

# Chapter 2

## Profile of higher education: academic and technological undergraduate education and graduate education

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## 1. Introduction

This chapter presents a diagnosis of the state of higher education in São Paulo (SP) State in the 2003-2006 period. It identifies the changes observed in the trends outlined in 2004 edition of the *Indicators of Science, Technology, and Innovation in São Paulo State* (2004 edition) and broadens analysis of some problems and peculiarities of higher education in São Paulo State.

At first, the complexity of the system is discussed in terms of types of institutions and courses, the responsibility of the federal, state, and municipal governments for offering places in educational institutions is also discussed.

A comparative approach is used hereafter in the analysis. The data for the 2003-2006 period are compared with those for the previous period (1999-2002). In addition, the educational characteristics of São Paulo State are compared with those of Brazil and other countries whenever possible, allowing distinctive features of São Paulo State to be defined.

The supply of places in undergraduate education is approached in the first basic question, where gross enrollment ratio (GER) and net enrollment ratio (NER) are used as indicators. The recent evolution in these rates and the prospects for growth in access to higher education are analyzed. While assessing access, the dynamics and performance of primary and especially secondary education (which influence the expansion of higher education) are also included in the discussion in addition to considering the increase in the number of undergraduate places and enrollment.

Regarding undergraduate education, the relative contribution of the public and private sectors is also analyzed by highlighting structural differences such as the supply of undergraduate places, faculty, and diversity of institutions. Distribution of enrollment by field of knowledge and internalization of education are also addressed, seeking to assess the diversification in teacher training and the geographic reach of undergraduate education. Finally, quality of education is indirectly assessed through the relative offer of evening courses, as well as degrees held by academic staff and the faculty workload.

Recently, changes in higher education policy by the São Paulo State government contributed to diversify the supply of courses and expand the network of technology education. In this chapter, the great expansion in enrollment in technology courses is cited as a response to the current needs of both labor market and society.

In addition, a short discussion on distance learning is presented for the first time in the series *Indicators*

*of Science, Technology, and Innovation in São Paulo State*. Its potential to expand access to higher education in Brazil has attracted the interest of the federal government, which has developed initiatives with federal universities in order to establish a network for distance-learning courses alongside traditional courses.

Finally, the graduate system is analyzed in detail, highlighting the pioneering and exemplary role of the São Paulo State government through its three state universities. Graduate programs, offered mainly by the public sector, are important centers for research and training of new researchers. With the autonomy to define their curricula, ongoing evaluation and federal and state support for research, these centers have a good overall performance and constitute the most successful segment of higher education in São Paulo State and Brazil.

## 2. Institutional organization of the higher education system in São Paulo State

In order to analyze the higher education system in São Paulo State, the internal differences of the system must be taken into account. The structure of higher education in São Paulo State is governed by federal law (Brasil, 1988, 1996; Ranieri, 2000). This law establishes a basic division regarding the legal nature of higher education institutions (HEIs), classifying them as public and private institutions, with different regulatory frameworks. Recent censuses of higher education include a special category of nonprofit private institution, incorporating community, philanthropic, and religious HEIs. In addition, there are two other subsystems: the federal system (comprising institutions funded by both the federal government and the private sector) and the state system (including institutions funded by states and their municipalities). At the same time, public and private institutions are classified as academic and technological by the national system (Box 1).

On the other hand, academic HEIs comprise universities, university centers, integrated and single-course colleges, institutes or HEIs. According to the law, courses are also distinguished by (1) period (day and evening courses) and (2) sequential courses (Box 4), undergraduate, graduate (MSc and doctoral degrees), and extension. Recently, development of the system brought a new modality: distance courses. In

## Box 1 – Academic and technological courses

In Brazil, the term “undergraduate course” is traditionally restricted to the bachelor (bacharelado) and licenciante (licenciatura) degrees. The latter includes courses on education and other specific knowledge areas, giving graduates a license to teach in primary education.

Technology courses have been developed more recently, have a shorter duration and offer qualifications more directly geared to the labor market, giving rise to a new category of higher education. For a long time the status of these courses was uncertain and they were not included in the higher education censuses.

Classification of HEIs by type of academic organization (used since 2000) includes universities, university centers, integrated and single-course colleges, schools and institutes, and centers for technological education. There is not a general designation for the first four categories, although all of them award the same type of degree. Therefore, this chapter uses the expression “academic courses

and institutions” to define this ensemble and distinguish the segment from technology courses, which differ both in the type of education offered and the degree awarded. In general, this expression corresponds to tertiary courses classified as “Type A” by the OECD, i.e., they are “largely theory-based and are designed to provide sufficient qualifications for entry to advanced research programs and professions with high skill requirements.” In addition, these courses “have a minimum cumulative theoretical duration (at tertiary level) of three years’ full-time equivalent, although they typically last four or more years” (OECD, 2004, p. 44-45)

On the other hand, technology courses are similar to “Type-B” tertiary courses, characterized by their “shorter duration in relation to “Type-A” courses. Moreover, their focus is directed mainly to “focus on practical, technical or occupational skills for direct entry into the labor market, although some theoretical foundations may be covered.” (OECD, 2004, p. 46)

Brazil, HEIs typically provide the same type of degree (recognized nationwide), which is usually associated with a regulated profession. There are no courses for liberal arts or general studies.

Regarding the type of degree, the difference between academic and technological institutions is that the latter provide higher technical training for the labor market and award a degree in technology.

In this context, the higher education system in São Paulo State features as a fragmented ensemble with four well-defined and independent subsystems. On one hand, private institutions are included in the federal educational system, which encompasses two federal universities<sup>1</sup> and a third one (the recently-established Federal University of ABC), in addition to two isolated institutions. All these institutions are directly subordinated to the Ministry of Education (MEC). On the

other hand, public institutions are subordinated to the São Paulo State Government and include three separate systems. In the first subsystem, there are three state universities – University of São Paulo (USP),<sup>2</sup> Campinas State University (UNICAMP), and São Paulo State University (UNESP) and two isolated Medical Schools (Marília Medical School and São José do Rio Preto Medical School). Recently, all of them were brought under the remit of specific department of the government, in the São Paulo State Higher Education Secretariat. The second system is the network of technology colleges, Faculdades de Tecnologia (Fatecs), which are subordinated to the State Department of Development. Its organization is different from that of the university and has a very tenuous relationship with it. In addition, the Fatecs are integrated with technical (middle) schools. Finally, there is the municipal system. It has neither

1. Federal University of São Paulo (Unifesp) and Federal University of São Carlos (UFSCar).

2. Faculty of Chemical Engineering of Lorena was integrated with USP on May 29, 2006, and renamed Lorena School of Engineering (EEL).

institutional relationship with the others nor internal tools for integration amongst different institutions (administered by the respective city governments). The State Education Council (responsible for accreditation of these institutions) is the only São Paulo State government body to which they are subordinated. It is worth noting that this Council is responsible for both recognizing and relicensing courses in the three state systems. However, it serves as neither a coordination nor policy formulation body

However, it is important to emphasize that legal distinction does not always correspond to real differences. From a legal standpoint, universities that should be autonomous and whose function should include training highly qualified personnel, undergraduate and graduate education, and research (conducted by a high percentage of doctorate-holding instructors working full time), do not always perform this role. In São Paulo State, public universities do perform this role, with the exception of the two municipal units.<sup>3</sup> Very few private universities in São Paulo State meet the requirements established by law. Almost all of them are predominantly focused on undergraduate education. Classification of HEIs as universities is not associated with the quality of education offered by them, especially in the private sector.

University centers should be institutions for undergraduate education, where the quality of education offered to students could justify concession of autonomy. Few of them meet these requirements and many cannot be distinguished in terms of quality from private non-autonomous HEIs (such as isolated universities, schools, and institutes and integrated colleges).

Institutions without autonomy offer undergraduate education and differ from those mentioned above mainly due to their smaller structure than the type of course provided. Most of them, especially some private universities and university centers, focus on low-cost evening courses offered to a population of varied income levels who usually work during the day.

An alternative classification of HEI, similar to those proposed by Steiner (2006) and Balbachevsky (2007), would involve the following types:

1 – Large institutions with:

- undergraduate education and graduate programs, awarding including master's and doctoral degrees in different fields of knowledge; most of them were graded 4 and above by

CAPES (Brazilian Federal Agency for Support and Evaluation of Graduate Education);

- a primarily full time, highly qualified academic staff (over 50% holding doctorates);
- consolidated and highly-rated research centers, and scientific production in national and international journals;
- high prestige, as expressed by an applicant per place ratio greater than 4.

2 – Large institutions with:

- most undergraduate places in daytime courses in different areas of knowledge;
- a small number of graduate programs, most of them in master's level;
- several non-academic graduate programs;
- some courses in areas requiring more investment, such as medicine, science, or engineering;
- research groups with low number of publications, mostly in national journals;
- more than 30% of faculty holding MSc and PhD degree;
- at least 25% teachers employed full time;
- good prestige, as expressed by an applicant per place ratio greater than 2.

3 – Smaller institutions with:

- a focus on higher professional education;
- prestigious and high-demand courses, as expressed by an applicant per place ratio greater than 2;
- some form of applied research;
- a small number of teachers holding master's and doctoral degree, as well as teachers with no academic degree, but with great professional experience;
- few teachers working full time;
- specialization courses such as MBA, master's (especially professional) courses and few doctoral programs;

4 – Large or small institutions with:

- no bachelor's courses in areas requiring more investment;
- most undergraduate places in evening courses;
- no research-based graduate programs;
- no regular scientific production;
- less than 2 applicants per place;
- less than one-third of teachers holding academic (MSc and PhD) degrees;
- less than 10% faculty employed full time.

