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Higher Education, the Academic Profession, and Economic Development in Brazil

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With 192 million inhabitants and more than two trillion dollars of gross domestic product in 2010, Brazil has one of the largest economies in the world and, with about US$11,000 per capita, is an upper-middle-income country. In the last ten years, the country has benefited from the expansion of international trade and is a major exporter of agricultural, mineral, and also manufactured products. Most of the population lives in large urban settlements, such as São Paulo, Rio de Janeiro, Recife, Belo Horizonte, and Salvador. Social and economic inequality, still one of the highest in the world, is improving; and absolute poverty is being reduced. Brazil is a federation, with 27 states and more than 5,000 municipalities, with the central government playing a major role in tax collection and distribution of social services and benefits. Taxes amount to about 37 per cent of the gross domestic product—the highest percentage in Latin America and similar to that of developed welfare states—without, however, providing similar types of services. Most of the tax revenue supports an oversized public bureaucracy, social security, and the service of public debt.

Public education started late and higher education later still. By 1950, 57 per cent of the population of five years and older, was illiterate; and only 56,000 attended some kind of a higher education institution, in a population of 41 million. By 2000, all children had access to education, but many still drop out when reaching puberty; and the quality of education, as measured by the Organization for Economic Cooperation and Development Program for International Student Assessment (OECD 2009) and other national and international assessments, is low. At age

15, most students entering high school do not have the minimum competencies in reading and mathematics for their levels, and many others have already dropped out of school. Higher education has been expanding continuously—6.3 million students for a population of 191 million in 2009. Yet, there are still serious shortcomings of quality and coverage. With recent economic growth, shortages of qualified manpower became a serious problem. In 2011, a survey among Brazilian industrialists found that 69 per cent of them revealed difficulties in finding qualified workers and that this was affecting their ability to compete. In recent years, education has become a major issue in public debate. The public sector already spends 5 per cent of gross domestic product on public education (with an additional 2% spent by families), and there is a proposal to extend public expenditure to at least 7 per cent (Confederação Nacional da Indústria 2011).

Higher education in Brazil

Until the early 19th century, Brazil was a Portuguese colony. The first higher education institutions—two schools of law, two medical schools, and one polytechnic and military school—were created around 1810. Other institutions were created later on, but the first university, the Universidade de São Paulo, was only established in 1934—bringing together the pre-existing schools of engineering, medicine, law, agriculture, and some others, in the state of São Paulo. They were supposed to be integrated by a new Faculty of Philosophy, Sciences, and Letters, modeled presumably on the Italian legislation, conceived to prepare academics for secondary education, and doing research, which at the time only existed in schools of agriculture and medicine and in some institutes dealing with tropical diseases and plagues (Stepan 1971). To staff the new institution, professors from Germany, Italy, and France were hired in the areas of chemistry, physics, biology, and the social sciences, and some of them remained in Brazil. In 1937, the national government created the Universidade do Brasil (currently the Federal University of Rio de Janeiro, which existed on paper since 1920), also around a Faculty of Philosophy and with invited professors from abroad. In the early 1940s a Catholic university was established in Rio de Janeiro, and since the 1950s a network of federal universities was created throughout the country, together with public and private non-university higher education institutions (Schwartzman 1991). In 1991, Brazil had about 893 higher education institutions, enrolling about 1.5 million students. Of these institutions, 99 had university status—half of them

public—while 794 were non-university, small, mostly private higher education schools—teaching evening courses in areas such as law, administration, and accounting (Instituto Brasileiro 1993).

This typology of institutions—university and non-university, public and private—summarizes the way the higher education sector was shaped from the beginning and still remains, to a large extent, today. The main purpose of all institutions, university or otherwise, has been to provide students with a legally and nationally valid professional certification. This certification is particularly valued in the more traditional learned professions—law, medicine, engineering, and dentistry—which are regulated by law and have a legal minimum curriculum established by the Ministry of Education, in partnership with legally established professional councils. This same model was extended to other fields. In 2004, Brazil had 43 legally regulated higher education professions—including statisticians, chemists, public-relation specialists, journalists, economists, sociologists, meteorologists, nurses, musicians, and football coaches (Nunes and Carvalho 2007). All these course programs last four to six years. There are no general education, college-type undergraduate courses and few two-year, postsecondary vocational programs.

From a legal point of view, professional degrees—granted by a university, non-university institutions, or faculties—are the same, which creates a permanent problem for government and professional corporations of trying to prevent (unsuccessfully, in most cases) the proliferation of low-quality diploma mills.

According to the legislation, universities are institutions that, besides providing professional degrees, also offer graduate education, do research, and include the social, biological, and physical sciences, and professions. Universities are autonomous and free to decide how many students to admit and what programs to offer. However, they have to abide to the minimum legal syllabus for the regulated professions. Non-university institutions require authorization from the Ministry of Education to open new course programs and change the number of places being offered, and are subject to closer oversight. In practice, only a few universities actually do research and graduate education in a significant way. In 1968, new legislation introduced several features of North American higher education, including regular master's degree and doctoral programs, the credit system, the replacement of chairs by academic departments, and strengthening the role of the university central administration. In the new model, academics would be affiliated not to a faculty but to a department, according to their field of knowledge, and be assigned to teach in professional or graduate-course programs, as

needed. However, the most traditional faculties maintained their autonomy, and, in the public perception, the main role of higher education institutions is still to provide degrees in the learned professions.

Public institutions are fully funded by the national or state budgets, while private institutions are funded either by private endowments or, in most cases, by tuition. In the past, private institutions were supposed to be nonprofit, and this was indeed the case for the Catholic universities and other denominational institutions (such as Universidade Mackenzie in São Paulo, established by the Presbyterian Church in 1870 as a high school), and also some community-supported institutions in the southern states, populated largely with descendants of German, Italian, and Japanese immigrants. However, as demand for higher education expanded, for-profit institutions began to appear, and the legislation now allows higher education institutions to function as privately owned, for-profit companies.

