Tertiary Education and Lifelong Learning in Brazil

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Main Findings

Access and Equity

- *With only one quarter of the relevant population group attending a tertiary education institution, Brazil has the next to lowest gross enrollment rate among the largest Latin American countries, well below the average for the continent (30.3%). This is reflected in the very small proportion of the labor force with tertiary level qualifications (8%).*

- *Access to tertiary education, especially to the most prestigious universities, is heavily skewed against students from low income families. There are also serious regional disparities.*

- *Most of the growth at the tertiary level has been absorbed by private institutions which enroll almost three quarters of the total student population. The private sector has been responsive to the needs of Brazilian students, in particular by organizing night classes and moving to cities in the interior to better cater to students with limited income.*

- *To improve equity, the Government of Brazil has launched the ProUni program which appears to function effectively in placing academically qualified low-income students into private tertiary education institutions. Affirmative action programs have also been recently piloted in a number of public universities. The third pillar of the government's equity policy is the new student loan scheme which needs additional funding to cover all needy students..*

Quality and Relevance

- *Brazil is the 5th most populated nation and the 10th largest economy on the planet, it has world class companies such as Embraer and Aracruz Celulose, but there is no Brazilian university among the 100 top ranked universities in the world, unlike the best universities in Russia, China and India.*

- *The Brazilian tertiary education system is very heterogeneous. Research production is concentrated in a very small group of elite public universities. There is a second tier of public and private universities with pockets of excellence. At the other end of the spectrum, there are many universities and tertiary education institutions with less than satisfactory standards.*

- *Brazilian tertiary education institutions still have a long way to go in terms of academic staff qualifications, modern curriculum, interactive pedagogical methods, and adequate infrastructure. Few institutions have forged meaningful linkages with the productive sectors.*

- *The production of graduates shows a disproportionate share of students coming out of the social sciences and humanities. In addition, there are insufficient graduates from non-university institutions and short duration professional programs such as those typically offered by community colleges and post-secondary technical institutes.*

- *Internationalization is not high on the agenda of most Brazilian tertiary education institutions. International mobility for students and academic staff is limited. Foreign language competencies are low. The proportion of foreign students is very small.*

- *The quality of teaching, learning and research in the Brazilian tertiary education system has improved over the past ten years overall, reflecting a greater emphasis on quality concerns. Unlike other countries in the region that have essentially constructed their quality assurance system around a formal accreditation process, Brazil has pioneered the use of assessment tests to measure student learning in conjunction with external evaluations of tertiary education institutions and has put in place a very rigorous assessment of graduate programs.*

- *Graduate unemployment has become a more serious issue in recent years, reflecting potential areas of mismatch between the supply of tertiary education graduates and labor market needs.*

- *Brazil is the main contributor of research products in Latin America. But it is outperformed by Argentina, Chile and Uruguay in terms of relative contribution. Brazil's rate of patent acquisition is overshadowed by that of Korea and China. Very few federal universities are actually productive in conducting advanced research in leading edge areas from an international viewpoint.*

Governance, Management and Financing

- *Under the present centralized governance system, there are considerable constraints that hinder public universities to exploit their potential to the fullest and to operate as world-class institutions.*

- *With very limited performance-based budget allocation mechanisms, public universities have no particular managerial and financial incentives to use resources more efficiently and become more responsive to labor market and societal needs.*

- *The Brazilian federal universities are characterized by high unit costs reflecting low student / faculty ratios and a large share of personnel expenditures under the combined effect of generous pension schemes and a disproportionate number of administrative staff.*

Summary of Recommendations

Strategic Vision

- *The Government of Brazil's ambitious plan to increase tertiary education coverage, achieve greater equity, enhance quality and improve relevance cannot be achieved only with the traditional approach of establishing and funding new public universities with government budgetary resources. A three-pronged strategy is proposed to attain the planned objectives: (i) balanced growth of the university and non-university sub-sectors with clear quantitative targets for the latter; (ii) greater resource diversification in public universities, including higher levels of cost-sharing; (iii) and increased incentives and accountability for good quality private institutions.*

- *The Government of Brazil should decide how many world-class universities the country needs and can afford, as well as the criteria for selecting and funding them. Explicit policies and additional funding should be available to encourage the development and upgrading of existing institutions and centers of excellence that would form the basis of these world-class universities. Particular attention should be paid to the governance reforms needed to facilitate the operation of world-class universities.*

Governance and Financing

- *To allow public universities to strengthen their performance and become more innovative, the Government of Brazil should promote greater autonomy while putting in place adequate accountability mechanisms.*

- *To promote greater efficiency in the use of public resources, the Government of Brazil should consider applying a combination of complementary performance-based funding allocation mechanisms to allocate public resources among tertiary education institutions.*

- *To ensure adequate coverage and long term sustainability, the Government of Brazil needs to increase funding for low income students while ensuring high repayment levels. It may also want to explore the feasibility of setting up an income contingent student loan system that could, in principle, be more efficient and equitable than the present mortgage type scheme.*

- *There is a need to establish a labor market observatory to monitor the labor market outcomes of tertiary education graduates on a continuous basis, widely disseminate information about careers and pathways, and advise decision-makers on necessary adjustments at the level of tertiary education institutions as well as labor market policies.*

Access and Equity

- *The single most important lever to increase equity in tertiary education access will be to improve the quality of public secondary education.*

- *The Government of Brazil needs to elaborate a lifelong learning strategy and qualifications framework to establish better linkages and bridges among all providers of education and training services.*

- *The Student Loan Scheme requires a number of adjustments to guarantee the availability of financial aid to all needy students and improve its financial sustainability. The eligibility criteria need to be tightened by placing an income ceiling to make sure that only students from low and middle income families benefit from the subsidized loans. The financial guarantee requirement should be removed for students from the poorest families.*

Quality and Relevance

- *To enhance quality, tertiary education institutions should seek to raise the level of qualifications of their academic staff, improve pedagogical practices, integrate research into the undergraduate curriculum, upgrade their infrastructure and offer a stimulating learning environment. It is important to forge close linkages with the productive sectors, especially for professional tracks and science and technology related programs.*

- *Tertiary education institutions in Brazil need to place more emphasis on preparing globally minded, locally responsible, and internationally competitive students. Brazil needs to raise foreign language competencies among its academic staff and graduates. The country would benefit from accelerating the international mobility of students, professors and researchers. Specific resources should be made available to support all these initiatives.*

- *There is a need to encourage more students to study in science and engineering disciplines and to develop attractive non-university alternatives to train middle-level professionals and technicians.*

- *The top research universities should develop extensive linkages with the productive sectors to better respond to their needs, develop contracting activities, and commercialize inventions through business incubators.*

Introduction

Compared to Spanish-speaking South America, the Brazilian tertiary education system developed relatively late and slowly (Levy, 1986). Even though some professional faculties had been established in the 19th century, the first true universities were not created until 1920 (University of Rio de Janeiro) and the early 1930s (University of São Paulo and University of the Federal District). After rapid growth in the 1960s and the 1970s, the Brazilian tertiary education system had become the largest in the region by 1980, with almost one-and-a-half million students, two-thirds of them enrolled in private institutions. Partially as a result of the fiscal crisis, enrollment growth slowed down considerably in the following two decades; it did not even keep up with population growth. But it has accelerated again since 1998.

In 2006, the last year for which official statistics are available, the Brazilian tertiary education system was made of 2,270 institutions enrolling 4.6 million students. This corresponded to a gross enrollment rate of about 25 percent and the highest proportion of students attending a private institution in Latin America (74%).

Table 1. The Brazilian Tertiary Education System (2006)

	Public	**Private**	**Total**
Institutions	248	2,022	2,270
Students	1,209,304	3,467,342	4,676,646

Source: Ministry of Education portal, Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP) www.inep.gov.br

The Government of Brazil (GOB) is currently considering an ambitious reform program that would provide for significant expansion of the public network of tertiary education institutions, including the federal universities, and increased funding for research and post-graduate education.[1] The reform envisages as well measures to improve the quality and relevance of tertiary education programs across the board, to consolidate the licensing and evaluation system for private institutions, to grant more autonomy to public universities, and to amplify the affirmative action program. Recent events and political statements indicate, however, that this reform agenda may have been temporarily put on the back burner, except for the establishment of a few new federal universities and the affirmative action dimensions of the reform program.

To assess whether the tertiary education system is in a position to contribute adequately to Brazil's strategy to move towards innovation-driven economic growth, this chapter examines the following dimensions:

- access and equity: has Brazil expanded its tertiary education system sufficiently, and do all groups in society have equal opportunities to participate?

[1] Throughout this report, GOB refers to the federal government.

- quality and relevance: are universities and other tertiary education institutions producing the kind of graduates and research outputs that the new economic agenda requires?
- governance, financing and management: is the governance structure appropriate to facilitate the transformation of the tertiary education system? Is Brazil investing sufficiently at the tertiary education level? Are resources allocated and utilized in an effective manner?

This report is based on field visits, interviews and focus group meetings conducted between November 2006 and April 2007. It relies on official government documents and policy statements, studies and annual reports prepared by the universities visited, secondary data analyses by Brazilian researchers, surveys, newspapers and other media including the Internet. Available quantitative information was retrieved from databases of the Ministry of Education, international organizations such as UNESCO, OECD, the Inter-American Development Bank and the World Bank**.** The report is organized into two main parts. It starts with a diagnosis of the present situation, relying on a range of key indicators to benchmark Brazil's tertiary education system against select OECD and Latin American countries and on an in-depth analysis of the system's main strengths and areas of weaknesses. The second part provides policy recommendations and detailed action plans to improve the Brazilian tertiary education system, with special attention to the governance and financing framework, the research and innovation nexus, access and equity issues, as well as ways to improve quality and relevance.

Part 1 – Diagnosis of the Present Situation

1.1 Access and Equity

Coverage

It is paradoxical to observe that Brazil has, at the same time, one of the largest tertiary education systems in the world and one of the relatively less developed systems in Latin America. In fact, with only one quarter of the relevant population group attending a tertiary education institution, Brazil has the next to lowest enrollment rate among the largest Latin American countries, well below the average for the continent (29%). As table 2 shows, only Mexico has lower coverage at the tertiary level.

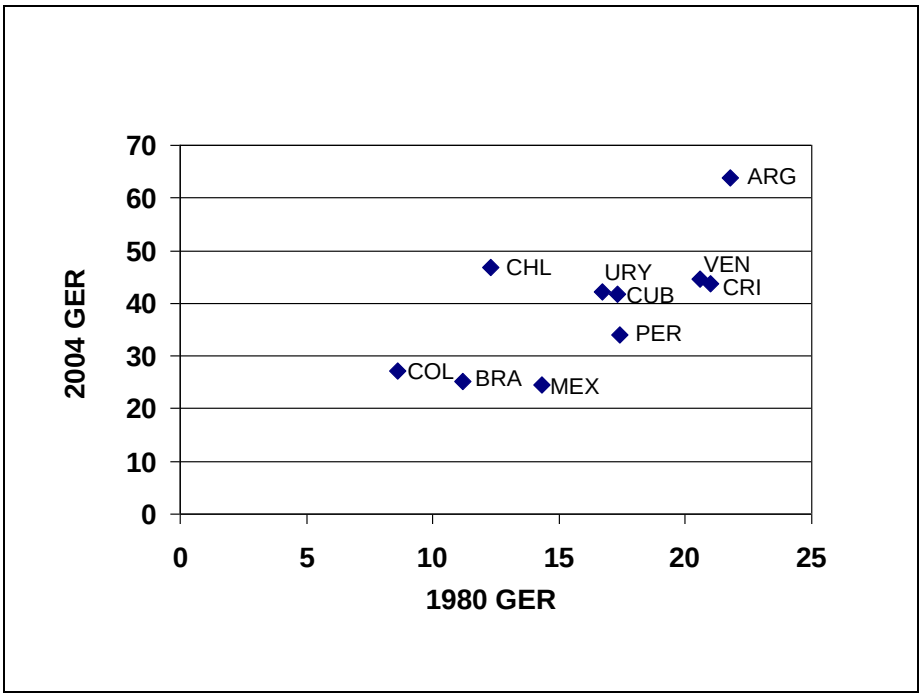
Table 2. Tertiary Education Coverage in Latin America (1980-2004)

Countries	1980	1990	2004	% Increase 1980 - 2004
Argentina	21.8	38.5	63.9	292
Brazil	**11.2**	**11.3**	**25.1**	**224**
Chile	12.3	21.3	46.9	381
Colombia	8.6	13.4	27.1	315
Costa Rica	21.0	26.4	43.7	208
Cuba	17.3	20.9	41.7	241
Dominican Republic	n/a	20.4	36.9	n/a
Mexico	14.3	15.2	24.6	172
Peru	17.4	31.1	33.9	195
Uruguay	16.7	30.7	42.2	253
Venezuela	20.6	29.2	44.6	217
Latin America	n/a	15.6	30.3	n/a

Source: EdStats, The World Bank, last data update June 2006, retrieved Sep. 5, 2006, and IESALC, 2006.

Figure 1 below, which plots the evolution of the tertiary enrollment rate between 1980 and 2004, illustrates the increasing gap between Brazil and most Latin American countries.

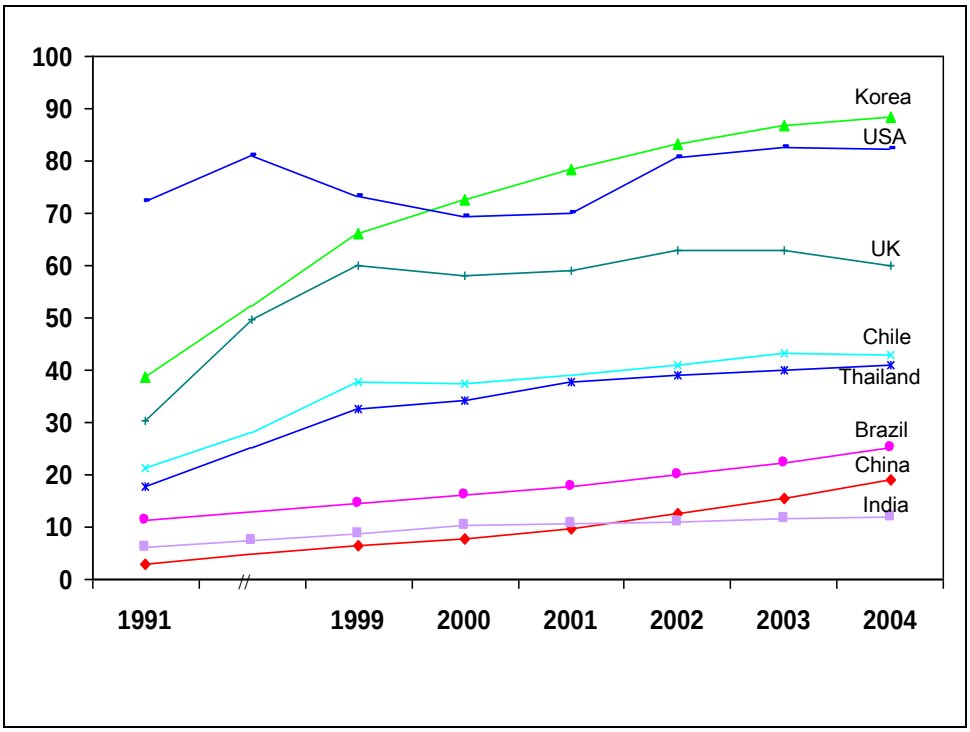
Figure 1. Evolution of Tertiary Education GER in Selected Latin American Countries



Source: EdStats, last data update June 2006, retrieved Sep. 5, 2006

Brazil's relatively low performance in terms of tertiary education coverage is also obvious when comparisons are made beyond Latin America. Figure 2, which presents data on several OECD and developing countries, clearly indicates that countries like China, who not too long ago were way behind Brazil, are rapidly catching up and are likely to achieve a higher level of coverage than Brazil within two to three years.

Figure 2. Evolution of Tertiary Education GER in Selected Countries



Source: OECD and UIS

As can be expected, the low level of development of the tertiary education system is reflected in the distribution of educational attainment of the Brazilian labor force. Table 3 below, which shows the proportion of the adult population with tertiary education, clearly illustrates the disadvantage at which the Brazilian labor force is, compared to some of the country's economic competitors.

Table 3. Share of Labor Force with Tertiary Education (2005)

Country	25-64 Age Group	25-34 Age Group
Brazil*	8	8
Chile*	13	18
Korea	32	51
Mexico	15	18
OECD average	26	32

*Year of reference: 2004
Source: OECD. (2007). *Education at a Glance,*.available at www.oecd.org/edu/eag2007

What are the reasons for the low level of coverage of the Brazilian tertiary education system? The principal factors explaining this situation are, on the one hand, the relatively low growth of secondary education and, on the other hand, the fact that the GOB has maintained the size of the public tertiary education sub-sector fairly stable over time, and has allowed the brunt of the expansion in tertiary enrollment to be absorbed by private institutions. As table 4 shows, between 1996 and 2006, the number of public institutions grew only by 17% over the entire period, from 211 to 248, whereas the number of private institutions nearly tripled, from 711 to 2,022. Half of the private tertiary education institutions in operation today have been established since 1998.

Table 4. Evolution of Number of Tertiary Education Institutions (1996-2006)

Type of Institution	1996	2006
Universities (public)	72	92
Universities (private)	64	86
Non-university multiple faculty (public)	11	8
Non-university multiple faculty (private)	132	227
Non-university single faculty (public)	128	148
Non-university single faculty (private)	515	1,709
Total (public)	**211**	**248**
Total (private)	**711**	**2,022**

Source: Ministry of Education, *Sinopses Estatísticas da Educação Superior*, 2006, available at http://www.inep.gov.br/superior/censosuperior/sinopse/default.asp

Equity Dimensions

> *Pobres pagam para estudar nas faculdades particulares e ricos estudam de graça nas universidades públicas. Desmanchar esse xis é um grande primeiro passo.*
>
> *Poor people pay to study in private faculties whereas rich people study for free in public universities. Undoing this is a big first step.*
> Title of 2 October 2006 article in Veja on-line

Not only is tertiary education coverage low in Brazil, but there are also serious equity concerns. Access to tertiary education is heavily skewed against students from low income families. As of 2006, only 8% of the total student population came from the bottom two quintiles (2006 Household Survey *PNAD*), as illustrated by Table 5 below.

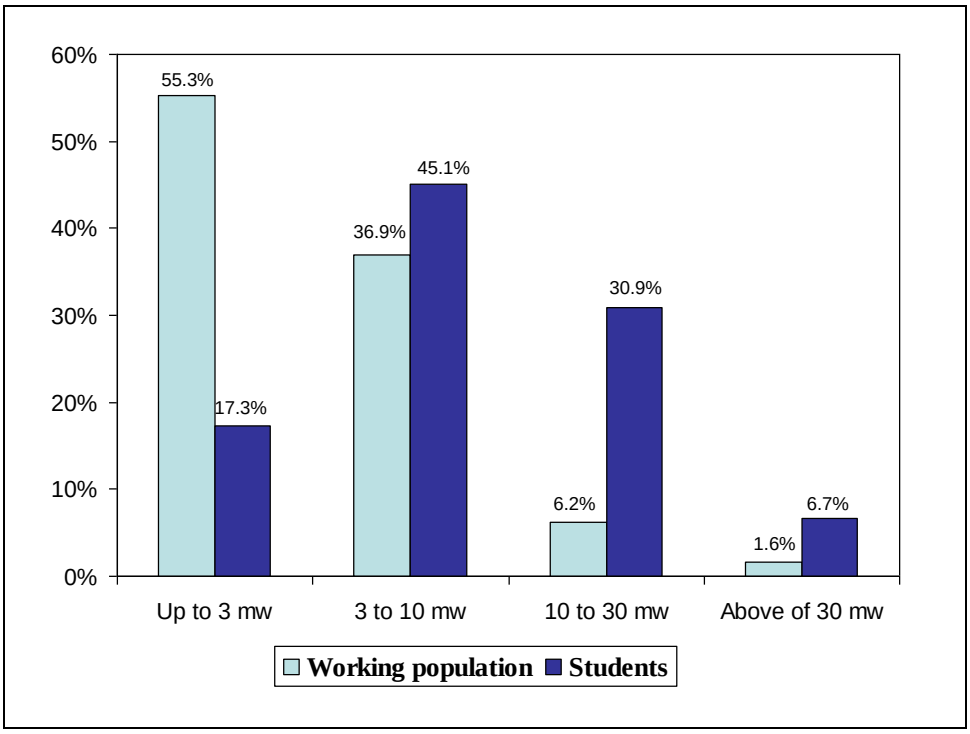
Table 5. Distribution of Students by Family Income Decile

Deciles	2004 (%)	2004 (cumulative)	2006 (%)	2006 (cumulative)
1	1	1	2	2
2	1	2	1	3
3	2	4	2	5
4	4	6	3	8
5	5	9	3	11
6	5	14	6	17
7	9	23	9	26
8	14	37	14	40
9	23	60	22	62
10	40	100	38	100

Source: Household Surveys compiled by PNAD (*Pesquisa Nacional por Amostra de Domicilios*)

The extent of inequality cannot also be illustrated by comparing the proportion of workers by income groups, measured as multiples of the minimum wage, and the proportion of students from these same groups (Figure 3).

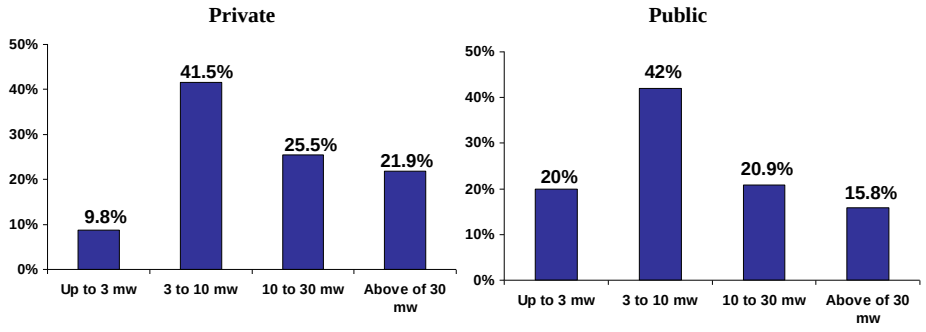
Figure 3. Distribution of Students by Income Group (2003)



Source: JBIC (2005), with MEC/INEP data.

Another way of analyzing the unequal distribution of the student population is to compare the distribution of students by income level across public and private tertiary education institutions. Figure 4 below illustrates the concentration of students from the richer family groups in Brazilian tertiary education institutions in general, as well as the relatively higher proportion of low income students in the tuition-free public institutions.

Figure 4. Distribution of Students in Public and Private Tertiary Education Institutions (income as a multiple of minimum wage)



Source: JBIC (2005) based on MEC/INEP data.

Obviously, the presence of low income students in public institutions depends on the degree of selectivity of these institutions. Data from a recent study at the State University of Campinas (UNICAMP) in the State of São Paulo, which is widely considered as among the best universities in Brazil, provide a vivid illustration of the extent of social bias characterizing the student population of an elite Brazilian university (table 5). The proportion of undergraduate applicants to first year places is 16 to 1 at UNICAMP and 15 to 1 at the University of São Paulo - USP), compared to a national average of about 4 to 1 in public tertiary education institutions. At USP, in 2006, only 3 new entrants in medicine out of a total of 180 came from public high schools. On average, all disciplines considered, 30 percent of new entrants at USP were public school graduates.

Table 6. Socio-Economic Characteristics of Undergraduate Students at UNICAMP

	Low Income Family	Having attended a public high school	Father with tertiary degree	Mother with tertiary degree
UNICAMP	10%	27%	53%	41%
São Paulo	57%	84%	11%	12%
Brazil	69%	83%	8%	9%

Source: Pedrosa, 2006

2003 estimates of the incidence of public expenditures in education show that students from the lowest quintile receive 2% of tertiary education expenditures versus 58% for the highest quintile. Thus, Brazil is a textbook illustration of a highly regressive system whereby the most qualified students, coming from middle- and high-income families and graduating usually from exclusive private secondary schools, are enrolled in the free top public universities or the most prestigious programs in private universities, while less academically qualified students more often than not are enrolled in the less prestigious programs offered by public universities and institutes or attend fee-paying private tertiary education institutions.

Several factors converge to create this unique situation: a government-controlled system, at the federal and state levels, that limits the number of places in public universities; public secondary schools of poor quality that do not prepare students well for access to the most prestigious programs in public universities; admissions procedures that are biased in favor of students coming from a private high school (66% of new entrants at UNICAMP while private high schools represent only 6% in São Paulo State); and insufficient financial aid for academically deserving students from low income families.

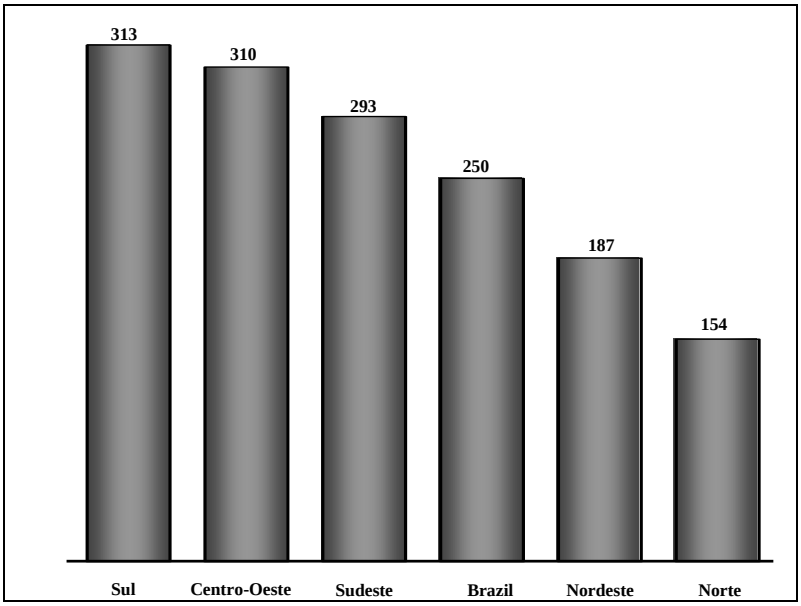
There is also a regional dimension to the equity problem, besides the socio-economic aspects discussed above. As a matter of fact, the national data hide significant regional disparities, as illustrated by table 6 and figure 5. Tertiary education coverage is particularly low in the poorest states such as Pará, Maranhão, Ceará and Bahia in the Norte and Nordeste regions where secondary education is less developed than in the rest of the country (Annex 1). By contrast, the situation is much better in the Federal District (more than twice the national average), Mato Grosso do Sul, Rio Grande do Sul, Rio de Janeiro, Santa Catarina and Paraná (Centro-Oeste, Sul and Sudeste regions).

Table 7. Regional Disparities in Tertiary Education Coverage (Proportion of Students per 10,000 Inhabitants in 2006)

Region	Number of Students per 10,000 Inhabitants
Norte	187
Nordeste	154
Sudeste	293
Sul	313
Centro-Oeste	310
Brazil	**250**

Source: MEC/Inep/Deaes, *Sinopse de Educão Superior* 2006 and IBGE, *Estimativas da População 2006*, available at www.ibge.gov.br

Figure 5. Regional Disparities in Tertiary Education Coverage (Proportion of Students per 10,000 Inhabitants in 2006)



Source: MEC/Inep/Deaes, *Sinopse de Educacão Superior* 2006 and IBGE, *Estimativas da População 2006*, available at www.ibge.gov.br

On the positive side, however, it is important to mention the faster growth of tertiary education programs in cities located in the interior than in state capitals in the past few years (JBIC, 2005). Back in 1996, 44.8% of all undergraduate courses were offered in state capitals, but by 2004 about 64% of all tertiary education institutions were located outside state capitals. The great majority of them (89%) are private institutions established to cater to young people who cannot afford to move to the state capital to study. In this instance again, the private sector has shown better responsiveness than the public universities.

Equity Improvement Programs

The GOB has put in place a number of programs to address the serious equity issues plaguing the tertiary education system. The most important equity programs to be examined in that context are:

- ProUni
- Affirmative Action programs
- Student Loan programs

ProUni

In 2004, the Ministry of Education launched a program called ProUni (*Programa Universidade para Todos- "*University for All") which aims to place academically qualified low-income students into private tertiary education institutions. To be eligible, a student must have a passing grade in the voluntary national end-of-secondary examination (ENEM) and demonstrate that he/she comes from a low income family. If the family has an income equal or less than one-and-a-half minimum wages per family member (R$622.5)[2], the student gets a full tuition fee scholarship. With an income up to three minimum wages (R$1,245), the student gets a half scholarship. Full time students who receive the full scholarship are also eligible for a monthly maintenance grant of R$300 since March 2006. About 12,000 students are expected to get this additional benefit. The Government's target is to finance up to 400,000 students under ProUni by 2008, which would be equivalent to 33 percent of the current enrollment in public tertiary education institutions.

In practice, the scholarship does not involve any actual transfer of resources from the Ministry of Education to the students or the participating tertiary education institutions. Instead, these institutions receive a tax exemption upfront during the first year of participation in the program. The tax exemption continues every year as long as they maintain the scholarships for students that entered in previous enrollment rounds, and provide scholarships for new ProUni students according to a formula of one scholarship for every 10.7 new students enrolled (1 for 9 in the case of a non-profit tertiary education institution).

[2] At exchange rate of March 12, 2008 this is equivalent to about US$370.5.

After three years of operation, ProUni has shown tangible signs of success. About 112,000 students benefited during the first year (out of 340,000 candidates), and more than 160,000 received a ProUni scholarship during the academic year 2006-07 (out of 800,000 candidates). The drastic increase in the number of candidates allowed the Ministry to raise the cut-off point for the selection of eligible students based on their ENEM results, from 56 in 2004-05 to 62 in 2005-06. But it was brought down to 45 in 2007.