3. University of Taubaté (Unitau) and University of São Caetano do Sul (USCS).

The above classification has an empirical basis and involves different variables, hence corresponding to a model. Although it is relatively easy to distribute HEI at the extremes of the above categories, their distribution into the intermediate levels requires a judgment based on qualitative criteria, which is subjective.

However, there is some correspondence between the legal classification and the one proposed herein:

- Type 1, e.g., is strongly associated with public universities;
- Types 2 and 3 tend to cover both public and private institutions;
- Type 4, on the other hand, comprises almost exclusively private institutions.

In the following analysis, both types of classification were used: the legal one (for general aspects of the system, since it is used in official statistics) and that proposed herein (for a detailed analysis of HEI in São Paulo State). In this classification, presence of graduate programs and size were taken into account (Section 4).

### 3. Undergraduate education

#### 3.1 Social inclusion in higher education: enrollment ratios

Systematic use of educational statistics and comparison between Brazil and other countries consolidated since the 1980s have had significant public repercussions in showing that Brazilian higher education enrollment ratios (see Box 2) have been far lower not only than those of the developed countries, but also in comparison with other Latin American countries.

In fact, despite the recent growth in enrollment ratios in higher education in Brazil, these may be considered abnormally low when the level of development in the country is considered. In 2006, GER and NER were 19.3% and 12.7%, respectively. In that year, these rates were higher in São Paulo State: 24.4 and 16.4%, respectively (Table 2.1).

#### Box 2 – Indicators of inclusion in higher education

The term inclusion refers to the overall capacity of the system to recruit students as well as to their ability to continue and complete their studies in the higher education system. The main indicator for inclusion in higher education is the enrollment ratio (also called access rate). The enrollment ratio can be expressed as a GER or NER. Net ratio corresponds to the ratio between the number of young people with a given age (usually 18-24 years) enrolled in higher education and the total number of youths at the age considered. Gross ratio corresponds to the ratio between the number enrolled in higher education (regardless of their age) and number of youths at the age considered.

In Brazil, GER is far higher than NER and this is a problem. This is because a high percentage of students were older than the appropriate average age. This occurs for two reasons. First, the high rates of repetition and dropout (and later return to education is typical of the middle school and

causes the average age of admission into higher education (above 18 years) to increase. The second reason is associated with both the expansion of educational opportunities and demands of the labor market. Thus, a large number of people complete and leave middle school to enter the labor market, but return to school looking for an additional training in college. In most cases, students continue to work while they study, and this is facilitated by the abundant evening courses (especially in the private sector). Gross ratio seems to be better than NER as an indicator to evaluate the government effort to democratize access of the population to higher education. Finally, GER indicates that more people are trained in higher education in the country thereby increasing the educational level of the adult population. In fact, this is the most important factor in qualifying the workforce and raising the level of schooling within the population.

**Table 2.1**  
**Total population and population aged 18-24, total enrollment in higher education and enrollment related to the population aged 18-24, gross (GER) and net (NER) enrollment ratios – Brazil and São Paulo State, 1999-2006**

Geographic area	Population (1)		Enrollments in higher education		Gross enrollment ratio (GER) (4) (B / A) (%)	Net enrollment ratio (NER) (C / A) (%)
	Total	18-24 age group (2) (A)	Total (B)	18-24 age group (2) (3) (C)		
<b>1999</b>						
Brazil	163,947,554	21,147,094	2,369,945	1,553,863	11.2	7.3
São Paulo State	35,816,740	4,807,219	740,113	467,494	15.4	9.7
<b>2002</b>						
Brazil	174,632,960	23,098,462	3,479,913	2,271,118	15.1	9.8
São Paulo State	38,177,742	5,074,348	988,696	649,304	19.5	12.8
<b>2006</b>						
Brazil	186,770,562	24,285,150	4,676,646	3,091,260	19.3	12.7
São Paulo State	41,055,434	5,202,987	1,268,976	850,642	24.4	16.4
<b>Growth (%)</b>						
<b>1999-2002</b>						
Brazil	6.5	9.2	46.8	46.2	34.4	33.8
São Paulo State	6.6	5.6	33.6	38.9	26.6	31.6
<b>2002-2006</b>						
Brazil	7.0	5.1	34.4	36.1	27.8	29.4
São Paulo State	7.5	2.5	28.3	31.0	25.2	27.8

**Sources:** INEP. Higher Education Census (microdata), IBGE. National Survey by Household Sampling (PNAD).

**Notes:** 1. Net enrollment ratio (NER) corresponds to the ratio between the number of young people with a given age (usually 18-24 years) enrolled in higher education and the total number of youths at the age considered. Gross enrollment ratio (GER) corresponds to the ratio between the number of [youth] enrolled in higher education (regardless of their age) and number of young at the age considered. 2. See Detailed Table 2.1.

(1) Estimate of the resident population on 1 July in that year.

(2) Data from the PNAD.

(3) Enrollment in MSc and PhD programs were included.

(4) These data differ from those presented in Table 2.2. It is likely that the data published by UNESCO were overestimated because they seem to include all types of post-secondary courses. In Brazil, where the data from the National Household Sample Survey (PNAD) are used for the population with the age considered and those of the National Institute for Educational Research (INEP) are used for enrollment, the discrepancy is evident. A GER of 19.3% was obtained for 2006; according to the UNESCO, GER is of 25.5% for the same year. Similar results were obtained with data from 1999 (11.2 and 14.5%, respectively). Additional information can be found in Box 3.

### 3.2 Growth of enrollment ratios in higher education in São Paulo State and Brazil: comparison with other countries

Regardless of the fact that the process of globalization has taken its current dimensions, international comparisons are necessary since the transformations that occur in the higher education systems correspond to social and quite large economic forces, which can be felt in all countries. Given the purpose of this chapter, comparison with the international context is essential to understand the development of higher education in a country, and especially in one state. However, as reliable international comparisons are difficult to obtain, their interpretation must be done carefully (Box 3).

With the reservations noted in Box 3, a number of conclusions on the Brazilian case can be drawn from the data in Table 2.2.

First, a block of countries with gross enrollment ratios (GER) (2006) greater than 90%, including Finland (93.2%) and South Korea (92.6%), must be better understood. Finland, which is recognized as having the best existing educational system, already had very high enrollment ratios (82.4% in 1999). It is a country with a small population and very low rates of social, economic, and ethnic inequity; in addition, it has had a highly educated population for more than one generation. Although South Korea has a culture that greatly appreciates studying and has shown extraordinary progress in education in recent decades, its 92.6% enrollment ratio is debatable, as a surprisingly large difference in comparison to 1999 was observed (66.0%). On the other hand, the OECD data analyzed in this chapter (technological education section) indicate that more than half the enrollment in these two countries occurs in Type-B courses.

#### Box 3 – Statistics in international comparisons

International comparisons must be made with caution for two reasons. First, the quality of statistics produced in different countries is varied. This is especially true for courses in which the data results from estimates. Second, data on very diverse educational systems in terms of duration of courses, types of degree awarded, entrance requirements, among others, are difficult to be made compatible.

Regarding the various possibilities available for further education after basic education, another difficulty appears in the very understanding of what higher education may be.

For this reason, data published by the Organization for Economic Cooperation and Development (OECD) in *Education at a Glance* (OECD, 2004, 2006, 2008) are used whenever possible. These data have been previously made compatible at two levels of courses (A and B), so that distinctions can be made between courses lasting two, three, or four years in the U.S. and long-term vocational (or technology) and academic courses in other countries.

OECD does not provide data equivalent to those used in this chapter to calculate the GER. However, it uses another indicator related to the

adult population (in different age groups) who concluded Type A or B higher education..

To calculate the GER, the data produced by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in *Education for All* (UNESCO, 2008) are used. However, it is likely that these data are overestimated, because they seem to include all types of post-secondary courses. In Brazil, where calculations are based on data from *Pesquisa Nacional por Amostra de Domicílios* (National Household Sample Survey – PNAD; population in the age group considered) and those of *Instituto Nacional de Pesquisas Educacionais* (National Institute for Educational Research – INEP; enrollment), the difference becomes apparent. Gross enrollment ratios of 19.3% and 25.5% are obtained (2006) when data from these sources and from UNESCO are used, respectively. Similar results are obtained with data for 1999, when the rates calculated correspond to 11.2% and 14.5%, respectively. In addition, disparities such as the values for GER in Cuba, 20.5% (1999) and 87.9% (2006), are difficult to be explained. Finally, rates greater than 90% (as is the case of South Korea, Greece, and Finland) are hard to accept in more in-depth research.