The 1968 reform led to two diverging trends. Until the 1960s, teaching in a public university was mostly a secondary activity for prestigious professionals, who would earn most of their income from their practice as lawyers, medical doctors, dentists, or engineers and would teach for the prestige and networking opportunities provided by the university. After the reform, teaching in public universities became a career in the civil service, with competitive salaries and other benefits of full-time employment. Besides lecturing, higher education academics were supposed to do research and service activities and graduate education programs were created to grant the advanced degrees required for their careers (Balbachevsky and Schwartzman 2010). These trends were followed by the creation or expansion of several research-support agencies, by both national and state governments, which provide additional resources and income for academics in public universities. They include the National Council for Scientific and Technological Development, an agency within the Ministry of Science and Technology which provides fellowships and research grants; the Financing Agency for Studies and Projects, also within the Ministry of Science and Technology, which provides support to large-scale projects and industrial innovation; and the Coordination for the Advancement of High Level Personnel, an agency within the Ministry of Education which provides fellowships for postgraduate studies and performs the assessment of postgraduate course programs. In the state of São Paulo, the State Foundation for Science and Technology provides both fellowships and research support of various kinds, and many other states have similar institutions. Most of this professionalization of academic

careers took place in the federal universities and in the state of São Paulo, the largest and richest state in the Brazilian federation. Later, other states also created their own academic careers for their institutions.

This public sector, however, did not grow fast enough to accommodate the expanding demand for higher education, which was mostly absorbed by private institutions. The limited growth of the public sector can be explained by two factors: its high cost, due to the relatively high academic salaries; and selective admission of students, based on *numerus clausus* (closed numbers) and competitive entrance examinations for the various course programs in each university. This differed from policies in most other Latin American countries, where the rule has been open admissions and a lack of well-paid careers for academic staff in public institutions.

Today, about 78 per cent of enrollment in higher education in Brazil takes place in private institutions. Private institutions could not adopt the same organization model and career patterns of the public ones. Public institutions are fully supported with budgetary resources and legally forbidden to charge tuition; private institutions, with few exceptions, cannot receive public subsidies and depend on tuition to survive. Since public institutions attract the best-qualified students, coming usually from richer families, private institutions need to cater to low-income sectors unable to pay much. Most of their students must work and, because of that, most of their courses are provided in the evenings. The private institutions cannot afford to hire many full-time academics or provide the conditions for academic research. It is difficult for the private sector to teach in fields requiring technical facilities; so, it tends to concentrate on the social professions—administration, accounting, law, and teacher education—instead of medicine, dentistry, engineering, and other technically based fields.

Brazilian legislation still assumes that all higher education provision should be organized within a university or, eventually, evolve into one—centered on high-quality academic research and Wilhelm von Humboldt's ideal of integration between research and teaching. Yet, in practice, few institutions, even in the public sector, can meet the standards related to a research university. A recent study found that only ten universities in Brazil could be classified as comprehensive research universities, providing doctoral education and doing research in a wide variety of subjects: the three state universities of São Paulo (Universidade de São Paulo, Universidade Campinas, and Universidade Estadual Paulista) and seven federal universities in the states of Rio de Janeiro, Minas Gerais, Pernambuco, Rio Grande do Sul, Brasilia, and Santa Catarina (Steiner 2005); other institutions may provide advanced education and research in selected areas.

Twenty-one per cent of the country's population and 33 per cent of the national gross domestic product is concentrated in the state of São Paulo. It is the country's industrial, agricultural, and financial hub; and the metropolitan area around the city of São Paulo, with about 20 million people, is one of the largest in the world. Politically, the state has a strong tradition of autonomy regarding the national government. Besides the three state universities, which are among the best in the country, São Paulo has a well-endowed Science Foundation, which provides support for graduate education and research in the state.

Currently, Brazilian legislation allows the existence of three main types of institutions: fully autonomous universities, with graduate education and research; autonomous university centers, with no graduate education and research but, supposedly, good-quality teaching in different fields; and isolated faculties, with limited autonomy to create new programs and to expand admission. There are also a small number of technical institutes supported by the federal government, but Brazil never developed an extended system of technical, shorter higher-education programs—such as the French Institutes Universitaires de Technologie.

In recent years, this picture has been changing in many ways. In the public sector, the federal government has been pressing public institutions to admit more students and to open evening courses. One program gives additional resources for federal universities willing to expand. Many institutions are introducing quotas for low-income or minority students. Private universities are granted tax exemption, if they admit a certain number of low-income students without fees. The quality of public higher education is uneven, with some observers believing it is declining. Some private institutions are starting to compete with the public ones, by providing high-quality and expensive education—in fields such as business administration, law, and economics. In the past, most private institutions were small, family-owned institutions. Today, some private institutions have opted to provide high-quality, expensive education in fields such as business administration, economics, and law. Yet, most of the private sector has developed into large for-profit institutions, offering low-cost evening courses for older and less-qualified students, who would not be admitted or could not manage the course loads at public institutions in the most demanding fields. A recent merger of two large private universities created the Universidade de

Anhanguera, in São Paulo, probably the second largest higher education institution in the world—after the University of Phoenix in the United States—with more than 400,000 students. Some of the large for-profit universities attract money from national and international investment funds, and their shares are negotiated in the stock exchange.

As the Brazilian economy grows and the country seeks to compete more strongly in the international economy, the issues of quality and coverage of Brazilian higher education become more pressing. The percentage of young people, of the age 18–24 years attending higher education is still very low, about 15 per cent, with half of the students older. This limits the number of students who finish secondary education and are able to continue to study for a postsecondary degree. The priority of the national government in the last several years has been to expand access by all means, without considering its implications in terms of quality. Except for the Universities of São Paulo and Campinas, no Brazilian institution appears in the different international rankings of higher education institutions. Quality control in graduate education and research has been traditionally much stronger but is still limited, in terms of the requirements of a mature, knowledge-based economy.