The participation of the private sector has also been very enthusiastic, partly because many of them have unfilled capacity and partly because of the social appeal of the program. More than 1,200 institutions, out of a total of 2,022 private tertiary education institutions in Brazil, have joined the program. About half are for-profit institutions; the other half is split between non-profit and philanthropic institutions. Since the tax exemption brings significant financial advantages only to the for-profit universities, the strong participation of non-profit and philanthropic universities is a clear indication of the program's influence.

Notwithstanding its innovative character and ingenuous financing engineering, ProUni raises a number of questions requiring further investigation before the program's effectiveness and impact can be fully assessed:

- Proper targeting of intended students. It will be important to verify that ProUni beneficiaries match the intended selection criteria. It is indeed surprising, given available data on the quality of secondary education, that so many students of low-income families would be completing secondary education and achieving good results in the ENEM test.

- Quality of participating private universities. In the absence of a formal accreditation system that all tertiary education institutions are subject to, there is a sense that the Brazilian quality assurance system, SINAES, is not sufficiently strong to regulate the sector, provide reliable information on existing institutions and protect students from diploma mills. One of the risks that ProUni faces, therefore, is that a significant proportion of beneficiary students would end up in low quality private institutions and that the program ends up buying places that students would not otherwise be willing to pay for.

- Actual cost of the program. Even though the Ministry of Education does not actually pay for the scholarships given to ProUni participants, there is a significant opportunity cost for the Ministry of Finance. The value of the tax exemptions offered to participating universities has been estimated at 100 million Reais during the first year of the program, benefitting 112,000. About 400,000 students are expected to benefit in 2008. Financial projections of the full administrative and opportunity costs of the program are needed to make a complete cost-benefit assessment and comparison with marginal costs in the public university sector.

- Academic results and labor market outcomes of participating students. The most significant test of the success of the program will be to observe the academic results and labor market outcomes of participating students and to compare actual opportunities with initial expectations. The results of field visits seem to indicate that the ProUni students do fare as well if not better than the other students enrolled in these private institutions.

- Finally, there is a need to consider the more fundamental issue of possible social bias that ProUni would reinforce by channeling academically qualified students from low income families towards the less prestigious private tertiary education sub-sector instead of finding ways to democratize access to public universities.

Affirmative Action programs

The GOB has been increasingly concerned with racial inequities reflected in the education system. In a country where 6.2 percent of the population consider themselves as blacks, the tertiary education population has only 2 percent of black students. Table 7 below illustrates the income differential between whites and blacks in Brazilian society.

Table 8. Income Differences between Blacks and Whites (2006)

Families' Income	Blacks	Whites
Families with less than R$1,500 per Month	57.7%	30.0%
Families with More than R$2,500 per Month	20.4%	46.6%

Source: JICA (2006).

To address this issue, the Government presented a law to Congress that would oblige the federal universities to reserve at least half of new places to students originating from public schools, to be divided among black, mixed race and indigenous students.

Special attention is also paid to the ethnic distribution of ProUni participants. The proportion of indigenous and Afro-Brazilian students receiving scholarships must be at least equal to the group's proportion of the total population in the State where they are studying. During the first year of ProUni implementation, about 34% of the selected students came from these groups.

Even before these government initiatives, a number of public universities had established their own form of affirmative action program (Renato, 2006). The University of the State of Rio de Janeiro (UERJ) was the first tertiary education institution to adopt a quota system in 2001, initially guaranteeing 40 percent of undergraduate places for blacks and persons of mixed race who had attended public primary and secondary schools. But this

first quota system was immediately challenged in court and the University modified the eligibility criteria to eliminate the mixed race concept, make the prior schooling requirement more flexible, and reduce the number of quota places. The Federal University of Brasilia (UnB) introduced its own quota system for Afro-Brazilian students in 2004.

The more advanced equity scheme comes from UNICAMP which has designed an affirmative action program providing for easier admission criteria (30 extra points on top of a minimum of 500) for public high school graduates who have successfully passed the first phase of the university admission exam (vestibular). Ten additional points are given to those who declare themselves as black, mixed race or indigenous. A preliminary evaluation of the program revealed that the beneficiaries performed relatively better than high income students selected through the regular admission and that "it is possible to accommodate affirmative action programs and merit criteria when recruiting undergraduate students to a highly selective (research) university" (Pedrosa, 2006).

An evaluation study of a similar program at UERJ pointed out that the beneficiaries seem to have been able to reduce, equal and even surpass the score difference that they had with other students in the vestibular exam. However, while students coming from the public schools perform as well or better compared to graduates of private high schools, black and indigenous students who did also benefit from the program could only reduce the gap but not surpass the others. Two hypotheses might explain this result: the low socio-economic background of many black and indigenous students could hamper their academic performance, and they might be evaluated differently as a result of discrimination. Further analysis should be undertaken to test those explanations[3].

Notwithstanding the good intentions behind these quota programs, the GOB needs to carefully review the lessons from international experience with affirmative action programs, which highlight the following generic difficulties (Sowell, 2004):

- How to limit preferences and quota in time and scope;
- How to ensure that the actual beneficiaries are those targeted by the preference program;
- How to avoid polarization leading to inter-group resentment and conflict;
- How to avert overall efficiency losses.

In the Brazilian case, an additional complication comes from the fact that there is no legal definition of a "black person" and that, until now, universities have relied on self-declarations by students to identify those eligible to benefit from the quota system. This makes it even more likely that the problem of "re-designation" found in other countries would also emerge in Brazil, whereby some students would arbitrarily label themselves as members of the African-Brazilian group for the sole purpose of taking advantage of preferential admission and/or related financial benefits (ProUni, scholarships, etc.).

[3] Antônio Gois, "Aprovado com benefício vai melhor na universidade", *Folha de S. Paulo Cotidiano*, 30/12/2007.

However, there have been several legal challenges against affirmative action in recent months. For example, in the State of Santa Catarina, the UFSC adopted a quota system in July 2007 that reserved 20% of new seats for students coming from public high schools, and 10% for black students who studied in public schools, with the possibility for those with low scores to still get a university place for half the fees. Students, who did well enough on the vestibular exam but were not accepted at UFSC because of the quota protested against this new system and got their voices heard in court. The Federal Justice of Santa Catarina suspended the UFSC quota scheme on the grounds that only a federal law could allow exceptions to the constitutional principle of equality of all citizens[4].

[4] Matheus Pichonelli, "Justica supsende sistema de cotas da Universidade Federal de SC", *Folha Online*, 21/01/2008, available a www.folha.com.br.

Box 1. Lessons from Preferential Admission Programs

Even if group preferences and quotas are aimed to be limited in time and scope, in most countries the capacity to control such policies and limit them over time has proven to be illusory, and so has the pretension of eliminating centuries-old inequalities through temporary programs. International experience shows that preferential admission programs tend to have the following negative consequences:

- The reaction of both the preferred and the non-preferred groups are neither controllable nor predicable. Non-preferred group members can redesignate themselves as members of the preferred group creating artificial categories and then distorting the purpose of reestablishing equal opportunities amongst groups and even worsening off the situation of the initial beneficiaries.

- The beneficiaries are not always those initially targeted: preferences can benefit more fortunate members of less fortunate groups, the lowest economic group being left behind.

- The benefits of such programs to the concerned groups or to the society as a whole has often been over-estimated: transfer of benefits from one group to another can change people's mindsets and result in important social, economical and efficiency losses if both groups tend to do less than their best or if the non-preferred groups decide to leave the country.

- Inter-group resentments can appear even when only minor transfers of benefits apply. Group preferences and quotas go against the principle of equality of treatment and can be interpreted as unfair and unjustified privileges even though individuals of the non-preferred groups have not lost anything.

- The concrete results of such policies on the reduction of inequalities are hard to evaluate since pre-existing trends and other social, individual and economical factors simultaneously act on the situation of these groups.

Warning against group preferences or quotas compensation does not mean not acknowledging that some groups did suffer or are suffering from discrimination; it aims at raising awareness on the concrete, actual and global consequences of such programs vs. just considering the rationales. Several country experiences show that the overall results could be clearly negative for the society. This is particularly important to consider knowing that once preferred policies are introduced, they can hardly be removed, and tend on the contrary to expand over time.

Source: Sowell (2004).

Student Loan Programs

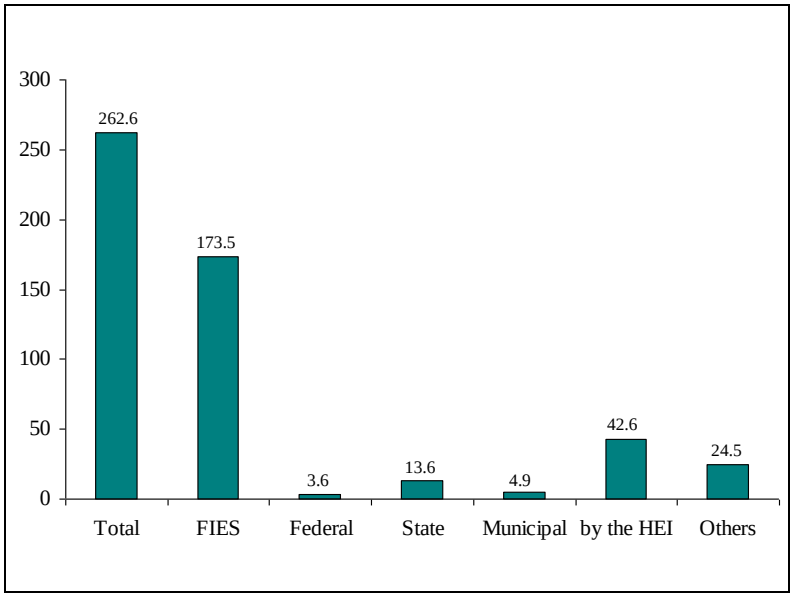
Brazil has had a national student loan program since 1976. The program has been managed by the Federal Savings Bank (*Caixa Economica Federal – CEF)* and has evolved through different structures over time. It ran into serious difficulties in the early 1990s because of excessive default rates (up to 70% of loan recipients) as a result of high inflation rates and ineffective approaches to pursuing defaulters.

The student loan program was cancelled in 1994 and a new scheme was set up in 1997 under the name of *Fundo de Financiamento ao Estudante do Ensino Superior (FIES)*. FIES loans finance 50 percent of tuition fees (reduced from 70 percent in earlier years) at a fixed annual interest of 6.5 or 3.5 percent depending on the program of studies (down from 9 percent until 2006). The students, who need to have two guarantors (except in the State of Alagoas), can enroll only in institutions accredited by the Ministry of Education and must maintain good grades (75 percent) to continue benefiting from the loan. By 2006, about 390,000 students had received a FIES loan.

A number of states and municipalities have their own small-scale student loan program. The most extensive one is operated by the State of Santa Catarina which allocates a share of tax revenue in support of the student loan program. Many private tertiary education institutions also manage their own student loan scheme in response to the financial needs of their students. Finally, there is a private foundation in Rio Grande do Sul, called FUNDAPLUB, that was set up by an association of professionals to provide student loans to needy students. FUNDAPLUB has distinguished itself as one of the more successful private student loan agencies in Latin America.

The administrative set up of FIES seems to be reasonably lean. The program is supervised by a small group within the Ministry of Education and administered by CEF on behalf of the Ministry. Figure 6 shows the distribution of available student loans by financing institution. It is estimated that about 262,600 students received financial aid through one of these loan programs in 2004, which amounts to about 10 percent of the total number of students attending a private institution. Considering that ProUni takes care of the financial aid needs of the poorest students, it can be assumed that FIES is reaching the majority of non ProUni students in need of financial assistance. But this would need to be verified with an appropriate survey.

Figure 6. Distribution of Student Loans by Financing Institution 2004)



Source: MEC/INEP.

Notwithstanding the positive features of FIES in terms of management and coverage, a number of adjustments could be considered. The first concern has to do with eligibility. Since there is no family income ceiling as condition of eligibility, it would be important to verify whether there is any leakage. Students from wealthy families could take advantage of the 6.5 percent concessional interest rate to support expenditures not directly linked to their studies, since money is fungible. Second, since the loan covers only half the tuition fees, low-income students may not be able to fund the other half themselves, not to mention their inability to cover living expenditures if they are not working. Third, the repayment schedule provides for equal monthly payment during the repayment period. This has the major drawback of translating into relatively high payments at the beginning of a graduate's professional career and relatively smaller payments as the income of the graduate increases over the years. The last aspect that needs to be investigated is the financial sustainability of the student loan scheme. So far, payment compliance has been satisfactory, with only 11 percent of graduates defaulting on their loans. But it is still important to monitor the accumulated costs of the program, namely the 2 percent administrative fee to *Caixa*, the cost of non payments and the interest rate subsidy, to make sure that there is no decapitalization of the FIES program.

Lifelong Learning Opportunities

In Brazil as in other parts of the world, the evolution towards a knowledge-based economy demands new skills and competencies and a new model of education and training to acquire them. Many countries are moving to develop a lifelong learning framework encompassing skill acquisition and renewal throughout the lifecycle of individuals and across all possible learning settings, from formal learning in established institutions to non-formal learning on the job to informal learning in all walks of life. A

key purpose of lifelong learning systems is to provide second chance opportunities for young people who did not complete secondary education or did not enter tertiary education and for adults in need of mid-career retraining and skills updating.

Brazil does not have a lifelong learning strategy yet. The country has a well-developed network of vocational training institutions organized under SENAI, but there are very few linkages between SENAI and the tertiary education system under the responsibility of the Ministry of Education. Even within the tertiary education system, mobility across different types of institution is limited. Few institutions have a modular course organization based on academic credits that would facilitate transfers from one institution to the other. There is no recognition of prior learning. Career guidance is not well developed and there are no special financing mechanisms for lifelong learners.

An important dimension of a lifelong learning system is the availability of institutions, programs and courses that provide opportunities for people who are working and/or who are out of the formal education system to resume or continue their education and training. In this context, a positive feature of the Brazilian tertiary education system is the widespread existence of night courses, as revealed by the unusually high proportion of students enrolled in this type of courses (table 8).

Table 9. Proportion of Students Enrolled in Night Courses by Type of Institution (%)

Type of Institution	1991	1997	2006
University	**37.8**	**44.5**	**50.5**
Federal	15.0	16.7	24.1
State	37.6	42.7	39.2
Municipal	71.1	72.1	67.8
Private	54.5	58.7	63.3
Non-University Multiple Faculty	**77.3**	**77.0**	**69.5**
Municipal	94.0	14.0	75.6
Private	76.6	77.3	69.3
Non-University Single Faculty	**75.1**	**76.3**	**75.5**
Federal	29.9	43.4	46.2
State	74.6	76.1	60.2
Municipal	82.1	82.2	75.8
Private	76.0	76.9	77.1
Total	**55.1**	**54.7**	**60.9**

Source: MEC/Inep/Deaes, 2006.

These data illustrate another characteristic of the Brazilian system, namely the fact that it is the fee-paying private institutions that have better responded to the absolute necessity, for many students, to work during the day in order to be able to pay for their studies and their living expenses.

Another key dimension is the opportunity to enroll in short duration professional programs and courses along the model of the French institutes of technology or the North American community colleges that offer courses with a high practical content directly linked to local labor market requirements. Traditionally, there have been very few institutions and programs responding to these characteristics in Brazil. But new legislation passed in 1996 has opened the door to the establishment of two categories of such short duration programs: technology courses and sequential courses within existing programs. The technology courses can be provided either by tertiary education institutions or by specialized training centers. The duration is usually of two and a half

years, leading to a degree that allows the graduates to continue studying at the postgraduate level. The sequential courses, which take up to two years to complete, are offered as part of regular four-year courses. Upon completion, the students receive a certificate of study.

The quantitative development of these short programs has however been relatively slow. By 2003, they represented only 2 percent of overall enrollment. Yet, the results of a survey of students enrolled in technology training courses conducted in 2003 by Paulo Renato Souza Consultores confirms that these programs do indeed perform a critical lifelong learning role, offering education opportunities to non-conventional students (JBIC, 2005). The most salient findings of the survey were that 60 percent of the students had been out of school for more than five years previously, and that they had chosen these particular courses because of the short duration and lower cost (about 30 percent less than regular four-year programs).

The last dimension to consider in this context is the availability of distance education as a flexible modality to allow employed youths to study part-time. Table 9 below shows the rapid growth of distance education courses and students enrolled in recent years.

Table 10. Evolution of Distance Learning (2000-2006)

Year	Courses	Students	Graduates
2000	10	1,682	-
2002	46	40,911	1,712
2004	107	59,611	6,746
2006	349	207,206	25,804

Source: MEC/Inep/Deaes – *Resumo Técnico Censo* 2000, 2002, 2004, and 2006.

However, when compared to the total number of students in the Brazilian tertiary education system, distance education appears to be still at a very early stage of development. In 2006, this modality enrolled a mere 4.4 percent of all students.

1.2 Quality and Relevance to the Needs of the Brazilian Economy

Among its 2,270 institutions of higher learning, Brazil boasts a small number of excellent universities. The top five federal and state universities are responsible for 61 percent of the scientific research carried out in the country and 60 percent of doctoral programs. Just one university, UNICAMP, accounts for 15 percent of all scientific output in Brazil and 10 percent of all postgraduate degrees given in the country. The 2,022 private institutions range from first rate universities engaged in research and teaching, such as the Catholic universities of Rio de Janeiro and São Paulo (PUCR and PUCSP), to a large number of single faculty institutions of variable standards. Many of the smaller public institutions are also considered of average quality.

In order to assess the quality and relevance of the Brazilian tertiary education system, this section explores the extent to which Brazil's universities can be considered as world class institutions, reviews the main pedagogical and organizational factors that impinge on the quality of education with an emphasis on academic programs, teaching, learning, faculty, and the quality assurance and accreditation processes, and provides insight into indicators that are used to assess the relevance of tertiary education.

Are Brazilian Universities World Class?

Notwithstanding the methodological limitations of any ranking exercise, international league tables show that the highest ranked universities in the world are the ones that make significant contributions to the advancement of knowledge through research, teach with the most innovative curricula and pedagogical methods under most conducive circumstances, make research an integral component of undergraduate teaching, and produce graduates who stand out because of their success in intensely competitive arenas during their education and, more importantly, after graduation. It is these concrete accomplishments and the international reputation associated with these achievements that make these institutions world class.[5]

How do Brazilian universities fare compared to the league of best universities in the world at large and in Latin America in particular? Over the past four years, two prominent international rankings have emerged, allowing for broad benchmark comparisons of institutions across national borders. With countries of similar levels of economic development, population size, and/or political stability, the rankings can be useful in providing a benchmarking mechanism for comparing the priority given to and support for tertiary education relative to each other. These two ranking differ significantly in their methodologies and their intended audiences, and together, they provide complementary perspectives on how the world of international tertiary education is coalescing into a singular system.

[5] For a critical assessment of league tables methodologies and policy usefulness, see Salmi, J., and A. Saroyan, (2007). League Tables as Policy Instruments: Uses and Misuses. Higher Education Management and Policy. OECD, Paris. Volume 19, No. 2.

The United Kingdom's Times Higher Education Supplement (THES) produces a ranking of the top 200 universities in the world. First presented in 2004, the methodology for this ranking focuses most heavily on international reputation, using subjective inputs such as peer reviews, quantitative data including the numbers of international students and faculty, and the influence of the faculty, as represented by research citations, to compare the international stature of institutions. In 2005, THES added another subjective component, employer recruiting surveys resulting in some significant changes in the rankings.

Although no Brazilian institution was included in the 2004 and 2006 THES world ranking, in 2005 and 2007, the University of São Paolo cracked the top 200 by landing a ranking of 196 and 175 respectively. In 2007, the University of Campinas came close to USP with a ranking of 177. The only other Latin American institution to make the THES ranking is UNAM, the National Autonomous University of Mexico, which was ranked 195 in 2004, rose to 95 in 2005, did even better in 2006 by reaching the 74th position, but fell to 192 in 2007. China, by comparison, has six universities in the top 100 (36th, 40th, 85th, 125th, 155th, and 163rd).

Table 11. Times Higher Education Supplement World University Rankings 2007

Country	Number of THES Top 200 Institutions	Ranking Positions
China	6	36, 40, 85,125, 155, 163
South Korea	3	51, 132, 63, 150, 198
Brazil	2	175,177
Mexico	1	192
Argentina	0	n/a
Chile	0	n/a

Source: Times Higher Education Supplement 2007. http://www.thes.co.uk

In contrast to the THES methodology, Shanghai Jiao Tong University in China has developed its own World University Rankings since 2003, using a methodology that focuses on seemingly more objective indicators, such as the academic and research performance of faculty, alumni, and staff. The measures evaluated include publications, citations, and international awards, such as Nobel prizes and Fields medals. Shanghai's ranking is also presented slightly differently: the top 100 institutions are listed in ranked ordinal, with each institution given a ranking of 1 through 100. After the top 100, however, the remaining 400 institutions are listed by clusters of approximately 50 and 100 (102-150, 151-202, 203-304, etc.), and alphabetically within those clusters.

Shanghai's 2007 ranking of the top 500 universities around the world include five Brazilian universities and three additional Latin American universities. Among the top Brazilian universities included in this ranking are the University of São Paolo (102-150), the University Estadual Campinas (203-304), the Federal University of Rio de Janeiro (305-401), the University Estadual Paulista (402-508), and the Federal University Minas Gerais (102-208). Mexico's UNAM is ranked lower (151-202) than Brazil's University of São Paolo. Argentina's University of Buenos Aires (UBA) is ranked in the 151-202

cluster, and the University of Chile is ranked in the 402-508 cluster. By comparison, China (excluding Hong Kong and Taiwan) has 12 institutions in this ranking, and South Korea has 9.

Table 12. International University Rankings (Brazil, Argentina, Chile, China, Mexico, South Korea)

Times Higher Ed. Supplement[6] 2007 (2006)	Shanghai Jiao Tong University[7] 2007
36 (14) Beijing University (China)	**102-150 Univ. São Paulo (Brazil)**
40 (28) Tsing Hua University (China)	151-202 Seoul National Univ. (South Korea)
51 (63) Seoul National University (South Korea)	151-202 Tsing Hua University (China)
85 (116) Fudan University (China)	151-202 Univ. Buenos Aires (Argentina)
132 (198) Korea Adv. Inst. Of Sci. & Tech. (S. Korea)	151-202 Univ. Nacional Autónoma Mexico
155 (165) China University, Sci. & Tech.	203-304 Korea Adv. Inst. of Sci. & Tech. (South Korea)
163 (179) Shanghai Jiao University (China)	203-304 Nanjing University (China)
175 (284) Univ. São Paulo (Brazil)	203-304 Peking University (China)
177 (448) Univ. of Campinas (Brazil)	203-304 Shanghai Jiao Tong Univ. (China)
192 (74) Universidad Nacional Autónoma Mexico	**203-304 Univ. Estadual Campinas (Brazil)**
	203-304 Yonsei University (South Korea)
	203-304 Zhejiang University (China)
	305-401 Fudan University (China)
	305-401 Jilin University (China)
	305-401 Korea University (South Korea)
	305-401 Pohang Univ. of Sci. & Tech. (South Korea)
	305-401 Sungkyunkwan University (South Korea)
	305-401 Univ. Fed. Rio de Janeiro (Brazil)
	402-508 Univ. Chile
	402-508 Univ Estadual Paulista (Brazil)
	402-508 **Univ Fed Minas Gerais (Brazil)**
	402-508 China Agr Univ. (China)
	402-508 Lanzhou Univ (China)
	402-508 Nankai Univ (China)
	402-508 Shandong Univ (China)
	402-508 Hanyang University (South Korea)

[6] **THES Methodology:** THES asked institutions to rank universities according to the following categories: Peer review (reputation); Int'l faculty; Int'l students; Student/faculty; Citations/faculty. "The five indicators have been chosen to reflect strength in teaching, research and international reputation, with the greatest influence exerted by those in the best position to judge: the academics." (http://www.thes.co.uk/worldrankings/)

[7] **Shanghai Jiao Tong University Methodology**: Universities are ranked by several indicators of academic or research performance, including alumni and staff winning Nobel Prizes and Fields Medals, highly cited researchers, articles published in Nature and Science, articles indexed in major citation indices, and the per capita academic performance of an institution. This methodology attempts to minimize subjectivity of reputation rankings by focusing on objective measures of research output. (http://ed.sjtu.edu.cn/ranking.htm)

In conclusion, comparing Brazil's performance in the two world rankings provides a tentative but interesting perspective of the position of Brazilian universities in the broad context of international tertiary education. Even though Brazil is the 5th most populated nation and the 10th largest economy on the planet, has world-class companies such as Embraer or Aracruz Celulose that are number one in terms of global market share for their products, there is no Brazilian university among the top 100 universities in the world in either international ranking, unlike the best universities in China and India. In the more subjective, reputation-based survey (THES), Brazil's University of São Paolo was listed lower than it was in the Shanghai ranking the two years it appeared in the British ranking. This may be an indication of the limited exposure of Brazilian tertiary education to a broad international audience (perhaps due to a language barrier or more limited exchanges of faculty and students than from comparator countries).

The Determinants of Quality

Selection of Students: Paths of Entry to Tertiary Education. Traditionally, the main channel for university access has been through competitive entrance examinations, known as *vestibular*, administered by individual universities or consortia of universities (World Bank, 2000). Over the years, the ratio of applicants to available places in the top federal and private universities has grown steadily. Table 12 illustrates the rising selectivity at the federal universities, from 6 to 1 in 1990 to more than 9 today.

Table 13. Selectivity of the *Vestibular* Examination by Type of Institution

Year	Federal	State	Municipal	Private	Total
1980	7.8	8.1	2.5	3.4	4.6
1985	6.8	6.3	1.9	2.5	3.5
1990	6.2	6.8	2.3	2.9	3.8
1995	8.7	9.2	3.0	2.9	4.3
2000	9.8	10.1	2.1	2.0	3.5
2001	10.8	9.9	2.0	1.8	3.2
2002	10.6	10.7	2.0	1.6	2.9
2003	10.9	9.2	1.8	1.5	2.5
2004	10.7	8.2	1.7	1.4	2.3
2005	10.3	7.9	1.6	1.3	2.2
2006	9.1	7,9	1.4	1.3	2.1

Source: MEC/Inep/Deaes, in *Sinopse de educação superior* 1980-2006..

Admission data in 2006 indicate that the ratio is even higher at UNICAMP (16 to 1) and at the University of São Paulo (15 to 1).

While the high degree of selectivity allows the most prestigious universities to select the best students, there is widespread concern that the *vestibular* discriminates against students from less privileged families who went to a public high school and cannot afford to enroll in a private preparation class. The *vestibular* is also viewed as an exam that does not measure competencies or academic potential but rather the memorization of facts and a set curriculum, allowing students to succeed through short-term training in the special private preparation courses.

After the National Education Law of 1996 removed the monopoly of the *vestibular* as the only selection mechanism for university entrance, two alternative paths were created. First, that same year, the Federal University of Brasilia pioneered a system of continuous evaluation (*Processo Seletivo Seriado – PSS*) allocating 25 percent of new places to high school students whose performance was assessed during their entire secondary school experience. There is a sense that evaluating the academic performance of students throughout their secondary schooling gives a better indication of overall preparedness to succeed in university. A number of federal and state universities have adopted a similar system since then.

Second, the Ministry of Education launched in 1998 a National Secondary Education Test (ENEM) as an alternative way for tertiary education institutions of measuring the academic achievement of high school graduates. This exam provides, for the first time in the history of secondary education in Brazil, a single, uniform measure of learning achievement nation-wide that attempts to place greater emphasis on general academic abilities and cognitive skills.

Even though ENEM is taken on a voluntary basis, it has been positively received by a growing number of institutions and students. As of 2004, about 400 tertiary education institutions were using the ENEM results as part of their selection procedure (JBIC, 2005). Table 13 below confirms the impressive increase in the proportion of high school graduates participating in the exam, from 7 to 74 percent within eight years, especially after the abolition of the examination fee for public high school students in 2001.

Table 14. Evolution of ENEM Participants

Year	ENEM Participants	Vestibular Participants	% of Secondary Education Graduates Taking ENEM	ENEM Participants / Vestibular Participants
1998	115,575	2,858,016	7%	4%
1999	315,960	3,344,273	17%	9%
2000	352,487	4,039,910	18%	8%
2001	1,200,883	4,009,075	64%	30%
2002	1,318.820	4,640,608	65%	26%
2003	1,322,645	4,579,675	70%	29%
2004	1,035,642	4,689,223	82%	33%
2005	2,200,619	4,663,197	84%	47%
2006	2,784,192	4,763,165	74%	58%

Source: MEC/INEP.

The fact that ENEM is also used to determine a student's eligibility for a ProUni scholarship will undoubtedly contribute to further increasing the attractiveness of this selection mechanism.

While it is too early to tell whether these new selection approaches are more effective in identifying the most qualified students and/or those with the highest academic potential to do well in tertiary education, they have undoubtedly leveled the playing field in terms of admission of students from less privileged background.

Where the situation remains preoccupying, however, is in the many private tertiary education institutions that do not screen candidates in any way as there are, at the present time, more vacant places than candidates to fill them. The decreasing ratio of applicants to vacant places in private universities, shown earlier in table 12, indicates that the situation is likely to worsen in coming years. A similar concern applies to the many low prestige state and municipal public tertiary education institutions.

Academic Staff. The proportion of academics with a doctorate degree, especially in universities that are research-intensive or aspire to be in that category, is an important indicator of teacher qualification. The data presented in table 14 below reveal that there

has been general improvement in recent years in Brazil. Overall, the proportion of academics with a doctoral degree rose from 15 percent in 1994 to 22 percent in 2006. Considerable efforts have been accomplished by the federal universities, in particular, which have seen the proportion of professors with a doctorate more than doubling during the same period, from 21 percent to 47 percent.