**Table 2.2**  
Gross enrollment ratios (1) – Brazil and selected countries, 1999-2006

Selected countries	Gross enrollment ratio (GER) (%) (1) (2)	
	1999	2006
Greece	46.8	94.9
Finland	82.4	93.2
South Korea	66.0	92.6
Cuba	20.5	87.9
United States	73.0	81.8
Denmark	56.1	79.9
New Zealand	64.3	79.7
Sweden	63.5	79.0
Norway	66.2	77.5
Iceland	40.0	72.9
Australia	65.4	72.7
Spain	56.7	67.4
Italy	47.1	67.0
Argentina	48.5	63.8
Belgium	56.7	62.8
Canada	60.3	62.4
Netherlands	49.5	59.8
United Kingdom	59.7	59.3
Ireland	45.9	58.8
Israel	48.4	57.6
Japan	45.1	57.3
France	52.4	56.2
Portugal	45.2	54.5
Chile	37.6	46.6
Switzerland	35.9	45.8
Panama	40.6	45.5
Bolivia	32.9	40.6
Peru	-	35.1
Colombia	22.0	30.8
Philippines	28.7	28.5
Mexico	18.2	26.1
Paraguay	13.0	25.5
<b>Brazil</b>	<b>14.5</b>	<b>25.5</b>
Costa Rica	16.0	25.3
China	6.4	21.6
India	-	11.8

Sources: UNESCO. *Education for All Global Monitoring Report 2009*.

(1) The number of students enrolled in higher education (regardless of age) is related to the number of young people in the corresponding age range.

(2) Data for Brazil in this table differ from those shown in Table 2.1 for the same age group. It is likely that data in this table (2.2) are overestimated, because they seem to include all types of post-secondary courses. Such discrepancy is evident in Brazil, where data from the National Household Sample Survey (PNAD for Pesquisa Nacional por Amostra de Domicílios; related to the population in the corresponding age group) and those of the National Institute for Educational Research (INEP for Instituto Nacional de Pesquisas Educacionais; related to enrollment) were used in the calculations. Using these data sources, a GER of 19.3% was obtained for 2006, according to UNESCO, a rate of 25.5% was recorded in the same year. The same occurs with the data for 1999, when the rates recorded are 11.2 and 14.5%, respectively. Details can be found in Box 3.

A second block shows higher education enrollment ratios in the range 70-85% in countries including the U.S. (81.8%), Denmark (79.9%), New Zealand (79.7%), Sweden (79.0%), Norway (77.5%), Iceland (72.9%), and Australia (72.7%).

The U.S. is different from other countries because it is among the most populous, richest, and most heterogeneous countries both ethnically and educationally. Also, it is the country whose higher education system shows the greatest diversity. Four other Nordic countries, including Finland, have similar characteristics and are a highly educated group of countries. Outside Europe, New Zealand and Australia are in this category (enrollment ratios of 72.9% and 72.7%, respectively).

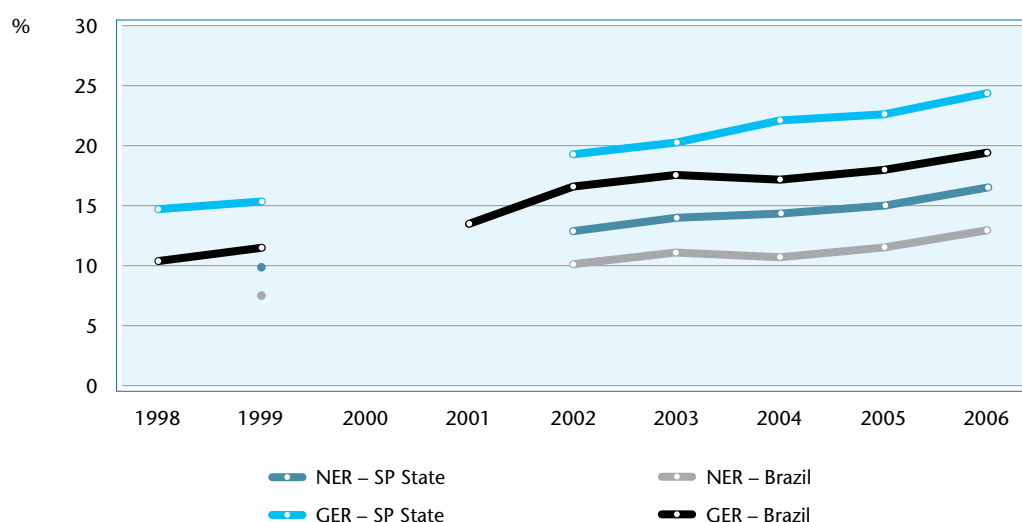
A third block, with indicators in the 60%-69% range, covers most countries in Western Europe, including Spain (67.4%), Italy (67.0%), and Belgium (62.8%). The following block is in the range 50%-59% and includes the Netherlands (59.8%), UK (59.3%), Ireland (58.8%), France (56.2%), and Portugal (54.5%). Outside Europe, Canada (62.4%), Israel (57.6%), and Japan (57.3%) are included in this block.

Comparing another group of countries and Brazil also proves interesting. These are populous countries, with extreme poverty affecting a large part of the population and high ethnic heterogeneity, but with a great economic potential, including China (21.6%) and India (11.8%).

Brazil, with enrollment ratios in higher education of 19.3% and 25.5% (data from INEP and UNESCO, respectively), seems to be in similar conditions to India and China.

Finally, the situation of Latin American countries must be explored in detail. Two countries (Cuba and Argentina) with the highest enrollment ratios show unreliable data. In Cuba, the enrollment ratio increased from 20.5% (1999) to 87.9% (2006), higher than in the U.S.. Although Cuba has a good basic education system, an increase of this magnitude in a relatively short time (and under a major economic crisis) is suspect. In Argentina, also affected by a serious economic crisis, the enrollment ratio increased from 48.5% to 63.8% in the same period. It is worth remembering that the enrollment ratio in Argentina, historically higher than in Brazil, increased dramatically in 1968 when entrance

**Figure 2.1**  
Gross (GER) and net (NER) enrollment ratios in higher education – Brazil and São Paulo State, 1998-2006



Source: INEP, Census in Higher Education (microdata); IBGE; PNAD.

Notes: (1) No data on [students] enrolled by age were found (1998, 2000 and 2001) that could allow rates to be calculated. (2) Net enrollment rate is the ratio between the number of young people in a given age range (usually 18-24 years) enrolled in higher education and the total number of young people in the corresponding age group. Gross enrollment rate is a ratio between the number of [students] enrolled in higher education (regardless of age) and the number of young people in the corresponding age group. (3) See Detailed table 2.1.



exams were abolished and admission was opened to middle school graduates. Thousands of new students entered the system without additional investment, increases in the teaching staff or expansion in physical facilities. Thus, the development of graduate programs and research, which found refuge in private centers outside the university was prevented.

Even if these two cases are excluded, the enrollment ratio in Brazil (25.5%; UNESCO) is much lower than that of most countries in the region, including Chile (46.6%), Panama (45.5%) and Peru (35.1%), but is closer to much poorer countries such as Mexico (26.1%) and Paraguay (25.5%). In Latin America, only very small and poor countries, such as Belize and Haiti, have enrollment ratios lower than those in Brazil. All the others have higher values.

However, it is noteworthy that the scientific production is smaller and the graduate programs are incipient in these countries. In none of them are education and research associated to universities as in Brazil. In these countries, research tends to develop outside the universities or in associated centers.

Awareness of this gap has led discussions on higher education and public policy to produce actions focused on the need to increase the number of undergraduate places and enrollment ratios. In Brazil and other countries in the region, this is especially true because there is great social pressure for access to higher education that affects public policy. In 1988, Brazil's Ten-Year Education Plan envisaged increasing enrollment ratios 30% of the population aged 18-24, up from 10% or tripling the number of students. Although the importance of increasing the higher education enrollment ratio in Brazil is unquestionable, little attention has been devoted to both effective progress and structural obstacles to its implementation.

### 3.3 Recent progress of enrollment ratios in higher education

Regarding recent advances, it is important to recognize the efforts made in the last seven years. In the 1999-2006 period, the GER in higher education in Brazil grew from 11.2% to 19.3%, an increase of 72% (Table 2.1, Figure 2.1). In São Paulo state, the ratios were higher, from 15.4% (1999) to 24.4% (2006), but growth was lower (58%).

However, the prospects for maintaining this growth rate through end of the decade must be examined. A

period of stagnation in enrollment had already been predicted in the previous edition of this series. Although this has not materialized, a reduction in the growth rate certainly occurred. In the 1999-2002 period, the enrollment grew 33.6% in São Paulo State and 46.8% in Brazil. In the 2002-2006 period, the growth in enrollment slipped 28.3% in São Paulo State and 34.4% in Brazil (Table 2.1, Figure 2.1).<sup>4</sup>

### 3.4 Structural barriers to expansion of access to higher education: relationship between primary and higher education

In order to understand the dynamics of these changes and to evaluate the possibilities of increasing access to higher education, an analysis that reaches beyond the number of undergraduate places and students enrolled in HEIs is necessary. In fact, debates on the subject and recommendations by many experts promoted a partial view of the problem since only the need to increase undergraduate places was emphasized. However, increasing enrollment ratios does not depend solely on expanding the number of undergraduate places. Higher education is not an isolated part of the education system; both its scope and quality depend on previous levels of education, which determine its expansion. One of the main factors responsible for the historically low enrollment ratios in higher education is a consequence of bottlenecks in the previous steps of education (in both primary and secondary education) in Brazil.

Therefore, some data in Chapter 1 on basic education should be revisited, especially those related to middle school (Table 2.3, Figures 2.2-2.4), since the increase in the supply of undergraduate places in higher education depends directly on the number of graduates in the immediately preceding level of education.

