICAMP)	State	4	1	2	2-4
Universidade Federal do Rio Grande do Sul (UFRGS)	Federal	5	4-10	5-8	5-6
Universidade Federal de Santa Catarina (UFSC)	Federal	6	11-21	12	8-11
Universidade Federal do Paraná (UFPR)	Federal	7	22-32	13-22	7
Universidade Estadual Paulista Julio de Mesquita Filho (UNESP)	State	8	4-10	4	2-4
Universidade de Brasília (UNB)	Federal	9	11-21	10-11	12-14
Universidade Federal de Pernambuco (UFPE)	Federal	10	11-21	13-22	15-18
Universidade Federal de São Carlos (UFSCAR)	Federal	11	11-21	10-11	12-14
Universidade Federal do Ceará (UFC)	Federal	12	11-21	13-22	15-18
Universidade do Estado do Rio de Janeiro (UERJ)	State	13	11-21	13-22	19-23
Universidade Federal da Bahia (UFBA)	Federal	14	NR	13-22	19-23
Universidade Federal de Viçosa (UFV)	Federal	15	22-32	13-22	12-14
Universidade Federal Fluminense (UFF)	Federal	16	22-32	13-22	19-23
Universidade Federal de São Paulo (UNIFESP)	Federal	17	3	5-8	8-11
Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS)	Private	18	11-21	13-22	NR
Pontifícia Universidade Católica do Rio de Janeiro (PUC-RIO)	Private	19	11-21	5-8	NR
Universidade Federal de Goiás (UFG)	Federal	20	NR	NR	8-11

Source: Folha, 2019a; THE, 2019; ARWU, 2019; QS, 2019.

Notable in the top 20 list is the preponderance of federal and state public universities. Only two private institutions – both with religious sponsors – are included within this elite group. Consequently, as a first step in further investigating trends within the broader population, further analysis was undertaken with an eye to isolating the influence of corporate status on rank at a more granular level. This was done by

comparing mean final scores (out of 100) of the 196 universities in the RUF survey, broken down by a number of administrative categories. The results of this analysis are presented in Tables 7 and 8.

As Table 7 reveals, for the entire population, federally funded public institutions outperform all other types by a fairly wide margin, scoring on average 62.73 out of 100. These are followed by state funded public institutions, at 47.16, private institutions at 39.87, and finally, municipal public organizations at 25. This largely conforms to broad characterizations of institutional types presented in the literature, with the possible exception of a select number of state universities, two of which rank within the top five universities on the RUF list for 2018 (see Table 6).

Table 7

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	

Source: Folha, 2019a

Table 8

Mean Performance Scores – Private Institutions by Type, 2018

Type of Private University	N	Mean Score
Religious-PUC	7	68.36
Religious-Other	11	46.59
Secular for Profit	22	40.72
Secular Not for Profit	49	34.83
Total	89	

Source: Folha, 2019a

Certainly as well broad conceptions of the generally inferior quality of private institutions is borne out. Further analysis reveals, however, a marked distinction between private universities of different types (see Table 8). The seven institutions sponsored by the Brazilian Catholic Church for example—designated as Pontifícia Universitária Católica (Pontifical Catholic University) – achieve a mean score of 68.36. All others fare less well, with secular not-for-profit (typically community-based) organizations scoring on average 34.83. With an average score of just over 40, for-profit institutions generally live up to their reputation as focused primarily on sectoral career training, drawing low scores for research.

Beyond corporate status, the analysis moved to consider differences in ranking associated with geography. In fact, it would appear where institutions are located in Brazil very much matters in terms of their impact on the RUF listing. Nominally, nearly two-thirds (126 of 196) of universities in the country are located in the most populous regions of the country, the South and South-East. Just 14 (7 percent) are located in the Central-West, and 56 (29 percent) in the North and North-East. Table 9 reveals marked differences in mean scores for universities across these regions—from highs of just over 50 in the Central-West and South, to a low of just under 34 in the North.

Associated with location is the relative wealth of each institution's home region, which is particularly accentuated in Brazil. As a federation, Brazil has been compared to a fictional "Belíndia" – that is, a country that includes standards of living across regions that approximate in some cases Belgium, and in other, the poorest parts of India (Bacha, 2012; see also Pfeffermann, 2016). As Table 9 shows, income per capita

ranges from a low of just over R$15,000 (R$1=USD$0.21) in the North, to a high of nearly R$40,000 in the Southeast. Correlational analysis reveals a strong association between the income per capita of an institution's resident state, and its RUF score (Pearson correlation=.563, p=000). This suggests that in some regions in the country, resources provided at the local level – through state governments, tuition-paying students, or the ability to collect ancillary fees – may be lacking to ensure the kind of performance that attracts higher institutional scores in those areas, particularly on key criteria such as research and teaching.

