

# The Brazilian Research Universities

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*João E. Steiner<sup>1</sup>*

## INTRODUCTION

Research and graduate universities constitute the top of the educational system pyramid. Most countries with a high degree of economic and social development have robust and diversified educational systems. In the age of the Knowledge Society, no country can do without a significant segment of research-oriented institutions.

Experts say that biological diversity is the basis of wealth – a sort of fundamental law of evolution. Thus, the planetary concern with preserving its biodiversity. With regard to educational institutions, could institutional diversity be equally a source of wealth? The example of the United States, which arguably boasts the planet's most diversified and successful system, seem to corroborate this. Individual and institutional potentialities flourish whenever there is diversity and freedom of organization. In most developed and developing countries, the system of higher learning is complex and diverse. In Brazil, this system's institutional diversity expanded in the 1990s and now performs a plurality of functions in academic/professional development (Martins, 2000). Legally speaking, the system comprises universities, university centers, affiliated colleges and schools, which can be public, private not-for-profit (community, faith-related, foundations etc.) or private for-profit. Not all universities are research universities and not all research universities are involved in research with the same intensity (Lobo, 2004). How, then, does one best characterize such diversity?

Assessments and evaluations are an essential part of academic activity. The evaluation of students is a universal practice. Although institutional evaluation is less common, a robust educational system must be transparent to its users and to society. With regard to graduate education in Brazil, the Ministry of Education's CAPES [Coordenação de

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Aperfeiçoamento do Ensino Superior = Office for the Improvement of Higher Learning] has been doing some paradigmatic work evaluating programs over the years.

In this essay, Brazilian doctoral and research universities are analyzed, some of their major strengths and weaknesses are considered, and a statistical comparison with the United States is made.

## Origins

The first courses of higher learning in Brazil were created in the early 19<sup>th</sup> century. After D. João VI, the Portuguese king, fled from Europe to Brazil in 1808, the country's first medical/surgical courses were established – one in Salvador, two in Rio de Janeiro. In 1810, the Royal Military Academy was founded (presently the School of Engineering of the Federal University of Rio de Janeiro). The Law Schools of São Paulo (in the city's downtown São Francisco square) and Olinda (in the state of Pernambuco) were constituted in 1827. In the final years of the Second Empire (1840-1889) and in the early Republic, several professional schools were created, encompassing Medicine, Engineering, Agriculture, and Law.

During the early 20<sup>th</sup> century, fully in the Republican era, the creation of professional schools was intensified. Soon, some of these schools were congregating to form the first universities: the Federal University of Paraná (1912), the Pontifical Catholic University of Rio Grande do Sul (1924) and the Federal University of Minas Gerais (1927) being the first ones. However, all these schools aimed at disseminating culture or providing professional training; entirely absent was the concept of teaching-related research, which at the time was already common in the Humboldtian universities of Europe and the United States, where teaching, learning and research were closely associated. Brazilian politics was then dominated by conservative agrarian oligarchies, a state of affairs known as *Café com Leite*<sup>2</sup> politics. The 1930 Revolution swept Getúlio Vargas into power, broke up the *Café com Leite* regime, and appointed the first Minister of Education and Health, Francisco Campos, who carried out conservative reforms in the country's higher learning, patterned in the already outmoded pre-Humboldtian universities. Existing universities and those created afterwards had or acquired these characteristics, with the exception of the University of São Paulo, which was created by the São Paulo state government.

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<sup>2</sup> Or “Coffee and Cream”, that is, the oligarchies of the coffee growers of São Paulo alternating power with the oligarchies of dairy farmers of Minas Gerais.

By the late 1950s, Brazil had nine federal, two state and eight faith-related universities. In the 1960s there were two surges of “university creation” (institutions that are now research universities), during a troubled time in Brazilian politics. The first occurred in 1960/62 (comprising the last year of Juscelino Kubitschek’s presidency, the short Jânio Quadros mandate and the first year of João Goulart’s parliamentary governance), which also saw an intensification of student unrest, goaded by the so-called “crisis of the residual students”.<sup>3</sup> The second surge took place during the university reform of 1968, coinciding with international student movements and a toughening up of the military government in Brazil.

After this second spurt, the ability of the federal government to create other universities withered and corporate-like universities began to appear in the early 1970s, a situation that remained unaltered until the end of the military regime. In 1985, when the country was redemocratized, private universities began to appear in earnest.