In the 1991-2000 period, enrollment in secondary education increased from 1,071,918 to 2,079,141 (São Paulo State). In the next six years, they fell to 1,813,795. This decrease in enrollment was more pronounced in São Paulo State and was observed some time before it occurred in other states (where the decline began in 2005). This behavior can be explained in part by the growth in enrollment in middle school as well as by the rise in enrollment ratios in higher education (which started earlier in São Paulo State). Acceleration of the initial pace of enrollment was favored by inclusion of an unmet demand, i.e., older students who had dropped out of school and later returned.

4. Extension in the growth period is probably associated with ProUni (see subsection 3.4.1 – Socio-economic inequality).

**Table 2.3**  
**Total population and population aged 15-17, total enrollment in secondary education and enrollment of the population aged 15-17, gross (GER) and net (NER) enrollment ratios – Brazil and São Paulo State, 1998-2006**

Geographic areas	Population (1)		Secondary education enrollment		Gross enrollment ratio (GER) (B / A) (%)	Net enrollment ratio (NER) (C / A) (%)
	Total	15 -17 age group (2) (A)	Total (B)	15-17 age group (2) (C)		
<b>2002</b>						
Brazil	174,632,960	10,353,123	8,710,584	4,161,691	84.1	40.2
São Paulo State	38,177,742	2,062,967	2,065,270	1,310,772	100.1	63.5
<b>2003</b>						
Brazil	176,871,437	10,481,393	9,072,942	4,470,266	86.6	42.6
São Paulo State	38,709,320	2,204,978	2,099,910	1,384,826	95.2	62.8
<b>2004</b>						
Brazil	181,581,024	10,742,044	9,169,357	4,660,419	85.4	43.4
São Paulo State	39,825,226	2,196,187	2,045,851	1,406,202	93.2	64.0
<b>2005</b>						
Brazil	184,184,264	10,658,958	9,031,302	4,687,574	84.7	44.0
São Paulo State	40,442,795	2,184,556	1,913,848	1,349,521	87.6	61.8
<b>2006</b>						
Brazil	186,770,562	10,424,755	8,906,820	4,723,399	85.4	45.3
São Paulo State	41,055,434	2,032,494	1,813,795	1,319,078	89.2	64.9
<b>Growth 2002-2006 (%)</b>						
Brazil	7.0	0.7	2.3	13.5	1.6	12.7
São Paulo State	7.5	-1.5	-12.2	0.6	-10.9	2.1

**Sources:** INEP. Higher Education Census (microdata), IBGE. National Survey by Household Sampling (PNAD)

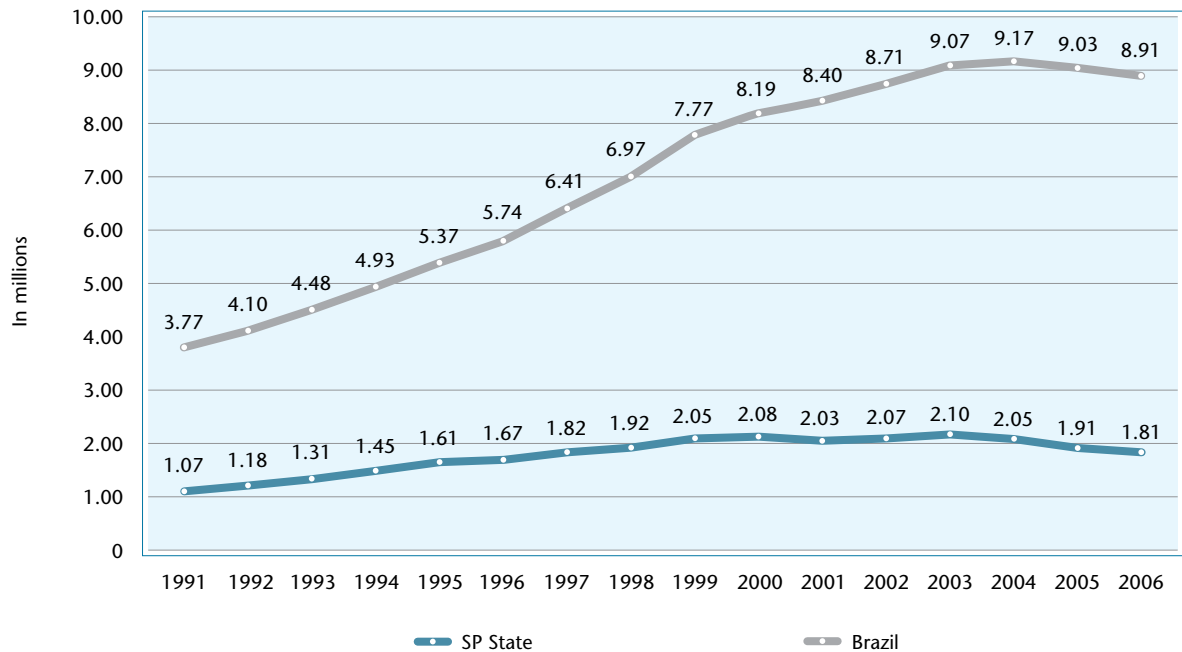
**Notes:** 1. Net rate corresponds to the ratio between the number of young people in a given age range (usually 15-17 years) enrolled in secondary school and all young people in this age group. Gross rate relates the number of [students] enrolled in secondary school (regardless of age) and the number of young people in that age group.

2. See Detailed Table 2.2.

(1) Estimate of the resident population on 1 July of that year.

(2) Data from PNAD.

**Figure 2.2**  
Enrollments in secondary education – Brazil and São Paulo State, 1991-2006



Source: INEP, Census in Primary Education (microdata).

Note: See Detailed Table 2.3.

In fact, GER in São Paulo State peaked at 100.1% (2002), declining to 89.2% in 2006. On the other hand, NER witnessed small variations in the period 2002-2006, with a minimum of 61.8% (2005) and a maximum of 64.9% (2006, Figure 2.4). Therefore, assuming that a much higher level of access in the previous decade had been reached (and that the repressed demand was satisfied), the decrease is not surprising.<sup>5</sup>

The data hitherto shown, together with Table 2.3, reveal that expansion in enrollment in higher education in the early 2000s, in both São Paulo State and Brazil, occurred shortly after the great expansion in secondary education. Likewise, the recent trend for deceleration in the growth of higher education occurred in the period following the reduction in enrollment and students completing secondary education.

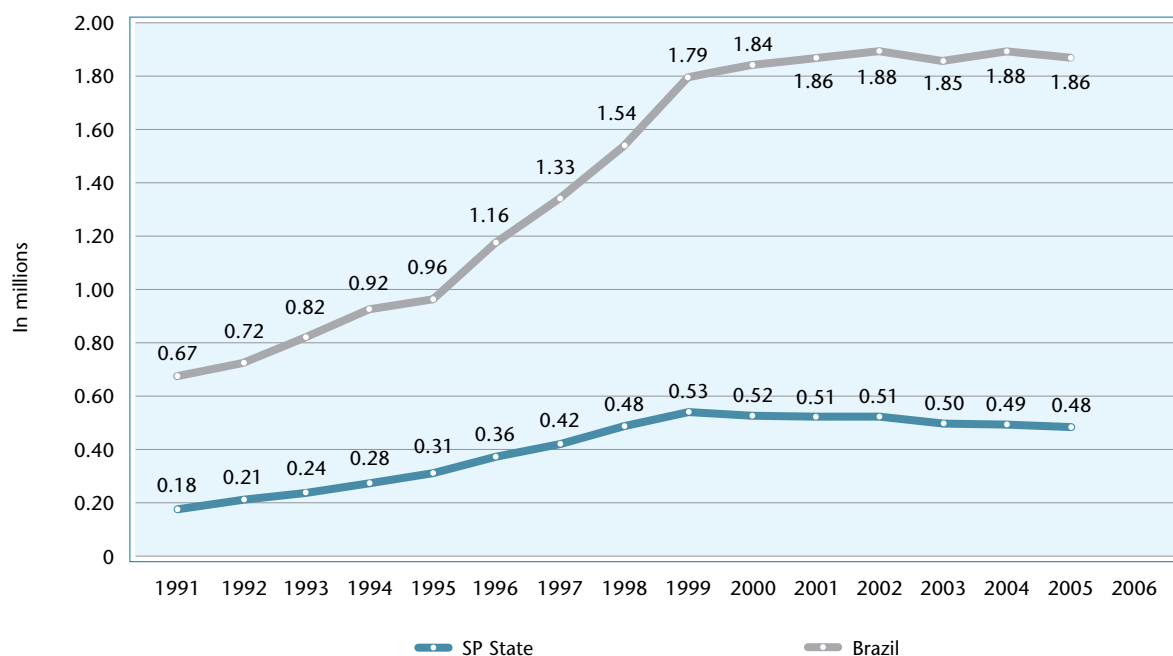
Regarding this trend, it is now possible to analyze the relationship between number of students completing secondary school, undergraduate places, and students entering higher education.<sup>6</sup> This relationship was not linear in the 1998-2006 period. Table 2.4 and Figure 2.5 show that there is correlation of undergraduate places in higher education and students completing secondary school. During this period, the number of undergraduate places and enrollment in higher education continued to grow. This growth caused a substantial reduction in the difference between number of students completing secondary school and those entering higher education, although the number of the former group has decreased.

In Brazil, regarding the relationship between total undergraduate places and students completing

5. However, it should be noted that the number of students completing high school is much smaller than that of students entering HEI.

6. It should be noted that students completing secondary education are not the only population of candidates competing in college entrance examination (and entering higher education). There is also a population of young people who have completed secondary school for some time, work and intend to resume their studies at a higher level to have more opportunities for professional progress (see Box 2).