Table 15. Distribution of Faculty by Level of Qualification

Qualification	1994		2006	
	# professors	%	# professors	%
Entire System			316,882	
Master's or Ph.D.	54,858	39%	185,752	59%
Doctorate	21,327	15%	70,616	22%
Private Institutions			209,883	
Master's or Ph.D.	16,742	25%	109,587	52%
Doctorate	4,477	7%	25,851	12%
Federal Institutions			58,078	
Master's or Ph.D.	24,046	55%	43,458	75%
Doctorate	9,147	21%	27,122	47%

Source: MEC/Inep/Deaes.

Another proxy for measuring the strength of the faculty is to look at the proportion of full-time teachers across institutions since the type of contract determines the amount of time that teaching staff can devote to research, teaching and services activities. It ranges from 83 percent in the federal universities to 28 percent in the municipal universities and only 25 percent in the private institutions (Table 15). In the latter ones, full-time faculty is the exception; most instructors are paid an hourly wage based on the actual number of classes taught.

Table 16. Share of Full Time Professors by Type of Institution (2006)

Type of Institution	Proportion (%)
University	**54.6**
Federal	83.3
State	75.6
Municipal	27.9
Private	24.9
Non-University Multiple Faculty	**6.4**
Municipal	n/a
Private	6.7
Non-University Single Faculty	**11.1**
Federal	81.1
State	57.5
Municipal	11.1
Private	8.7
Total	**35.9**

Source: MEC/Inep/Deaes, in *Sinopse de Educação Superior* 2006.

In Brazil as in other academic systems where teaching staff are civil servants, tenure is deemed more to be a right than a privilege. Once they are hired, professors are protected by the terms and conditions of employment of the federal system (*Regime Jurídico Unico* – RJU) and promotion is more linked to seniority than actual performance.

Quality Assurance. In April 2004, a new law established the National Higher Education Evaluation System (SINAES), composed of four principal elements: (i) the National Student Performance Examination (ENADE) in replacement of the *Provão;* (ii) a new institutional self-evaluation program which all federal and private institutions are supposed to undergo over a period of three years, operating along the lines of the previous PAIUB system; (iii) an external evaluation process for the federal and private institutions; and (iv) the systematic collection of statistical data on students, courses, and institutions. All assessment procedures are coordinated and overseen by the national

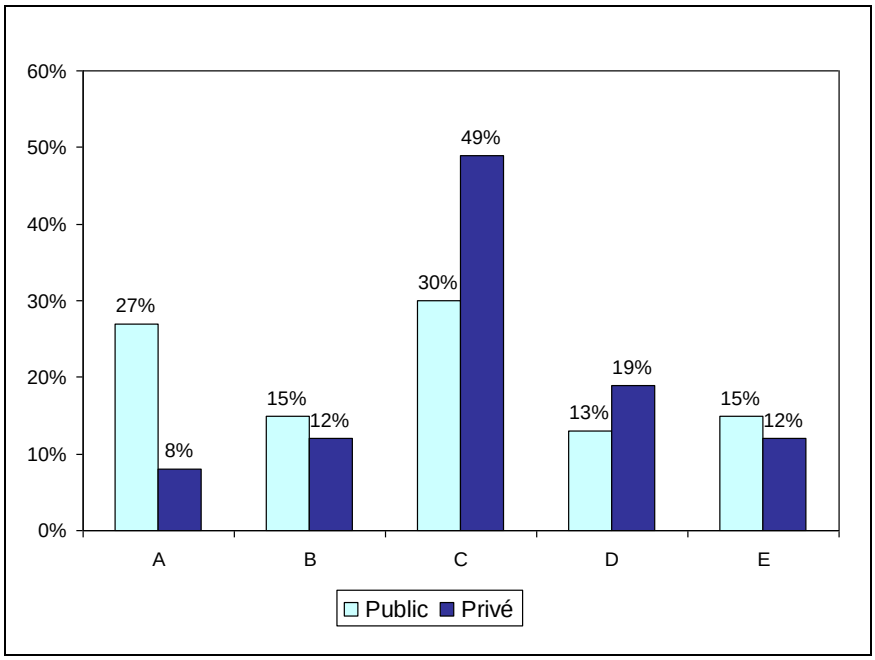
Committee for Evaluating Higher Education (Comissão *Nacional de Avaliação da Educacão Superior – CONAES*).

The new system builds on the significant impact of the *Provão* exam which, after its introduction in 1996, dramatically raised public awareness about the quality of tertiary education institutions. The *Provão* consisted of a final course examination for undergraduate students that did not count towards the graduation of the students themselves but served to evaluate the performance of their program and institution. First met with opposition, absenteeism and boycotts on a number of campuses, the *Provão* grew considerably in coverage and influence over the years. While only 56,000 students participated into the first exam which covered only three disciplines (administration, law, and engineering), by its last year of existence (2002) it was taken by 400,000 students and encompassed 24 subjects. Institutional results were made public every year in the press and via a government publication. The *Provão* was also used as an instrument to collect exhaustive data on the profile of graduating students and their evaluation of the quality of the education received.

Despite its significant methodological limitations, the existence of the *Provão* had three major consequences.[8] First, the exam results provided a proxy measure of quality that allowed the comparison of the programs of different tertiary education institutions across sectors and regions. They showed the wide range of standards across institutions, and confirmed that, by and large, public institutions maintained better quality than private ones, as illustrated by Figure 7.

[8] The *Provão* methodology was criticized on several counts: (i) use of a scale based on the norm comparing the average performance of students in one institution to the average performance of students from other courses in the same field of study; this made it impossible to meaningfully compare the results between different fields of study or even within the same field over several years; (ii) inability to measure the value added of the courses assessed in the absence of an earlier test at the beginning of the undergraduate studies; and (iii) risk of imposing a unified curriculum in a country where the wide range of regional specificities would call for a diversified curriculum (Verhine et al., 2005).

Figure 7. Proportion of Courses by *Provão* Grade (2003)

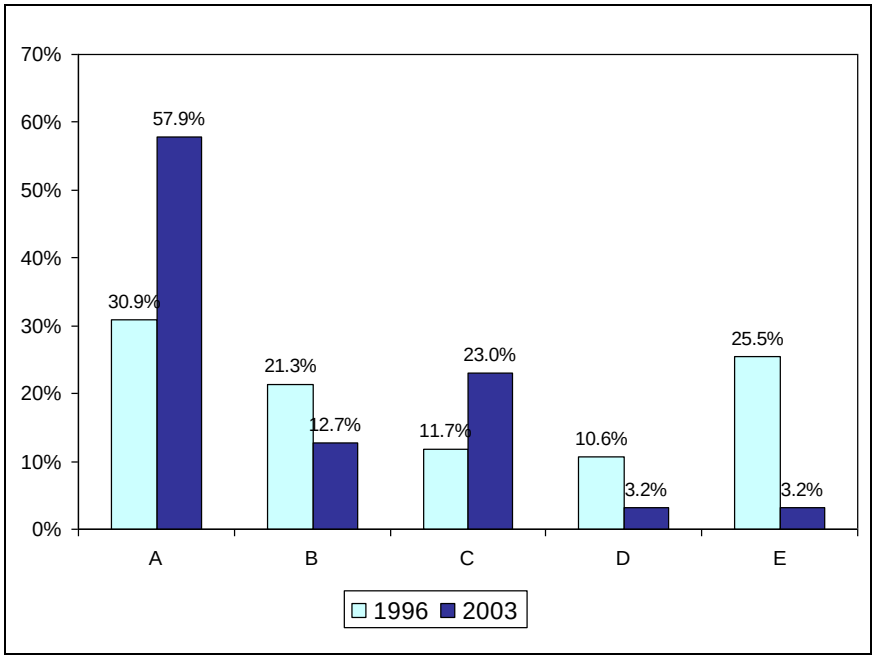


Source: JBIC (2005)

Second, students started to take the *Provão* results seriously into consideration in their choice of tertiary institution. Between 1996 and 2003, the demand for courses in private institutions that had been evaluated positively (grades A or B) grew by about 20%, whereas the demand for courses with a negative assessment (grades D or E) went down by 41 percent (JBIC, 2005).

Third, the institutions themselves made efforts to improve the quality of their academic offerings by trying to attract better qualified teachers, redesign their courses and upgrade their facilities. Comparing the *Provão* scores of the federal universities over the life of the exam clearly demonstrates this positive trend. For example, the proportion of courses receiving the top rating (A) almost doubled from 31 to 58 percent.

Figure 8. Evolution of *Provão* Scores of Federal Tertiary Education Institutions (1996-2003)



Source: JBIC (2005)

The combined results of the external evaluations and the Provão were supposed to constitute the basis for the formal accreditation and re-accreditation process carried out by the Ministry of Education. But in practice these aspects were never fully implemented.

> "Institutions only lost their accreditation in extreme situations and the process for periodic re-accreditation was not put into practice. The Ministry of Education intervened in some private institutions, but never in public ones and never in cases of a negative evaluation of academic quality. In some instances, attempts by the Ministry of Education to close courses and institutions that had attained very low assessment scores were subverted by means of appeals to the judicial system and/or to the CNE and also via political pressure." (Verhine and Dantas, 2005)

The *ENADE* test, which was implemented for the first time in 2004, differs from *Provão* in several ways. It examines both first-year and last-year students with the objective of measuring the value added of the tertiary level program and identifying the competencies not acquired by students. The assessment does not apply to all students but only to a random sample. The tests are administered every three years instead of every year. ENADE was supposed to operate on the basis of minimum standards defined by specialists from the different disciplines assessed, but no minimum standards have ever been established. ENADE results are not meant to be reported in the media. Finally, the test should in theory be fully integrated with the other components of the quality

assurance system, namely the self-assessment and external evaluation exercises, but it is not clear that this has happened.

Internationalization

A last aspect worth considering is the extent to which Brazilian universities are pursuing an internationalization policy, which is a dimension increasingly recognized as one of the key instruments to improve quality and relevance in an interdependent world. This means, among other things, effectively equipping graduates with the wide range of skills, knowledge and competences required in the global economy; conducting internationally competitive research; and attracting international students and professors. Internationalization of tertiary education is more than just the exchange of students and signing of collaborative agreements with foreign institutions. It involves embedding the international dimension in all aspects of teaching and research, at both national policy and institutional levels.

Student and academic staff international mobility. Government scholarships to study abroad are available from three agencies: CAPES, CNPq and FAPESP. But the number of scholarships is not very large. In 2005, for example, there were only 2,075 students being officially sponsored for graduate studies outside Brazil, which represents a mere 2 percent of the total postgraduate student population.[9] By comparison, Kazakhstan, a country of 15 million inhabitants, sent 1,700 students abroad on government scholarships that same year. Overall, 19,749 Brazilian students were enrolled outside Brazil in 2005[10]. Statistics on foreign students in the US show that, in 2005-06, there were only 7,000 Brazilian students compared to 76,000 Indians and 62,000 Chinese. During the same year, Mexico had twice as many students enrolled in US colleges as Brazil.

Similarly, the country's ability to attract foreign students appears to be very limited. In 2005, there were only 1,117 foreign students enrolled in Brazilian universities[11]. Detailed statistics from UNICAMP reveal even a downward trend: the proportion of foreign master's students went down from 4.6% to 2.6% between 1994 and 2004; similarly the proportion of foreign doctoral students diminished from 6.1% to 3% over the same period.

It is illustrative to contrast the case of Brazil with that of Malaysia, a country that actively seeks to attract foreign students. After ten years of existence, the private university sector in Malaysia had almost 40,000 foreign students in 2005, representing 14 percent of its total enrollment. During the same year, China had 78,300 foreign students. Statistics on the top destinations of US college students studying abroad show that Mexico was able to attract almost 10,000 US students in 2004-05, Costa Rica about 5,000, Chile 2,400, but Brazil received less than 2,000.[12]

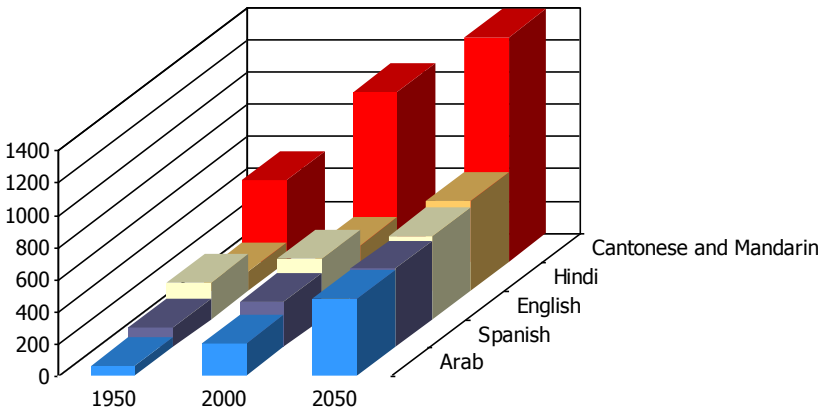
[9] Source: Institute of International Education, New York.
[10] OECD, *Education at a glance 2007*. Paris.
[11] Ibid.
[12] Ibid.

No specific data are available to measure the international mobility of academic staff. However, based on the visits of universities, it appears that there are relatively few opportunities for international mobility, and that they are concentrated in a limited number of fields of study and research. Most opportunities exist at the post-graduate level, through CAPES' Program on Academic Cooperation. But the academic staff interviewed indicated that the dissemination of information about opportunities for academic staff mobility could be improved, and that mechanisms used to assign these opportunities could be more transparent. Insufficient foreign language skills were identified as a critical limitation.

Foreign Languages. Command of an internationally useful second and third language has become an important skill for success in the current global environment (Marmolejo, 2005). One of the ten recommendations that UNESCO recently issued on building successful knowledge societies is to make linguistic diversity a priority. *"Knowledge societies must be based on a double multilingualism… and it is advisable to encourage bilingualism and, insofar as possible, trilingualism as early as primary school"* (UNESCO, 2005).

English has become a *lingua franca* in the economic, business and academic environments in today's increasingly interconnected world. It was estimated in 2001 that 70 percent of scientific publications in circulation were written in English, 17 percent in French, 3 percent in German, 1.4 percent in Spanish, and the rest in other languages (Hamel, 2002). English also dominates as a language of communication in the international business environment. Other languages of growing importance in the world are Cantonese and Mandarin, Hindi, Spanish, and Arab (see Figure 9).

Figure 9. Main Languages Spoken in the World (1950-2050) (Millions)



Source: Graddol, D. (1997)

Relevance to the Competitiveness Needs of the Brazilian Economy

This section turns to the issue of relevance, examining how well tertiary education prepares graduates for the world of work and how effectively tertiary education institutions contribute to innovation in the Brazilian economy.

Labor Market Outcomes

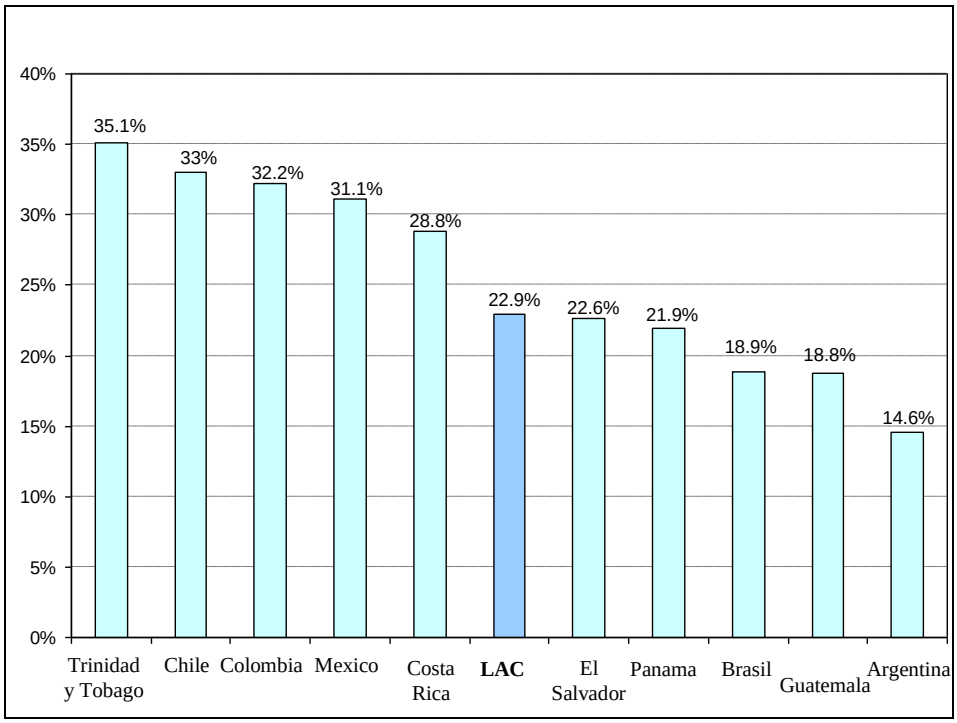
Graduate Unemployment. Unemployment has been rising steadily in Brazil since the early 1990s, from about 3 percent a decade ago to 9.3 percent in 2004. In recent years, graduate unemployment has become a more serious issue, reflecting potential areas of mismatch between the supply of tertiary education graduates and labor market needs. According to the 2004 Household Survey, the unemployment rate among tertiary education graduates was 16.4 percent, almost double the national average. Furthermore, it appears that up to 44 percent of employed graduates are performing jobs below their actual professional qualifications.

A 2005 survey of the thousand largest companies in Brazil gives some general indications about the views of the business community on tertiary education graduates (JBIC, 2005). Almost a third of the employers surveyed report that they find difficulties in recruiting workers, especially those with vocational training and tertiary education qualifications.

At the same time, employers are by and large satisfied with the quality of the graduates they are able to select. The hiring difficulties mentioned earlier seem to reflect more problems with the behavioral characteristics of the new recruits. Employers emphasize gaps in terms of leadership skills, personnel management competences, and ability to work in teams. The highest level of dissatisfaction seems to be associated with careers in business administration, which is consistent with the second-rate ranking results for MBAs that will be discussed later.

Skills Mismatch. One of the most worrisome features of the Brazilian tertiary education system is the lack of priority given to programs with a science and technology orientation. Even though the actual numbers vary depending on the classification adopted, it is clear that there is insufficient concentration in science and engineering when looking at the distribution of enrollment and graduates from an international or national perspective. Figure 10 shows that Brazil has one of the lowest proportion of students enrolled in science and engineering programs in Latin America.

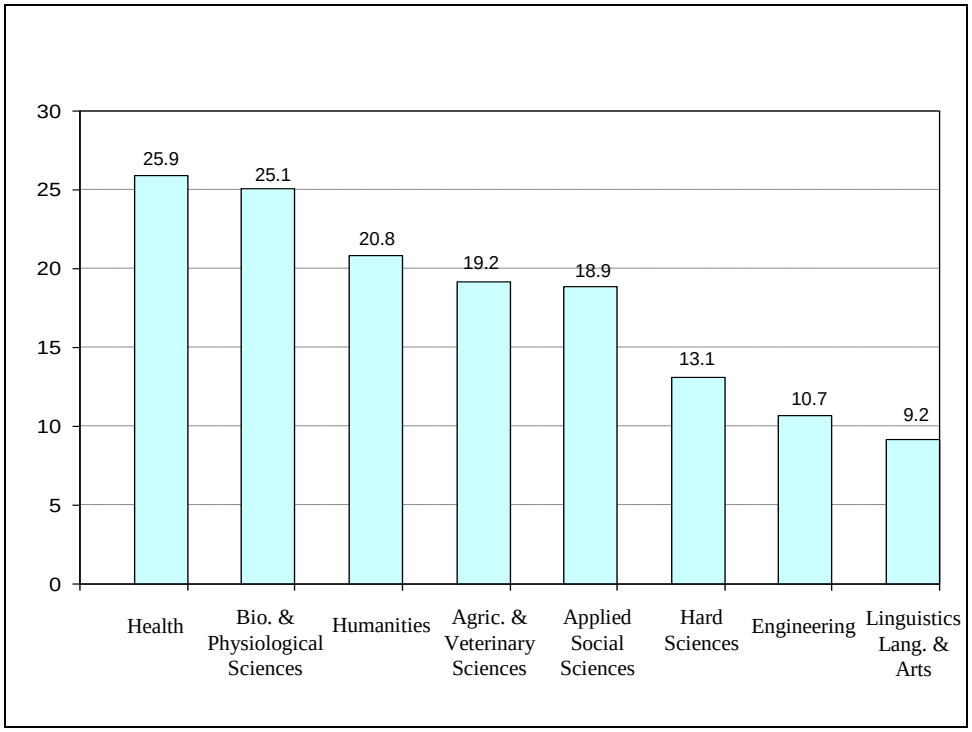
Figure 10. Proportion of Students Enrolled in Science and Engineering Programs in Selected Latin American Countries (2006)



Source: IESALC (2006).

Data from individual universities confirm the general trend among Brazilian students to consider careers in engineering and science less attractive than medicine or humanities. At the Federal University of Minas Gerais, for example, while the ratio of applicants over available spaces in medicine is 26, it is half that number for hard sciences and only 11 in engineering (Figure 11).

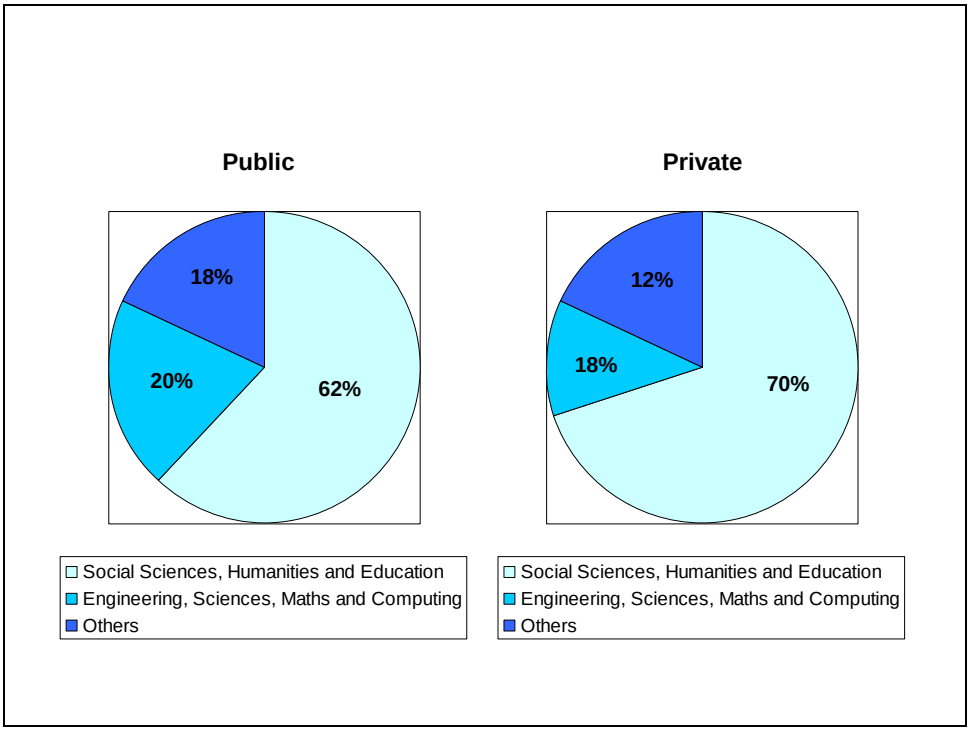
Figure 11. Preferences of Students at Federal University of Minas Gerais (2003)



Source: JIBC (2005)

Analyzing the distribution of graduates by discipline shows an even starker concentration in the social sciences. They represented 62 and 70 percent of all undergraduate students completing their studies in 2006 in public and private institutions, respectively. By contrast, engineering, sciences, mathematics and computing accounted for a mere 20 percent of graduates in public universities and only 18 percent in private institutions (Figure 12). The JIBC study (2005) attributes this pattern to a combination of supply and demand factors, including the fact that most of the enrollment expansion in Brazil has come from private sector institutions opting, naturally, to open soft careers without heavy investment, and the relatively slow growth of industry in recent years.

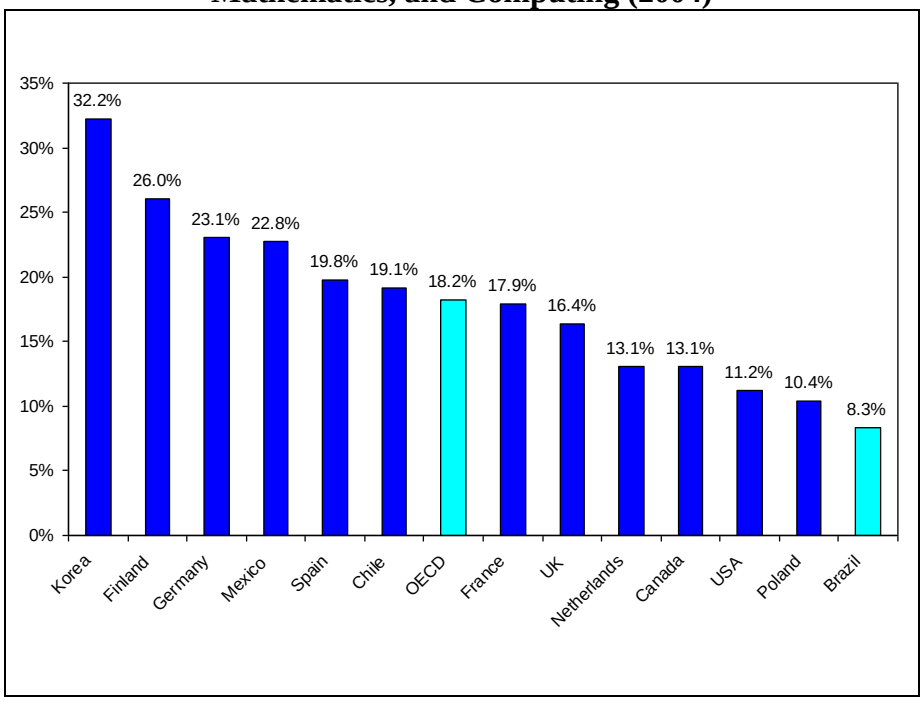
Figure 12. Distribution of Graduates by Field of Study (2006)



Source: MEC/INEP, *Sinopse de Educacão Superior 2006*.

Finally, comparing Brazil with OECD countries shows the seriousness of the situation. Figure 13 indicates that, in 2004, the proportion of graduates in engineering, mathematics and computing (8.3%) represented less than half the OECD average (18.2%).

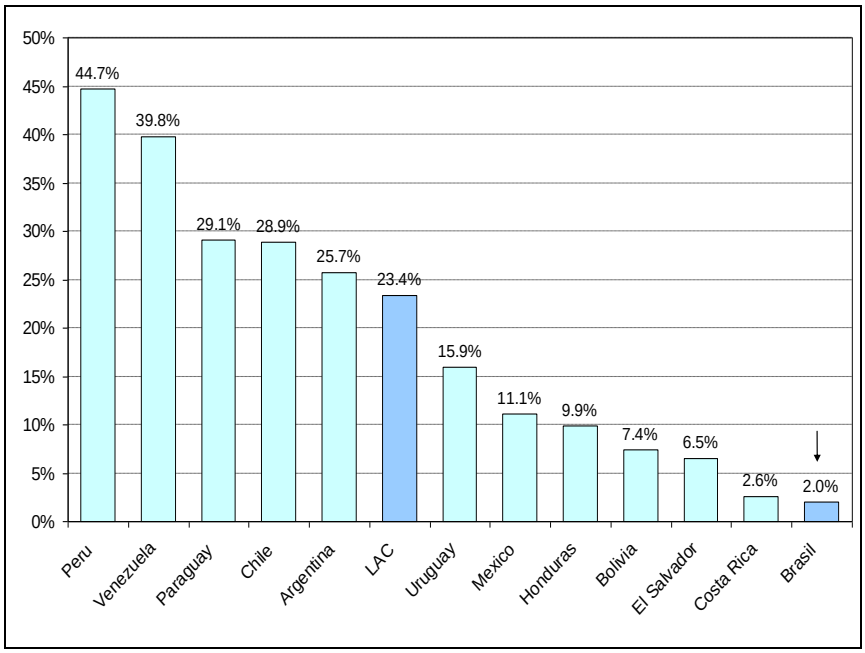
Figure 13. Proportion of Graduates in Engineering, Mathematics, and Computing (2004)



Source: OECD. *Education at a Glance 2006.*

Another source of potential imbalance in the production of graduates comes from the distribution between degree level and technician level qualifications. The earlier discussion on lifelong learning opportunities has shown that short duration professional courses enroll a tiny proportion of Brazilian students. Brazil's performance compares unfavorably with the situation in other Latin American countries and in OECD nations (Figure 14).

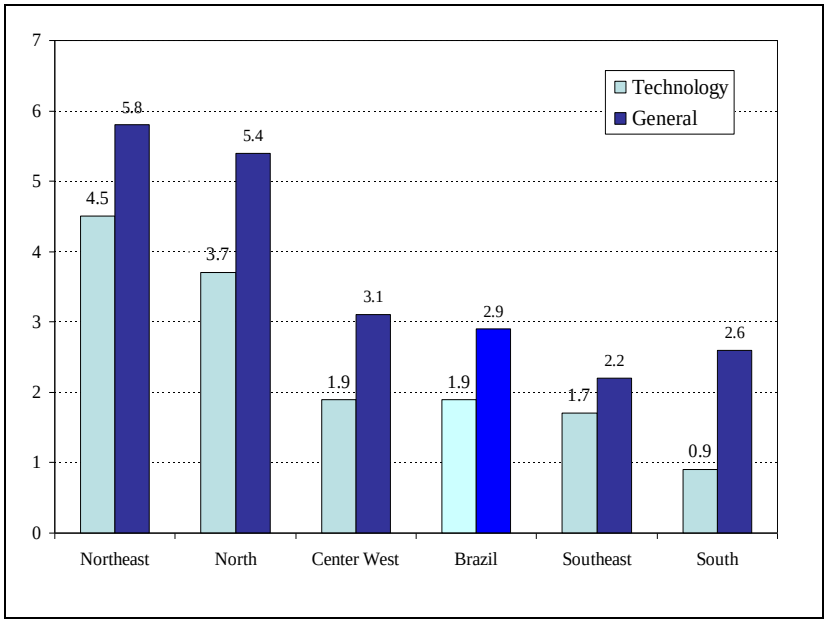
Figure 14. Proportion of Students Enrolled in Non-University Institutions in Selected LAC Countries



Source: IESALC (2006).