Over the last decades, Brazil’s higher learning system enjoyed substantial growth and witnessed great diversification. Nevertheless, the country still lacks a system to classify institutions such as the Carnegie Foundation’s (Lobo, 2004). In the absence of such metrics, we will resort to the Carnegie criteria to arrange the institutions of our graduate and research system. While these criteria are certainly not ideal to represent our reality, they do have the advantage of allowing a direct comparison with the American system. Furthermore, the criteria for graduate programs are more objective than the ones used for research institutions, inasmuch as there is no homogeneous database comprising the actual production of all fields of knowledge. For instance, Brazilian production in the area of Natural Sciences is almost entirely published in English, whereas in humanities it is mainly in Portuguese, making it difficult to establish a standardized methodology.

## **INSTITUTIONAL DIVERSITY**

How does one characterize institutional diversity? The Carnegie Foundation developed a system that enables all US higher education institutions to be classified. It was first developed in 1971, under the leadership of the educator Clark Kerr, and the first version was published in 1973 (updated in 1976, 1987, 1994 and 2000). The last version

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<sup>3</sup> That is, students officially approved in university admission exams but unable to enroll for physical lack of space in classes.

defines three categories: doctoral/research universities (divided in two groups: extensive and intensive); master universities and colleges (also divided in two groups; I and II) and baccalaureate institutions.

### **Doctoral/Research Universities: A Comparison between Brazil and the United States**

The US system of higher learning is currently one of the most admired in the world. The American research universities, in particular, are a solid model of what a good university should be. Nevertheless, the American graduate education system is not a paradigm for Brazil. Yet, a statistical comparison between both countries is in order, as we have data that follows the same classification criteria. This type of benchmarking is always useful to provide a better understanding of the similarities and differences between the two systems and, in consequence, of the reality of Brazilian universities.

Table 1 - Comparison between Doctorate/Research, Master's and Baccalaureate Institutions in Brazil and the United States

	<b>Public</b>	<b>Not-for-profit</b>	<b>Private</b>	<b>Total</b>
<b>BRAZIL (2003)</b>				
Doctoral/Research	32	7	0	39
Master's	21	18	15	54
Baccalaureate	142	292	1120	1554
<b>Total</b>	<b>195</b>	<b>317</b>	<b>1135</b>	<b>1647</b>

<b>USA (2000)</b>				
Doctoral/Research	166	93	2	261
Master's	272	331	8	611
Baccalaureate	1183	1251	607	3041
<b>Total</b>	<b>1621</b>	<b>1675</b>	<b>617</b>	<b>3913</b>

The US has 872 universities offering graduate programs in the four categories mentioned above (see Table 1). These universities are almost evenly split between the public and private not-for-profit categories, while for-profit universities account for only 1% of American higher learning institutions. In Brazil, on the other hand, out of a total of 93 surveyed universities, 53 are public, 24 are private - community, faith-related or philanthropic - and 16 are corporate-like private institutions. The US has approximately ten times more research universities than Brazil. This is also the rough proportion between the

GNP of the two countries, a coincidence that goes beyond a mere statistical curiosity, but has a deeper meaning inasmuch as, in the knowledge and information age, higher education is intimately associated with a country's economic performance.

At the top of the pyramid, public universities dominate the doctoral/research system both in the US (166) and Brazil (30), whereas the share of private for-profit universities is negligible in both countries: none exists in Brazil and no more than two in the US. However, the similarities end here. Master's universities are overwhelmingly private not-for-profit in the US. In spite of their strong presence in Brazil, this type of university has less impact than in the US. However, the major difference between both systems is the significant presence of for-profit private institutions, which are almost inexistent in the US but constitute a recent and rapidly growing phenomenon in Brazil, even if in terms of graduate education, their scope is limited to Master's universities. At the Baccalaureate level, Brazil has two times more private institutions than the USA!

With regard to Brazil's research universities, one is struck by the presence of community faith-related institutions. Paradigmatic among the extensive doctoral/research universities are the three Pontifical Catholic Universities (PUC) in São Paulo, Rio de Janeiro and Rio Grande do Sul. Among the intensive universities, one notes the presence of the Pontifical Catholic University of Campinas (PUCCAMP), the Jesuitical UNISINOS – Universidade do Vale do Rio dos Sinos - and the Methodist UMESP – Universidade Metodista de S. Paulo. Among master's universities, eight have Catholic origin, one Methodist, one Presbyterian and one Lutheran.