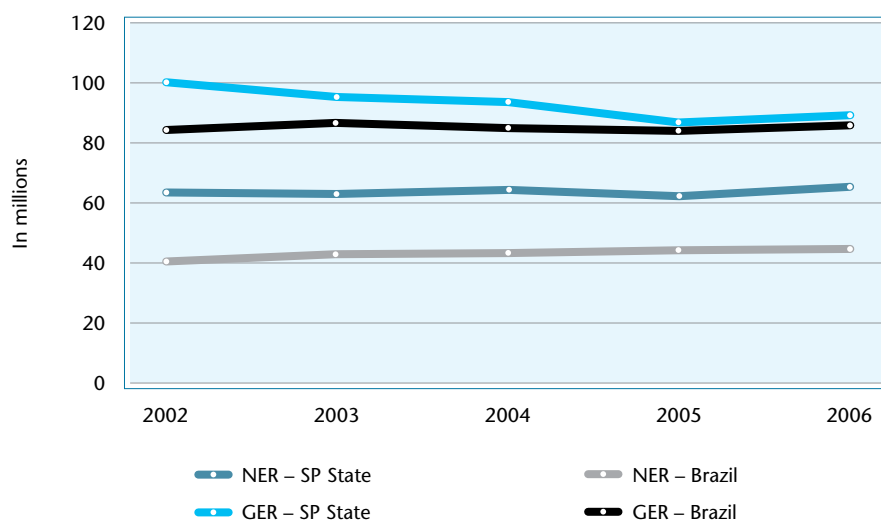
**Figure 2.3**  
Students completing secondary education – Brazil and São Paulo State, 1991-2006



Source: INEP, Census in Primary Education (microdata).

Note: See Detailed Table 2.3.

**Figure 2.4**  
Gross (GER) and net (NER) enrollment ratios in secondary education – Brazil and São Paulo State, 2002-2006



Sources: INEP, Census in Primary Education (microdata); IBGE, National Survey by Household Sample (PNAD).

Notes: 1. Net [enrollment] rate is a ratio between the numbers for young people in a given age (usually 15-17 years) enrolled in secondary school and all young people in the same age. Gross [enrollment] rate is a ratio between the numbers for [students] enrolled in secondary school (regardless of age) and young people in that age range.  
2. See Detailed Table 2.2.

**Table 2.4**  
Students completing high school, places in undergraduate courses, ratio of students completing high school to places in undergraduate courses and ratio of entrants into higher education to students completing high school, by type of administration – Brazil and São Paulo State, 1999-2006

Year	Students completing high school	Places in undergraduate courses			Students completing high school to places in UNDERGRADUATE COURSES			Entrants into UC to students completing high school		
		Total	Public	Private	Total	Public	Private	Total	Public	Private
<b>Brazil</b>										
1999	1,535,943	894,390	218,589	675,801	1.72	7.03	2.27	0.48	0.14	0.35
2000	1,786,827	1,100,224	237,982	862,242	1.62	7.51	2.07	0.46	0.13	0.34
2001	1,836,130	1,265,175	230,496	1,034,679	1.45	7.97	1.77	0.51	0.12	0.39
2002	1,855,419	1,590,699	263,572	1,327,127	1.17	7.04	1.40	0.59	0.14	0.46
2003	1,884,874	1,822,244	261,276	1,560,968	1.03	7.21	1.21	0.62	0.13	0.49
2004	1,851,834	2,080,358	283,822	1,796,536	0.89	6.52	1.03	0.64	0.14	0.50
2005	1,879,044	2,167,457	278,439	1,889,018	0.87	6.75	0.99	0.67	0.14	0.54
2006	1,858,615	2,337,488	298,191	2,039,297	0.80	6.23	0.91	0.71	0.15	0.56
<b>São Paulo State</b>										
1999	479,920	316,010	33,712	282,298	1.52	14.24	1.70	0.50	0.06	0.44
2000	534,421	363,595	35,935	327,660	1.47	14.87	1.63	0.45	0.06	0.39
2001	520,923	404,497	36,533	367,964	1.29	14.26	1.42	0.51	0.06	0.45
2002	510,375	484,243	42,687	441,556	1.05	11.96	1.16	0.56	0.07	0.49
2003	507,995	563,537	46,892	516,645	0.90	10.83	0.98	0.62	0.08	0.53
2004	497,999	692,760	51,236	641,524	0.72	9.72	0.78	0.67	0.09	0.57
2005	494,885	733,288	53,833	679,455	0.67	9.19	0.73	0.73	0.09	0.64
2006	479,432	819,116	56,112	763,004	0.59	8.54	0.63	0.81	0.10	0.72

Source: INEP, Primary Education Census, Higher Education Census (microdata).

Notes: 1. For comparison with the number of undergraduate places and entrances, students completing secondary school refer to the years immediately before the current year.

2. See Detailed Table 2.4.

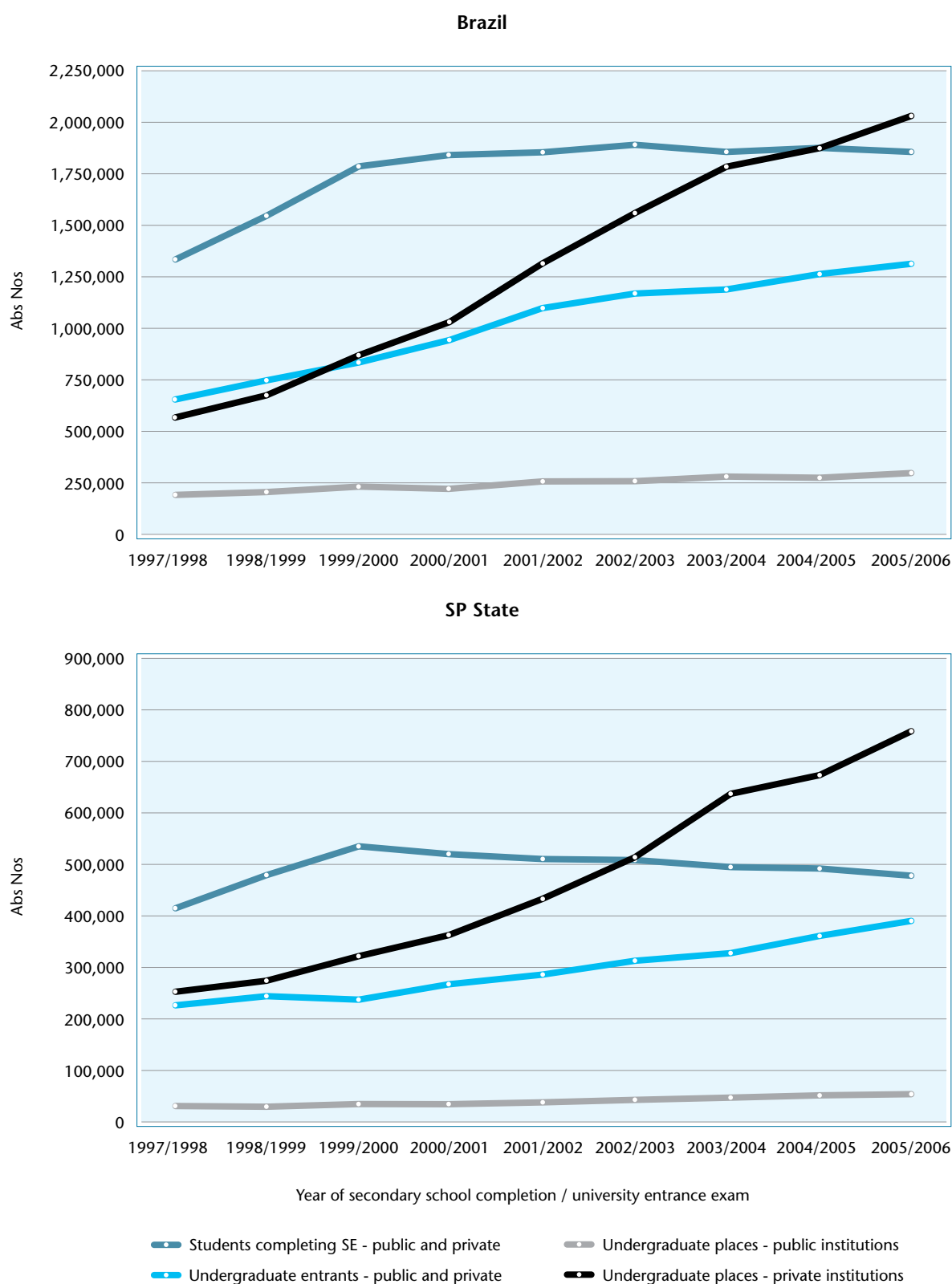
secondary school, the ratio for final-year students per place decreased from 1.72 (1999) to 0.80 (2006; Table 2.4). The number of undergraduate places has grown higher than the number of secondary school graduates. It should be noted that the oversupply of undergraduate places is due to the growth in private education. In this sector, the 2.27 ration in 1999 dropped to 0.91 in 2006.

In São Paulo State, the ratio between secondary school graduates and those entering higher education also declined. In private education, the ratio fell from 1.70 (1999) to 0.63 (2006). In public education, the number of undergraduate places per student secondary school graduates in São Paulo State increased from one per 14.2 students in 1999 to one to 8.54 (2006), i.e.,

the supply increased in this period. The tendency for the growth in places to outpace the number of secondary education graduates was particularly pronounced in São Paulo State, where there were 479,432 secondary education graduates and 389,137 HE entrants in 2006 (Detailed Table 2.4).