The main reason for this slow growth is that these courses are not well considered in Brazilian society. It is more prestigious to enroll into a regular university program than a technology course. As a matter of fact, the competition to enter these short duration programs is much less intense than for access to traditional universities. INEP statistics indicate that, in 2006, there was an average of 2.9 candidates for every university place versus 1.9 for places in technology courses. Figure 15 reveals that the Northeast is the region in Brazil where the demand for technology courses appears to be the strongest even though it does not rise above the traditional university programs (4.5 vs. 5.8).

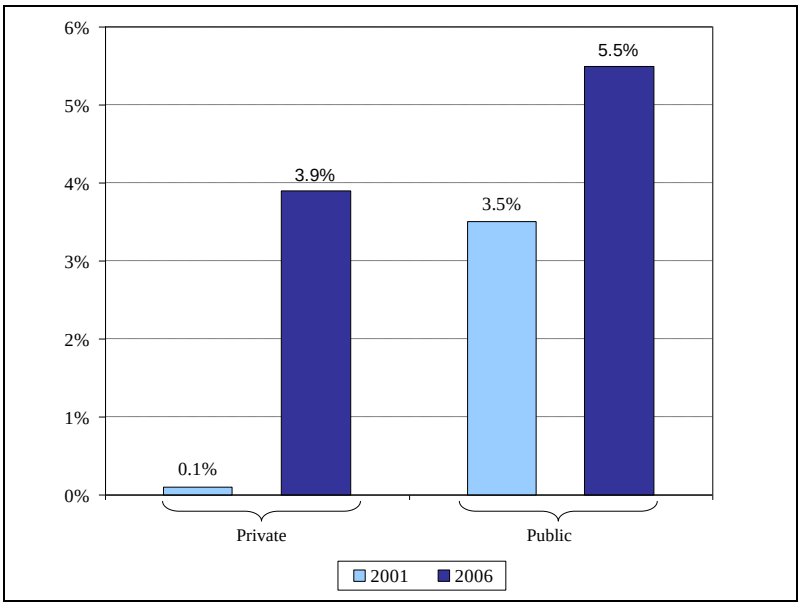
Figure 15. Selectivity in Technology Courses and Regular University Courses by Region (2006)



Source: MEC / Inep/Deaes, in *Sinopse de Educacão Superior 2006.*

Over the years, there has been a significant increase in the number of technological course offerings by private and public institutions leading to a growing share of the overall courses offered at the national level by both types of institutions (Figure 16).

Figure 16. Importance of Technological Courses in Private and Public Institutions (2006)



Source: MEC/Inep/Deaes, in *Sinopse de Educação Superior 2006*.

Management Education.

Benchmarking management education in Brazilian universities is also useful, considering the importance of developing an entrepreneurial culture among graduates. Part-time and full-time MBA programs are offered at a large number of Brazilian institutions, public and private.[13] But just like the universities, Brazilian MBAs do not fare particularly well in the international MBA rankings or even in the Latin American regional ranking. Only one institution offering MBAs, the COPPEAD Graduate School of Business at the Federal University of Rio de Janeiro, was included in the Financial Times' world ranking of MBAs (62nd place) in 2007 and (92nd place) in 2006. In 2008, Coppead disappeared from the Global MBA rankings. By comparison, there were three Chinese programs, all of them ranked much better than the Brazilian one (Table 16).

Table 17. Financial Times Global MBA Rankings 2008

School name	Country	Rank in 2008	Rank in 2007	Rank in 2006
CEIBS	China	11	11	21
University of Western Ontario: Ivey	Canada / China	53	41	31
Hong Kong UST Business School	China	17	-	47
Shanghai Jiao Tong University, ACEM	China	41	-	-
COPPEAD	**Brazil**	**-**	**62**	**92**
IPADE	Mexico	93	-	97

Source: The Financial Times. http://rankings.ft.com/rankings/mba/rankings.html

The more specialized regional ranking of MBAs in Latin America, prepared by the Chilean economic magazine América Economía, also shows COPPEAD as Brazil's top management program. But it is of concern to see that it is ranked only as the 9th MBA in the region, with programs from Costa Rica, Chile, Mexico and Argentina ranked higher (table 17).

[13] It should be noted that, in Brazil, there is a difference between MBAs, which are specialization courses, and Professional Masters in Administration, which offer an officially recognized master's degree generally considered to be of higher quality than the MBAs.

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Table 18. América Economía Latin American Business School Ranking (2005)

Ranking	Institution	Country
1	INCAE	Costa Rica/ Nicaragua
2	Universidad Católica de Chile	Chile
3	Universidad Adolfo Ibáñez	Chile
4	Egade - Tec de Monterrey, Monterrey Campus	México
4	ITAM – Autonomous Technological Institute of Mexico	México
6	Universidad de Chile – Graduate School of Business and Economics	Chile
7	IAE – Austral University School of Business and Management	Argentina
8	Universidad de Chile – Industrial Engineering	Chile
9	Coppead – UFRJ	Brazil
10	Universidad Gabriela Mistral	Brazil
11	Tec de Monterrey – Mexico City and University of Texas at Austin Campuses	México
12	Iesa	Venezuela
13	Universidad de los Andes – Business Administration	Colombia
14	Fundação Dom Cabral	Brazil
15	Universidad Torcuato di Tella	Argentina

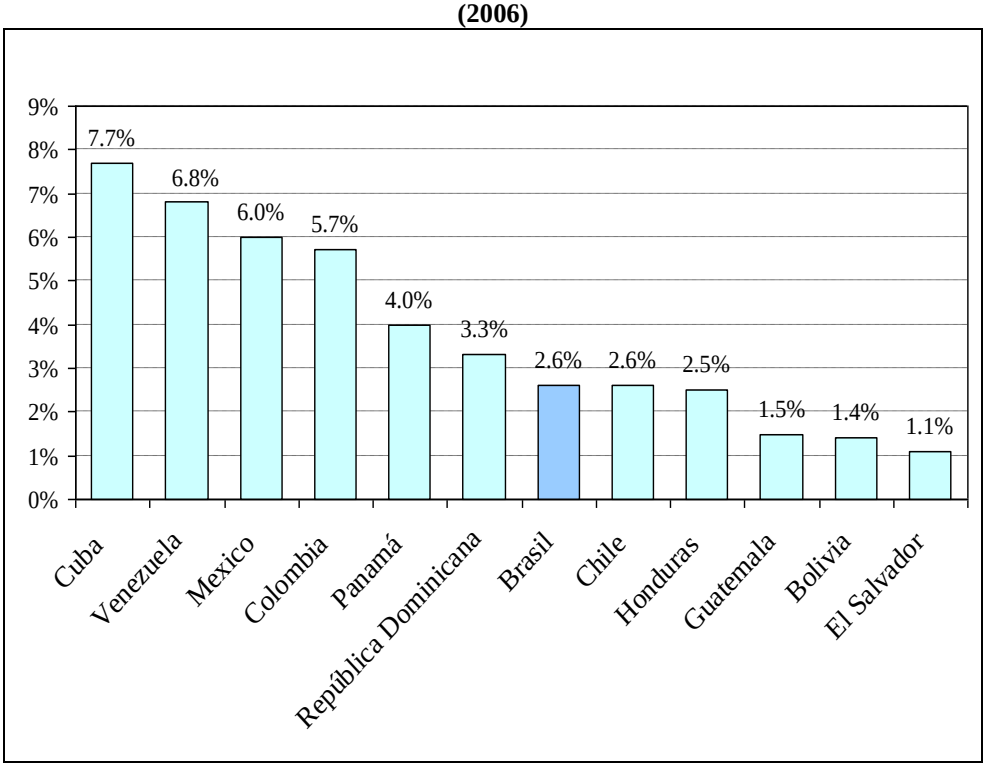
Source: World Education News and Record (WENR). August 2006, Vol. 19 (4). http://www.wes.org/ewenr/06aug/latinamerica.htm

Graduate Programs and University Research

CAPES (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*) operates under the authority of the Ministry of Education as the main agency responsible for financing and evaluating postgraduate studies, disseminating the results of scientific research, and promoting international scientific cooperation. It has played a crucial role in supporting the rapid expansion of postgraduate programs over the past ten years. The number of master's students grew by about 70 percent, from 44,000 in 1996 to 74,412 in 2006. During the same period, the number of doctoral students went from 20,000 to 44,466. With these increases came also a better geographical distribution of postgraduate courses, resulting in a significant decrease in regional disparities in terms of opportunities for advanced human capital training.

However, despite this rapid increase in recent years, student enrollment at the postgraduate level still remains relatively low, compared to other countries in the region. Figure 17 shows that, at only 2.6 percent in 2006, the proportion of postgraduate students in Brazil was half as high as that of Mexico and Colombia.

Figure 17. Proportion of Graduate Students in Selected Latin American Countries (2006)



Source: IESALC-UNESCO (2006), CAPES 2006.

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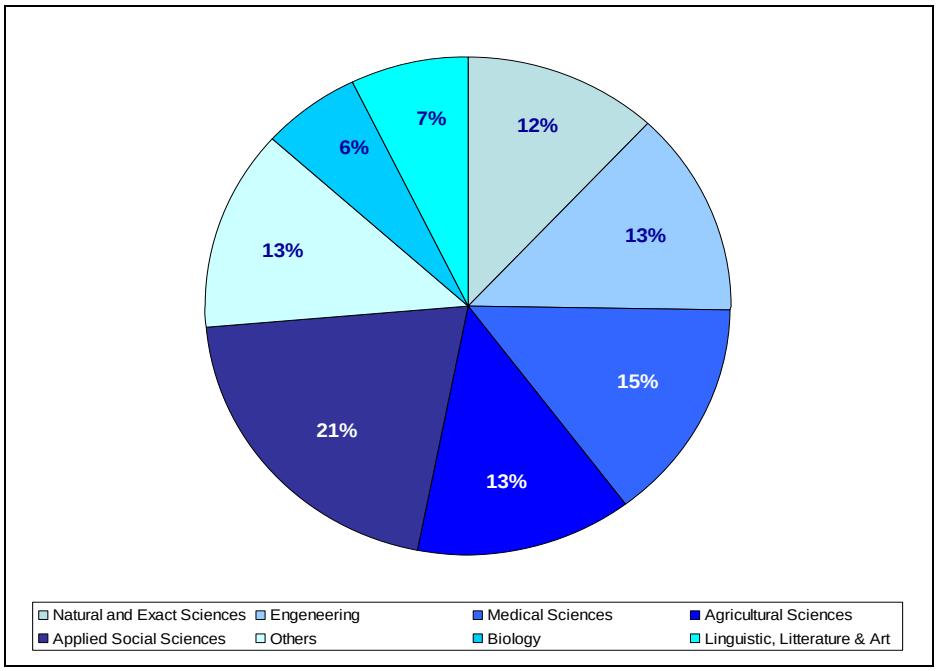
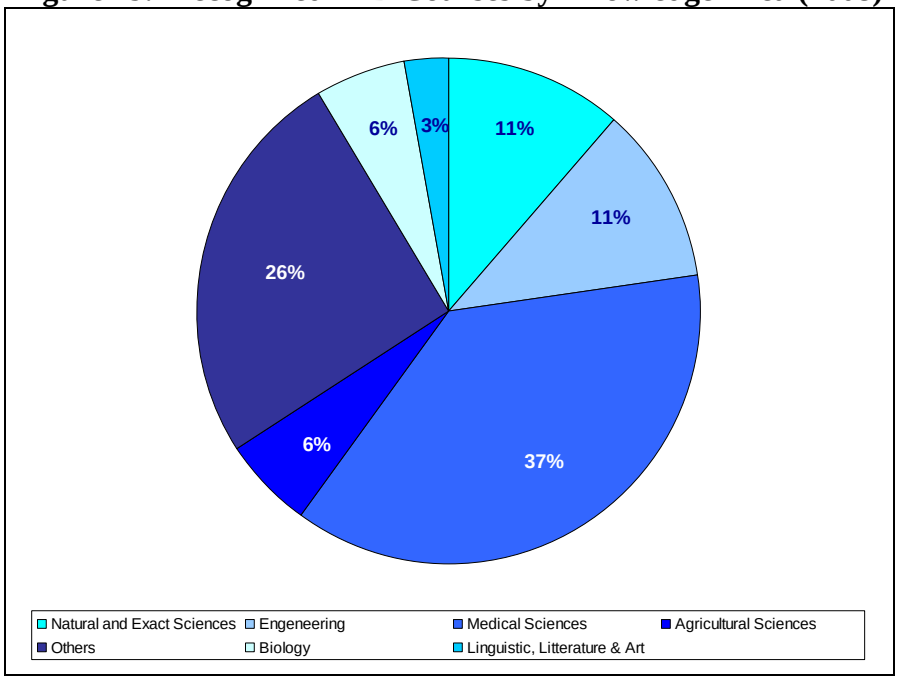
A very positive feature, however, is that the distribution of graduate programs at the master's and Ph.D. level is much more balanced than for undergraduate studies, as illustrated by Figures 18 and 19. At the master's level, humanities and social sciences account for no more than 28 percent of the total. Similarly, at the Ph.D. level, they represent 11 percent of all doctoral programs. The corresponding proportion is 62 percent for undergraduate studies in public universities.

Figure 18. Recognized Master Courses by Knowledge Area – 2008



Source: CAPES, 2008, retrieved on April 2008, available at: http://conteudoweb.capes.gov.br/conteudoweb/ProjetoRelacaoCursosServlet?acao=pesquisarGrandeArea

Figure 19. Recognized PhD Courses by Knowledge Area (2008)

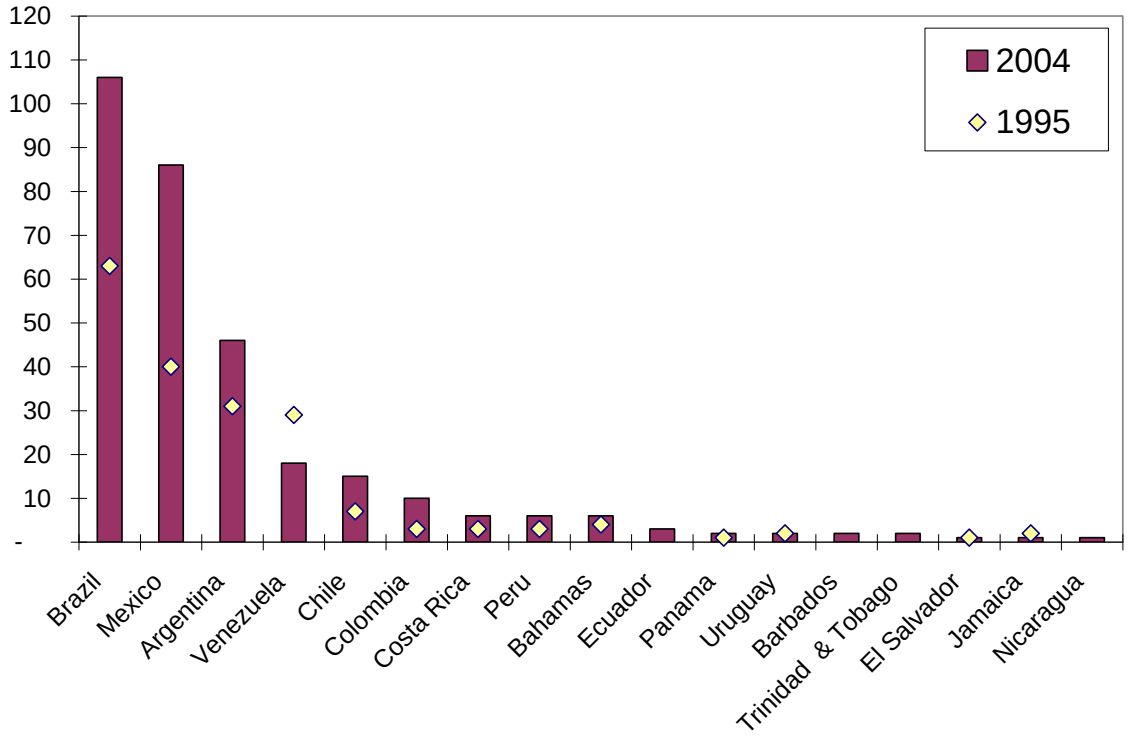


Source: CAPES, 2008, retrieved on April 2008, available at: http://conteudoweb.capes.gov.br/conteudoweb/ProjetoRelacaoCursosServlet?acao=pesquisarGrandeArea

Research Output

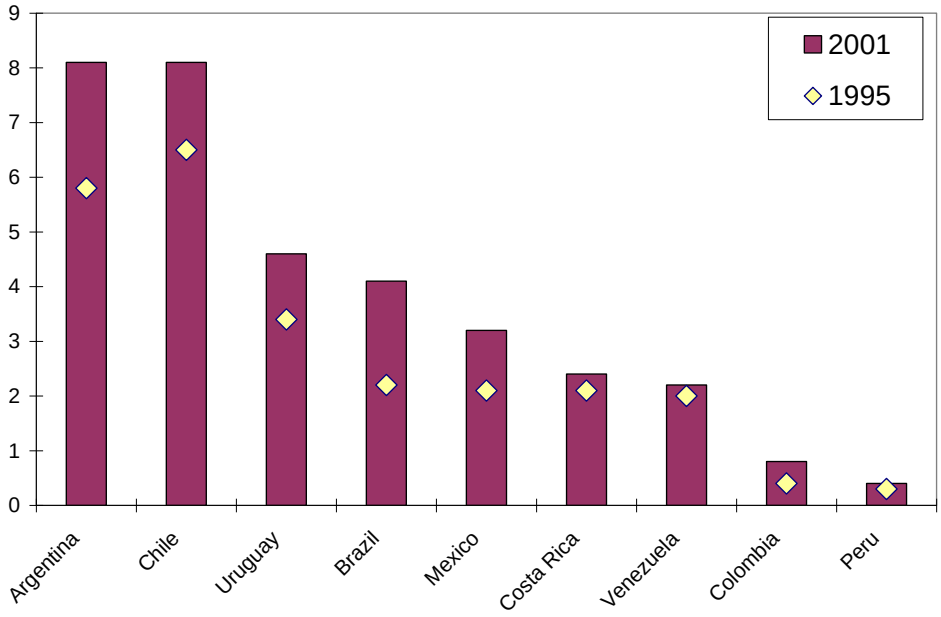
Brazil is the main contributor of research products in Latin America. The number of patents registered in the US almost doubled between 1995 and 2004, from 63 to 106, and the scientific publications output increased from 2.2 to 4.1 articles per 100,000 inhabitants between 1995 and 2001 (Figures 20 and 21). In terms of relative contribution, however, Brazil is outperformed by Argentina, Chile and Uruguay when considering the ratio of publications per 100,000 inhabitants which were 8.1 for Argentina and Chile and 4.6 for Uruguay in 2004. Similarly, the rate of increase in patent acquisition of Brazil is overshadowed by that of Korea and China, which quadrupled and increased six fold during the same period, respectively.

Figure 20. Patents Granted by the US Patent Office (1995-2004)



Source: IDB, 2006

Figure 21 Scientific Articles Per 100,000 Inhabitants



Source: IDB, 2006

Contrary to the pattern found in industrial countries, in Brazil most researchers are employed in the university sector, as illustrated by table 18 showing the sectoral destination of graduates with a master's or a Ph.D.

Table 19. Sector of Employment of Graduates in the 1990s
(%)

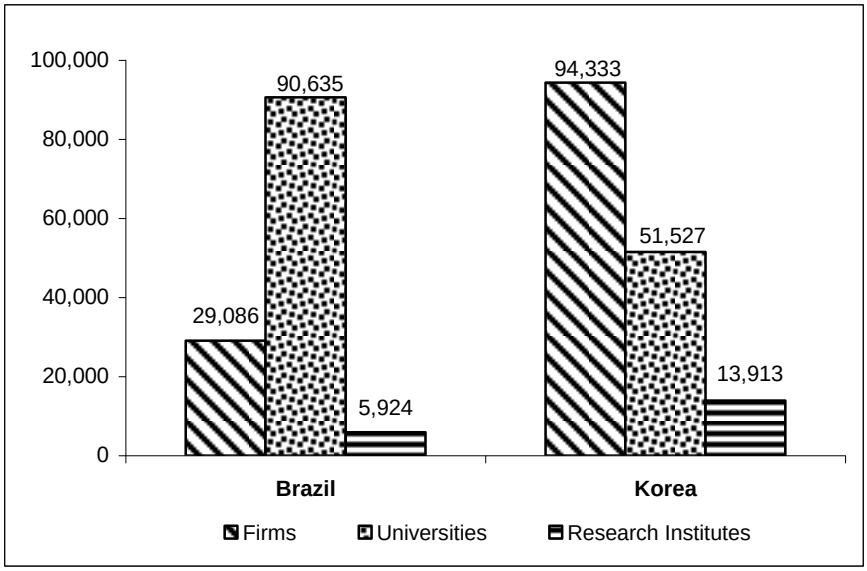
Sector of Employment	Masters	Ph.Ds
Administration / Public Services	20.7	10.9
Public / Private Enterprises	21.1	5.9
Universities	34.5	68.8
Research Institutes	5.4	8.3
Consulting Firms	12.5	4.5
Other	5.7	1.7

Source: *Plano Nacional de Pós-Graduação 2005-2010*, MEC/CAPES, table 16 page 44.

Furthermore, the proportion of researchers working in firms has decreased in recent years, which is also the opposite trend of what is happening in most countries. In 2000, 26 percent of the overall researcher population was employed in firms, compared to 70 percent in universities. By 2004, the proportions were 19 and 77 percent, respectively.

By contrast, in OECD countries, almost 70 percent of the researchers are active in firms, and less than 25 percent in the university sector. Figure 22 illustrates the fundamental difference between Brazil and South Korea in the distribution patterns of researchers.

Figure 22. Distribution of Scientists Active in R& D Activities in Brazil and Korea (2004)



Source: Campos (2008)

The national research production averages for Brazil hide important disparities across institutions. In reality, research production is concentrated in a small number of universities. Three universities in the State of São Paulo, USP, UNICAMP and UNESP, account for half of the total scientific production of the country. From a research output viewpoint, the Brazilian university sector can basically be divided into three groups. First, there is a small group of 3 to 5 top research universities that are very productive and whose research quality is leading edge from an international viewpoint. Second, there is a middle group of about 5 to 10 universities that are reasonably productive in specific fields of research. And finally many universities conduct little if any research, even though many of them aspire to be recognized as research universities. In many cases, they operate more as university colleges or even as community colleges than as full universities. To illustrate this pattern, table 19 below presents the results of the most recent round of CAPES evaluations, which identify those universities with programs considered to be world class (levels 6 and 7 in the CAPES evaluation scale).

Table 20. Institutions with Top Ranked Programs (2007)

Acronyms Institutions	Name of institutions	Number of highly rated programs*
USP	Universidade de São Paulo	64
UFRJ	Universidade Federal do Rio de Janeiro	27
UNICAMP	Universidade Estadual de Campinas	23
UFRGS	Universidade Federal do rio Grande do Sul	16
UFMG	Universidade Federal de Minas Gerais	15
UNIFESP	Universidade Federal do São Paulo	10
UFV	Universidade Federal de Viçosa	7
UNB	Universidade de Brasília	6
PUC-RIO	Pontificia Universidade Católica do Rio de Janeiro	5
UFBA	Universidade Federal da Bahia	5
UFSC	Universidade Federal de Santa Catarina	5
UNESP	Universidade Estadual Paulista Júlio de Mesquita Filho	5
FIOCRUZ	Fundacão Oswaldo Cruz	3
INPE	Instituto Nacional de Pesquisas Espaciais	3
UERJ	Universidade do Estado do Rio de Janeiro	3
UFPE	Universidade Federal de Pernambuco	3
UFSCAR	Universidade Federal de São Carlos	3
IUPERJ	Instituto Universitario de Pesquisas do Rio de Janeiro	2
UEM	Universidade Estadual de Maringá	2
UFC	Universidade Federal do Ceará	2
UFF	Universidade Federal Fluminense	2
UFPR	Universidade Federal do Paraná	2
UFSM	Universidade Federal de Santa Maria	2
CBPF	Centro Brasileiro de Pesquisas Físicas	1
EST	Escola Superior de Teologia	1
FAP	Fundação Antonio Prudente - Hospital A. C. Camargo	1
FGV/RJ	Fundacão Getúlio Vargas/ RJ	1
FGV/SP	Fundação Getúlio Vargas de São Paulo	1
IMPA-OS	Associação Instituto Nacional de Matemática Pura e Aplicada	1
ITA	Instituto Tecnológico de Aeronáutica	1
PUC/SP	Pontificia Universidade Católica de São Paulo	1
PUC-RS	Pontificia Universidade Católica do Rio Grande do Sul	1
UFBP/J.P.	Universidade Federal Da Paraiba/Joao Pessoa	1
UFCG	Universidade Federal de Campina Grande	1
UFPA	Universidade Federal do Pará	1
UFPEL	Universidade Federal de Pelotas	1
UFRN	Universidade Federal do Rio Grande do Norte	1
UFRRJ	Universidade Federal Rural do Rio de Janeiro	1
UFU	Universidade Federal de Uberlândia	1
UMESP	Universidade Metodista de São Paulo	1
UNISINOS	Universidade do Vale do Rio dos Sinos	1

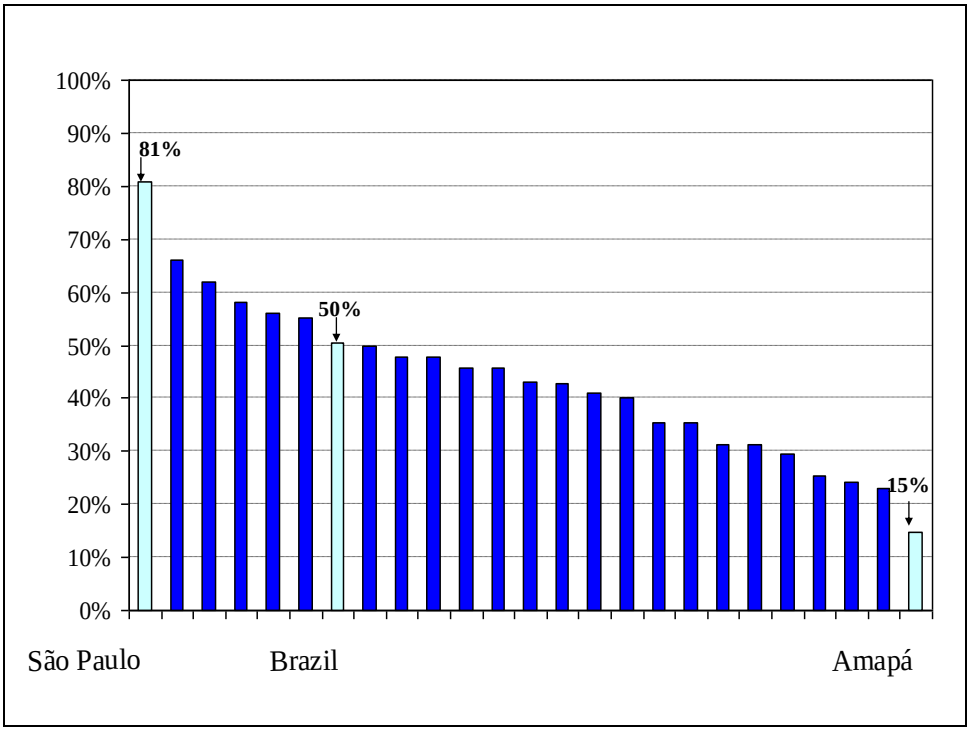
Note: Highly rated programs are those receiving a 6 or 7 rating.
Source: MEC/CAPES, Avaliacão Trienal 2007, available at: http://www.capes.gov.br/avaliacao/resultados/index.html

Only five private universities, the Catholic Universities of Rio de Janeiro, São Paulo, and Rio Grande do Sul, the University of Vale do Rio dos Sinos, and the Methodist University of São Paulo, made this list. Generally speaking, the few private universities with some research capacity seem to be hampered by the absence of strong incentives and appropriate legislation to encourage donations from the productive sectors and philanthropists. While they can compete for and do receive a non negligible share of public resources available for research from CAPES, FINEP or CNPq, they express concern because this funding comes as direct research grants without any allowance for the type of overheads resources needed to build up an institution's research capacity (staff and equipment).

It should be noted that, for historical reasons, the regional distribution of federal universities, which is where most of the research takes place, is quite imbalanced. While the large majority of States (20 out of 27) have only one federal university, Pará and Paraíba have 2 each, São Paulo and Pernambuco have 3, Rio Grande Do Sul and Rio de Janeiro have 4, and Minas Geraís has the largest concentration with no less than 11 federal universities. This pattern does not follow the spatial distribution of population, as illustrated by Annex 2 which calculates the number of federal universities for 10 million inhabitants in each State.

Another way to analyze the differences in research capacity is to look at the regional distribution of PhD concentration within federal universities (Figure 23).

Figure 23. Proportion of Faculty Holding a Ph.D. in Federal Universities Distributed by State (2006)



Source: MEC/Inep/Deaes, *Sinopse da Educação Superior* 2006.