According to the Ministry of Education,[1] in 2009, there were 2,314 higher education institutions in Brazil—90 per cent private—and 5.1 million students in regular, first-degree courses, 75 per cent of which are in private institutions. Of the institutions, only 186 had university status. The size of these institutions varies enormously. A small, isolated faculty would have about 1,700 students, on average; a university, 15,000. The largest private university, based in São Paulo and with locations scattered in many cities, had 213,000 first-degree students in 2008; the largest public university, the University of São Paulo, had about 55,000 first-degree and 25,000 graduate students in 11 locations.

Data on graduate education are collected by a different agency in the Ministry of Education, the Coordination for Improvement of Higher Education Personnel (see Table 2.1). In 2009, there were 88,286 students in master's degree programs, 53,237 students in doctoral programs, and 9,122 students in professional master's degree programs. Of the 150,000 graduate students, 80 per cent were in public universities, one-third of them in the state of São Paulo. Also, some graduate programs are granted by public research institutes, which are not usually classified as higher education institutions—such as the Institute of Applied and Pure Mathematics in Rio de Janeiro, the Brazilian Center for Physics Research, or the Oswaldo Cruz Institute in the field of public health.

Table 2.1 Postgraduate education in Brazil: students and degree programs, by level and type of institutions

Institutions	Students			
	Master's	Doctoral	Professional master's	Total
Federal	46,628	28,569	3,234	78,431
State	23,522	19,486	1,396	44,404
Private	17,585	5,163	4,253	27,001
Municipal	551	19	239	809
Total	88,286	53,237	9,122	150,645

	Degree programs				
	Master's	Doctoral	Master's/ Doctoral	Professional master's	Total
Federal	568	22	792	97	1,479
State	210	18	416	33	677
Private	262	0	172	109	543
Municipal	14	n.a.	2	4	20
Total	1,054	40		243	1,337

Note: n.a. = not applicable.
Source: Ministry of Education, Coordination for the Advancement of High-Level Personnel 2009. http://www.capes.gov.br (accessed August 26, 2010).

These data from the Ministry of Education do not fully coincide with those of the National Household Sample Survey. The 2008 survey identified 6.2 million first-degree students, 1.1 million more than the Ministry of Education; and 326,000 graduate students, half of them in private institutions, about twice as many as those reported by the education authorities. The larger number of graduate students is probably due to the inclusion of students in non-degree, specialization, or master of business administration-type programs, which are not regulated and do not enter the Ministry of Education official statistics.

The academic profession and its subcultures

Public and private, university and non-university, and nonprofit and for-profit institutions have different institutional cultures, deal with certain kinds of students, and arrange various working contracts with their staff; and these differences affect, necessarily, the characteristics of the academic staff in each of these contexts. In public universities, most

academics have full-time contracts, earn most of their income, and spend most of the time at their institution. This varies somewhat, by fields and generation. Older lawyers, medical doctors, and dentists may maintain a private practice, while younger professors of mathematics, physics, or economics would not. Although all academics are supposed to have a doctoral degree and to engage in research, in practice only some of them meet these requirements. Those who do research have access to funds from science and technology agencies, are affiliated with scientific societies, travel to participate in scientific events, and can do consulting or technical assistance work. Those with lesser academic credentials may get more involved with local professional networks and with the academics' unions, which are present and active in all institutions. In both cases, academics have a sense of ownership regarding their university and participate directly or indirectly in commissions, councils, and other governance bodies.

The situation is quite different in the private sector and, particularly, in the new, large, for-profit universities that have emerged in recent years. In these institutions, the teacher is just an employee. Some of them may have full- or half-time contracts; but most work with part-time contracts—based on the number of classes taught in each semester, with no job stability or prospects for a career. These large universities have adopted quality controls that are typical of large service companies, controlling the time the teacher enters and leaves the classroom and the fulfillment of prescribed teaching curricula. Another approach is to make sure that the teachers are not too severe or too lenient with their students, who are asked to respond to consumer satisfaction surveys. If a concern exists regarding quality control, a teacher can be reprimanded or replaced. The teachers usually teach in the evenings, work in their main jobs during the day, and may teach in different institutions at the same time, with no particular loyalty to any of them.

Table 2.2 gives the main figures for the academic profession in Brazil, based on the 2008 higher education census carried out by the Ministry of Education. The census counts the number of teaching posts per institution but does not say whether the same person holds posts in different places. There were, in 2008, 338,890 higher education teaching posts in the country, or about 15 first-degree students per teacher, with large variations among sectors: 10.6 students per teacher-post in the public sector and about 17.3 in the private sector. Besides, 76 per cent of the academics in public institutions had full-time contracts, against just 18 per cent in the private sector.

Table 2.2 Academic posts[a] in higher education institutions

	Full-time	Part-time	Per hour	Total
Private	40,774	50,431	128,317	219,522
Public	91,608	18,756	9,004	119,368
Total	132,382	69,187	137,321	338,890

Note: [a]The same person can have two or more part-time posts.
Source: Ministry of Education, Higher Education Census 2008.

It is possible to summarize the features of the academic profession in Brazil, in terms of four clearly differentiated groups of people (Schwartzman and Balbachevsky 1996). The more traditional and smaller group is formed by people in prestigious professions—lawyers, medical doctors, engineers—who earn most of their income from their private practice or outside jobs and for whom teaching in higher education is a secondary activity. They may teach in private institutions but also work part-time in public institutions, as happens with many of the professors in the more prestigious public law schools. A second small group is formed by academics, who were able to complete their doctoral studies in a prestigious institution, often abroad, and consider themselves, in the first place, to be academic researchers. The third group, which makes up the bulk of the teaching staff in public institutions, is composed of people who depend wholly on their university job, have a specialization or a master's degree (seldom a doctorate), and see themselves mostly as public employees. Most of them have full-time contracts and enjoy the benefits of civil service employment—including job stability, reasonable salaries, and early retirement. The fourth group is made up of staff whose main source of income comes from teaching part-time in private institutions, without stable contracts and often working in one or more places.