The situation is therefore paradoxical: Brazil's GER in higher education is still lower than that in all countries in Latin America; yet at the same time, a very high ratio of secondary school graduates is absorbed in higher education: 81% in São Paulo State and 71% in Brazil. These rates are higher than those observed in many developed nations. In addition, there is a significant ratio of unfilled undergraduate places concentrated in the private sector (Figure 2.6).

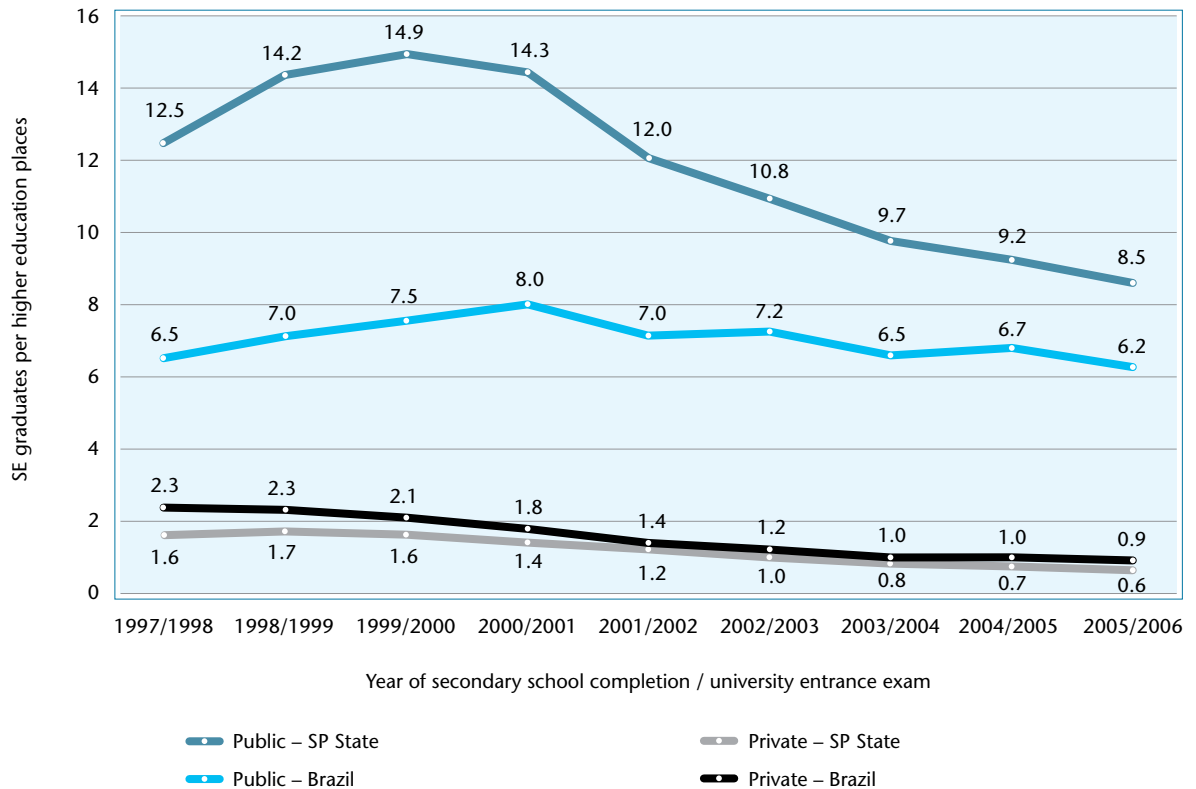
**Figure 2.5**  
**Students completing secondary education, undergraduate places, applicants and entrants, by type of administration – Brazil and São Paulo State, 1997-2006**



Source: INEP, Primary education Census, Higher education Census.

Note: See Detailed Table 2.4.

**Figure 2.6**  
Ratio of students completing secondary school to undergraduate places in HEI, by type of administration – Brazil and São Paulo State, 1997-2006



Source: INEP, Primary education Census, Higher education Census.

Note: See Detailed Table 2.4.

From a technical standpoint there is not a shortage of undergraduate places in higher education does not exist in São Paulo State and Brazil. The system has the capacity to absorb all potential demand, which is limited by the number of secondary school graduates. Regarding entrance, all actual demand is absorbed by the system in São Paulo State. However, given that there is a high dropout rate during and just after elementary school, the total demand for undergraduate places is higher since other young people, who usually continue to work while attending classes at the tertiary level, are also included.

Increase in the enrollment ratio depends on other factors, and the most important of them is the great economic and social inequality that characterizes the country.

### 3.4.1 Socioeconomic inequality

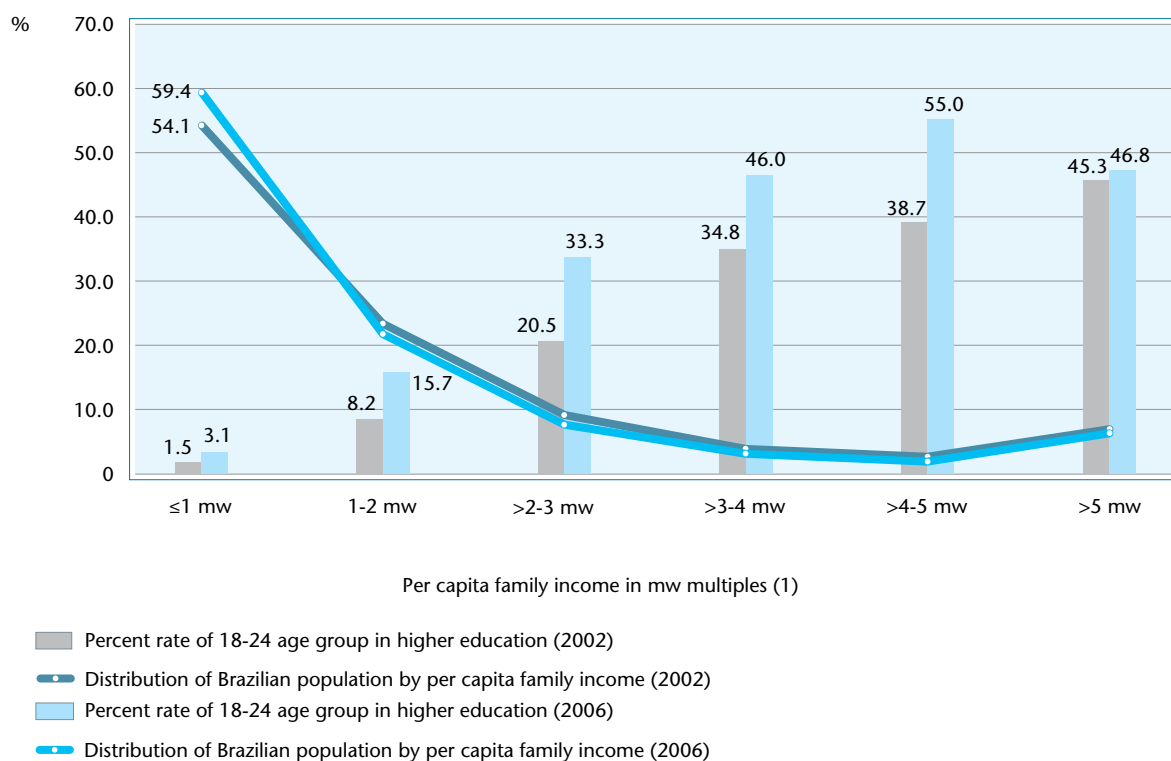
There is a consensus that education and income levels are linked. The countries with the best education

systems and highest access ratios to higher education are those with the lowest percentage below the poverty line and where social inequalities are less pronounced. Brazil has one of the highest rates of socioeconomic inequality and a very low average schooling. Assuming that an increase in undergraduate places in higher education alone can expand access to this system for all strata of the population is not reasonable.

An examination of access to education by income level reveals that those earning more than two minimum salaries per capita, the enrollment rate is close to that observed in developed countries. The enrollment ratio in Brazil for those earning 4 to 5 minimum salaries is equivalent to that observed in Central Europe. Therefore, marked expansion in enrollment depends on absorption of lower-income populations (Figure 2.7 and Detailed Table 5.2).

Within the current structure of the system because most undergraduate places are found in the private sector, which charges tuition (in contrast to free public education), greater inclusion of students de-

**Figure 2.7**  
Percent rate of 18-24 age group in higher education and distribution of population by per capita family income in minimum wage (mw) multiples – Brazil and São Paulo State, 2002-2006



Source: IBGE, National Household Sample Survey (PNAD).

Notes: The graph for year 2002 (Andrade, 2004; published in Indicators of Science, Technology and Innovation in São Paulo, 2004) is used herein and complemented.

2. Houses in the rural areas of Rondônia, Acre, Amazonas, Roraima, Pará, and Amapá were excluded.

3. See Detailed table 2.5.

(1) Including families without income.