Taking American and Brazilian universities as a whole (Brito Cruz, 2005), we find that of the top ten doctorate-granting institutions, four are Brazilian (USP – Universidade de São Paulo, UNICAMP – Universidade Estadual de Campinas, UNESP – Universidade Estadual Júlio de Mesquita Filho and UFRJ – Universidade Federal do Rio de Janeiro) and six are American (U California - Berkeley, Nova Southeastern U, U Texas - Austin, U Wisconsin - Madison, UI Urbana-Champaign and U Michigan). The highest ranking is the University of São Paulo, which in 2003 granted more doctorates (2,180) than the three top-ranking American universities combined.

Table 2 - Doctorates Granted in Brazil and in the US

Year	Brazil	USA (total)	USA (citizens)
1988	915	33,500	23,290
1993	1,792	39,800	26,449
1998	3,949	42,645	28,456
2003	8,094	40,710	26,413

A comparison between the relative and absolute numbers of doctorate recipients in various fields of knowledge in 2003 reveals some surprises. One often hears that in Brazil the number of doctors is far greater in areas of basic research than in applied research. However, contrary to this urban legend, the percentage of Engineering doctorates in Brazil (13%) is identical to the US's. In basic science, the percentage is less in Brazil (13% in Biological Sciences, 11% in Exact & Earth Sciences) than in the US (14% and 15%, respectively). Most surprising, though, is that the absolute numbers of doctors in some areas of applied science in Brazil (1,026 in Agrarian Sciences; 1,549 in Health Sciences) is similar to the US's (1,042 and 1,633, respectively); this means that, in relative terms, their number is five times larger in Brazil than in the US.

Table 3 - Comparison of Doctorates Granted by Area  
in Brazil and the US in 2003

Area	Brazil	US (total)	US (citizens)
Agrarian Sciences	1,024 (13%)	1,042 (3%)	481 (2%)
Biological Sciences	1,028 (13%)	5,694 (14%)	3,782 (14%)
Health Sciences	1,549 (19%)	1,633 (3%)	1,166 (4%)
Exact & Earth Sciences	913 (11%)	5,963 (15%)	3,143 (12%)
Engineering	1,023 (13%)	5,265 (13%)	1,898 (7%)
Social Sciences	736 (9%)	6,763 (17%)	4,947 (19%)
Humanities/Education	1,821 (22%)	14,350 (35%)	10,996 (42%)
<b>Overall total</b>	<b>8,094 (100%)</b>	<b>40,710 (100%)</b>	<b>26,413 (100%)</b>

When only American citizens are taken into account, the numbers are even more surprising. In areas of applied science, the absolute numbers are similar or even inferior to those of Brazil. Only 7% were Engineering doctors, a mere 4% obtained doctorates in the area of Health and 2% in Agrarian Sciences (Table 3). These numbers imply a clear risk of

a brain drain in fields of overwhelmingly applied science, a potentially damaging situation for countries like Brazil.

### **Geographic Distribution**

The geographic distribution of Brazilian doctoral/research universities is highly irregular. Three major regions can be distinguished, with very distinct characteristics and HDIs (Human Development Index):

*The South/Southeast*, with an HDI between 0.79 and 0.82, takes the lead, with 15 extensive and 14 intensive doctoral/research universities. These two regions have 101 million inhabitants, comprising 56% of the Brazilian population.

*The Northeast*, with an HDI between 0.65 and 0.70, has two extensive doctoral/research universities (the federal universities of Pernambuco and Bahia) and five intensive ones. This region has 68 million inhabitants, or 38% of the Brazilian population.

*The Amazonia*, with an HDI between 0.70 and 0.72, has only one intensive research university (Universidade Federal do Pará). The population of this region is approximately 20 million.