The political organization and mobilization of the third group display many of the features of the teaching profession in public institutions in Brazil. The staff are organized in powerful unions, both at national and regional levels—such as the National Docent's Union of Higher Education Institutions and the Docent's Association of the University of São Paulo. These unions are associated with Brazil's Laborers' Party, of former president Luis Ignácio Lula da Silva, and can influence and have veto power on the legislation and actions from the education authorities that may affect the interests of their affiliates. They oppose anything that they may consider the "privatization" of public universities (including charging tuition for students, individual salary

negotiations, or competing in the market for research grants) or that can threaten the stability and the contract benefits of their members. The unions are opposed to any policy that may differentiate the academics' income in terms of their performance, except through seniority or formal academic credentials. For instance, in 1998 (during the government of Fernando Henrique Cardoso), the Ministry of Education introduced an additional premium to the teachers' salaries, according to the number of classes taught each month. This was a "gratuity," in the sense that it was a temporary payment that could be stopped if the teacher taught fewer classes or upon retirement. In 2005, the unions demanded, and achieved, the transformation of this additional payment into a permanent part of their salaries.

For academics in the third group, with doctoral degrees and engaged in research, who can get additional benefits from research grants, affiliation with their academic association is more relevant than affiliation with the unions; but their interests usually coincide, except when the unions try to curtail the freedom the researchers have to administer their grants or earn additional income from consulting. The National Council for Science and Technology provides about 6,000 research productivity grants every year, which can add up to R$2,800 (Brazilian reais, equivalent to US$1,600) a month, tax free, for university professors who apply for it with a research plan—not usually accessible to the other three groups.

The fourth group is made up mostly by academics who work in private institutions. They work more, earn less, and have less political clout. One would expect that the staff in such working conditions would be unhappy with their situation, but in fact they are mostly satisfied with their jobs (Balbachevsky and Schwartzman forthcoming), which is probably explained by the low expectations regarding their situation. They do not identify much with the institution where they work, either because they teach in different places or because teaching is a secondary activity for them. They are also unionized, but the unions in the private sector are less politicized and militant than those in the public institutions. One important difference is that unions in the public sector can strike without risking job stability and loss of income, while in the private sector they cannot.

Qualifications

In federal universities, an academic career comprises five ranks—auxiliary, assistant, adjunct, associate, and full professor (*auxiliar, assistente, adjunto, associado, titular*). Each of these ranks, up to full professor, is divided into four levels. In principle, access to a university career track should require a doctoral degree and passing and winning an open formal contest (*concurso*). These contests are formal procedures for each track to which anyone can apply, requiring a written and oral examination and a formal lecture, plus an evaluation of the applicant's qualifications by a committee of internal and external examiners.

However, in federal institutions, a doctoral degree is not required for the first two ranks. In the past, many academics with just a graduate (undergraduate) degree were hired through provisional contracts, which were later transformed into permanent appointments. Promotion up to associate level is done by seniority and also by the acquisition of postgraduate degrees; promotion to full professorship, in principle, should also depend on passing an open competition. Admission is usually at the assistant level, but individuals can present themselves in a formal contest for full professorship, if they have the proper formal qualification.

In the state universities of São Paulo, the ranks are auxiliary, assistant, doctor professor, associate, and full professor (*auxiliar, assistente, professor doutor, associado, titular*). A doctoral degree is required for the doctor professor's rank. To be promoted to associate professor, it is necessary to pass a *livre docência* exam, reminiscent of the German *Privatdozent* qualification[2]; to be promoted to full professorship, it is necessary to be approved in an open competitive exam. Other states have similar career paths, except for the *livre docência*, which is a peculiarity of the São Paulo institutions. Most private institutions do not have career ladders, instead salaries are paid according to the academic degree owned by the faculty member. The Ministry of Education collects information on formal degrees, but not on academic ranks.

Table 2.3 gives the distribution of Brazilian academics by academic qualification and type of institution. Although, in principle, it is necessary to have a doctoral degree to teach in higher education, only 22 per cent of academics actually have that degree, ranging from 48.1 per cent in public universities to 17 per cent in a public faculty. The best situation is found at the public universities in the state of São Paulo, where 86 per cent of the academic staff have a doctorate. At present, lesser degrees—such as master's, specialization, and training certificates—are accepted by many institutions as academic credentials. Specializations are programs that provide a teaching load of at least 360 hours of instruction to the students, and are given by a recognized institution; and training certificates are similar programs with a teaching load of 180 hours

Table 2.3 Academic qualifications of faculty members in institutions

Institution and faculty	With no university degree (%)	First degree (%)	Specialization (%)[a]	Master's degree (%)	Doctoral degree (%)	Total
Public university	0.02	11.9	12.8	27.1	48.1	103,607
Private university	0.00	7.9	20.3	29.4	14.3	103,607
Public university center	0.00	9.5	37.2	36.9	16.3	975
Private university center	0.00	9.9	34.1	43.2	12.8	35,212
Public faculty	0.04	7.8	36.8	38.3	17.0	6,729
Private faculty	0.01	9.2	44.4	38.0	8.3	109,770
Public technological center	0.65	15.8	30.7	38.4	14.4	8,057
Total (*N*)	97	36,012	100,419	121,548	80,814	367,957

Note: [a]Specialization is one of the lesser degrees—a program with a teaching load of at least 360 hours, provided by an institution.
Source: Ministry of Education, Higher Education Census (2008).

of instruction. Currently, Brazilian universities graduate about 11,000 students with PhDs each year—a significant number, but still a small proportion compared with the need to fill the 287,000 teaching positions still staffed by underqualified personnel. Moreover, since private, low-cost teaching institutions are not able to pay for full-time staff with advanced degrees, this picture is not likely to change in the foreseeable future.