**Table 2.5a**  
Distribution of the population aged 18-24 who attends or attended higher education, by the percentages of the family income in minimum wage ranges, according to the type of administration of the secondary school – Brazil, 2003

Per capita family income in minimum wage ranges (mw)	Distribution of the population aged 18-24 who attends or attended higher education: percentages of the family income in minimum wage ranges, according to the type of administration of the secondary school		
	Total	Private	Public
Total (Abs N <sup>est</sup> )	2,408,054	1,742,057	665,997
Total (%)	100.0	100.0	100.0
≤½ mw	3.0	2.0	5.0
>½-1 mw	8.0	6.0	11.0
>1-2 mw	23.0	22.0	28.0
>2-5 mw	43.0	45.0	37.0
>5 mw	23.0	25.0	19.0

Source: IBGE, National Household Sample Survey (PNAD).

Note: Based on Andrade and Dachs (2007).



**Table 2.5b**  
Distribution of the population aged 18-24 who attends or attended higher education, by the percentages of the type of administration of the secondary school, according to the family income in minimum wage ranges – Brazil, 2003

Per capita family income in minimum wage ranges (mw)	Distribution of the population aged 18-24 who attends or attended higher education: percentages of the type of administration of secondary school, according to the family income in minimum wage ranges			
	Total		Private (%)	Public (%)
	Abs. nos.	(%)		
<b>Total</b>	<b>2,408,054</b>	<b>100.0</b>	<b>72.0</b>	<b>28.0</b>
≤½ mw	64,952	100.0	53.0	47.0
>½-1 mw	181,644	100.0	58.0	42.0
>1-2 mw	561,744	100.0	67.0	33.0
>2-5 mw	1,038,809	100.0	76.0	24.0
>5 mw	560,905	100.0	78.0	22.0

Source: IBGE, National Household Sample Survey (PNAD).

Notes: 1. Based on Andrade and Dachs (2007).

2. See Table 2.5a.

depends on a decrease in the degree of social inequality allowing families to keep their children in school until they complete high school and finance their higher education in private institutions.

However, it should be noted that the following statements are not true: (1) public education gives preferential treatment to people with higher incomes and (2) young people with lower socioeconomic status are included in the private sector.

In fact, the proportion of higher income populations is greater in both public and private education. However, there are important differences: the proportion of low-income students in public higher education is higher than in the private HEIs; inversely, the proportion of students from higher-income families in the private sector is higher than in public HEIs (CARDOSO, SAMPAIO, 1994; SAMPAIO, 2000; ANDRADE, DACHS, 2007). In 2003, 16% of students with incomes earning 1 minimum salary attended public schools and 8% (half as many) attended private schools (Tables 2.5a and 2.5b).

Increasing free undergraduate places in both public and private schools has been adopted as a strategy to boost Brazil's enrollment ratio. In the latter case, scholarships are directly or indirectly funded by the government. Both solutions are not mutually exclusive. In the first option, it should be noted that the ratio of high school graduates and undergraduate places in public higher education in São Paulo State, was 14.2 (1999) and decreased to 8.5 (2006), although it is much higher than in the private sector. In Brazil, this

ratio was lower and more stable and decreased from 7.0 (1999) to 6.2 in (2006) (Table 2.4).

The second option was implemented by the federal government through the ProUni Program (2005), which was probably responsible for the fact that enrollment in private higher education has not diminished as expected. Data from SisProUni/MEC (ProUni System) show a total supply of 13,939 partial scholarships and 21,713 full scholarships in São Paulo State (2005). In 2006, the number of partial scholarships was reduced to 11,007; on the other hand, 25,768 new full scholarships were added for a total of 36,775 full scholarships, or about 20% of total enrollment in undergraduate courses at public HEIs. There is no data available for actual scholarships awarded.

Even this second solution has barriers related to social inequality. In order to receive a scholarship, the student must fall below the income ceiling and obtain a minimum score on the National Secondary School Exam (ENEM). Given these criteria, the number total applicants fell below the scholarships offered, prompting officials to raise the income ceiling to fill available undergraduate places. The problem is that the number of low-income pupils who complete high school with good enough scores to enter higher education is insufficient, although the academic admission requirements for private education are lower than in the public HEIs. Therefore, another barrier to increasing access to higher education in Brazil is emerging: the quality of primary education (discussion in the next section).

**Table 2.6**  
Distribution of students aged 15, by performance evaluation in the PISA reading test 2006 – Brazil and selected countries, 2006

Selected countries	Levels of proficiency in the PISA reading test 2006												
	Total (%)	Below Level 1 ( $< 334.75$ )		Level 1 ( $\geq 334.75 - < 407.47$ )		Level 2 ( $\geq 407.47 - < 480.18$ )		Level 3 ( $\geq 480.18 - < 552.89$ )		Level 4 ( $\geq 552.89 - < 625.61$ )		Level 5 ( $\geq 625.61$ )	
		%	SD	%	SD	%	SD	%	SD	%	SD	%	SD
South Korea	100.0	1.4	(0.3)	4.3	(0.7)	12.5	(0.8)	27.2	(1.1)	32.7	(1.3)	21.7	(1.4)
Canada	100.0	3.4	(0.4)	7.6	(0.4)	18.0	(0.8)	29.4	(1.0)	27.2	(0.8)	14.5	(0.7)
Australia	100.0	3.8	(0.3)	9.6	(0.5)	21.0	(0.7)	30.1	(0.6)	24.9	(0.7)	10.6	(0.6)
Germany	100.0	8.3	(0.9)	11.8	(0.8)	20.3	(1.0)	27.3	(0.9)	22.5	(1.1)	9.9	(0.7)
Japan	100.0	6.7	(0.7)	11.7	(1.0)	22.0	(0.9)	28.7	(1.0)	21.5	(0.9)	9.4	(0.7)
Switzerland	100.0	5.3	(0.6)	11.1	(0.6)	22.9	(1.0)	30.4	(0.9)	22.6	(0.9)	7.7	(0.7)
Portugal	100.0	9.3	(1.0)	15.6	(1.0)	25.5	(1.0)	28.2	(1.1)	16.8	(0.9)	4.6	(0.5)
Chile	100.0	14.8	(1.2)	21.5	(1.3)	28.0	(1.1)	21.1	(1.1)	11.0	(0.9)	3.5	(0.6)
<b>Brazil</b>	<b>100.0</b>	<b>27.8</b>	<b>(1.2)</b>	<b>27.7</b>	<b>(0.9)</b>	<b>25.3</b>	<b>(1.1)</b>	<b>13.4</b>	<b>(0.8)</b>	<b>4.7</b>	<b>(0.5)</b>	<b>1.1</b>	<b>(0.3)</b>
Argentina	100.0	35.8	(2.4)	22.1	(1.6)	21.8	(1.3)	14.3	(1.3)	5.1	(0.7)	0.9	(0.2)
Mexico	100.0	21.0	(1.3)	26.0	(1.0)	28.9	(1.0)	18.2	(0.8)	5.3	(0.4)	0.6	(0.1)

Source: standard deviation.

Note: PISA = Program for International Student Assessment.

### 3.4.2 The quality of primary education

In order to better understand the challenges to increasing access to higher education, another factor must be added to analyze the relationship between income and educational level: the quality of secondary education outcomes.

In fact, regarding the data shown in Chapter 1, the level of student performance in primary education is insufficient, tending to decrease from primary to secondary education. According to data from the international evaluation PISA<sup>7</sup> 2006 on reading proficiency, only 18.1% of Brazilian students were classified at levels 3 and 4 and only 1.1% at level 5 (Table 2.6). In mathematics, the performance was even worse.

On the other hand, 55.5% were rated at 1 and below. The Basic Education Evaluation System (*Sistemas de Avaliação de Educação Básica*, SAEB) and São Paulo State Student Assessment System (*Sistemas de Avaliação de Rendimento Escolar do Estado de SP*, SARESP) show similar data for secondary education graduates (Table 2.7). Regarding public education alone, which encom-

passes most students, the performance is even lower, reflecting deficiency in primary education.

Results of the São Paulo State Educational Development Index (*Índice de Desenvolvimento da Educação no Estado de SP*, IDESP) – a new indicator that measures the performance of students enrolled in São Paulo State public schools – were released in May 2008 revealing an average of 1.41 (on a scale of 0-10) for third-grade students in secondary education (Table 2.8).

In recent decades, performance indicators have been falling following the increase in enrollment. Moreover, performance has worsened in later grades. From 2007 onwards, a slight improvement has occurred in the performance of initial elementary school grades; however, it has not yet been reflected in the final grades of this education level or in secondary education.

The vast majority of young people complete secondary education with serious difficulties in reading, writing and solving elementary mathematical problems with fragmented knowledge on current events (sociopolitical progress) and a minimal scientific foun-

7. The Program for International Students Assessment (PISA) evaluates students aged 15 with a 1-5 scale, according to ranges of scores obtained in proficiency tests. In the PISA reading test 2006, the levels corresponded to the following score ranges. Level < 1: scores < 335; Level 1: scores in the range 335-407; Level 2: scores in the range 407-480; Level 3: scores in the range 480-553; Level 4: scores in the range 553-626; Level 5: scores > 626.