Different regions have different patterns of institutions. In the state of São Paulo, for instance, the university system is dominated by the three large state universities and, in the private sector, we find a strong presence of faith-related universities. However, one should note the great deficit of federal universities (there are only two, insufficient for the size of the population) and the complete absence of a non-faith-related community system – which explains the explosive growth of private universities. The same absence of such community universities can be found in the states of Rio de Janeiro and Minas Gerais, where we find a very strong presence of federal universities and in the case of Minas Gerais, an incipient state system of higher education. The southern region, which also has a strong presence of federal universities and an incipient system of state universities, is likewise characterized by the presence of a robust system of community universities, notably in the states of Rio Grande do Sul and Santa Catarina. Finally, in the northeast all seven research universities are federal.

### **RESEARCH UNIVERSITIES: GRADUATE STUDIES AND QUALITY**

Since 1976, CAPES has carried out periodic assessments of all graduate programs in Brazil. Until 1997, each program was graded from A to E according to criteria established



by each area's committee. From 1998 onwards, CAPES adopted a 1 to 7 grading scale, whereby programs that score 6 and 7 are deemed world-class. To assure the validation of these metrics, CAPES organizes periodic evaluations of all programs with high-level international committees.

CAPES attributes a grade for each master's and doctoral program (master's programs that do not offer doctoral degrees can achieve a maximum score of 5). In this essay, we will extrapolate CAPES' practices and assign an average grade for each institution. To measure the quality of each university's graduate offerings, we will take the weighted average of all its graduate programs, assigning the CAPES grade for each program and using the number of doctorate recipients per year as the weight.

The overall Brazilian weighted average of CAPES grades wavers around 5.0 (between 4.9 and 5.1) for doctoral programs, although there are very significant variations from area to area and not all fields of knowledge exhibit the same quality. In Health Sciences, for instance, the average is 4.2, whereas in Exact & Earth Sciences it is 5.7. Some universities remain systematically below this average, while others persist systematically above. One may conclude that, in terms of both institutions and disciplines, Brazil has many so-called "islands of excellence".

Six of Brazil's doctoral/research universities are specialized, that is, have one or two dominant major fields: four are specialized in Agrarian Sciences (UFV – Universidade Federal de Viçosa, UFLA – Universidade Federal de Lavras, UFRRJ – Universidade Federal Rural do R. de Janeiro and UFRPE – Universidade Federal Rural de Pernambuco), one in Medicine (UNIFESP – Universidade Federal de S. Paulo) and one in Human Sciences (PUC/SP).

It is common knowledge that Brazilian public universities tend to offer high-level education and that the quality of private universities is often questionable. At least with regard to graduate studies, these views can be tested. The average CAPES grades for public, community and private master's and doctoral universities, show a correlation between each type of university. Extensive doctoral/research universities obtain the best grades, followed by intensive, Master's I and Master's II – which received the worst grades. Surprisingly, because it goes against the grain of conventional wisdom, we found no significant correlation with the administrative nature of the institution. For a given type of institution, the score averages are basically the same in public and in community-type universities.

The presence/absence of doctorate programs as well as the size of the graduate activities seem to correlate better with the average score than the administrative nature of the institution. The master degree score is systematically low for those universities that do not offer doctoral programs, regardless of the nature of the institution. For those universities that do offer doctoral programs, the average score is related to the size of the graduate activities for both master (strong correlation) and doctoral (weak correlation) programs. Non-community private universities do not offer doctoral programs, with very few exceptions. As a consequence they have poor scores, as have public universities with similar condition.

A more detailed analysis of the quality and institutional diversity of Brazilian universities involved in graduate programs can be found in Steiner (2005).

### **Ranking Universities around the World**

In 2004, two world-class surveys were carried out in an attempt to classify the universities of the world, one by the Chinese university *Xangai Jiao Tong*, the other by the British *Times Higher Education*.

The Chinese survey was based on the following criteria (and weights): number of alumni who received a Nobel prize or the Fields medal (10%); number of professors who received these awards (20%); highly quoted researchers (20%); articles published in *Nature* or *Science* (20%); articles published in the *Science Citation Index – expanded* and in the *Social Science Citation Index* (20%); sum of the indicators above divided by the size of the staff (10%).

The *Times Higher Education* survey was based on the review of 1,300 specialists in 88 countries, with a 50% weight. In addition, the research considered the cosmopolitanism of faculty (5%) and students (5%), the faculty-per-student ratio (20%) and the number of quotations per faculty member (20%).