Academic contracts

Public universities in Brazil are part of the civil service, and both academics and administrative staff are subject to national rules and regulations relating to the civil service. All academic hiring in public universities requires a public posting of positions; and the applicants must submit their curriculum vitae, provide a formal lecture, and go through a written examination—assessed by a committee of people from within and outside the department. This is a formal procedure; there are no search committees and no possibility of choice by the university authorities. Anyone can apply, and those with higher grades obtain the jobs. University departments can exert some discretion in the selection of the examiners (with at least one coming from an outside institution); and the examiners can confer among themselves, before grading the candidates according to their formal qualifications and performance in the written and oral examination and public lecture. But, at the end, each examiner issues their verdict, and the applicant with the higher grade gains the job. For federal universities, the Ministry of Education establishes the number of postings available for each institution. Beyond that, the universities are free to carry out the selection process. Once admitted, an academic gets a full-time contract and becomes a civil servant of the national or state government, depending on the university affiliation.

To be a civil servant in Brazil has many advantages—including additional benefits for academics. Once hired as a civil servant, it is impossible for a person to be dismissed; except due to gross misbehavior, which requires a complex procedure and final approval at the ministerial level, although it can be overruled by the courts. This means that, in practice, all academics entering public institutions are tenured, regardless of their future performance. Salaries tend to be higher than those in the private job market. The retirement age in the country is 65 years for men and 60 years for women, but, for those in education, including university professors, it is five years earlier—60 and 55. It is also possible to retire earlier from public service after ten or more years of

work, with proportional earnings, and to get another job in another university, combining the two salaries.

In public universities, up to an associate professor rank, promotion takes place regularly, based on seniority and the acquisition of additional academic credentials. It is a bureaucratic procedure that does not depend on assessments of any kind. Salaries are the same, according to the rank, in all federal universities; and there is no allowance for individual salary negotiations. Benefits include 45 days of paid vacations, health coverage, and generous retirement benefits. Until recently, academics could retain their full salary after retirement. However, some changes have been introduced in recent years, reducing this value—depending on the time the person occupied the position, his or her age, and other factors. The universities can also grant extended leaves for academics to complete their master's or doctoral degrees in other institutions, as well as sabbatical leaves every five years.

Besides the basic salary, actual remuneration may include benefits related to academic degrees and current or past administrative activity. Full-time, exclusively dedicated academics cannot have other regular employment but may receive research fellowships and additional payment for research and technical activities done within the university. Many public universities have established autonomous foundations, which are used to sign research and technical assistance contracts with public and private agencies, and firms that pay additional money for researchers involved in their projects. This practice is not allowed in other branches of the civil service but has been tolerated in the universities.

Most private higher education institutions work with part-time or hourly contracts for their academic staff, with a core group of full-time employees as well. The minimum qualification is an undergraduate degree, but the institutions need to hire a certain number of lecturers with specialization and master's or doctoral degrees to meet the requirements of the Ministry of Education. There are no formal procedures for hiring the staff. An institution needing a lecturer in a given subject can place an advertisement in a newspaper or on the internet, and the decision to hire is made by the person in charge. In both cases, contracts are regulated by Brazilian legislation for private labor contracts. Even if the payment is made according to the number of hours taught, it is necessary to have a formal working contract if it is not an occasional job. This legislation requires a one-month vacation and an additional "Christmas" salary for all labor contracts in the country. Both the employer and employee must contribute

about 10 per cent of the salary to the national social security fund, which allows for retirement after 30 years of work for women and 35 years for men, or at ages 60 and 65—at most about R$3,000 a month (US$1,700) or less, depending on the previous income. Moreover, employers have to make a monthly deposit for each employee in a government fund ("working time warranty fund"), which can be used if the person loses the job, retires, or faces some other special circumstances. The employer is free to dismiss the employee at any time—with payment of an indemnity that is proportional to the duration of the contract. There is no tenure, and the employee does not lose retirement benefits. So, mobility is much easier in the private than in the public sector, both from the employer's and the employee's points of view. In some institutions, academics have access to a private health plan, but this is not mandatory. Those working in the private sector are also entitled to 13 salaries (13 paychecks a year), 30 days of paid vacation, and early retirement, if they teach; but otherwise, the benefits are much smaller. They can be dismissed at any time, receiving a small compensation in proportion to the working time—there is no tenure. There is a ceiling for retirement payments equivalent to about US$2,000 a month, or less, depending on the salary earned while active, the person's age, and the number of years contributing to social security. For greater retirement benefits, it is necessary to join a private retirement fund.

Salaries and other revenues

Table 2.4 gives the range of monthly salaries for academics in full-time, exclusive dedication contracts in federal universities. It goes from about US$20,000 to 87,000 a year. State universities have their own payment scale. In the state of São Paulo, the corresponding range is from R$3,435.00 to R$10,216.96 per month, or between US$25,000 and US$76,000, a year. Salaries in poorer states can be lower. The admission procedures, promotion rules, and benefits in state universities are similar to those of the federal government.

Although the pay scales are the same in all federal universities, each person is attached to the institution where she/he works and not to the national civil service, which means that one cannot move to another institution with the same job, except in exceptional situations. One consequence of this system is the minor mobility of academics from one institution to another and the lack of mechanisms for public universities to compete for talent in the country or abroad. There are

Table 2.4 Academic salaries in federal universities in Brazil, 2010 (R$)

	First degree	Training[a]	Specialization[b]	Master's degree	Doctoral degree
Full professor	4,786.62	5,221.96	5,580.63	7,818.69	11,755.05
Associate 4	3,662.97	3,945.91	4,241.00	5,793.14	7,913.30
Adjunct	3,662.97	3,945.91	4,241.00	5,793.14	7,913.30
Assistant	3,201.62	3,444.85	3,643.99	4,874.54	
Auxiliary 1	2,762.36	2,949.68	3,120.08		

Notes: Values in Brazilian reais (US$1.00 = R$1.75).
[a]Training is a lesser programs, similar to specialization, with a teaching load of 180 hours.
[b]Specialization is a lesser programs, with a teaching load of at least 360 hours.
Source: Ministry of Education; the full source of the information is Presidência da Repu'blica Casa Civil Subchefia para Assuntos Jurit'dicos LEI No 11.784, DE 22 DE SETEMBRO DE 2008. http:www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/lei/l11784.htm (accessed April 6, 2011).

resources to pay visiting professors for short periods, but a public university finds it difficult to hire a foreign-born academic for its permanent staff.