Various authors have expressed concern about the limited contribution of universities to the development of a strong national innovation system (Cruz, 2006; Campus, 2008). It is widely estimated that most of the research in Brazilian universities is of a theoretical nature, partly due to the fact that CAPES evaluations emphasize the production of articles published in scientific journals. But a few institutions have managed to forge close links with industry. UNICAMP, for instance, operates a self-financed Innovation Agency which has been quite successful in creating a culture of applied research and helping researchers register as many as 30 patents in the past three years. The Catholic University of Rio de Janeiro, which is strong in the area of computer and software engineering, has established a flourishing incubator. The Getulio Vargas Foundation is the country's premier think tank in the area of applied economics. Last but not least, USP has an excellent record in the areas of biotechnology, energy, informatics and engineering, for example (Schwartzman, 2008). The work of these top institutions is recognized internationally, as illustrated in Box 2 in the case of USP.

Box 2. Brazil's Success in Plant Pathology

The Botany Department at the University of São Paulo is a spare, gray two-story building surrounded by uneven grass. The lights are turned off in the hallways to save electricity. Power outages have been a problem. But inside its walls lies perhaps the best hope to protect California's $2.7 billion wine industry from a devastating predator. A team of Brazilian scientists has cracked the genetic code of the bacterium Xylella fastidiosa, which has decimated vineyards in Southern California and is rapidly heading north.

Under a unique combined project, the U.S. Department of Agriculture, the California Department of Food and Agriculture and the American Vineyard Foundation are funding the work. The U.S. government turned to Brazil for help because "Brazil is now the leader in this area of agriculture," said Edwin L. Civerolo of the USDA's Agricultural Research Service. "We did not have the experience or infrastructure to do the work."

The Brazilian team broke into the major leagues last year when its genetic analysis of a Xylella strain that attacks orange trees was published in the leading research journal Nature. That feat made the São Paulo scientists the first in the world to decode the genome of a plant pathogen. Since then they have carved out their niche in the global scientific community as leading experts on plant pathology.

Their funding initially came from the state of São Paulo, which sets aside 1 percent of its tax revenue every year for scientific research. The brains came from 200 researchers in 34 laboratories throughout São Paulo state led by biologists Marie-Anne Van Sluys and Mariana C. de Oliveira of the University of São Paulo and João Paulo Kitajima, a computer software specialist at the University of Campinas.

The University of São Paulo's laboratories house the latest gene-sequencing equipment and analyzers. Each machine rapidly sequences units of DNA, essentially spelling out in order all the letters of the microbe's genetic code. The results are then sent electronically to the bioinfomatics laboratory at the University of Campinas, where genes are identified and described by computer analysis. The results are sent back to the biologists to determine the genes' function and significance.

Key to Brazil's success was the decision not to follow the conventional route of most countries on a quest for scientific glory and build a special institute for genetic research. Instead, the São Paulo State Research Foundation created a virtual genomics institute, called the Organization for Nucleotide Sequencing and Analysis, out of existing laboratories. Rather than bricks and mortar, funding went into sequencers and computers. The network has grown to 50 centers throughout Brazil. Researchers are connected by the Internet and communicate daily.

"No buildings, no walls, no turf battles," said the president of the foundation. The operating imperative was one of cooperation, rather than competition, among scientists. Simpson, of the cancer research institute, put it this way: "It's human nature to be competitive. What we did was to turn it outward. We're competing as a group against the rest of the world."

Source: The Washington Post, 29 Dec. 2001

1.3 Governance and Financing

Governance and Management

This section focuses on the structures, processes and activities that are involved in the planning and direction of institutions and people working in the tertiary education sector. The Ministry of Education (MEC) is the main body in charge of steering and managing tertiary education in Brazil through its Secretary in charge of Higher Education (SESU). SESU's mission is described as one of planning, coordinating and supervising the implementation of higher education policies. Three semi-independent agencies complement the work of SESU. CAPES is responsible for the development and improvement of post-graduate training and research. INEP collects data and publishes statistics on tertiary education institutions. CNPq, the National Council for Scientific Research, coordinates and funds research activities in public and private universities.

While SESU determines policies for the entire sector, the federal government has no direct jurisdiction over state and municipal tertiary education institutions. The various state higher education councils make decisions regarding all management aspects pertaining to institutions (budget, personnel and salary policies, student intake) and the status of new institutions. It is only in the area of curriculum that state and municipal institutions must follow federal guidelines since diplomas can be recognized only by the federal government.

The 1988 Federal Constitution, in its article 207, guarantees university autonomy in the pedagogical, scientific, administrative and financial areas, and the 1996 National Education Law (*Lei de Diretrizes e Bases – LDB*) gives universities the freedom to set their own personnel policies, establish research programs, adjust their enrollment based on capacity, and enter into contracts as legal entities. But the numerous laws, decrees, resolutions and regulations that organize the tertiary education sector and define how universities are allowed to operate seriously undermine, by their lack of coherence and overemphasis on central control and uniform treatment, these autonomy principles. In the own words of a legal expert writing on the impact of the Brazilian higher education legal framework, "[…] in reality, the more the legislation attempts to discipline and regulate the higher education system, the less the State is able to expand its range of action and mobilize the instruments that are at its disposition in order to achieve the desired objectives, and the more it legislates, the less internal consistency there is. From this perspective, it appears that the Law, as far as university autonomy is concerned, does not fulfill its function of providing incentives and stimulating socially desirable behaviors, notwithstanding the plethora of organizational norms."[14] The end result is that the actual degree of autonomy of Brazilian universities is significantly less than what the Constitution and LDB had foreseen.

From an international perspective, it is interesting to benchmark Brazilian universities in terms of decision-making autonomy, using the results of a recent OECD survey.

[14] Ranieri, N.B.S (2006). "Aspectos Jurídicos da Autonomia Universitária no Brasil". Instiuto de Estudos Avançados da Universidade de São Paulo. Page 3. Available at www.iea.usp.br/observatorios/educacao

Table 21. Extent of University Autonomy in Selected OECD Countries and Brazil

Country / Category	HOL	AUS	IRL	UK	DK	SWE	FIN	BR (Fed)	BR (St)	BR (Priv)
Own buildings and equipment	X	X	X	X					X	X
Borrow funds	X				X				X	X
Spend budgets to achieve objectives	X	X	X	X	X	X	X	X	X	X
Set academic structure and courses		X	X	X		X	X	X	X	X
Employ and Dismiss staff	X	X	X	X	X	X	X		X	X
Set salaries	X	X		X		X	X		X	X
Decide size of Student enrolment	X		X		X			X	X	X

Note: X means that the university has the power to perform this function autonomously;
Source: These responses come from a survey undertaken in 2003 by members of the OECD's Institutional Management in Higher Education Programme. Reported in OECD (2003) Education Policy Analysis. The information for Brazil is based on interviews conducted during the World Bank team visit in January 2007.

Table 20 illustrates two fundamental aspects of the Brazilian tertiary education system. First, public universities in Brazil actually have less autonomy than similar institutions in OECD countries. The more salient differences are the right to borrow from commercial banks, the ability to create new positions to hire teaching staff, the possibility to offer competitive remuneration conditions, and the authority to dismiss non-performing academics. Second, these restrictions do not apply equally to all public universities in Brazil. The state universities in the State of São Paulo have more flexibility, including the right to decide on the number of new positions and the possibility to top up the salaries of better performing academic staff. This explains one of the specificities of the Brazilian tertiary education system, namely the fact that the top two universities in the country, USP and UNICAMP, are not federal institutions.

What happened in the case of São Paulo State is that, back in 1988, the State Governor decided to grant increased autonomy to the universities as a way of appeasing striking professors demanding a substantial salary increase. Instead of conceding on the salary increase request, the Governor passed the responsibility on to the universities themselves

by establishing more transparent budget rules and giving them additional control over their financial and personnel resources.[15]

But generally speaking, public universities in Brazil are subject to many rigid administrative rules that constrain them in the management of their resources and prevent them from operating with the flexibility that universities in other parts of the world enjoy. Even though professors are hired through open competition, the number of positions is controlled by the federal and state governments. The salary scale is the same throughout Brazil and promotion is based on years in service, not performance. It is difficult to recruit part-time practitioners from industry and almost impossible to bring professors from public universities in other states as visiting professors for a full academic year or even a term. This seriously limits opportunities for cross-fertilization.

Box 3. Do Governments Care about Higher Education? Lessons from the Soccer Field

For the sake of argument, let us consider the following: how would Barcelona's professional soccer team (FC Barcelona) perform if it were constrained by all the rules that burden our universities? What would happen if all the players were civil servants with salaries determined by a government ministry and if they were allowed to continue playing every day regardless of their behavior during official games and practice sessions? What would happen if the club's income was not linked to its game results, if it could not pay higher salaries to attract the best players in the world or if it could not get rid of the under-performing players? What would happen if team strategy and tactics were decided by the government rather than by the coach? Wouldn't such an approach risk relegating the Barcelona team to the sidelines of mediocrity? If we agree that such an approach is unwise for a sports team, why do we allow our universities to operate under such conditions? This suggests that, deep down, we care more about soccer than about the education of our children.

Adapted by Jamil Salmi and Richard Hopper from Sala I Martín, X. (2006). "A great sense of humor", Vanguardia, 17 November 2006.
Professor Sala I Martín teaches at Colombia University in the US and Universidad Pompei F in Spain

One area where public universities have greater autonomy, though, is the selection of the rector. University rectors are appointed by the President of the Republic from a list of three candidates. The three candidates, who must have at least a master's degree, are chosen democratically by the entire university community, including students, administrative personnel, and teachers, the latter commending a 70% voting power.

[15] Lobo, R. L. and S. Filho (2006). "Autonomia das Universidades Públicas". Instituto de Estudos Avançados da Universidade de São Paulo. Available at www.iea.usp.br/observatorios/educação

Rectors serve a four-year term that can be renewed once. As in other countries, the electoral dimension in the selection process introduces elements of political clientelism.

Private tertiary education institutions enjoy more independence since their income is totally linked to tuition fee revenues, with the exception of the ProUni scheme. As in other Latin American countries, they are subject to government control in the area of quality assurance. But, as discussed earlier, application of the SINAES standards seems to be relatively lenient, certainly more than in Chile, Colombia, El Salvador or Mexico, for example, where failure to get accreditation led to the closure of poor quality institutions.

Financing

The realization of the Government of Brazil (GOB)'s ambitious plans to expand the tertiary education system hinges in part on the availability of financial resources. This section reviews the following dimensions:

- resource mobilization: is Brazil investing sufficiently at the tertiary education level?
- resource allocation: are public resources distributed in a manner that encourages innovation and rewards performance?
- resource utilization: are available resources used in an effective manner?
- equity: are public funds distributed among various population groups in an equitable way?

Resource Mobilization

Because of the federal nature of the political system in Brazil, financing for education is organized differently from most other countries. Responsibility for funding primary and secondary education is shared between the state governments and the municipal authorities, while the federal government's principal obligation is to finance higher education. This explains why, at 54 percent in 2005, the share of tertiary education in federal education spending appears to be much higher than the share of public education expenditures going to that education level in almost any other country in the world (Table 22). This unusually high proportion reflects not only the fact that the federal government is not responsible for most of the financing for primary and secondary education in Brazil, but also that the federal universities have always been generously financed by the GOB, without little concern for efficiency in the deployment and utilization of resources.

Table 22. Education Expenditures
(1998-2006)

Year	Public Expenditures on Education as % of GDP (a)	Education as % of Federal Government Budget (b)	Higher Education as % of Federal Education Budget (c)
1998	5.2	n.a	39.8
1999	n.a	n.a	45.5
2000	5.0	1.7	60.9
2001	5.2	1.9	53.8
2002	4.2	2.0	52.2
2003	5.3	1.5	52.2
2004	4.8	1.6	49.4
2005	4.3	1.4	53.8

Source: SIAFI, Secretaria do Tesouro Nacional (STN)
Notes: (a) Federal government expenditures as percentage of GDP; (b) education spending as a percentage of government budget refers exclusively to federal government expenditures; (c) higher education as share of education budget refers to the federal expenditures only.

Put in international perspective, the data show that the GOB devotes the equivalent of 0.7 percent of GDP to tertiary education, less than the 1.1 percent OECD average (Table 22).

Table 23. Public Expenditures on Tertiary Education
(2006)

Countries	Tertiary Education Public Expenditures as % of GDP
Malaysia*	2.6
Korea, Rep. of*	2.4
Denmark	1.6
Finland	1.5
Sweden	1.5
Ireland	1.0
Germany	0.9
USA	1.0
OECD Average	1.1
United Kingdom	0.8
Thailand*	0.8
China*	0.8
India*	0.7
Russia	0.7
Brazil	**0.7**

Note: *Year of reference is 2003.
Source: OECD. (2008). *Education at a Glance*; UNESCO (20056 from Global Education Digest 2006. *Comparing Education Statistics across the World.* Montreal: UNESCO-UIS.

But considering the low level of enrollment in tertiary education in general and the fact that three-quarters of the students attend private tertiary education institutions at their own cost, this level of public funding is on the high side. One of the determinants of this relatively high level of public expenditures is that the cost of tuition in public universities is heavily subsidized. All the public universities (federal, state, municipal) are free of charge, in accordance with the 1988 Constitution's statement that public institutions are not allowed to charge fees. As a result, the federal tertiary education institutions do not generate themselves more than 3.5 percent of their total resources (Schwartzman, 2006, p. 2). The level of public expenditures is further driven by the fact that budget allocation mechanisms are not directly linked to performance and internal efficiency is quite low, as will be seen in subsequent sections.

Resource Allocation

Until the mid-1990s, the budgets for public tertiary education institutions were not linked to performance in any way. Like many countries in the developing world, Brazil had a traditional historical / negotiated allocation system to distribute the budget among public universities, whether at the federal or state level. In 1997, the federal government put in place measures to encourage tertiary education institutions to be more efficient, linking their financial resources to objective indicators such as the number of students and postgraduate activities. But the impact of these measures has been lessened due to the

disproportionate share of personnel expenditures (salaries and pensions) in the total budget of each federal university. Between 1995 and 2002, for example, personnel expenditures grew from 77.6 to 85.2 percent of the total budget transferred to the federal universities (JIBC, 2006).

In the State of São Paulo, rigid budget allocation mechanisms have been in place since the 1988 reform mentioned earlier (see Governance section). The three universities receive a fixed proportion of the state budget and the share going to each university is also defined in a rigid fashion, regardless of fluctuations in the number of students, professors or research activities.

Generally speaking, the distribution of funding of public universities hardly takes institutional, and by extension, individual performance, and productivity into account. Universities receive funding whether they perform well or not in terms of quality and employability of the graduates and efficient use of available resources. At the level of the individual faculty members, other than intrinsic motivation and perhaps a strong sense of responsibility in nation building, there are few incentives for academics to improve their performance in research and teaching. As civil servants, their positions are secure. Their success is hardly bound to their competitive capacity and the impact of their scholarship and research. Although there are individuals across the system whose performance can be considered "world-class", the context does little to prepare the majority for performing in a competitive way at the national level, let alone at international levels.

It is only at the postgraduate level that resource allocation takes place in a more transparent and objective manner. The scholarships given by CAPES and the research grants available from the Ministry of Science and Technology through CNPq and FINEP are allocated strictly on the basis of competitive mechanisms rewarding the quality of programs and research proposals.

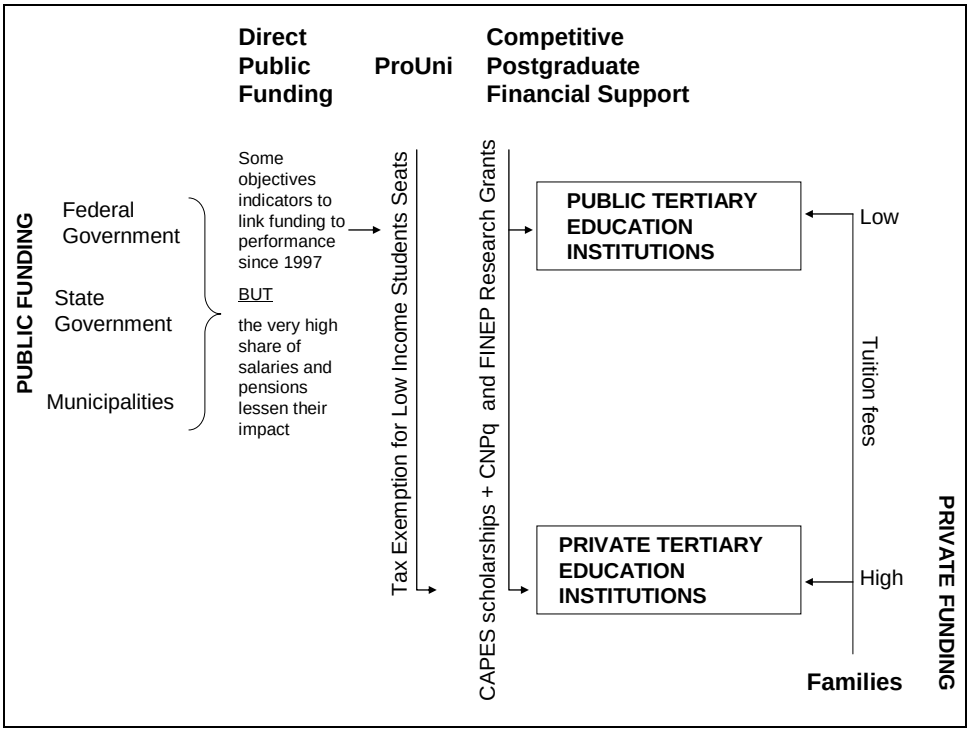
ProUni, as a demand-side allocation mechanism, is the other unusual resources transfer mechanism in the Brazilian tertiary education system, even though no additional money goes directly to the concerned universities since the purchase of seats for low-income students is financed through tax exemptions. But it is worth underlining that few countries in the world allocate public resources to their universities through demand-side mechanisms in such a transparent and objective manner as ProUni does. As a matter of fact, Kazakhstan and Georgia in Central Asia and the State of Colorado in the United States are the only demand-side schemes financing the recurrent expenses of tertiary education institutions indirectly through vouchers provided to the students.

Furthermore, even fewer governments accept to provide public resources to private institutions in support of low income students or members of other minority groups. A few countries, such as Chile and Ivory Coast, have grants programs for which students enrolled in private tertiary education institutions are also eligible. Others, such as Colombia, Malaysia and the US, have put in place student loan schemes supporting students in both public and private institutions. ProUni in Brazil and the "Coverage with Equity" program recently launched in the Colombian Department of Antioquia are

unique in that their selection criteria combine strict academic requirements with rigorous targeting.

The flow of funds in tertiary education is described in Figure 24.

Figure 24. Flow of Funds to Tertiary Education in 2005 (million Real)

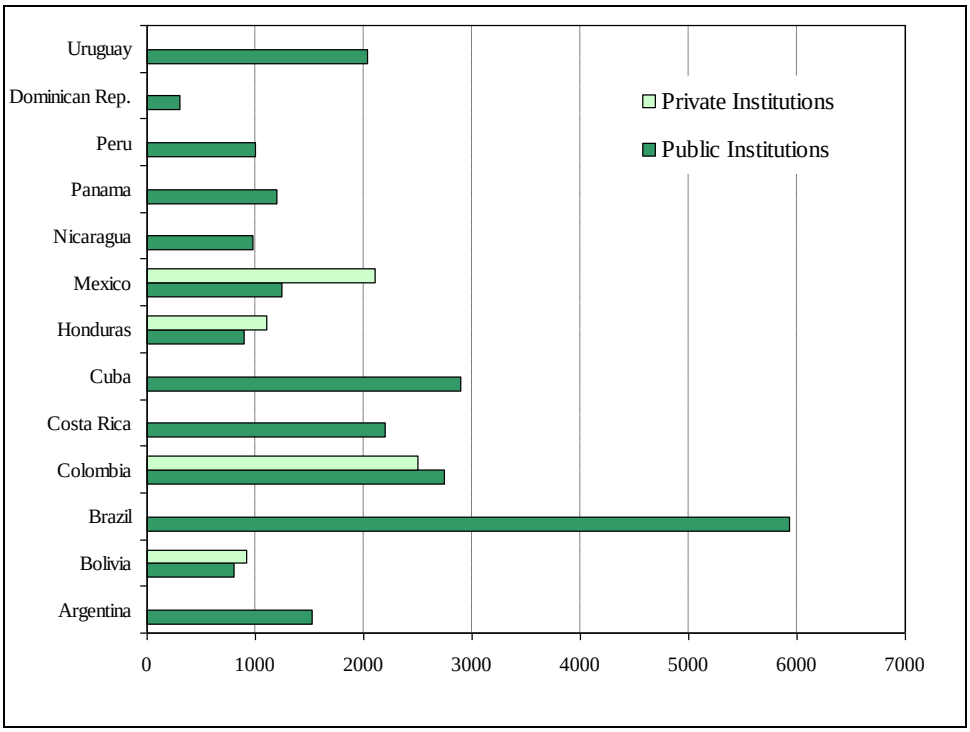


Elaborated by Jamil Salmi and Chloë Fèvre

Resource Utilization.

The Brazilian tertiary education system has always been known for its high level of unit costs, especially in the federal universities. The results of a recent UNESCO study show clearly the extent to which Brazil is an outlier in Latin America (Figure 25). The data indicate that Brazil's unit costs are at least twice as high as those of the most expensive systems in the region, Colombia and Cuba, and three times as expensive as Mexico, Uruguay and Argentina.

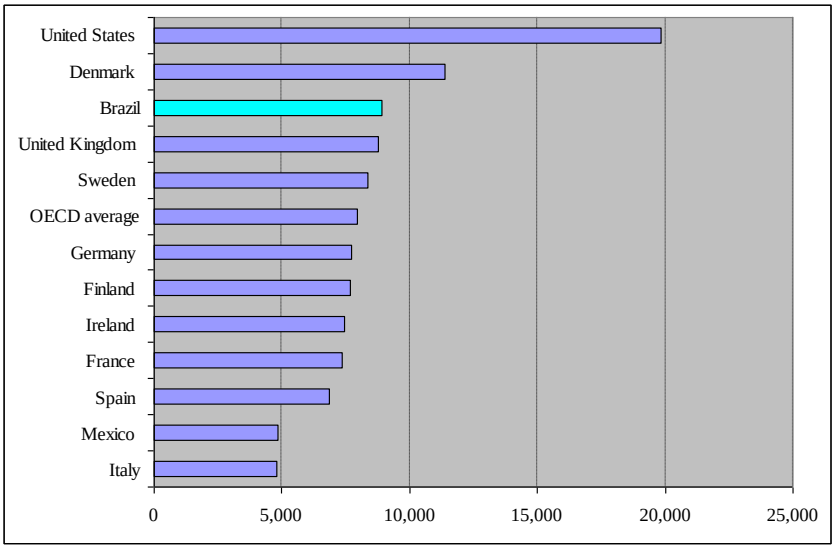
Figure 25. Unit Costs in Selected Latin American Countries (US$)



Source: IESALC (2006). *Informe sobre la Educación Superior en América Latina y el Caribe 2000-2005.*

Even when compared with industrial countries, unit costs in Brazilian tertiary institutions come out on the high side, as illustrated by Figure 26. In fact, they are third only to the US and Denmark, while being similar to those in the UK and 85 percent higher than in Italy and Mexico.

Figure 26. Per Student Annual Expenditures in Tertiary Education Institutions in 2004 (PPP US$)

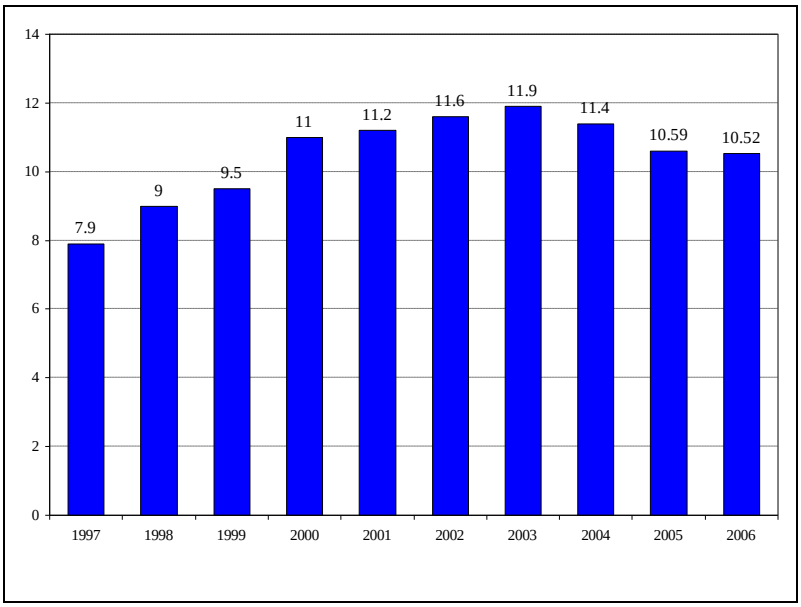


Note: Brazil and Italy: Public Institutions only
Source: OECD. (2007). *Education at a Glance*.

The main two factors explaining these excessive unit costs are the low students per teacher ratios and the high level of personnel expenditures. Figure 27 shows the evolution of the students per teacher ratio in federal universities between 1997 and 2006. Despite some significant improvement since the mid-1990s, the ratio remains quite low at 11.2 in 2006[16].

[16] This ratio includes only working teaching staff. The ratio including all teaching staff is 10.5.

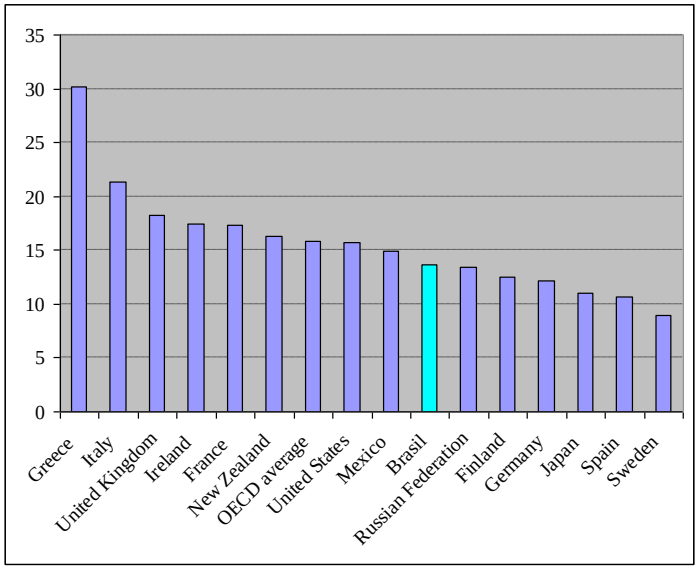
Figure 27. Evolution of Student / Faculty Ratios in Federal Universities (1997-2006)



Source: MEC/Inep/Deaes.

This can be better appreciated by comparing the ratio in all Brazilian tertiary institutions (13.6) with that in OECD countries where the 15.8 average represents a 16 percent difference (Figure 28).

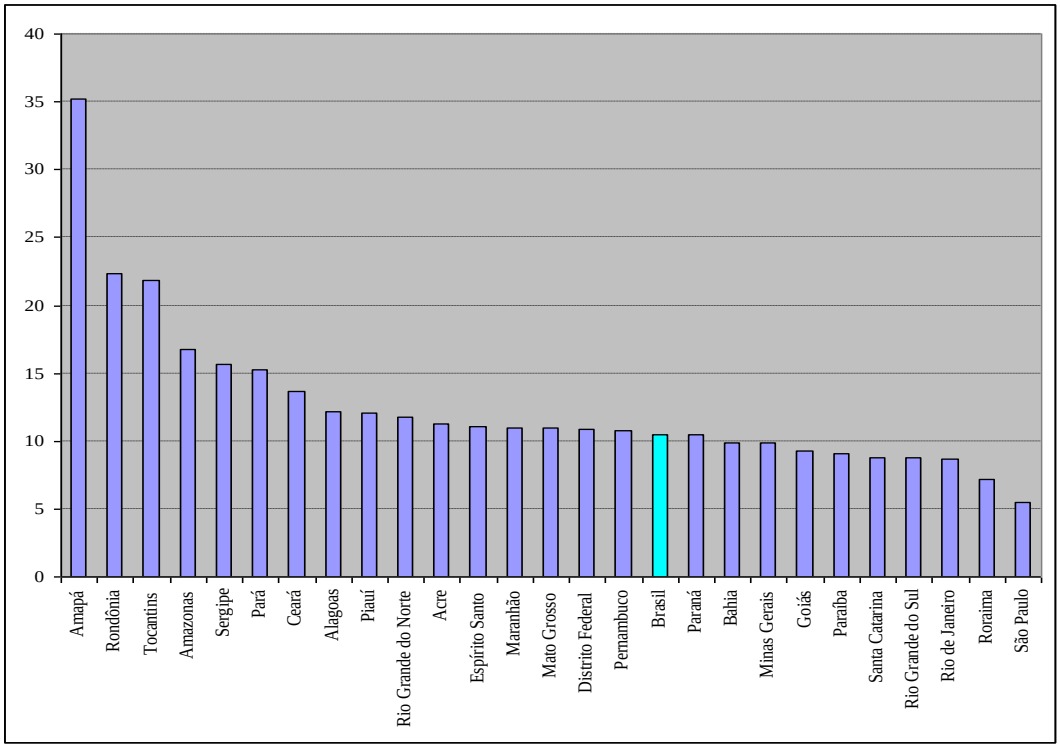
Figure 28. Student / Faculty Ratios in Selected OECD Countries (2005)



Source: OECD. (2007). *Education at a Glance.*

In addition, the national average for Brazil hides important regional differences. Figure 29 shows the range of students per teacher ratio across all the federal universities. These statistics illustrate the sharp contrast between a situation of overcrowding in some of the states, such as Amapá, and the persistence of generous conditions in several federal universities, such as São Paulo, Roraima, Rio de Janeiro, Rio Grande do Sul, and Santa Catarina with students per faculty ratios lower than 9. In the latter case, these low ratios are due to the fact that the federal universities operate a significant number of courses with a very small number of students.