Clearly, both studies have many flaws. However, so far no one has discovered how to carry out this type of survey free from criticism. One of the major strictures to such studies is that they are often biased by their Anglophonic viewpoint. It is known that scientometry preferentially takes into account productions in the English language, but, for instance, a large part of the Brazilian scientific production is published in Portuguese (especially in Human Sciences and Applied Social Sciences) and, therefore, is not computed by international statistics. To obtain a good indication of the current production volume of Brazilian researchers one should check the data base of Scielo, the Scientific Electronic

Library Online. This virtual library now contains almost 150 Brazilian journals, totaling impressive 2 million accesses per month. Yet only a small fraction of these journals is indexed in the ISI; of the ten most accessed titles in Scielo, nine are printed in Portuguese.

Still, even if the aforementioned caveats and others unmentioned are taken into account, the fact is that, in the international perception, there are no world-class universities in Brazil. In the Chinese survey, the top ranking Brazilian university is the University of São Paulo (USP), but even then it occupies the bottom rungs of the 200 best institutions (UNICAMP, UFRJ and UNESP are included among the top 500 universities). In the English survey, however, which lists the 200 best universities in the world, no Brazilian institutions are mentioned.

### **World-Class Universities**

In the research universities milieu, one often hears the expression “world-class universities”. For Schwartzman (2005), a world-class university must “develop science and technology, but also culture, general learning, knowledge and the ability to understand what happens in one’s country and in the world. It must prepare a broad diversity of professionals, such as professors, diplomats, high public officials, politicians, journalists, historians etc. It must act as a bridge of contact and communication between the country and the world, and be a standard of quality for other institutions.”

Does Brazil have world-class universities? In view of the above descriptions, the country’s doctoral/research universities possess, in some degree, all the listed features, but these are always more or less severely restricted. No Brazilian university was included among the world’s 150 best universities in the two aforementioned surveys.

When we examine CAPES’ weighted averages, we find that no university has an overall average of 6 or more – which, according to CAPES’ standards, would place them in the international level, at least in terms of their postgraduate programs. In a few major fields, however, some universities have attained this level – in agrarian Sciences (UFMG – Universidade Federal de Minas Gerais), Exact & Earth Sciences (USP, UNICAMP, UFMG and UFScar – Universidade Federal de São Carlos), Human Sciences (UFF – Universidade Federal Fluminense), Engineering (UNICAMP and UFSCar) and Linguistics, Literature and Arts (UNICAMP), for instance.

## **The Ranking and “Prestige” of Courses and Universities in Brazil**

Rankings of college courses and universities are routinely published in Brazil. Popular magazines such as *Playboy* and *Guia do Estudante [Student Guide]*, published by Editora Abril Cultural, and large circulation newspapers like *Folha de São Paulo* and *Estado de São Paulo* periodically carry out and publish such surveys. Research universities (albeit called otherwise) are frequently mentioned as the best. It is important to note that, in the academic milieu, a program’s “prestige” depends on how high it scores in the CAPES evaluations. Grades 6 and 7 (which CAPES formally considers as international level) are often mentioned as “evidence” of high level and prestige. For a university, the relevant indicator is the number of programs that obtained grade 6 or 7 – and even in publications and surveys made for popular consumption, this is an important reference.

The yearly *Guia do Estudante*, which enjoys great prestige among students preparing to take college admission exams, also evaluates Brazilian undergraduate courses. Each course receives a certain number of stars, from one to five. The publication only mentions “starred” courses, that is, courses that earned three, four or five stars. According to the *Guia do Estudante*, 185 institutions had “starred” courses in 2004, the most prestigious being those with the greatest share of three- to five-star courses. Using these criteria, the 2004 edition listed the top ten universities which, incidentally, are the same institutions that also are the first on the list of extensive doctoral/research universities in the Carnegie classification. It is important to point out that the Carnegie criteria are quantitative and refer to doctoral programs, whereas the criteria of the *Guia do Estudante* are qualitative and pertain to undergraduate programs. The extremely strong correlation that exists between both taxonomies cannot be random and certainly indicates a cause/effect relationship between both metrics.

In spite of the popular notion that those who graduate from the “good public universities” are better equipped than graduates from other schools, I am unaware of any study of their employability and salaries. However, it is known that a worker’s average income is strongly dependant on the number of years of study, including undergraduate and graduate education (see Schwartzman, 2004).