Most private institutions do not publish data on their salary levels and career paths. However, an informal enquiry among several private institutions showed that they pay between R$20 and R$50 per hour taught, depending on the academic's formal degree. This means that a 20-hour, part-time job receives between R$455 and R$1,032 (US$260 and US$590) per month. Yet, many academics work only 12 or fewer hours per week in an institution, which means that they have to work in different institutions or must combine teaching with other professional activities to earn a reasonable income.

Table 2.5 presents the main data on university academics' income, based on the National Household Survey for 2008. The figures refer to monthly income in Brazilian reais in 2008. The estimated number of academics in the survey is much smaller than the figures reported by the higher education census—96,000 in the public sector against 119,000 in the census and 112,000 in the private sector against 219,000 in the census. One possible explanation for the differences is that the census gives information on posts, while the household survey gives information on people who may hold one or more teaching posts; and there may also be sampling errors. As one could expect, this difference is much higher in the private sector, where part-time contracts are the rule.

Table 2.5 Mean income of teachers in higher education

	Main work (R$)	All activities (R$)	Main work (%)	Number of cases
Public sector, civil servant	2,564.00	2,921.98	87.7	65,756.00
Private sector, regular contract	2,025.13	2,471.29	81.9	98,835.00
All public sector	2,213.37	2,512.83	88.1	96,000.00
All private sector	1,887.77	2,301.15	82.0	112,026.00
Total	2,027.75	2,389.71	84.9	208,026.00

Notes: R$1.75 = US$1.00.
Source: National Household Survey (PNAD) (2008).

The data also show that, although most academics in public institutions are civil servants and most of those in the private sector have private working contracts, many exceptions occur regarding these rules. About 17 per cent of those working in the public sector do not have a regular job, and 12.6 per cent are hired according to private law legislation. While only limited information is available about the kind of jobs held, these academics may be, for instance, graduate students working as research or teaching assistants or replacement academics with temporary contracts. In the private sector, about 9 per cent of the academics do not have a regular working contract. Incomes of those in the public sector are higher than those in the private sector, and incomes of those with regular contracts are higher than those without these contracts. For the civil servants in the public sector, their main salary represents 87.7 per cent of their income from all activities. For those with regular contracts in the public sector, their main salary is only 82 per cent, with another 18 per cent coming from other sources. One-fourth of the academics holding civil servant status earn additional income from a secondary job and for those with private law contracts, 32 per cent do. This proportion is likely to be still higher, given people's propensity to not fully report the income earned outside their main job.

Figure 2.1 compares the distribution of earnings for higher education teachers in public institutions, with civil service contracts, and for those in the private sector, with labor-market contracts. Each column corresponds to one-fifth of the income distribution for the academics. For the lowest 20 per cent, the mean monthly income is R$898.54 (US$511.16); for the upper 20 per cent, the mean monthly income is R$7,320.54 (US$4,183.16). Of the academics in the private sector, 43 per cent are

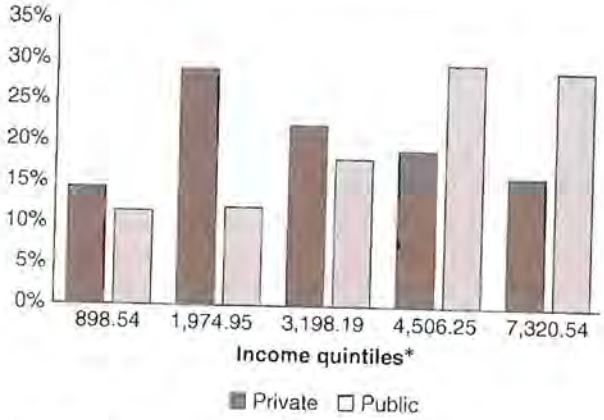

Figure 2.1 Income distribution of teacher earnings (R$).
Notes: The data are monthly incomes. *Five salary levels.
Source: National Household Survey (PNAD) (2008).

in the first two of the five levels, while 58.4 per cent of those in the public sector are in the two highest groups.

Higher education teachers in Brazil tend to have incomes above the average for persons in other careers with similar qualifications. For those in the public higher education sector, income is not as good as salaries of medical doctors, top-level engineers, and those in business—but is better than in other, less prestigious occupations. Earnings for those in the private higher education sector are closer to the average for persons with higher education—similar to architects, civil engineers, and data-processing specialists. Thus, higher education teachers, particularly those working in the public sector, are part of the country's upper-middle class—that is, likely to live in upper-middle-class neighborhoods, own a house or an apartment, have a car, and send their children to private schools.

Academics' working conditions

More detailed information on the working conditions of Brazilian academics can be obtained from the International Comparative Survey on the Academic Profession, carried out in Brazil, in 2007 (Balbachevsky and Schwartzman 2009; Balbachevsky et al. 2008). The sample of 1,200 respondents included academics in public and private institutions, as well as in non-university scientific research centers and institutes. For the analysis, the respondents were divided into five strata, based

on the characteristics of the institutions in which they work—public, research-intensive universities; other public universities; private, elite institutions; other private institutions; and research institutes.

Table 2.6 shows that, in a typical 40-hour week, for half of the time academics are devoted to teaching and related activities, with the heaviest teaching load taking place in private institutions. Research-related activities consume half of the time in research centers but less than 6 per cent in private institutions. The third activity is administrative work, about 5 per cent of the time; and other activities take another 2–3 per cent of the time.

In public universities, full-time contracts assume that academics spend half of their time in research. As Table 2.6 shows, the percentage reported by academics is closer to ten hours, or 25 per cent of the time, except in research institutes. Still, there are many indications that only a fraction of those claiming to do research are actually engaged in research activities. In the private sector, most academics have a secondary job; and even among those in the public sector, 18.3 per cent have an additional job, either in another teaching institution, a non-governmental organization, or working in private practice.