The most dramatic reflection of this appears in the comparison of state funded universities across regions. As Table 10 shows, state universities in the South-East post average scores of 73.87. Of the seven state-funded institutions in the region, moreover, four reside in RUF's top 20 list – they are in fact the only state universities within that top tier. By contrast, state universities in the North score on average only 21.54, with those in the North-East well under 50. Again, this presents a reasonable case to argue for the strong links between resources and performance.

What is perhaps far more interesting however, is the fact that a similar, if less dramatic variation also holds for federal universities which receive the bulk of their support from the central government. Again, referring to Table 10, the scores of federally-funded universities clearly align with the general trend found for RUF's larger 196 institution set. Mean performance scores for federal universities in the North and Northeast, at 40.74 and 57.27 respectively, are considerably lower than for the Central-West and Southeast, at 72.9 and 74.48. This represents a somewhat surprising finding, given the fact that federal universities are largely funded on the same formula across Brazil, and subject to the same budgeting process managed by the MEC and the federal government each year.

Table 9

Mean Performance Scores by Region, 2018

Region	N (%)	Mean Score	GDP/Capita	Population (%)
North	17(9)	33.53	R$19,204	18,182,253 (9)
North-East	39(19)	48.31	R$15,905	56,760,780 (27)
Central-West	14(7)	50.29	R$39.312	16,085,885 (8)
South	47(24)	50.19	R$36,312	29,754,036 (14)
South-East	79(40)	49.09	R$38,544	87,711,946 (42)
Total	196(100)			208,494,900 (100)

Source: Folha, 2019a; IBGE, 2019a: 9; IBGE, 2019b.

Table 10

Mean Performance Scores for Federal Universities by Region and Institutional Type, 2018

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

Source: Folha, 2019a

DISCUSSION AND CONCLUSION

The results presented in this study largely confirm assertions in some quarters within the literature regarding the importance of previously ignored factors associated with ranking differentiation (e.g., Anowar, 2015; Jöns and Hoyler, 2013). Without question, corporate status, geography and regional income levels can have a profound effect on where universities sit in national ranking exercises – in this case the RUF.

As to how precisely these types of factors influence institutional capacities in ways that affect rankings, the Brazilian case tentatively offers at least a few clues. For example, with respect to the impact of corporate status, private universities – with their over abiding focus on vocational training – are much less involved in "scoring-rich" activities linked to research. By focusing their activities on teaching and vocational training, they remain destined to remain at the bottom of the ranking pile. By contrast, public institutions at the state and federal universities are, for the most part, more heavily engaged in research activity, thus attracting top notch scholars, graduate students and international linkages that pump ranking scores.

To some extent, regional variations may also be understood with reference to a number of factors. Within Brazil, universities located within more populous regions benefit from significant pools of talented students and faculty, and other economies of scale that location affords. The higher density of institutions in the South and South-East also allows for more easy collaboration among researchers across multiple other high-quality institutions in the same state or region. Moreover, they are more easily connected by major airport hubs (primarily in the South-Eastern cities of Rio de Janeiro and São Paulo) facilitating international connections, attracting top-notch visiting faculty and/or fee-paying international students.

The relative wealth of Brazil's regions also clearly plays a role in determining what resources are available to support university excellence. As shown above, those states with higher GDP per capita and better able to provide institutional subsidies are home to many of the country's top-ranked institutions—most evidently displayed in the case of the South-East region. In addition, such institutions also have access to regional research funding agencies with relatively deep pockets, such as the Fundação de Amparo a Pesquisa do Estado de São Paulo (FAPESP), known internationally for providing outstanding research support programming. At the same time, the situation is not clear cut, owing to the fact that within the federally-funded network there exist discrepancies in ranking across regions by wealth, despite the fact that federal institutions are funded by the central government. Clearly other factors are at play in this case.

In this and other regards, the study does then offer as many questions as answers as regards to the influence of factors such as those examined here. This is a clarion call for further and more detailed research on variable impacts on ranking beyond the identification of patterns. For example, in the case of federal universities in Brazil, is funding uniform across regions, or is it variable and why? How might location affect relatively the ability of federal institutions to use available mechanisms to secure outside funding through ancillary services or other sources? Is it possible that funding levels are linked to regional variation in graduate/undergraduate enrolments, which in turn themselves may influence rankings? To what extent might political considerations linked to national and state-level politics affect funding flows? And how might rankings themselves be influencing how federal and state governments allocate resources now and more importantly, in future—thus creating circular effects? This last question is particularly salient as attempts have been made recently in Brazil (as well as other jurisdictions) to reallocate resources within the federal system to reflect questions of "quality" (see Folha, 2019c).

The answers to these and other questions certainly would provide considerable insight to underlying factors affecting the RUF rankings. Beyond Brazil, they also provide pathways to further analysis of ranking systems within other national jurisdictions and the international sphere more broadly. Given the increasing importance of rankings and reliance on them for decision making among a variety of constituencies, such work definitely assumes an increasing value and importance.

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