Figure 29. Range of Students / Faculty Ratios in Federal Universities Across States (2006)

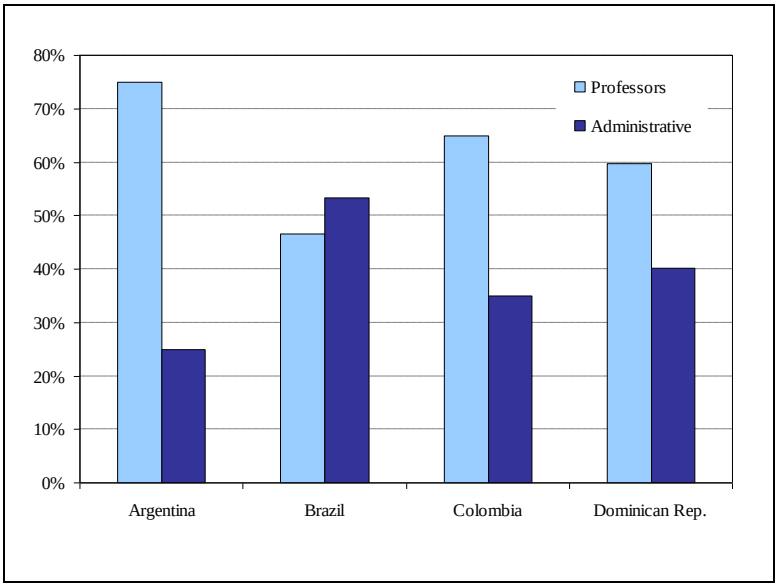


Source: MEC/Inep/Deaes, Sinopse de Educacão Superior 2006.

The second factor contributing to the high unit costs is personnel costs. Not only is the number of teachers excessive relative to the number of students, but the public universities are also financially responsible for paying the pensions of their retired professors. As a result, the proportion of the personnel budget taken up by pensions increased from 27.6 to 33.5 percent between 1995 and 2002.

In addition, Brazilian universities employ large numbers of administrative and support staff whose remuneration adds to personnel expenditures. In this area as well, Brazil stands out among Latin American countries as the tertiary education system with the highest proportion of non-teaching staff (Figure 30). In fact, Brazil is the only case with more administrative staff than teaching staff.

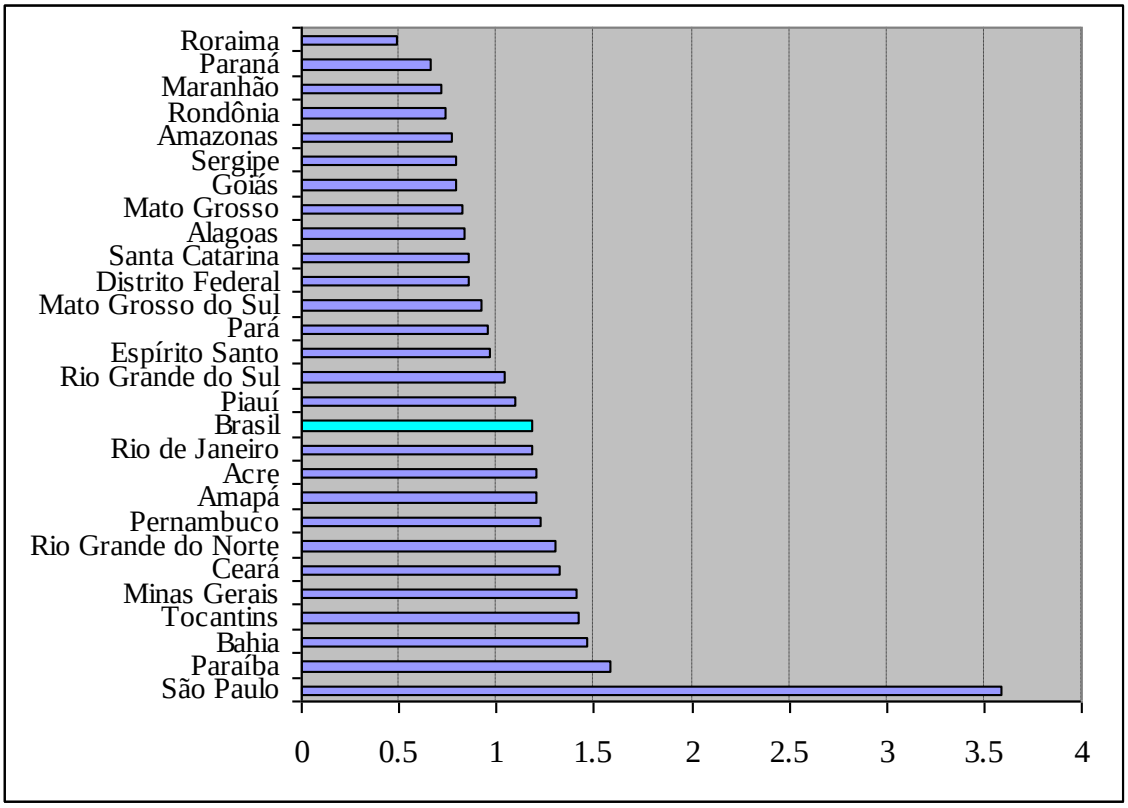
Figure 30. Teaching Staff Compared to Administrative Staff (2001, 2006)



Note: Brazil: 2006, Federal tertiary institutions only; Argentina, Colombia and Dominican Republic: 2001.
Source: MEC/Inep/Deaes for Brazil; National Studies IESALC-UNESCO for the other countries.

The situation has slightly improved in recent years, with the ratio of administrative staff to faculty going down from 1.15 in 1998 to 1.07 in 2006, but there are still very large regional variations among federal universities, as Figure 31 illustrates.

Figure 31. Ratio Working Administrative Staff / Working Teaching Staff in Federal Universities by State (2006)



Source: MEC/Inep/Deaes. *Sinopse de Educação Superior* 2006.

But reporting on unit costs only does not tell the full story. To measure internal efficiency more realistically would require looking at the cost of producing a graduate. Unfortunately, there are no recent studies of actual time to produce a graduate compared to the theoretical length of study programs. But the limited information available from UNICAMP seems to indicate that there is a certain degree of wastage despite the very selective admission process. A survey of students admitted in 1994-97 revealed that, by January 2005, only 72 percent had graduated, 26 had dropped out or been expelled, and the remaining 2 percent were still active students (Pedrosa, 2006).

Finally, the efficient use of resources can be measured by calculating a productivity ratio for each university, defined as the number of highly-rated programs (levels 6 and 7 in CAPES evaluations) divided by the number of professors with a PhD. Table 23 presents an interesting picture whereby the most productive universities in terms of research volume (USP and UNICAMP) are not the most efficient institutions when one considers their teaching resources. The other outstanding result is the case of PUC-RIO which comes out in second place in the productivity ranking.

Table 24. Research Productivity (2006)

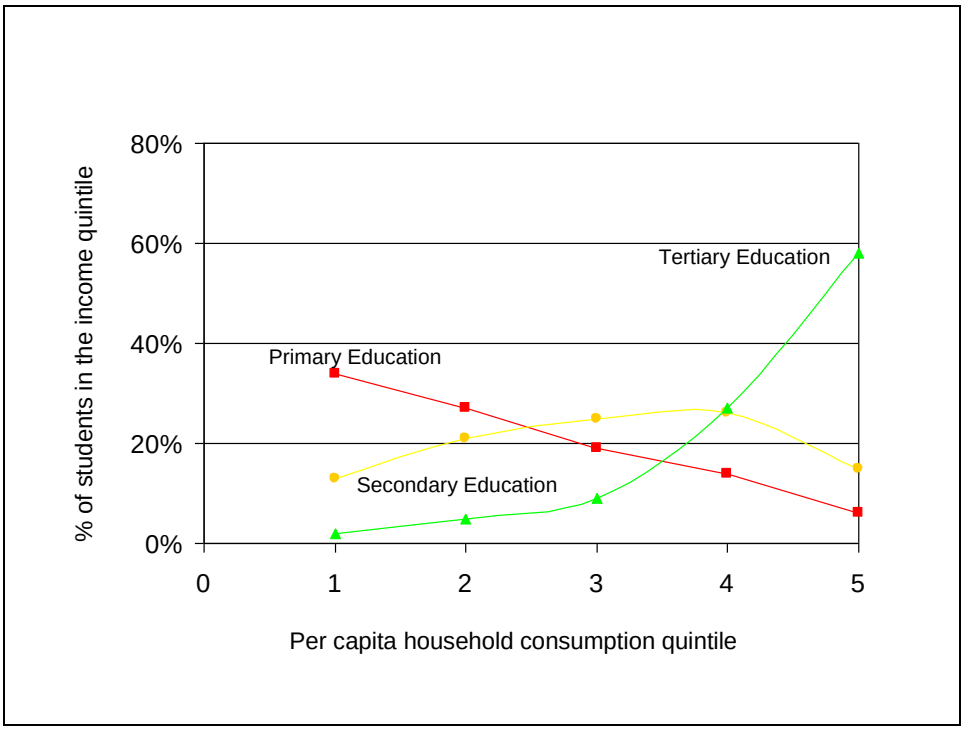
Acronyms Institutions	Name of institutions	Number of programs highly rated(a)	Number of professors with PhD	Productivity Ratio (c)
UNIFESP	Universidade Federal de São Paulo	8	533	15.0
UNICAMP	Universidade Estadual de Campinas (b)	23	1736	13.2
UFRJ	Universidade Federal do Rio de Janeiro	31	2368	13.1
PUC-RIO	Pontificia Univ. Católica do Rio de Janeiro (b)	5	386	13.0
USP	Universidade de São Paulo (b)	61	4841	12.6
UFV	Universidade Federal de Viçosa	7	564	12.4
UFRGS	Universidade Federal do Rio Grande do Sul	15	1,544	9.7
UFMG	Universidade Federal de Minas Gerais	14	1794	7.8
UNB	Universidade de Brasília	6	1,130	5.3
UFSCAR	Universidade Federal de São Carlos	3	581	5.2
UFSC	Universidade Federal de Santa Catarina	5	1264	4.0
UNESP	Univ. Est. Paulista Júlio de Mesquita Filho (b)	5	1363	3.7
UFSM	Universidade Federal de Santa Maria	2	632	3.2
UFC	Universidade Federal do Ceará	2	643	3.1
UFBA	Universidade Federal da Bahia	3	1001	3.0
UFCG	Universidade Federal de Campina Grande	1	340	2.9
UFRRJ	Universidade Federal Rural do Rio de Janeiro	1	358	2.8
UFPEL	Universidade Federal de Pelotas	1	363	2.8
UFPE	Universidade Federal de Pernambuco	2	1107	1.8
UFPR	Universidade Federal do Paraná	2	1110	1.8
UFU	Universidade Federal de Uberlândia	1	615	1.6
UFPA	Universidade Federal do Pará	1	716	1.4
UFRN	Universidade Federal do Rio Grande do Norte	1	767	1.3
UFF	Unniversidade Federal Fluminense	1	1265	0.8

Notes: (a) Programs that were rated 6 or 7 by CAPES; (b) year of reference 2004; (c) Productivity Ratio: Number of Programs highly rated for 1,000 Professors with Ph.D.
Source: CAPES; MEC/Inep/Deaes.

Benefits Incidence

The adverse equity situation that characterizes access to the Brazilian tertiary education system also means that public spending is unequally distributed among income groups, as highlighted by Figure 32 based on the latest household income survey data.

Figure 32. Distribution of Enrollments by Income Quintile (2003)



Source: UNESCO - IESALC

This pattern is highly regressive, as the Ministry of Education recognized itself in an official report published in 2003: "channeling a large proportion of the education budget for the financing of the federal institutions of higher education reduces the amount of resources available for the other levels of education. From an equity viewpoint, this policy produces significant distortions, which result in a highly regressive aspect of education funding. Approximately 46% of the resources of the Central Government for higher education benefit individuals who belong to the 10% richest group in the population."[17]

The degree of inequality is even greater at the post-graduate level, where not only students pay no tuition fees but a majority of them receive generous CAPES scholarships. According to a study based on a detailed analysis of household survey data, 70 percent of master's and Ph.D students belong to the richest income decile (Carvalho, 2003).

[17] Quoted in Schwartzman (2006), p. 23-24.

Part 2 – Policy Options for a More Effective Contribution of the Tertiary Education System to Competitiveness and Growth

Notwithstanding the impressive attainments documented in the previous section, the Brazilian tertiary education system faces a number of salient issues that need to be addressed urgently, including low coverage, a high degree of inequality, heterogeneous quality, rising graduate unemployment, weak linkages with industry, lack of autonomy, and low internal efficiency.

In December 2004, the Government of Brazil presented a reform project, in the form of a new higher education law that seeks to introduce the following measures:

- additional funding to expand the network of federal universities;
- more management autonomy to public universities;
- extension of direct election of university rectors to private sector institutions;
- increased control of private institutions;
- prohibition of foreign participation in Brazilian institutions; and
- expansion of the affirmative action program to have half of new entrants coming from public high schools.

For political reasons, the law has not been considered by Parliament yet and is unlikely to be passed in the near future. The only measures that appear to be considered for implementation in the near future are the establishment of new federal universities and the continuation of the ProUni program. It should be noted, in that respect, that creating several new federal universities and expanding the ProUni program would certainly help to increase coverage, but it is doubtful that it would be sufficient to resolve the equity, quality and efficiency issues outlined earlier. In fact, as long as the federal universities recruit the most academically qualified students and continue to operate with little accountability, this strategy would risk further reinforcing existing inequalities and is unlikely to eliminate the sources of inefficiency analyzed earlier.

The remaining section of the report, organized in three parts, offers a range of options for a more balanced development of the Brazilian tertiary education system. It starts with outlining the kind of medium-term strategic vision that would be needed to address current problems in a holistic manner. It then reviews the governance and financing reforms that would enable tertiary education institutions to operate more effectively and efficiently. Finally, it proposes a number of measures to improve the quality and relevance of Brazilian universities, including measures to build on existing areas of excellence for consolidating the leading universities into full-fledged world-class institutions.

2.1 - Elaborating a Strategic Vision to Define a Sustainable Growth Model

The portal of the Secretary of Higher Education in Brazil presents an impressive variety of special programs--no less than 19--that illustrate the Government's commitment to tertiary education development. What is missing from official documents, however, is an overall strategic framework with a clear vision of how the Government wants to transform the tertiary education system, together with the concrete growth targets that it seeks to achieve. Box 4 provides an example of clearly stated objectives for the tertiary education coverage expansion in Malaysia.

Box 4. Tertiary Education in the 9th Malaysia Development Plan

Greater access to tertiary education will be provided to achieve the target of 40 per cent participation rate of the age group 17- 23 years in 2010. Enrolment at the post-graduate level will be expanded to meet the target of 25 per cent of the total enrolment at degree levels in 2010. A special program will be implemented to increase the enrolment of postgraduate students, particularly in S&T programs. During the Plan period, enrolment in tertiary education institutions at all levels is expected to increase to 1,326,340 in 2010 with 32.3 per cent at first degree and 35.8 per cent at diploma levels. To cater for the projected increase in demand for associate professionals and technicians, more courses, particularly at the diploma level, will be offered.

Source: Economic Planning Unit, accessed on 12 March 2007 at http://www.epu.jpm.my/rm9/html/english.htm

The Government of Brazil's ambitious plan to increase tertiary education coverage, achieve greater equity, enhance quality, and improve relevance cannot be attained only with the traditional approach of establishing and funding new public universities with government budgetary resources. To elaborate a realistic and financially sustainable plan, it is important to look at alternative enrollment growth strategies in terms of the institutional configuration of the tertiary education system (public / private, universities / non university institutions) and various learning modalities (face-to-face, distance, virtual).

Box 5. Setting the Policy Framework for Higher Education in California

California pioneered the establishment of a policy framework for a state system of higher education in the United States when it developed and implemented its first Master Plan in 1959-60. The primary issues considered at that time were the future roles of the public and private sectors and, in particular, how the public sector should be governed and coordinated to avoid duplication and waste. Major principles that emerged from the initial master plan still shape the state's system today:

- Recognition of different missions for the four components of the higher education system (University of California, California State University, community colleges, and private universities and junior colleges);
- Establishment of a statutory coordinating body for the entire system;
- Differential admission pools for the University and State Colleges;
- Eligibility of students attending private institutions for the state scholarship program.

The California Master Plan for Higher Education, which is revised about every ten years, is not a rigid blueprint to control centrally the development of California's system of higher education. Rather, it sets some general parameters, focuses primarily on the boundaries among the four sectors of higher education, and strives for a system that balances equity, quality and efficiency.

Source: World Bank, 1994.

A three-pronged strategy is suggested to attain the planned enrollment increase in a financially sustainable way: (i) balanced growth of the university and non-university sub-sectors with clear quantitative targets for the latter; (ii) greater resource diversification in public universities, including higher levels of cost-sharing; and (iii) increased incentives for good quality private institutions.

Balanced Growth of the University and Non-University Sub-Sectors

Spreading enrollment growth across a number of different tertiary education institutions, instead of simply expanding the university sector, can be an effective strategy to implement the enrollment strategy in a more financially manageable way from a public resources perspective. In addition to protecting the resource base of the public universities by absorbing a significant proportion of secondary school graduates, the non-university institutions can make a useful contribution by offering training opportunities that respond flexibly to labor market demand. This is especially important in the case of Brazil, where graduates from non-university institutions represent a very small share of all new entrants into the labor market with a bachelor's degree.

In a way, the federal government needs to do, for the entire country, what a special task force is in the process of accomplishing for the State of São Paulo, through the design of a master plan modeled after the California Master Plan. The São Paulo plan seeks to reach a 60 percent net enrollment rate by multiplying the number of community colleges,

technical institutes and polytechnics and making more scholarships available for access to private tertiary education institutions.

For this strategy to work in the long term, it is important to maintain clear policies regarding the respective roles of both types of institutions. One of the challenges is to dispel the perception that the non-university institutions are second rate compared to the universities while at the same time avoiding the risk of academic drift often associated with the development of non-university institutions. The transformation of the Egyptian technology institutes into regular universities in the early 1980s and the abolition of the distinction between universities and polytechnics in the United Kingdom in the early 1990s illustrate this danger.

A special challenge, in formulating and implementing a differentiated expansion strategy, is to think through the functional linkages among the various types of post-secondary education institutions that are needed to put in place a coherent lifelong learning framework. The various types of institutions should not operate as parallel, unrelated sub-sectors, but rather as complementary parts of a well-articulated system that offers multiple learning paths. In this context, student mobility could be encouraged by removing all the barriers among the segments of the tertiary education system, among institutions within each segment, and among disciplines and programs within institutions. The promotion of open systems can be achieved through recognition of relevant prior professional and academic experience, degree equivalencies, career guidance, a modular curriculum with academic credits, credit transfer mechanisms, tuition exchange schemes, access to national scholarships and student loans, career pathways, and the creation of a comprehensive qualifications framework. Multiple pathways linking secondary education, both general and vocational, to tertiary education are also needed. Examples include remedial courses (such as those offered in community colleges) and bridge courses on fundamental subjects, particularly in mathematics and science.

Box 6. Building a Lifelong Learning System in Chile

In Chile as in most developing countries, there is no formal articulation between the university sector and the non-university sector. Typically, a student who graduates from a non-university tertiary education institution, such as a vocational training institute, a technical institute or a community college, has no other choice but entering the world of work. There is no possibility to transfer directly to a university or even to a higher academic level in the non-university sector. It is also very difficult for these graduates to go back to formal university studies after a few years of professional experience.

A recent initiative taken by the University of Conception aims at breaking this traditional barrier. A proposal to integrate a two-year post-secondary vocational training center, a four-year technical institute and the faculty of engineering of the university has been awarded a grant by the Competitive Quality Improvement Fund supported by an ongoing World Bank-financed higher education project. The curriculum of all three institutions will be adjusted to allow for direct transfer of credits and recognition of the vocational training center and the technical institute's qualifications for access to the university's faculty of engineering.

Source: Elaborated by Jamil Salmi

Finally, at the system-level, there is a need to establish a labor market observatory to monitor the labor market outcomes of tertiary education graduates on a continuous basis, widely disseminate information about careers and pathways, and advise decision-makers on necessary adjustments at the level of tertiary education institutions as well as labor market policies.

Income Diversification and Cost-Sharing

Although public funding remains the main source of support for tertiary education in most countries in the world, public universities have sought to complement their revenues in a variety of ways, including generating business income from institutional assets, encouraging donations from companies and philanthropists, and mobilizing additional resources from students and their families. Annex 3 provides an overview of the various income diversification mechanisms that Brazilian universities could pursue, in addition to those already practiced in the country.

In that perspective, the Ministry of Education (SESU) could consider implementing a program of financial incentives to encourage the public universities to generate additional resources, above and beyond what they manage to mobilize presently, through continuing education programs, consultancies, research contracts, and other income generation mechanisms. Positive government incentives for income generation can take the form of

matching funds linked to income generated from outside sources in some ratio, or even of a multiplier coefficient with a funding formula, as practiced in Singapore and in the U.S. state of Kentucky. Favorable tax incentives are also essential to stimulate philanthropic and charitable giving to tertiary education institutions. Among developing countries, India has one of the most generous tax concession schemes; 100 percent of individual and corporate donations to universities is exempt from taxation.

At the same time, it is important to note that, with the exception of the Scandinavian economies which have very high taxation levels, few countries in the world have been able to significantly expand their tertiary education system, while at the same time improving its quality, without requiring a growing financial contribution from students and their families to the cost of studies. China, for example, introduced fees in 1997 (equivalent to 20 percent of unit costs in undergraduate education), followed by the United Kingdom and the Czech Republic in 1998, and Austria in 2001. Tuition fees have doubled in Canada during the 1990s. The top engineering and management schools in India charge about $3,500 a year, equivalent to 7.2 times the country's per capita GDP.

Table 25. Average Tuition Fees in Selected Universities (2003 US$)

Country / Type of Institution	Tuition Fees (US$)	Living Cost (US$)	Total Costs (US$)
Brazil (public)	minimal	2,285	2,364
Brazil (private)	2,837	2,285	5,122
Chile (public)	3,140	2,800	5,940
Chile (private)	3,610	2,800	6,410
Colombia (public)	573	2,492	3,065
Colombia (private)	2,386	2,492	4,878
Mexico (public)	382	1,017	1,399
Mexico (private)	3,159	1,017	4,176
Peru (public)	455	695	1,150
Peru (private)	5,785	1,701	7,486
Malaysia (private)	4,000	2,600	6,600
Malaysia (public)	290	2,600	2,890
Australia (public)	3,855	7,811	17,631
Canada (public)	3,464	8,707	15,510
France (public)	minimal	12,906	12,906
New Zealand	1,764	10,765	18,659
Singapore (public)	6,082	7,298	13,380
United Kingdom (public)	15,029	11,350	26,379
United States (public)	5,027	11,321	24,799
United states (private)	18,604	12,154	35,769

Source: Blom, A. and Murakami, Y. (2007); OECD (2006).

Obviously, if some or all public universities were to charge higher tuition fees, the effects on equity and access would have to be carefully considered. However, the existence and further expansion of the student loan program (FIES) should provide a mechanism to ensure that cost sharing does not have adverse equity effects, especially for students from the lowest socio-economic groups. Options for improving the operation of the student loan program are outlined in the next section.

The political sensitivity of raising tuition fees should also be taken into consideration to avoid any backlash. This can be addressed through participatory meetings and communication efforts to create ownership among the various stakeholders and mobilize support for the proposed measures. The purpose of these consensus-building activities would be to establish a clear linkage between increased cost-sharing and the likely improvements that additional financial resources would bring about.

Box 7. Consensus Building and Cost Sharing in Northern Mexico

The Mexican constitution provides for free public education at all levels, and cost sharing has always been fiercely resisted by the professors and students of the country's largest public university, the National Autonomous University of Mexico (UNAM). In 1999 the university was closed for almost a year by a strike supported by the majority of its 270,000 students after the rector suggested a US$100 increase in tuition fees, from US$8 a year.

In northern Mexico, by contrast, the rector of the public University of Sonora was successful in introducing cost sharing after initiating, in 1993, a consensus-building process to explain to the staff and students the need for supplementary resources to maintain the quality of teaching and learning. After some initial resistance, including a widely publicized 2,000-kilometer march by protesters from Hermosillo to Mexico City, the students accepted the principle of a yearly payment to generate supplementary resources. A participatory process was to determine the allocation of these resources to equity and quality-improvement initiatives. Since 1994, the students have been paying an annual contribution of about US$300 for this purpose. A joint student-faculty committee administers the funds, which are used to provide scholarships for low-income students, renovate classrooms, upgrade computer labs, and purchase scientific textbooks and journals. A poster is prepared every year to disseminate information on the use of the money collected at the beginning of the academic year.

Source: Elaborated by Jamil Salmi

Further Growth of the Private Sector

During the 1980s and the 1990s, private tertiary education institutions were the main source of enrollment growth in the absence of expansion of public institutions. In recent

years, the federal government has taken proactive measures to encourage access to private tertiary education institutions for low-income students through the ProUni and FIES programs. Continuous support for these two programs would usefully complement the strategic approaches of institutional diversification and resource mobilization outlined above.

In that context, the Government of Brazil could consider the possibility of offering limited subsidies to the private sector. For example, private institutions might be given the opportunity to apply for government financial support in areas of high priority, such as engineering or medicine, for example. Financial incentives to stimulate the development or strengthening of quality private tertiary education institutions can of course be only justified on the grounds that they provide a means of expanding enrollments at lower public cost than by expanding public universities.

2.2 Implementing the Strategic Vision: Governance and Financing Implications

In what ways are Brazilian universities different from the top Asian, European, and North American universities, and how do the differences hinder further advancement? Universities are complex organizations and their successful performance is dependent on multiple factors. The elite league of universities are those whose faculty and students are highly successful in making academic work and product relevant and useful to society. Among other things, their environments foster competitiveness, unrestrained scientific inquiry, critical thinking, innovativeness, and creativity. Moreover, because they enjoy considerable autonomy, their structures are not inhibited by various bureaucracies and they are flexible enough to quickly respond to the demands of a rapidly changing global market.

Compared with this vision of world class universities, Brazilian universities have weaker governance and financing arrangements, including insufficient autonomy and accountability mechanisms. Reforms are therefore needed to improve the governance arrangements and make the financing mechanisms more performance-based.

2.1 Improving the Governance Structure and Patterns

Trends in governance patterns in OECD countries point to the fact that, in order to promote the development of increasingly complex and diversified tertiary education systems, governments can be more successful by steering from a distance rather than exercising too much of a direct supervisory role (OECD, 2004). This governance mode can be achieved through a regulatory framework that encourages and facilitates, rather than controls, innovations in public universities and private sector initiatives.

In the case of Brazil, three major changes could be envisaged. First, the federal and state governments could grant increased management autonomy to the public tertiary education institutions under their authority. The experience with the State of São Paulo universities after the 1988 governance reform illustrates how even moderate management autonomy can have a noticeable impact in terms of increased operational efficiency.

Table 25 below presents data comparing inputs and results at USP between 1989 and 1994 that show clear efficiency gains as a direct result of the 1988 autonomy reform.

Table 26. Improved Efficiency at the University of São Paulo (USP)

Efficiency Indicators	1989	1994	Change
Professors	5,546	5,023	-9.4%
Administrative Staff	17,735	15,558	-12.4%
Undergraduate Students	34,782	35,835	+3.0%
Graduate Students	12,918	16,212	+25.5%
Master Theses	1,036	1,388	+34.0%
Doctorates	598	807	+34.9%
Publications in Brazilian Journals	13,098	13,971	+6.6%
Publications in Foreign Journals	2,054	3,133	+52.5%

Source: Lobo and Filho (2006), p. 4.

The second area where change is highly needed is the remuneration regime of university professors and employees. As long as all teaching and administrative staff are under a common civil service regime that does not take performance into consideration and does not allow for differentiated salary scales, management autonomy will remain meaningless. In addition, pension payments should not continue to be part of universities' budgets but should be fully funded and administered by the Social Security Administration.

Lastly but equally important is the issue of the mode of appointment of university leaders and the role of university boards. A growing number of countries are setting up boards with extensive powers over the management of universities. Boards can be responsible for overseeing all financial management aspects, selecting the Rector, determining the appointment and employment conditions of staff, and deciding on the management of the property of the university. The recent governance reform in Denmark provides an illustration of the type of changes that a country like Brazil could reflect on.

Box 8. Higher Education Reform in Denmark: The University Act of 2003

Through reforms in four key areas --institutional autonomy, institutional leadership, quality assurance and internationalization--, Denmark is in the process of transforming its university system into an independent sector contributing to broad national success by answering more effectively to the evolving labor market that it serves.

Institutional autonomy: increased independence for Denmark's universities.

- As of 2003, all universities in Denmark are considered independent subsidiaries of the Ministry of Science, Technology, and Innovation.
- Funds are distributed based on established rates for research and on per student enrollments and completion, to establish more objective criteria for funding.
- Institutions are allowed to use their complete subsidies as they deem necessary, may also seek outside sources of funding to complement the state contributions, and may establish profit-making activities.
- Performance contracts, first introduced in 1999, are agreements between the government and individual institutions regarding how each institution will seek to maximize its individual strengths as defined by the institution itself. Institutions seek success in areas where they are most competitive.