## **Research Institutes**

Not all of the academic research and teaching is done in universities. In Brazil, research institutes also are quite active. The Instituto Tecnológico de Aeronáutica – ITA, for instance, is quite famous, for having graduated high quality aeronautic engineers over

the last 55 years. As a consequence, a major aeronautic industry – EMBRAER – has been established; it is now the fourth largest aeronautic industry in the world. Another important institute that does not have teaching activities is EMBRAPA – Empresa Brasileira de Pesquisa Agropecuária – in the field of agrarian sciences. This institute, that has about 40 departments scattered all over the country, has been instrumental in the development of the strong Brazilian agribusiness. The institutes FIOCRUZ and BUTANTAN have played a major role in the research of the Health Sciences, including the production of vaccines. A few dozen of other institutes, linked to various ministries or state secretaries have played important roles in the academic research.

### **Academic profession**

The academic profession varies in a significant manner in the distinct groups of universities. Public universities have mostly full time teachers and professors while in private institutions most of them are part-time. As an example, the University of São Paulo – USP – has currently a faculty of about 5,000; among them 77% are full time and 94% have PhD. Such a pattern is followed by most of the best federal universities. Surprisingly some of the not so good public universities also have mostly full time faculty, while the percentage of people with PhD is significantly lower. In private universities, on the contrary, the faculty is mostly part time and less graduated. The higher education system in Brazil is still expanding quite strongly, as a consequence of the demographic demand from the graduates of the high-school system.

## **THE CURRENT SCENARIO**

### **Demographic and Political Pressures**

The increasing demand for higher learning is exerting powerful pressures on the system. In recent years, elementary education has been universalized, while secondary education expanded threefold, generating growing demographic pressures with political consequences that force public universities to increase their enrollment (not necessarily accompanied by corresponding expansion of infrastructure and personnel). The fact that the public sector is not satisfying this demand led to an increase of private initiatives, not always with adequate supervision and evaluation by the government, and with serious consequences to educational quality.

## **Admission and Affirmative Actions: Social and Racial Inclusion**

Admission to public universities is extremely competitive, not only because they are free, but also because of their greater academic prestige. This prestige derives from the fact the most of the country's research is carried out in such institutions, as confirmed by the statistics that 91% of all doctorates are granted by them.

Consequently, the Brazilian middle class keeps their children in private high schools so they might have a better chance in the college admission exams. Families with fewer resources have to educate their children in lower quality public secondary schools, diminishing their chances of attending college free of charge and forcing them enroll in paid private colleges.

In Brazil, it is traditional for each university to organize its own admission exam, defining who will be admitted. In recent years, some universities have included academic achievement during high school as part of this process. In tandem, some public institutions have also established recently a racial quota system, an initiative that has proven to be quite polemical.

## **Autonomy**

The Brazilian 1988 Constitution ensures the autonomy of universities. However, it was never regulated at the federal level. *Autonomy* indicates the power for self-normalization (Ranieri, 2005) – and this conflicts with external demands for social accountability.

For federal universities, autonomy has long been a recurring petition, although its exact meaning, scope and limitations are not clear (Durham, 2005). Because of this, autonomy has emerged as a central issue of the University Reform that the Ministry of Education proposed in 2005.

## **Institutional and Research Financing**

The basic needs of Brazilian public universities -- personnel (active and inactive), infrastructure and services – are funded by the government and research financing (projects, scholarships and infrastructure) comes from specific federal and state agencies.

Federal universities are institutionally funded by the Ministry of Culture and Education. State universities are financed by their respective state governments. Private universities are financed by the students' tuitions. According to Schwartzman (2005), the

institutional budget of the private university system is approximately US\$ 6 billion per year; that of federal universities, US\$ 3 billion; and of state universities, US\$ 1.5 billion.

Research in Brazil, on the other hand, is funded in an entirely different manner. At the federal level, the main financing agency for researchers is the CNPq [Conselho Nacional de Desenvolvimento Científico e Tecnológico = National Council for Scientific and Technological Development], an office of the Ministry of Science and Technology, which maintains a vigorous program of graduate scholarships for master's and doctorates, in addition to a program of scientific initiation. CAPES, an agency of the Ministry of Culture and Education, also provides scholarships for masters and doctorates. And FINEP [Financiadora de Estudos e Projetos = Financing Agency for Studies and Projects] helps to fund institutions, having been recently strengthened with the creation of the so-called Fundos Setoriais [federal funding from discrete private sources].