Given the expectation that all academics should do research and publish, the number of persons reporting to have done research and been published is relatively high in all groups. However, Table 2.7 shows large differences in the nature of the research activity of various groups. In the research centers and research-intensive universities, research is done with outside funding, more articles are published in international publications and in peer-review journals, and international collaboration is more frequent. In non-research public and private institutions, external funding is much more limited, most of the publications are in Portuguese, and international cooperation is less active. In the private sector, the teaching load tends to be large, and little time is allocated for research. This is not necessarily the practice in public universities, where the teaching load is not related to one's performance in research. The 2007 Academic Profession Survey found that, on average, academics in public, research-intensive institutions spend 16.7 hours a week in teaching activities, compared with 18.9 hours in other public institutions and 21 hours in the private sector. Most academics in the public sector have full-time contracts, while very few do in the private sector. In 1988, the federal government introduced legislation providing an additional payment for higher education teachers, according to the number of classes given; but this policy was abolished in 2006, with the additional payment becoming part of the regular salary.

Table 2.6 Hours worked per week in different activities, by type of institution, 2007

Type of institution	Intensive public research	Other public	Elite private	Other private	Research institutes	Total
Teaching (preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work) in hours	17.11	19.82	21.17	22.76	12.03	19.87
Research (reading literature, writing, conducting experiments, fieldwork) in hours	12.84	9.14	9.3	5.86	20.41	9.36
Extension (services to clients and/or patients, unpaid consulting, public or voluntary services) in hours	2.78	2.6	3.55	2.17	1.09	2.53
Administration (committees, department meetings, paperwork) in hours	5.41	4.77	6.34	3.24	6.09	4.64
Other academic activities (professional activities not clearly attributable to any of the categories above) in hours	3.03	2.36	2.17	2.73	2.24	2.54
Total respondents in the survey	195	614	60	270	53	1,192

Source: Changing Academic Project. 2007. http://www.open.ac.uk/cheri/pages/CHERI-Projects-CAP.shtml (accessed April 8, 2012).

Table 2.7 International publication patterns, 2007

Characteristics of research	Types of institution				
	Public, research intensive	Public, other	Private, elite	Private, others	Research institutes
Academic articles published in the last three years	6.51	4.19	2.46	3.28	7.43
Research with outside funding (%)	59.2	29.9	24.9	13.1	40.0
Only published the language of instruction at your current institution (%)	28.5	57.9	29.7	71.9	19.6
Never co-authored with colleagues located in other (foreign) countries (%)	71.8	85.5	91.9	94.2	51.0
Never published in a foreign country (%)	37.2	68.1	45.9	84.3	25.5
Never published in a peer-reviewed journal (%)	41.6	54.0	40.5	75.9	19.6

Note: % within the type of institution.
Source: Changing Academic Project. 2007. http://www.open.ac.uk/cheri/pages/CHERI-Projects-CAP.shtml (accessed April 8, 2012).

Dispersed centers of research

A better account of the effects of higher education on economic development requires an analysis of the scope of research. Research in Brazil is not only conducted at research universities. Several ministries support research at non-university institutions.

The best contribution to economic development in Brazil, in terms of research, was probably in agriculture. Agricultural research takes place mostly in an institution associated with the Ministry of Agriculture, the Brazilian Enterprise for Agricultural Research, which has provided a long history of developing new-plant varieties and technologies to make use of impoverished soil, enabling Brazil to become one of the largest agricultural producers in the world. This institution works in partnership with several universities and benefits from researchers graduated from Brazilian institutions and abroad, but is not a higher education institution.

A century ago, research in tropical medicine in non-university institutions, such as the Oswaldo Cruz Institute in Rio de Janeiro, was important to identify the nature and to reduce or eliminate the devastating effects of Chagas disease, malaria, yellow fever, and other diseases. The Oswaldo Cruz Institute remains an important research center within the Ministry of Health, and tropical medicine remains one of the strongest fields of research in Brazil (Glänzel, Leta, and Thijs 2006; Leta, Glänzel, and Thijs 2006).

The creation of the National Council of Research and the Brazilian Institute for Physics research in the 1940s were part of an effort to develop nuclear capabilities in the country, which was not successful. In the late 1970s, the science and technology sector was reorganized by the military government to realign it with the drive for economic development; several ambitious high-technology projects were started, in the areas of computer science, semiconductors, and space technology. Some of these projects have not succeeded or are lingering; but there was a substantial increase in the volume of resources dedicated to science, technology, and research, which led to the creation of a Ministry for Science and Technology in 1985. Embraer—the Brazilian Agency for Space Research and one of the world's largest manufacturers of mid-size planes—grew from the Technological Institute of the Air Force in the city of São José dos Campos and was considered the best engineering school in the country. Petrobrás, Brazil's oil company, has partnerships with many universities to develop all kinds of technologies related to deep-sea oil drilling. Other examples could be listed (Schwartzman 2008).

Still, overall, the productivity of Brazilian science is not so high. In 2009, 32,100 articles were published by Brazilian authors, indexed by Thomson Reuters Scientific INC, corresponding to 54 per cent of the publications in Latin America and 2.69 per cent worldwide. This was a significant increase compared to 2000—with 10,521 publications, 1.35 per cent worldwide. The number of patents registered at the US Patent Office was quite small, 148 in 2009, compared with 9,556 for South Korea.[3] The number of citations of scientific publications by Brazilian authors was 8.91 for the period 1996 to 2009, above Russia and India (4.48 and 6.2), but well below the United Kingdom, Canada, or Belgium (in the 14–15 range).[4] This index may be biased in favor of English-speaking countries (the highest ranks are those of the United States and the United Kingdom) but is nevertheless a rough indication of the relevance and impact of a country's scientific output.