Institutional leadership. Leadership at every level is balanced within and outside the institution:

- Governance of the institution is primarily in the purview of an external majority university Board, whose members are elected, not appointed, and include representatives from both within and outside the university, including academic and administrative staff, and students.
- Each university's Rector is hired by the Board after an international search and serves at the will of the Board.
- Deans are hired and supervised by the Rector and in turn hire and supervise Department Heads.

Source: Universities Act 2003, retrieved on 12/14/05 from http://www.videnskabsministeriet.dk.

It is interesting to note that one of the most prestigious business schools in the country, *Fundação Getiulio Vargas* in São Paulo, announced recently that the general director of

the school would not be elected anymore, but appointed based on a competitive search process.[18]

In transforming these fundamental dimensions of the prevailing governance patterns and allowing public universities to operate with more autonomy, the Government of Brazil would need to consider two implementation aspects. First, it would have to decide on the scope and speed of reform implementation. One possible approach would be to follow the example of Japan, which recently granted increased autonomy to its 150 public universities all at once within the context of the so-called "corporatization reform". Alternatively, the Government of Brazil may want to move gradually, starting with a limited number of universities as a pilot experience, and then expanding to the rest of the sub-sector, as Thailand and Indonesia have done in the past 10 years. While the latter approach has the advantage of providing a testing ground to learn from the initial implementation phase, it has the drawback of differentiating among existing public universities by allowing some to function in a more autonomous matter while keeping the others as constrained as in the past.

The second implementation aspect that requires special attention is the capacity building needs of the public universities. Managing a university in a fully devolved environment is a complex and challenging task involving special skills, including the ability of managing change and overcoming resistance to that change. These skills will need to be developed and extended in a system that has not encouraged them before. There will also be an immediate requirement for strengthened internal systems of management control and reporting. Planning and decision making processes may also need to be reviewed and restructured so that the newly empowered University Boards and their sub committees would be properly involved in all the main strategic decisions.

Funds should therefore be set aside by the Government of Brazil for staff development, training and strengthening of management information systems that the public universities will require. The UK experience, for example, suggests that, in order to effectively promote reforms in institutional management, it is important to consider all the means of assisting and enabling the universities to improve themselves and their management capacity. When the polytechnics were given autonomy and taken out of local government control in 1989, many of them lacked adequate staffing and processes. Over a period of 18 months extensive training and development took place, and the UK Ministry of Education commissioned external management consultants and accountants to confirm that each polytechnic was in a proper state of readiness to take on its new financial responsibilities. Some of the following approaches and tools can be relied upon to help build up the management capacity of higher education institutions:

- Programs of workshops and seminars for institutional leaders and managers to meet and discuss ways of making change;

[18] Takahashi, F. (2007). "FGV vai acabar com eleição para director." Folha de São Paulo. 27 February 2007. Accessed on 2/28/07 at http://www1.folha.uol.com.br/folha/educacao/ult305u19389.shtml

- Commissioned national training and development programs aimed at all the key professional skills such as accountants, property managers, human resources and ICT specialists;
- Provision of central funding to which institutions can bid for help with collaborative software development, use of external consultants, benchmarking exercises and exploration of good management practices;
- External audits of management capacity and skills;
- Publication of good management practice guidelines on matters such as financial strategy, strategic planning, risk management and human resources strategies.[19]

Finally, it is important to underline that increased autonomy does not mean absence of outside controls, quite the opposite. Accountability in Brazil is already provided through ENADE, SINAES and CAPES on the quality of teaching and learning side. Budget allocation mechanisms that reward performance can also be a powerful accountability tool.

2.2 Relying on Performance-Based Budget Allocation Mechanisms

To stimulate a more effective use of public resources, the Government of Brazil could introduce complementary performance-based budget allocation mechanisms that provide financial incentives for improved institutional results in relation to national policy goals. Over the past decade, a number of allocation mechanisms that link funding directly to some measure of outputs or outcomes were designed and put in place in various parts of the world.[20] Four main types of innovative allocation mechanisms might be considered in this context:

- Output-based funding formulas: output or outcome measures are used to determine all or a portion of a funding formula, for example universities are paid for the number of students they graduate, sometimes with higher prices for graduates in certain fields of study or with specific skills;
- Performance contracts: governments enter into regulatory agreements with institutions to set mutual performance-based objectives;
- Performance set asides: a portion of public funding for universities is set aside to pay on the basis of various performance measures;
- Competitive funds: financing is awarded to peer-reviewed proposals designed to achieve institutional improvement or national policy objectives.

Output-Based Funding Formula

[19] For examples of these, see the publications of the English Higher Education Funding Council and their Good Management Practice program at www.hefce.ac.uk

[20] Salmi, J. and A. Hauptman (2006). "Innovations in Tertiary Education Financing: A Comparative Evaluation of Allocation Mechanisms." HDNED Education Series number 2, Washington DC. The World Bank.

A more transparent and objective way to distribute funds for recurrent expenditures uses a formula linking the amount of resources spent on inputs, such as the number of students or professors, to some indicator of institutional performance, such as the number of graduates. Examples of countries that have built performance into their funding formulas include:

- England where the recurrent expenses formula is paid on the basis of the number of students who complete each year of study;
- Denmark which has a 'taximeter model' in which 30 to 50 percent of recurrent funds are paid for each student who passes exams;
- Netherlands where half of recurrent funding is based on number of degrees awarded;
- South Africa where the funding formula takes both the number of students enrolled and the number of graduates into consideration;
- Norway where some funding has been based on the number of credits obtained and, beginning in 2007, a portion of funding will be based on the number of graduates;
- Some U.S. States, including Arkansas, Kentucky, South Carolina, and Tennessee, which have experimented with an approach based on the benchmarking of their tertiary education institutions against reference universities and colleges in other States; and
- Ontario, Canada, where the funding of community colleges is linked to the outcome of key performance indicators that measure the degree of satisfaction of students, graduates, and employers with the quality and relevance of the colleges' programs and services.

A recent feasibility study in Malaysia calculated that the Government of that country could save between 10 and 30 percent of the operating budget of the public universities if resources were allocated on the basis of a funding formula using unit costs benchmarked against the better performing institutions.[21] It should be noted, however, that no single perfect formula exists that is valid for all countries under all circumstances. Rather, each country must choose an allocation mechanism consistent with the goals and priorities of its tertiary education development strategy and must be prepared to make changes over time as these goals and priorities evolve.

Performance Contracts

Performance contracts are non-binding regulatory agreements negotiated between governments or buffer bodies and tertiary education institutions which define a set of mutual obligations, usually performance targets to be achieved by the institution, sometimes with additional funding provided by the government. The agreements may be with entire systems of institutions or individual institutions. All or a portion of funding may be based on whether institutions meet the requirements in the contracts. The agreements can be prospectively funded or reviewed and acted upon retrospectively.

[21] Innovation Associates. 2004. "Development of a New Funding Methodology for Malaysian Public Institutions of Higher Education". Report commissioned by the Ministry of Higher Education.

Examples of countries or regional governments with performance contracts include:

- *France* which since 1989 has devoted one third to half of the recurrent budget to 4-year performance contracts. Payments are made when the contracts are signed, with a post-evaluation to assess the degree and effectiveness of implementation;
- *Finland* has contracts that set out general goals for the entire tertiary education system as well as specific goals for each institution;
- *Denmark* uses "development contracts" setting long term improvement goals for the institutions;
- *Colorado* (US) which as part of its new voucher scheme is setting up performance contracts that would penalize institutions that do not meet standards as part of broader reform effort that includes demand-side vouchers and fee for services;
- *Virginia* (US) which is developing contracts with its public universities in which increases in autonomy are exchanged for reduced funding levels from the State. The model evolved from a request by the three top universities in the State to swap reduced public funding for greater autonomy in how public funds are spent to the final version that applies to all public institutions in the State;
- *Quebec* (Canada) which used performance contracts beginning in the mid-1990s, but has dropped them as a policy mechanism in recent years;
- *Switzerland* which started to introduce performance contracts in the mid 1990s as part of a reform to grant universities greater autonomy. A recent evaluation of the reform (Schenker-Wicki, 2006) indicates that, in the absence of complementary changes within the universities themselves, the performance contracts have not yielded significant efficiency gains;
- *Spain* where some provinces have recently developed an interesting variation on this model called a "contract program" ("contrato-programa marco de financiación global") as a result of the new decentralization policy which delegates significant powers to the autonomous regions of the country (see Box 9);
- *Chile* is in the process of introducing "performance agreements" on the basis of which public universities will receive additional resources to implement institutional improvement plans.

Box 9. Performance Contracts in Spain: The "Contract Program" in Madrid

The first "contract program" in Spain was signed in 2005 between the autonomous government of Madrid and the six public universities operating in the Spanish capital city. This agreement combines the elements of a funding formula and a performance contract with a multi-year horizon (five years). Not only does the formula allocates resources for both teaching and research, amounting to 85 percent of the total budget contribution, but it also provides funding against a number of policy objectives (restructuring of studies in accordance with the Bologna process, better deployment of teachers, improvement in pedagogical practices and use of education technologies, continuing education, etc.). The "contract" includes as well a clause for compensatory payments to the universities less favored by the new allocation model in order to reduce past resource disparities.

Source: Interview with the Rector of Universidad Autónoma de Madrid, 28 November 2005.

Performance Set Asides

Under this approach, a portion of funding for recurrent expenses is set aside to be allocated on the basis of a number of performance measures. The number of indicators varies from single to multiple (as many as twelve or more). The performance measures are typically decided through negotiations between government agency or buffer body and institutional officials.

South Africa has for a number of years set aside most of its core budget for teaching, research, and other services based on multiple performance measures. This performance funding is supplemented by a competitive fund. In the US, more than a dozen state governments have used performance set asides over the past decade or more. Examples include:

- Tennessee which sets aside 6 percent of funds based on multiple criteria - four standards and ten indicators – with each of these given a certain weight. Institutions compete against their own record; and
- South Carolina which for a number of years based most of its recurrent budget allocations on a wide variety of performance criteria.

The South Carolina experience is instructive in that it represents an extreme in performance-based funding as the State decided to allocate almost its entire recurrent budget on the basis of performance measures. The general evaluation of the South Carolina performance-based funding experience is that it failed because there were too many indicators and standards and thus the signals provided to institutions were mixed and confusing.

Competitive Funds

To encourage the transformation of tertiary education institutions, some countries have established competitive funds for the purposes of improving quality and relevance, promoting innovation, and fostering better management – objectives that are difficult to achieve through funding formulas. Under such systems, institutions are typically invited to formulate project proposals that are reviewed and selected by committees of peers according to transparent procedures and criteria. The eligibility criteria vary from country to country and depend on the specific policy changes sought. In Argentina and Indonesia, for instance, proposals can be submitted by entire universities or by individual faculties or departments. In Chile, both public and private institutions are allowed to compete. In Egypt, a fund was set up specifically to stimulate reforms within faculties of engineering.

A fundamental prerequisite for the effective operation of competitive funds—and one of their significant benefits—is the practice of transparency and fair play through the establishment of clear criteria and procedures, and the creation of an independent monitoring committee. In countries with a relatively small or isolated academic community, it is desirable to draw from a regional or international pool of peer reviewers to reduce the danger of complacency and subjective evaluation among a limited group of national colleagues. Use of a transnational pool is a long-standing practice in Scandinavian countries and the Netherlands. One of the added benefits of competitive funding mechanisms is that they encourage higher education institutions to undertake strategic planning activities which help them formulate proposals based on a solid identification of needs and a rigorous action plan.

International experience with competitive funds has shown the need to consider three operational questions when designing a new fund: (i) How to create a level playing field in diversified systems with strong and weak tertiary education institutions? (ii) Should private institutions be eligible? (iii) Is it desirable to closely link access to funding with accreditation or similar quality assurance requirements?

In some cases there may be a compelling argument for opening several financing windows with different criteria and funding ceilings or for setting up compensatory mechanisms to increase equity among institutions. In Indonesia, for example, three different windows were designed to serve universities according to their actual institutional capacity. In a recent tertiary education project in China, the top universities were required to form a partnership with a university in a poor province as a condition for competing for resources from the curriculum reform fund. In Egypt, the competitive fund in the Engineering Education Reform project had a special window for technical assistance to help less experienced engineering schools prepare well-formulated proposals. In Chile, a special window was recently opened to provide preparation funds for universities requiring assistance in strategic planning and subproject formulation.

Box 10. The Contribution of Competitive Funds

Well-designed competitive funds can greatly stimulate the performance of tertiary education institutions and can be powerful vehicles for transformation and innovation. Argentina's Quality Improvement Fund (FOMEC) has encouraged universities to engage in strategic planning for the strengthening of existing programs and the creation of new interdisciplinary graduate programs. Within universities, faculties that had never worked together started cooperating in the design and implementation of joint projects. In Indonesia, a series of World Bank projects that began in 1993 has succeeded in stimulating ownership within the entire academic community of new paradigms in tertiary education. In Egypt, the Engineering Education Fund was instrumental in introducing the notion of competitive bidding and peer evaluation in the allocation of public investment resources. The fund promoted in an effective manner the transformation of traditional engineering degrees into more applied programs with close linkages to industry. The new competitive fund in Jordan has detailed guidelines which are described in an operations manual, and it relies on international peer reviewers for projects of national interest. In Chile, a second wave of tertiary education reforms is being supported by a competitive fund for diversification (development of the non-university sector) and quality improvement of all tertiary institutions.

Source: The World Bank (2002). Constructing Knowledge Societies. Washington D.C.

Governments that wish to encourage the growth of high quality private institutions can use competitive funds to support investments in these institutions. A competitive fund for engineering education in the Philippines had this feature in the 1980s and ongoing funds in Sri Lanka, Chile and Ghana make public funding available to private institutions.

Finally, one of the strengths of competitive funds is that they are more likely to be effective in improving quality than broader-based approaches such as negotiated budgets or funding formulas. Therefore, one way in which competitive funds can improve quality is to link eligibility for funds to participation in the accreditation process, either on a voluntary basis (Argentina) or in a compulsory way (Chile). Another approach is to use quality improvement as a criterion in evaluating proposals and selecting recipients.

Demand-Side Funding Allocation

While the large share of public support of tertiary education in most countries is provided directly to institutions, many nations also provide some portion of the public funds for tertiary education to students and their families in the form of scholarships and student loans. But one of the more innovative student-based approaches is demand-side vouchers which finance the recurrent expenses of institutions indirectly through vouchers provided to the students who chose in which higher education institution they want to study.

Demand side vouchers are so innovative that there are few examples of countries or sub-national governments that use them to pay for recurrent expenses. The most prominent

examples can be found in the former Soviet Republics of Kazakhstan and Georgia which began implementing a voucher scheme in 2001 and 2005, respectively, and the state of Colorado (US) which introduced a similar system in 2004. In Kazakhstan, about 20 percent of the students receive voucher-like education grants that they carry with them to the public or private university of their choice, so long as they choose to study a grant-carrying subject. For the students, eligibility is determined by their score in the highly competitive Unified National Test (equivalent to the Brazilian ENEM) that replaced the old system of university entrance exams, and their subject choice. For the tertiary education institutions, eligibility is a function of their standing with the quality assurance unit of the Ministry of Education and Science, and the subjects they offer.

Even after only a few years of operation, the Kazakh voucher system appears to be functioning as an effective allocation instrument to reward those institutions that are perceived as better performing and offer national priority subjects. All tertiary education institutions, public and private alike, are very attentive to their ability to attract education grant beneficiaries. The voucher scheme also seems to be a successful tool to promote the growth of the better quality private institutions which have been able to multiply the number of grant beneficiaries within the past three years.[22]

Box 11. The Voucher Experiment in Colorado

Under this plan, all undergraduates at public and private institutions in the State are scheduled to receive a uniform voucher (officially referred to as 'stipend') that covers a portion of the average cost per student at Colorado public institutions. Students then submit the voucher to the institution they choose to attend (including private institutions in the State) to be used to defray an equivalent amount of their tuition fees and related expenses. Students and their families are responsible for paying the tuition fees over and above the amount of the voucher although these costs can be covered through student financial aid with no effect on the amount of voucher received.

In the first year of the plan, the vouchers were worth $2,400 per student, which covered about half of the estimated costs of educating undergraduates in that year. The $2,400 value of the voucher was substantially below the initial estimates of the program because actual funding fell short of levels projected at the time the legislation was enacted. Colorado students attending private institutions were eligible for $1,200 in the first year of the program. The amount of tuition that voucher recipients are responsible for paying varies depending on the institution attended.

Source: Salmi, J. and A. Hauptman (2006). "Innovations in Tertiary Education Financing: A Comparative Evaluation of Allocation Mechanisms." HDNED Education Series number 2, Washington DC. The World Bank.

[22] OECD / World Bank (2007). Review of the Tertiary Education System of Kazakhstan. Paris, forthcoming.

It should be noted in that context that the ProUni program constitutes an interesting variation of a voucher scheme applying only to private universities.

Funding of Research

To integrate its research universities into the global research community, Brazil will need to allocate more R&D resources on a competitive basis, provide special incentives for collaboration with foreign research institutes, universities and private companies, provide special R&D funding allocations that are not tied to undergraduate enrollment, and introduce programs for attracting world class researchers and professors from abroad, much as countries such as South Korea, Singapore and China do today.

Box 12. United States' Los Alamos Nuclear Research Center

Leading nations with a strong science and technology sector finance R&D almost exclusively through transparent and open competition. Even funding for most strategic research areas such as nuclear research is allocated on competitive basis according to pre-defined and objective criteria. For example, in 2005, the US Department of Energy launched a request for proposals for management of the world's most renowned nuclear center, Los Alamos. The grant was allocated for seven years with annual funding of around US$2.2 billion. The contract may be extended to 13 years, based on the performance during the first period. After evaluating very competitive proposals, the government selected a team made up of the University of California and three large engineer and technology companies

Source: The US Department for Energy: http://www.energy.gov/news/2820.htm.

International experience indicates that one of the most effective ways of allocating research funds is to promote the development of centers of excellence at particular institutions specializing in certain fields or endeavors. Centers of excellence have the potential of improving the relevance of research if the themes on which the centers focus accurately reflect national priorities and societal needs.

New Zealand and the Netherlands are examples of OECD countries that have funded their academic research through centers for excellence. A number of states in the U.S. have also adopted this approach to supplement the research funding embedded in the core funding formula in a more specialized fashion. The China '211' project, the Brain 21 program in South Korea, and the Millenium Institutes recently established in Chile are also examples of how countries establish or boost research centers of excellence. Table 26 describes the most recent "excellence" funding initiatives implemented throughout the world.

Table 27. Recent Research "Excellence" Initiatives
Annex 1. Recent Research "Excellence" Initiatives

Country/ Region	Name of Initiative	Number of Target Institutions and Eligibility Criteria	Resources Allocated	Investment Horizon
Africa	**NEPAD / Blair Commission for Africa (Proposed)** [23]	1) Revitalise Africa's institutions of higher education 2) Develop centres of excellence in science and technology, including African institutes of technology	1) US$500 million a year, over 10 years 2) up to US$3 billion over 10 years	Launched in 2006
Canada	**Canada Networks of Centers of Excellence** [24]	23 currently funded Networks of Centers of Excellence 16 previously funded Networks	C$77.4 million per year since 1999 C$47.3 million a year in 1997-1999 C$437 million in total in 1988-1998	Operating since 1988 Permanent program since 1997
Canada	**Canada Global Excellence Research Chairs**[25]	Four priorities in the federal Science and Technology Strategy: the environment, natural resources and energy, health and information and communication technologies	C$21 million	2009- 2012
Chile	**Chile Millennium Science Initiative** [26]	Groups of Researchers:	3 Science Institutes: $1 million a year for 10 years; 5-12 Science Nuclei: $250 thousand a year $25 million in total in 2000-2004	Every 5 years for nuclei and every 10 years for institutes

[23] http://www.eurodad.org/articles/default.aspx?id=595
[24] http://www.nce.gc.ca/
[25] www.budget.gc.ca/2008/speech-discours/speech-discours-eng.asp
[26] http://www.msi-sig.org/msi/current.html

China	**China 211 Project** [27]	107 higher education institutions	36.82 B Yuan between 1995-2005	Launched in 1996 1996 – 2000 (1st round) 2001-2006 (2nd round) 2007-2011 (3rd round)
China	**China 985 Project** [28]	39 research universities	27.07 B Yuan (1st round)	Launched in 1999 1999 – 2001 (1st round) 2004-2007 (2nd round)
China	**Chinese Academy of Sciences (CAS) Institutes**[29]	Mathematics and physics 15 Chemistry and chemical engineering 12 Biological sciences 20 Earth Sciences 19 Technological sciences 21 Others 2	4.80 B Yuan (1st round)	Launched in 1998 1998-2000 (1st round) 2001-2005 (2nd round) 2006-2010 (3rd round)
Denmark	**Denmark (Globalization Fund)**	Funds to be allocated to research universities on a competitive basis	$1.9 billion between 2007 and 2012	Launched in 2006
Europe	**European Commission, Framework Programme 7 (FP7)** [30]	TBD – determined by structure of Research Proposals (RFPs)	Based on number of RFPs with a "centre of excellence" structure The overall FP7 budget is EUR 50.5 Billion covering 2007-2013 [31]	2007-2013

[27] Ministerial Office of "211 Project". 2007. Report on "211 Project" (1995-2005). Beijing: Higher Education Press.
[28] N. C. Liu and L. Zhou. 2007. Building research university for achieving the goal of an innovative country. Beijing: China Renmin University Press.
[29]http://www.itps.se/Archive/Documents/Swedish/Publikationer/Rapporter/Arbetsrapporter%20(R)/R2007/R2007_001%20FoU-finansiarer.pdf; Chinese Academy of Science, http://www.cas.ac.cn/html/books/o6122/e1/04/tongzhi/tz004.htm; http://baike.baidu.com/view/229786.htm
[30] http://ec.europa.eu/research/era/pdf/centres.pdf
[31] http://cordis.europa.eu/fp7/what_en.html#funding

France	**"Opération Campus"[32]**	Develop 10 regional Centers of Excellence in higher education and research. Overall, the Centers will regroup 38 universities and research organizations representing 340,000 students and 13,000 researchers.	$5 billion (Euro)	Launched in 2008
Germany	**Germany Excellence Initiative 2006 [33]**	40 graduate schools 30 Clusters of Excellence (universities and private sector) 10 Top-level research universities	$2.3 billion in total	Five year funding Two rounds: 2006, 2007
Japan	**Japan Top-30 Program (Centers Of Excellence for 21st Century Plan)** [34]	31 Higher Education Institutions	$150 million / year (Program Total: 37.8B Yen)	5 year funding Launched in 2002 3 rounds: 2002, 2003, 2004
Japan	**Japan Global Centers of Excellence Program** [35]	50 – 75 Centers Funded per year (5 new fields of study each year)	50 – 500 Million Yen per center per year (~$400,000 – $4M)	5 years Launched in 2007
Korea	**Brain Korea 21 Program [36]**	• Science and Technology: 11 Universities • Humanities and Social Sciences: 11 Universities • Leading Regional Universities: 38 Universities • Professional Graduate Schools in 11 Universities	$1.17 billion in total	7 years Two rounds in 1999

[32] http://www.france-science.org/Operation-Campus-6-projects-kept?var_recherche=operation%20campus; http://www.universityworldnews.com/article.php?story=20080613092922742
[33] http://www.dfg.de/en/research_funding/coordinated_programmes/excellence_initiative/
[34] http://www.jsps.go.jp/english/e-21coe/index.html
[35] http://www.jsps.go.jp/english/e-globalcoe/index.html; http://www.jsps.go.jp/english/e-globalcoe/data/application_guidelines.pdf; http://www.jsps.go.jp/english/e-globalcoe/data/review_guidelines.pdf
[36] http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN015416.pdf; http://www.bk21.or.kr/datas/english_ver.htm

Korea	**Korea Science and Engineering Foundation (KOSEF)** [37]	1) Science Research Centers (SRC) /Engineering Research Centers (ERC): up to 65 centers 2) Medical Science and Engineering Research Centers (MRC): 18 Centers 3) National Core Research Centers (NCRC): 6 Centers funded in 2006	1) $64.2M / year 2) $7M / year 3) $10.8M / year	1) up to 9 years 2) up to 9 years 3) up to 7 years All 3 programs launched in FY 2002 or FY 2003
Russia	**Russia's "Federal Universities"** [38]	Establish a network of high-status federal institutions which are specialized research universities and lifelong vocational centers.	n.a.	Under consideration (Two pilot universities were established in 2007)
Taiwan	**Taiwan Development Plan for University Research Excellence** [39]	Selection and financial support of internationally leading fields	$400M	4 years
United Kingdom	**UK Funding for Excellent Units** [40]	Universities with the highest marks after the Research Assessment Exercise	$8.63 billion disbursed after 2001 RAE	5 years for Research Council funded Centers [41] Two rounds: 1996 and 2001 2008 RAE Scheduled [42]
USA, Arizona	**Science Foundation Arizona**[43]	Public-private partnership to strengthen scientific, engineering and medical research	$135 million + $135 million (1:1 matching)	Annually since 2006

[37] http://www.kosef.re.kr/english_new/programs/programs_01_04.html
[38] http://www.universityworldnews.com/article.php?story=20081024094454199
[39] http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN015416.pdf
[40] http://www.hefce.ac.uk/research/funding/
[41] http://www.rcuk.ac.uk/research/resfunding.htm
[42] http://www.rae.ac.uk/
[43] http://www.sfaz.org/

USA, California	**California Institutes of Science and Innovation**[44]	University-industry partnerships to address state problems	$400 million + $800 million (2:1 matching)	Annually since 2000
USA, North Dakota	**North Dakota Centers of Excellence**[45]	Public-private centers focusing on local needs	$50 million + $100 million (2:1 matching)	Annually since 2007
USA, Washington	**Washington State Life Sciences Discovery Fund**[46]	Bioscience research that provides economic and health benefits	$350 million	10 years since 2005
USA, Georgia	**Georgia Research Alliance**[47]	Public-private partnership to recruit eminent scholars to Georgia universities	$30 million	Annually since 1990
USA, Indiana	**Indiana 21st Century Research and Technology Fund**[48]	Academic and commercial sector partnerships	$26 million	Annually since 1999
USA, Kentucky	**Kentucky's "Buck for Brains"** [49]	Endowed chairs for top talent	$350 million	Since 1997
USA, Ohio	**Ohio's Third Frontier**[50]	Establishment of Centers of Innovation as joint initiatives of universities and private research organizations	$1.6 billion	10 years since 2003
USA, Oklahoma	**Oklahoma Center for the Advancement of Science and Technology**[51]	Nanotechnology research	$29 million	Annually since 1987

Elaborated by Natalia Agapitova, Alka Arora, Michael Ehst and Jamil Salmi (last update 25 November 2008)

[44] http://www.ucop.edu/california-institutes/about/about.htm
[45] http://governor.state.nd.us/media/speeches/040325.html
[46] http://www.lsdfa.org/home.html
[47] http://www.gra.org/homepage.asp
[48] http://www.21fund.org/
[49] http://www.wku.edu/IA/bucks/index.html
[50] http://www.odod.ohio.gov/tech/program.htm
[51] http://www.ocast.state.ok.us/

Lastly, several options exist for providing financial incentives to encourage collaboration between universities and the private sector, including: (i) funding centers of collaborative research that require private co-financing and leadership; (ii) matching private funds for the contracting of public research; and (iii) rewarding private-public collaboration as a criterion for allocating institutional funding to universities and research centers.

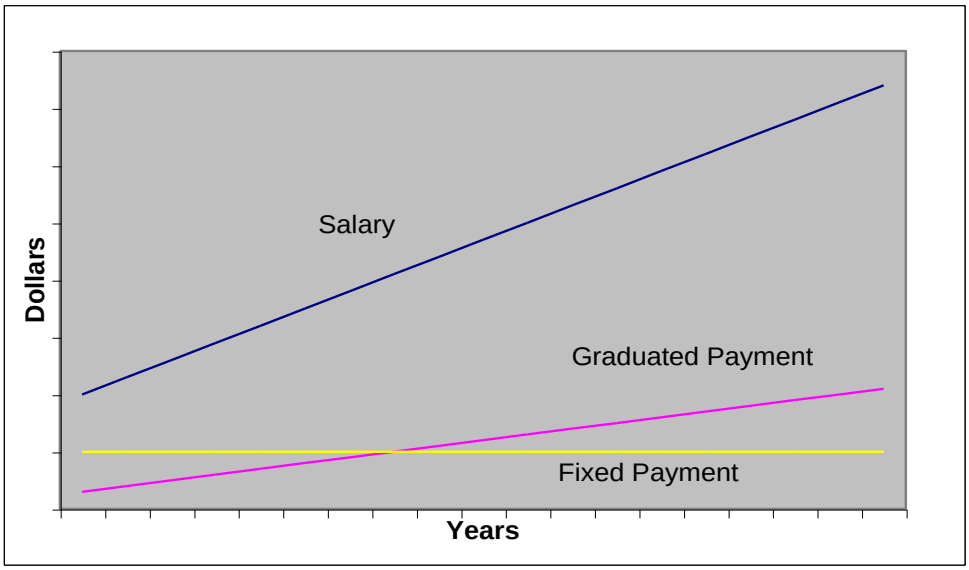
Guaranteeing the Financial Sustainability of the Student Loan Scheme

The Government of Brazil has endorsed the fundamental equity principle that no academically qualified student should be denied access to tertiary education for lack of financial resources. Considering the shortcomings documented earlier, a number of adjustments could be made to the loan program to ensure higher efficiency and financial sustainability. To begin with, the eligibility criteria need to be tightened by placing an income ceiling so as to make sure that only students from low and middle income families benefit from the subsidized loans. For students from the poorest families, the Government could envisage removing the financial guarantee requirement. The Student Loan Agency in the Northern State of Sonora in Mexico, ICEES, has been able to improve loan recovery in a major way by requiring parents of loan applicants to participate in a formal co-guarantee signature ceremony that does not involve any financial guarantee but has a highly symbolic signification.