At the state level, several support foundations have been established. The pioneer and paradigmatic agency is FAPESP [Fundação de Apoio à Pesquisa do Estado de São Paulo = Foundation for Research Support of the State of São Paulo], which boasts a tradition of efficiency in providing support for individual research projects and a fine program of master's and doctorate scholarships, in addition to programs for scientific initiation and postdoctoral studies. Inspired by its success, similar foundations (FAPs) were created in other states, including Rio de Janeiro, Minas Gerais, Pernambuco, Rio Grande do Sul, Amazonas and, recently, Santa Catarina, although they all face various instabilities and irregular funding. In recent years, FAPESP launched an institutional support program and a program to provide support for small, technology-based companies.

### **The Legal Framework and Institutional Assessments**

In view of the growing difficulty of public universities to fulfill the demand for an increasing number of higher education enrollments, private institutions are becoming more and more important and numerous. However, this expansion was not accompanied by the requisite quality control or even quality assessment. Today there is a demand for a legal framework to make the system more transparent for users and for society as a whole.

### **Leadership**

The process of appointing university presidents is a frequent source of controversies – some lobby for indirect processes, others for direct elections. The latter often include the more articulate segments of the student body, as well as movements of unionized faculty

and employees. As a rule, the best international practices are either unknown or ignored (Marcovitch, 2005).

The militant activities of unionized faculty and employees, as well as the organized movements of students, have led to frequent strikes in public universities, causing an accelerated erosion of their image in the eyes of Brazilian public opinion.

There also seems to be a growing lack of institutional commitment on the part of academic leaderships, who seem to be more concerned with their (legitimate) research activities and other professional interests. Managerial hindrances, excessive bureaucracy, the wear and tear of political and ideological confrontation, among others, seem to be among the causes of such disinterest.

## CONCLUSIONS

The main conclusions of this essay may be summed up as follows:

The institutional diversity of research, graduate and undergraduate institutions, has increased in Brazil over the last decades. Using criteria from the Carnegie Foundation to classify institutions of higher learning, Brazil had 39 doctoral/research universities, 54 master's universities and 1,554 baccalaureate institutions in 2003.

The ratio between graduate universities and GDP is approximately the same in Brazil and in the United States. Brazilian doctoral/research universities, like their American counterparts, are chiefly public institutions, followed by community universities (which, in Brazil, have predominantly faith-related origins).

Contrary to common wisdom, Brazil produces a larger percentage of doctorates in applied areas than the USA. In fields like Agrarian Sciences and Health Sciences, the absolute numbers are similar. This implies a clear risk of future brain drain in these fields of knowledge, potentially damaging for countries like Brazil.

The geographic distribution of research universities is highly irregular. Three major regions can be discerned: the *south/southeast*, with 26 universities; the *northeast*, with 7; and the *Amazonia*, with only one.



The undergraduate programs of Brazilian universities are rather irregularly evaluated, but graduate programs have been assessed quite systematically and rigorously since the 1970s, by means of high-credibility peer evaluation processes. In general, doctoral/research universities have received high scores, the average of extensive institutions being higher than that of intensive ones. Different fields of knowledge seem to mature differently: Health Sciences obtained the worst scores (4.2) and Exact & Earth Sciences the best (5.7).

According to both international and national evaluations, Brazil has no acknowledged world-class university. Some universities have reached international levels in various major fields. Taking into account only the average CAPES scores, among the Brazilian largest universities that come closest to becoming world-class institutions are UNICAMP and UFMG, although USP is generally recognized as the leading university in the country.

Public universities are financed by the government that created them, as required by the Federal Constitution, whereas private universities are funded by their students' tuition. Currently both systems suffer from funding problems.

The current scenario of discussions involving the fortunes of research universities in Brazil are centered on the federal government's proposal for a University Reform and includes, among others, the following items: Demographic and political pressures to increase enrollment opportunities in public universities, together with affirmative actions for social and racial inclusion; Institutional autonomy, associated with more effective manners of institutional and research financing; A legal framework and the evaluation of private institutions; Establishment institutional leadership.

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