Conclusions

To what extent do higher education and the academic profession contribute to Brazil's social and economic development? The link between education, as human capital, and economic development, is well established in the economic literature (Becker 1964; Schultz 1994). But, also, the expansion of education is strongly influenced by movements of social groups, to gain prestige and access to privileged jobs and market niches, which do not necessarily generate wealth and increased productivity to society as a whole. Several authors have analyzed this by looking at education as a "positional good," and interpreting education expansion in terms of the search for credentials, rather than the search for increasing knowledge and competencies (Brown 2003; Collins 1979; Hirsch 1977; Schwartzman 2011). These two interpretations do not need to be considered as mutually exclusive, since, to some extent at least, the drive for education credentials leads also to the increase in competencies. But the drive for higher credentials leads also to a redistribution of existing wealth in favor of some groups (Bourdieu and Passeron 1990). Distinguishing these two aspects of education development helps when discussing its impact on broader economic development and well-being.

In Brazil, the expansion of higher education was clearly not driven by sustained public policies for economic growth but, instead, by a demand for greater social mobility—which governments, at different points in time and with limited resources and policies, tried to steer. The creation of a public university sector was linked to a broader process of urbanization and the expansion of the public sector, as well as to the ability of professional corporations to enact legislation protecting their market niches—already present in the 19th century (Coelho 1999), it became stronger as the country modernized. A recent example of this trend was the successful drive of sociologists' and philosophers' unions and associations to make the teaching of sociology and philosophy mandatory in secondary education, creating a large job market for themselves, justified by the need to increase the students' critical thinking.

Another issue is the competencies produced by the higher education system. About 43 per cent of all first-degree students are in the fields of the social sciences, business, and law professions, which do not require much in terms of previous qualifications and limited investments in equipment by the institutions. This proportion is highest in the private sector. The second largest segment is in education, provided mostly by state and private institutions. Most of these courses take place in the evening, and a large part of the students are schoolteachers, working to

earn a formal qualification, allowing them to be promoted in the public schools where they work. At the other extreme, only 8.4 per cent of the students are in the field of engineering and production.

The large agricultural and mining companies in Brazil are capital intensive and do not employ many people. Industry is more productive today than in the past, but employs fewer people and makes use of imported machinery. The most complex industries—in areas like automobile manufacturing, industrialized food, metallurgy, and appliances—are either foreign-based or in partnership with foreign companies that do their research abroad. Industrialists complain of the lack of qualified middle-level technicians, but do not require many specialists with higher education degrees. The most demanding fields, in terms of manpower, are services of different kinds—commerce, transportation, education, health care, and also construction work. In that sense, one could say that the profile of the students coming out of higher education institutions is adjusted to the country's economy. Evidentially, a higher education diploma in Brazil leads to higher income, even if the person ends up working in activities requiring only secondary education skills. This status quo has to do with the relative scarcity of people with higher education degrees in the country. In 2009, only 11 per cent of the population aged 25–40 years had a higher education degree, according to the National Household Survey. Moreover, with the legal knowledge, people with diplomas are able to circumvent protective legislation, particularly in public jobs.

Finally, how good is higher education produced in Brazil? If one judges from international rankings, it is apparent that no institution in the country appears in the top 100, in any of the most influential rankings. This is probably unfair to the University of São Paulo, which appears as the best in the Latin American region in international comparisons and has strong research departments, graduate programs, and professional schools in medicine, engineering, law, economics, agriculture, and other fields (Schwartzman 2007). This university and some other public institutions—such as the University of Campinas and the Federal University of Minas Gerais—also appear at the top in the national rankings of degree programs, carried out regularly by the Brazilian Ministry of Education. These rankings, however, only report which programs are better or worse and do not include standards to distinguish among the excellent, good, acceptable, and unacceptable. Yet, law students need to pass a bar exam carried out by the lawyers' professional association, before being allowed to practice; and only about 20 per cent of the applicants pass, which is either an indication of the quality of the education provided by most Brazilian law schools or a reflection on the quality of the examination.

It is possible to summarize by saying that some of the higher education provided by Brazilian institutions is good but that most of it is bad. While most of the low-quality programs in business administration, law, and economics—provided in large scale by private institutions—do not form specialized study, they do provide students general competencies they would not receive otherwise. Since these programs are not subsidized, the fact that they respond to demand and that their graduates earn higher salaries in the job market constitutes their value. The issue is more serious in low-quality programs provided by public universities that are heavily subsidized by the government and do not charge students tuition. There are good reasons to argue that public universities should be required to show that they are using public resources effectively and providing skills in areas of higher priority for society. However, it is difficult politically for governments to implement such policies, particularly if they are associated with changes that might restrict access to public subsidies.

Brazilian higher education, as well as the working conditions and competencies of its academic profession, is uneven—as are most things in the country, with large social and regional imbalances. Development of the higher education sector needs to be conceptualized as part of a broader process of social change, which is neither harmonious nor efficient and is subject to periods of rapid expansion and retraction. The experience of the last several decades has been mostly of expansion and growth, and it is hoped that this enhancement will continue.

Notes

1. There are two main sources of information on Brazilian education. One is the National Institute for Education Research of the Ministry of Education in Brasília, which performs regular censuses of basic and higher education, collecting data from the institutions, and is also in charge of the main assessment systems for basic, secondary, and higher education. The second is the Brazilian Institute for Geography and Statistics, Brazil's census office. Besides the decennial demographic census and other statistics, this institute carries out a yearly National Household Sample Survey, which collects education, employment, and other information from a sample of about 100,000 households. The data of these two sources diverge somewhat, but since they bring different types of information, both will be used in the text that follows.
2. "Privatdozent (abbreviated PD, P.D. or Priv.-Doz.) or Private lecturer is a title conferred in some European university systems, especially in German-speaking countries, for someone who pursues an academic career and holds

all formal qualifications (doctorate and habilitation) to become a tenured university professor. With respect to the level of academic achievement, the title compares to associate professor (North America) or something between senior lecturer and reader (UK); however, the title is not connected to any salaried position" (http://en.wikipedia.org/wiki/Privatdozent).

3. This data was compiled by Brazil's Ministry of Science and Technology.
4. According to *CSImago Journal and Country Rank*. http://www.scimagojr.com/countryrank.php.

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