In order to improve loan recovery, FIES and *Caixa* will need to reexamine their administrative arrangements, including finding more effective methods to locate students (computerized MIS, use of social security number, link to degree award ceremony, etc.) and enforcing stricter sanctions against delinquent graduates such as relying on a collecting agency to garnish part of their income and reflecting a graduate's loan repayment history to his/her credit rating. As an overall recovery target, the Government of Brazil could take as benchmark the Australian experience with the Higher Education Contribution Scheme, where the level of repayment matched the level of new loans after 10 years.

Another factor that can contribute to improved loan recovery is to program the repayment schedule in line with the natural evolution of salaries. Relying on graduated payments or making payments proportional to earnings as in the UK and Australian schemes, instead of fixed payments, would help minimize the burden on graduates and improve loan recovery, as illustrated by the following Figure.

Figure 33. Graduated versus Fixed Payments



Source: Salmi, J. (2003). "Student Loans in an International Perspective: The World Bank Experience." LCSHD Paper Series number 44, Washington DC: The World Bank.

By its very nature, FIES, like any student loan program, is faced with a difficult dilemma. As an instrument of equity promotion, it has an important social responsibility and needs to operate in such a way as to serve the funding needs of students from the low income groups. But as a financial institution, it is required to respect basic principles of financial viability to be able to continue to function in a sustainable fashion. These two inherently antagonistic objectives are difficult to reconcile and represent the fundamental challenge that FIES managers need to overcome. Annex 4 presents a list of performance indicators that could guide FIES management in monitoring the effectiveness of the student loan program.

Income-Contingent Loan Schemes

A growing number of countries—among them, Australia, New Zealand, South Africa, Sweden, and the United Kingdom—have opted for an income-contingent loan system (sometimes referred to as a graduate tax), in which loan repayments are a fixed proportion of a graduate's annual income (see Box 13). Although experience to date is limited, these systems can in theory achieve a better balance between effective cost recovery and risk to the borrower than mixed-loan programs. Administration is generally simpler and cheaper because loan recovery is handled through existing collection mechanisms such as the income tax administration or the social security system. Income-contingent loans are also more equitable and satisfy more fully the ability-to-pay principle, since repayments are in direct proportion to a graduate's income. Although income-contingent loans have considerable promise, their feasibility depends heavily on the existence of a reliable income tax or social security system with access to accurate income information and the administrative capacity to handle loan collection efficiently and effectively.

Box 13. The Experience with Income Contingency Loans in Australia and New Zealand

Australia and New Zealand, which both charged little or no fees at their public institutions in the late 1980s, adopted similar strategies to increase cost sharing. Both decided to increase fees while introducing student loan programs that would allow students to pay for these higher fees over an extended period of time based on their incomes once they completed their education. But the two countries took somewhat divergent approaches in how they imposed fees and in the characteristics of the income contingent repayment schedules they adopted:

- In 1988, Australia through its Higher Education Contribution Scheme (HECS) adopted a very innovative approach to cost sharing. Faced with prospective widespread student opposition to imposing tuition fees, Australian policy makers decided to use public funds to pay the fees while students were enrolled. All students participating in HECS were then obligated to repay these fees once they completed their tertiary education as a percentage of their incomes, although students with below average incomes were exempted from repayment. HECS applies only to fees, not living expenses.
- Beginning in 1990, New Zealand took the somewhat more traditional approach of imposing fees at their public institutions that students and their families would be required to pay upfront when they enrolled. Beginning in 1992, students could borrow to cover the cost of these fees as well as a substantial amount of living expenses. Repayment of these loans would then occur through the income tax system based on a percentage of students' income once they completed their education and the amount borrowed.

New Zealand and Australia have moved in different directions since they first adopted their income contingent student loan plans nearly two decades ago. New Zealand began with a more market-based approach in which virtually all borrowers (who then constituted a small share of students) repaid on the basis of their income and there was only modest reduction in interest rates below market levels. Over time, New Zealand has moved away from market-based principles by increasing subsidies, including exempting more lower-income students from making repayments and forgiving interest on most loans. As a result, borrowing has grown substantially over time.

Australia's HECS system, on the other hand, created a public expenditure challenge as the government found it difficult to pay for both operating subsidies along with the initial HECS fees. To meet this challenge, Australia in 1997 moved toward the market by reducing HECS subsidies and introducing three bands of HECS tuition fees as well as reducing the level of income exempted from HECS repayment. Thus, as Australia has moved to a more market-based student loan system, New Zealand has moved away from a such approach.

Source: Salmi, J. and A. Hauptman (2006). "Innovations in Tertiary Education Financing: A Comparative Evaluation of Allocation Mechanisms." HDNED Education Series number 2, Washington DC. The World Bank.

In summary, there is a large range of resource allocation mechanisms that the GOB may consider to pursue its policy objectives for tertiary education development. The experience with performance-based allocation mechanisms in various countries over the past decade or more suggests that tying policies to results can have many beneficial effects. It also indicates that rather than relying exclusively on one funding method, countries are better off selecting a mix of allocation instruments to meet the various policy objectives sought as long as these various instruments complement each other.

2.3 Improving Quality and Relevance

Strengthening Quality Assurance and Quality at the Institutional Level

Successive Brazilian governments have made laudable efforts to put in place a comprehensive system of quality assurance. Unlike other countries in the region that have essentially constructed their quality assurance system around a formal accreditation process, Brazil has pioneered the use of assessment tests to measure student learning in conjunction with external evaluations of tertiary education institutions. One of the challenges, at the present time, is to ensure that SINAES actually functions as an integrated system and that the accreditation sanctions are fully enforced. It is worth mentioning in that context that, in order to participate into the ProUni program, private universities need to maintain their good standing in SINAES for three consecutive years. It will be important to define the exact criteria used to determine what constitutes "good standing".

The other aspect that needs to be considered is ENADE, the assessment test which measures student learning at the undergraduate level a few months before graduation. While the *ENADE* test successfully addresses some of the shortcomings of the *Provão*, the following adjustments could be considered in order to improve its usefulness as a key element of the SINAES quality assurance system:

- technical aspects: (i) pre-testing of test items and questionnaires to ensure the construction of comparable instruments to measure key competencies and abilities; (ii) development and administration of tests in a stable manner within each area of study to ensure comparability over time; and (iii) procurement process covering the entire three-year cycle.

- organizational aspects: (i) adequate work conditions to enable CONAES to operate in an independent manner and integrate itself fully with INEP deadlines and schedule; (ii) full cooperation between federal and state governments to guarantee participation of state institutions; and (iii) greater integration of SINAES and CAPES to ensure complementary assessment of undergraduate and graduate courses.

To enhance quality within tertiary education institutions, attempts should be made to raise the level of qualifications of their academic staff, improve pedagogical practices,

integrate research better into the undergraduate curriculum, upgrade their infrastructure and offer a stimulating learning environment.

To improve the internationalization dimension, tertiary education institutions need to place more emphasis on preparing globally minded, locally responsible, and internationally competitive students. Brazil needs to raise foreign language competencies among its academic staff and graduates. The country would benefit from accelerating the international mobility of students, professors and researchers. Additional resources should be made available to support all these initiatives.

Developing World Class Universities

As was established earlier, Brazil can take pride in the excellent performance of a good number of departments throughout its tertiary education system, as well as in the first rate contribution of a small number of leading universities. However, the fact that no Brazilian university is considered to be among the 100 top ranked universities in the world even though Brazil is the 10th largest economy in the world points to the need for a strategy to transform the top universities into world class universities. This means that the Government of Brazil, together with the authorities of the concerned States, should create the conditions that would enable these universities to compete at an international level for reputation and awards, foreign students, research grants, and on the whole range of other indicators on which the quality and relevance of university education are assessed.

The Government of Brazil, and the concerned States, need therefore to make strategic decisions around two sets of critical questions:

- How many world class universities are desirable and affordable?
- Which ones should be selected for that purpose, and how should they be chosen?

While there is no magic rule to guide the decision on the number of such universities, it would certainly make sense to have more than one top university to encourage competition and emulation among the most reputable institutions in the country. Supporting three to five universities to transform themselves into world class universities could perhaps be a reasonable target in the medium-term (5 to 8 years), considering the financial resources required in the face of the continuously rising cost of research infrastructure.

Linked to the decision about the number of target universities is the question of the appropriate strategic approach to follow in order to select among existing universities. The Government of Brazil and the concerned States must consider the extent to which it wants to manage the process in a centralized way or whether it wishes to steer the higher education system at a distance, relying on broad strategic orientations and financial incentives to entice the most dynamic universities to transform themselves. International experience suggests that the latter approach could be more effective in the long run (Salmi, 2009).

Box 14. A World-Class Challenge for the University of São Paulo

How is it that USP, the country's foremost university, does not make it into the top group in the international rankings, despite having some of the features of world-class universities? When it was created in 1934, USP leaders made it a point to hire only prominent professors from all over Europe (Schwartzman, 2005). Today it is the most selective institution in Brazil, it has the highest number of top-rated graduate programs, and every year it produces more Ph.D. graduates than any US university.

The University has very few linkages with the international research community and only 3 percent of its graduate students are from outside Brazil. The university is very inward-looking: most students come from the State of São Paulo and most professors are USP graduates. It is forbidden to write a doctoral dissertation in a language other than Portuguese.

At the same time, the University's ability to manage its resources is constrained by rigid civil service regulations, even though it is the richest university in the country. Added to this is the fact that, at USP as in the other Brazilian public universities, the spirit of democracy has translated into multiple representative bodies (*assembleas*), which complicates decision-making and the implementation of any forward-looking reform (Durham, 2008).

According to Schwartzman (2005), the key missing element is the absence of a vision of excellence to challenge the status quo and transform the university. This lack of strategic vision can be observed as much at the national and state government level as well as at the helm of the university itself.

Also, from a strategic perspective, it is important to note that the transformation of the university system cannot take place in isolation. On the contrary, the long term vision for creating world class universities, and its implementation, should be closely articulated with the country's innovation strategy, and the ongoing changes and planned reforms at the lower levels of the education system.

Box 15. Excerpts from Malaysia's Ninth Development Plan (2007-2011)

Measures will be undertaken to enhance the quality of public and private institutions of higher education to be at par with world renowned universities. Towards this end, the quality of institutions of higher education will be benchmarked against international standards to enable these institutions to become globally competitive. Institutions of higher education will continuously audit their quality through a rigorous rating system to nurture competition in the pursuit of excellence.

Institutions of higher education will undertake measures to increase the proficiency of students in English and enhance their ability to access knowledge and undertake research. Languages such as Mandarin, Tamil and Arabic as well as other foreign languages will be offered to undergraduates to encourage multilingualism in order to be competitive in the global market.

Public institutions of higher education and their academic and nonacademic staff will increase global outlook and international engagement with renowned international institutions to enable them to benchmark with best practices globally.

The research and innovative capability of local institutions of higher education will be strengthened to develop indigenous capacity building, particularly in key technology areas and to nurture an innovative society with a strong S&T capability. Towards this end, the enrolment of students in S&T programs at all levels will be increased to facilitate the creation of a critical mass of research scientists and engineers. This will provide the potential source for R&D activities and to meet the targeted ratio of 50 research scientists and engineers per 10,000 labor force in 2010.

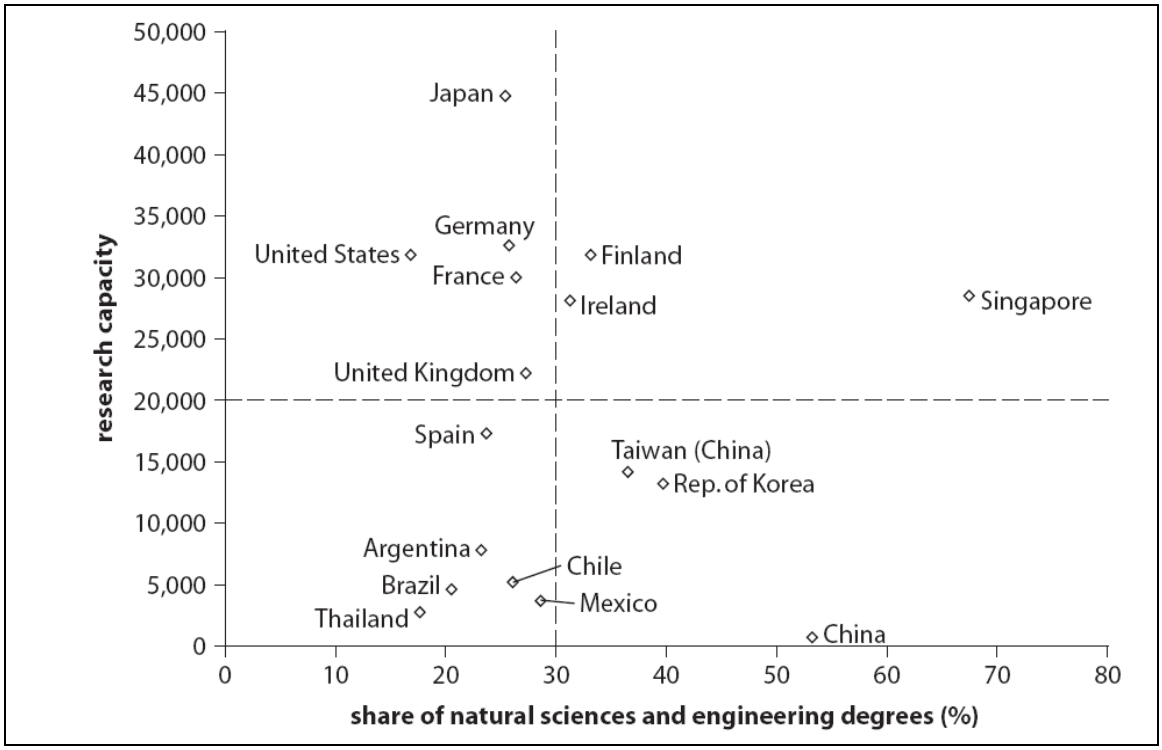
Greater collaboration in research will be undertaken between public institutions of higher education and the local industry and research institutes as well as with reputable foreign research institutions, universities and firms. Private institutions of higher education will be encouraged to collaborate in research with public institutions of higher education. *Universiti Malaya, Universiti Putra Malaysia, Universiti Kebangsaan Malaysia* and *Universiti Sains Malaysia* will be designated as research universities. These universities will be further developed to be at par with world renowned universities.

Source: Economic Planning Unit, accessed on 12 March 2007 at http://www.epu.jpm.my/rm9/html/english.htm

Increased Emphasis on Science and Engineering Programs

As observed in the first part of this report, the share of students enrolled in science and engineering programs is quite low compared to other countries in the region and elsewhere. There is a need, therefore, to orient more students towards these disciplines. As illustrated by Figure 28, the recent success of a number of European and East Asian nations recognized for their rapid development into knowledge economies points, in each case, to the importance of a strong human capital base to attract foreign direct investment and / or expand into leading edge sectors.

Table 28. GDP per capita and Share of Natural Sciences and Engineering Degrees



Source: Reproduced from Mathews and Hu (2007), p. 97

Increased demand for science and engineering programs among tertiary education students will need to be boosted by adequate measures at the lower levels of education, to ensure that science subjects are presented in an attractive way to younger students, including girls.

Development of the Network of Non-University Institutions

In addition to expanding engineering education at the undergraduate and graduate levels, one of the priorities of the Brazilian government should be to develop a network of specialized two- or three-year non-university institutions, such as technology institutes or community college type institutions, to train middle-level professionals and technicians. Through curricula that are adapted to local economic needs and by building strong links with local industry, these specialized institutions can also contribute to sub-regional economic development. Because of the shorter duration of studies and the generally higher internal efficiency, training costs at such institutions are typically lower than at universities. These institutions should be of high quality and relevance to avoid being considered as second-best option for those students who are not accepted into traditional universities.

The Government of Brazil could build on the successful experience of SENAI in the vocational training area to guide the development of tertiary level technical and professional programs.

Box 16. Successful Integration between Vocational Training and Tertiary Education: the Textile Industrial Engineering Course in Rio de Janeiro

An interesting example of integration between the vocational training system and the tertiary education system is the Textile Industrial Engineering Course, created in 1997 at the Chemical and Textile Industry Technology Centre (CETIQT) of the SENAI of Rio de Janeiro. This innovative offer aims to train professionals specialized and skilled for the rapid development of knowledge, for working in multidisciplinary teams, and for exercising leadership focused as enterprising and management action, as well as for perceiving the importance of environmental control and for understanding organizations and business.

The course added to its curriculum some novel aspects: management, environment, quality, humanities, technical standards, safety, sociology, politics and legislation. Its creation seeks to meet the aspirations of textile line employers: from the rural producer to the manufacturers and distributors, who seek to modernize and increase productivity and competitiveness in the sector in the internal and external markets.

A Graphics Technology course was added, in 1998, to the Textile Industrial Engineering Course. Through the SENAI "Theobaldo de Nigris" School, in São Paulo, this course, also a pioneer endeavor in Brazil, is to train professionals by solid development of their scientific and technological skills which will allow them to take part in the management of production, administration and business in the graphics area. Lasting three years and with a workload of 3,200 hours, the project was based on European and North American models for training graphics engineers. Along these same lines, the SENAI is preparing to launch new higher courses in the footwear, paper and food areas.

Source: Adapted from material on ILO / CINTERFOR website. Accessed on 7 March 2007 at http://www.ilo.org/public/english/region/ampro/cinterfor/publ/sala/moder_in/ii_g.htm#int_voc

Strengthening University-Industry Linkages (UILs)

Strengthening university-industry linkages is key to improving the contribution of Brazilian universities to the country's efforts to increase productivity and competitiveness. For this purpose, each university must define its niche in terms of addressing national, regional or local training and / or research needs, and then design courses and research programs appropriate to meet these needs. Forging close linkages with the productive sectors is especially important for professional tracks and science and technology related programs.

University-industry linkages come in many forms. Table 28 attempts to present, in a comprehensive manner, the range of possible mechanisms for the transfer of knowledge and technology between universities and firms. It should be emphasized that, according to recent studies on the contribution of universities to economic development, the training function is often more important than the research function (Yusuf and Nabeshima, 2007). In the case of Brazil, this finding makes it even more urgent to change the pattern of employment of university graduates by increasing the share of young researchers recruited by firms in the productive sectors.

Table 29. Matrix of Knowledge- and Technology-Transfer Mechanisms

University-Industry Linkages	Role of National Government	Role of Local Authorities	Comments
Public space function Contacts and networking Conferences and fora Publications and dissemination of findings	Develop and fund programs to create and support sectoral clusters and networks		With education and training, this function is seen by firms as the most important contribution of universities
Human capital formation Student participation in firm R&D (internships and co-op programs) Employment of first-level and master graduates Employment of postdoctoral graduates in R&D Participation of industry practitioners in teaching and curriculum development Joint diploma thesis or PhDs University researcher participation in firm Participation of firm employees in university training course (on-campus or on-site)	Technology scanning and incentives for establishment of new programs (emerging & inter-disciplinary fields) Targeted scholarships Mobility scholarships	Funding and tax incentives to facilitate insertion of Ph.D. graduates	Primary role of universities in support of innovation
Research Research contracts Joint R&D projects Research consortia Industry researchers seconded to university labs	Funding (direct / matching) Tax incentives Assessment of research capacity of universities Criteria for evaluating the performance of researchers	Funding Attracting "anchor tenants"[52] Helping cluster formation Targeted support for SMEs Intermediary agencies	Greatest returns at the intersection of traditional disciplines
Problem-solving and consulting Consulting contracts Testing, standards, prototypes, and proof of concept designs			
Technical infrastructure Use of university labs Common lab Science parks	Funding	Funding Serviced land and infrastructure	
Knowledge commercialization Licensing of university-held patents Incubators Spinoffs	IPR legal framework Financial autonomy of public universities	Funding Technical assistance	Mostly in biotechnology and biomedical sciences, also nanotechnology, new materials and IT

Source: Elaborated by Jamil Salmi based on material included in Yusuf., S. and K. Nabeshima (2007). How Universities Promote Economic Growth. Washington D.C., The World Bank.

[52] Agrawal, A. and I. M. Cockburn (2002). "University Research, Industrial R&D, and the Anchor Tenant Hypothesis." NBER Working Paper 9212, National Bureau of Economic Research, Cambridge, MA.

Strengthening MBAs. The large number of Brazilian MBAs is testimony to the commitment of universities to management education. As was discussed in the diagnosis part of this report, there is little doubt, however, that the quality and relevance of these programs needs to be enhanced if they are to compete effectively with the regional rivals. Given the government's commitment to promoting and supporting excellence in tertiary education to feed into Brazil's economic development, a logical area of focus would be investing in and improving existing management programs, particularly considering the quality foundation that already exists in some of them.

Box 17. Linking Science to Business
An Innovative Faculty Collaboration at the University of Chile

In 2003, the faculty of Business and Economics of the University of Chile considered it was time to abolish the artificial frontiers between sciences and business, and took the initiative to open up broader perspectives for both disciplines. Programs aimed at transforming scientific innovations into enterprises were developed through a new and creative collaboration between MBA students, faculty scientists, and the business community. The idea was to take advantage of different talents within the university to make the best use of research and translate scientific work into concrete business opportunities. To make it cost-effective and profitable for all parts, the collaboration has been incorporated into MBA programs. Instead of writing the traditional research thesis, MBA students now have the possibility to prepare group business plans to graduate. In 2006, 99% of MBA students chose this option. To ensure the collaboration between scientists and MBA students be efficient and trusty, an agreement of confidentiality is signed by both parts. After that, MBA students can explore the market opportunities of their counterparts' inventions, and prepare a marketing and business plan accordingly. The great advantage of this process is to provide a first hand experience to MBA students while giving scientists the opportunity to commercialize their inventions. It also increases confidence among researchers and profit-oriented people, as well as contributes to strengthen linkages between the university and the business community at large. Several projects have been developed since the initiative began. Among others, a project of technical development aimed at improving the cellulose production, whose patent belongs to the faculty of forest engineering, is in process to be sold to a private enterprise. Other projects are being developed in biotechnology, information technology, and mining.

This innovative approach seeks to give research more visibility, taking science and technology out of the labs to meet society's needs and become real engines of change and modernity. The University of Chile, already well known for its numerous technological projects and scientific inventions, now faces the challenge to make the best use of them.

Source: "Our objective is to bring together Sciences and Business"
Interview with Christian Willatt, Executive Director of the University of Chile, November 2006 (América Economía Online). Retrieved on November 15, 2006 at http://www.americaeconomia.com/PLT_WRITE-PAGE.asp?SessionId=&Language=0&Modality=0&Section=1&Content=27829&NamePage=VersionImprimible&DateView=&Style=15382-

Annex 2. Regional Disparities in Tertiary Education Coverage

Region/ State	Population	Number of students	Number of Students per 10,000 Inhabitants
Norte	**12, 900,704**	**280,554**	**187**
Rondônia	1,562,417	34,016	218
Acre	686,652	12,621	184
Amazonas	3,311,026	88,269	267
Roraima	403,344	8,625	214
Pará	7,110,465	85,670	120
Amapá	615,715	18,791	305
Tocantins	1,332,441	32,562	244
Nordeste	**47,741,711**	**796,140**	**154**
Maranhão	6,184,538	70,534	114
Piauí	3,036,290	58,730	193
Ceará	8,217,085	108,364	132
Rio Grande do Norte	3,043,760	59,812	197
Paraíba	3,623,215	62,268	172
Pernambuco	8,502,603	146,232	172
Alagoas	3,050,652	43,607	143
Sergipe	2,000,738	38,223	191
Bahia	13,950,146	208,370	149
Sudeste	**72,412,411**	**2,333,514**	**293**
Minas Gerais	19,479,356	487,789	250

Espírito Santo	3,464,285	88,514	256
Rio de Janeiro	15,561,720	4884235	3139
São Paulo	41,055,734	1,268,976	309
Sul	**25,107,616**	**854,831**	**313**
Paraná	10,387,378	311,848	300
Santa Catarina	5,958,266	202,876	340
Rio Grande do Sul	10,963,219	340,107	310
Centro-Oeste	**11,636,728**	**411,607**	**310**
Mato Grosso do Sul	2,297,981	67,113	292
Mato Grosso	2,856,999	72,257	253
Goiás	5,730,753	149,384	261
Distrito Federal	2,383,784	122,853	515
Brasil	**169,799,170**	**4,676,646**	**250**

Source: MEC/INEP, *Sinopse de Educacao Superior* 2006. Wikipedia Encyclopedia, http://en.wikipedia.org/wiki/List_of_the_states_of_Brazil_by_population_density

Annex 3. Disparities in Regional Distribution of Federal Universities (2006)

State	Number of Federal Universities	Population	Number of Federal Universities per 10 Million Inhabitants
Roraima	1	403,344	24.8
Amapá	1	615,715	16.2
Acre	1	686,652	14.6
Mato Grosso do Sul	3	2,297,981	13.1
Tocantins	1	1,332,441	7.5
Rio Grande do Norte	2	3,043,760	6.6
Rondônia	1	1,562,417	6.4
Minas Gerais	11	19,479,356	5.6
Paraíba	2	3,623,215	5.5
Sergipe	1	2,000,738	5
Distrito Federal	1	2,383,784	4.2
Rio Grande do Sul	4	10,963,219	3.6
Pernambuco	3	8,502,603	3.5
Mato Grosso	1	2,856,999	3.5
Alagoas	1	3,050,652	3.3
Piauí	1	3,036,290	3.3
Brasil	**53**	**169,799,170**	**3.1**
Amazonas	1	3,311,026	3
Espírito Santo	1	3,464,285	2.9
Pará	2	7,110,645	2.8
Rio de Janeiro	4	15,561,720	2.6
Santa Catarina	1	5,958,266	1.7
Goiás	1	5,730,753	1.7
Maranhão	1	6,184,538	1.6
Bahia	2	13,950,146	1.4
Ceará	1	8,217,085	1.2
Paraná	1	10,387,378	1
São Paulo	3	41,055,734	0.7

Source: MEC/INEP, *Sinopse de Educacao Superior* 2006. Wikipedia Encyclopedia, http://en.wikipedia.org/wiki/List_of_the_states_of_Brazil_by_population_density

Annex 4. Resource Diversification Matrix for Public Tertiary Education Institutions by Category and Source of Income

Category of income	*Source of income*				
	Government (national, state, municipal)	***Students and families***	***Industry and services***	***Alumni and other philanthropists***	***International cooperation***
Budgetary contribution					
General budget	X				
Dedicated taxes (lottery, tax on liquor sales, tax on contracts)	X				
Payroll tax			X		
Fees for instructional activities					
Tuition fees		X	X		
Degree / non-degree programs		X	X		
On-campus / distance education programs	X	X			
Advance payments		X			
Chargeback			X		
Other fees (registration, labs, remote labs)					
Affiliation fees (colleges)					
Productive activities					
Sale of services					
Consulting	X		X		X
Research	X		X	X	X
Laboratory tests	X		X		
Patent royalties, share of spin-off profits, monetized patent royalties			X	X	
deal			X		
			X		
Operation of service enterprises (television, hotel, retirement homes, malls, parking, driving school, Internet provider, gym)		X	X	X	
	X	X	X	X	X
Financial products (endowment funds, shares)					
Production of goods (agricultural and industrial)					
Themed merchandises			X	X	
Rental of facilities (land, classrooms, dormitories, laboratories, ballrooms, drive-through, concert halls, mortuary space)					
Sale of assets (land, residential housing)					
Fund raising					
Direct donations					
Monetary grants			X	X	X
Equipment			X	X	
Land and buildings	X			X	
Scholarships and student loans	X		X	X	X
Endowed chairs			X	X	
Indirect donations (credit card, percentage of gas sales, percentage of stock exchange trade, challenging grant)		X	X		
Tied donations (access to patents, share of spin-off profits)			X		
Concessions, franchising, licensing, sponsorships, partnerships (products sold on campus, names, concerts, museum showings, athletic events)			X		
Lotteries and auctions (scholarships)		X	X		
Loans					
Regular bank loans	X		X		X
Bond issues		X	X	X	

Source: Compiled by Jamil Salmi.

Annex 5. Monitoring Indicators for the Student Loan Program (FIES)

- *Demand and Targeting Indicators*

⇒ Evolution of tertiary education enrollment rate
⇒ Coverage (number of beneficiaries over student population)
⇒ Proportion of new beneficiaries accepted over the number of applicants
⇒ Proportion of beneficiaries from low and medium income families
⇒ Gender distribution of students and beneficiaries
⇒ Geographical distribution of students and beneficiaries
⇒ Distribution of students and beneficiaries by academic program
⇒ Academic results of beneficiaries (compared to general student population)

- *Financial Indicators*

⇒ Arrears and default rates (by socioeconomic group, gender, tertiary institution, academic discipline, and amount of loan)
⇒ Affected portfolio as a proportion of total portfolio
⇒ Delayed payments as a proportion of affected portfolio
⇒ Actual interest rate and subsidy level
⇒ Loan recovery ratio
⇒ Administrative costs compared to overall portfolio (and distribution of main expense categories)
⇒ Cash flow projections
⇒ Evolution of real value of assets
⇒ Distribution of funding sources
⇒ Dependency on government resources
⇒ Mobilization of non-government resource
⇒ Return on investment (return on capital, return on assets)

- *Institutional Operation Indicators*

⇒ Management indicators (measuring the efficiency and quality of internal processes)
⇒ Satisfaction of beneficiaries
⇒ Turnover of personnel
⇒ Indicators of promotion of the student loan program (awareness of the program and understanding of the terms and obligations)

Source: Salmi, J. (2003). "Student Loans in an International Perspective: The World Bank Experience." LCSHD Paper Series number 44, Washington DC: The World Bank.

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