**Table 2.7**  
Distribution of pupils of the state institutions of primary education in tests of Mathematics and Portuguese language, by levels of performance and education – São Paulo State, 2005-2007

Levels of performance	Distribution of pupils of the state institutions of primary education, by levels of performance, according to the levels of education							
	4 <sup>th</sup> year (elementary school)		6 <sup>th</sup> year (elementary school)		8 <sup>th</sup> year (elementary school)		3 <sup>rd</sup> year (high school)	
	SAEB 2005	SARESP 2007	SAEB 2005	SARESP 2007	SAEB 2005	SARESP 2007	SAEB 2005	SARESP 2007
<b>Mathematics</b>								
<b>Total</b>	100.0	100.0	...	100.0	100.0	100.0	100.0	100.0
Advanced	3.0	2.0	...	0.0	0.0	0.0	0.0	1.0
Adequate	16.0	17.0	...	22.0	8.0	5.0	6.0	4.0
Basic	34.0	37.0	...	23.0	44.0	45.0	31.0	25.0
Below basic	47.0	44.0	...	55.0	48.0	50.0	63.0	71.0
<b>Portuguese language</b>								
<b>Total</b>	100.0	100.0	...	100.0	100.0	100.0	100.0	100.0
Advanced	6.0	6.0	...	3.0	3.0	6.0	1.0	0.0
Adequate	29.0	35.0	...	34.0	15.0	24.0	18.0	21.0
Basic	36.0	39.0	...	45.0	53.0	47.0	34.0	39.0
Below basic	29.0	21.0	...	18.0	29.0	23.0	48.0	40.0

Sources: State Department of Education of São Paulo. System for Evaluation of Educational Achievement in São Paulo State (Saresp, 2007); Inep. System for Evaluation of Basic Education (Saeb, 2005).

**Table 2.8**  
Assessment by IDESP of pupil performance in state institutions of primary education, by curriculum subjects, regional coordination, and education level – São Paulo State, 2007

Coordinations, and education levels	Assessment by IDESP of the pupil performance in state institutions of primary education by levels of education and curriculum subjects		
	Portuguese language	Mathematics	Averages
<b>SP State</b>			
First half of primary education (Years 1-4)	4.00	2.47	3.23
Second half of primary education (Years 5-8)	3.39	1.69	2.54
Secondary education	1.99	0.82	1.41
<b>Coordination of Education of the Metropolitan Area of São Paulo (COGSP)</b>			
First half of primary education (Years 1-4)	3.75	2.18	2.96
Second half of primary education (Years 5-8)	3.01	1.37	2.19
Secondary education	1.76	0.62	1.19
<b>Coordination of Education of the State Countryside (CE)</b>			
First half of primary education (Years 1-4)	4.26	2.76	3.51
Second half of primary education (Years 5-8)	3.64	1.90	2.77
Secondary education	2.14	0.94	1.54

Source: SP State Department of Education.

Note: The São Paulo State Educational Development Index (IDESP) ranges from 0 to 10.

dations. As a result, these students have serious difficulties entering a good university.

Regarding this issue, Table 2.5 shows surprising results: even among the poorest people (with per capita family income below the minimum wage), 53% of about 65,000 students who entered higher education attended private secondary education. In the population with per capita family incomes of 0.5-1 and 1-2 minimum wages, the percentages are 58% and 67%. This shows low-income families can make a great effort to keep their children in private schools (which they consider the best ones), paying monthly fees or obtaining scholarships. This fact indicates the existence of a structural barrier to the growth of higher education, which directly affects public education.

### 3.5 Evolution in the number of graduates

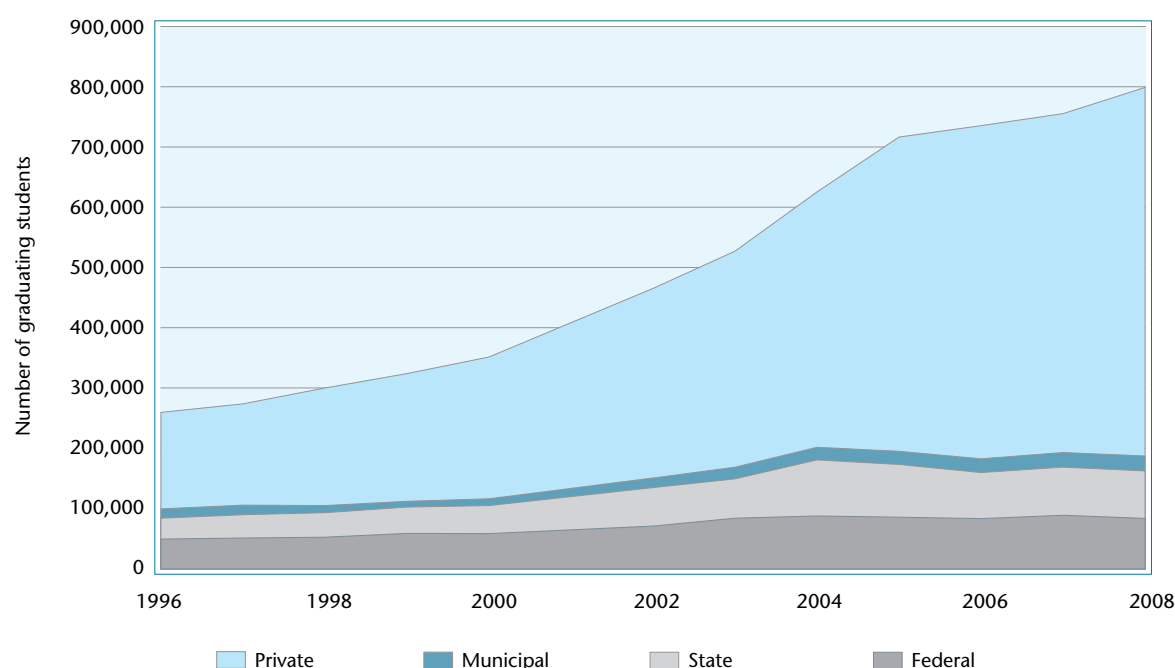
Figure 2.8 and Table 2.9 show the trend in the number of higher education graduates in Brazil, classified according to the nature of the institutions where they studied and how private institutions have predominated (77%).

In public HEIs, approximately equal portions of graduates come from federal (11%) and state (10%) institutions whereas a much smaller fraction (3%) comes from municipal institutions.

Figure 2.8 shows relative stability in the public system; while in the private system, on the other hand, growth continues, albeit at a much lower rate than observed prior to 2005, when a striking break occurred in this trend.

The situation in São Paulo State shown in Figure 2.9 is different from the remainder of Brazil in that the contribution of federal institutions is hardly noticeable; this fact was already observed in section 2.3.2, where enrollment is analyzed. The situation for 2008 is shown in Table 2.10, where the contribution of graduating students in federal institutions is shown to be more than 11 times smaller than in state institutions. The low federal government support to public higher education in São Paulo State is also highlighted in Chapter 3 (section 3.5.1.1 and Table 3.24). These data show that the probability of a São Paulo State secondary education graduate entering a federal university in the state lower than any other state in Brazil.

**Figure 2.8**  
Growth in the number of students completing undergraduate courses, by type of administration – Brazil, 1996-2008



Source: INEP/MEC.

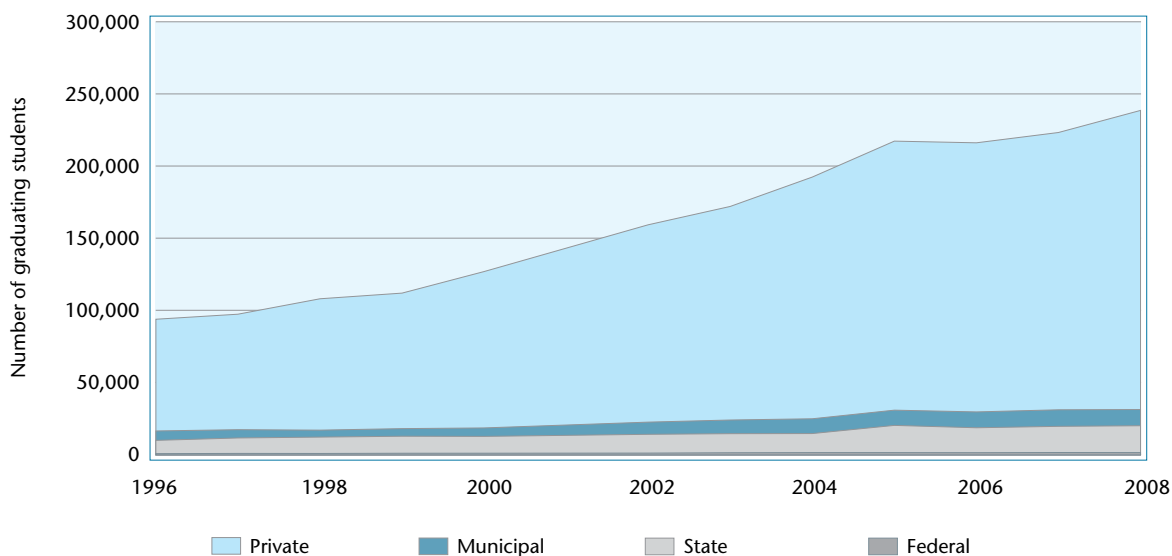
Note: See Detailed Table 2.6.

**Table 2.9**  
Students completing undergraduate courses, by administrative nature of the institution – Brazil, 2008

Types of administration	Students completing undergraduate courses	
	Abs. Nos.	%
<b>Total</b>	<b>800,318</b>	<b>100.0</b>
Public	187,758	23.5
Federal	84,036	10.5
State	78,879	9.9
Municipal	24,843	3.1
Private	612,560	76.5
For-profit	375,001	46.9
Community/faith based/philanthropic	237,559	29.7

Source: Inep/MEC

**Figure 2.9**  
Growth in the number of students completing undergraduate courses, by type of administration – São Paulo State, 1996-2008



Source: INEP/MEC.

Note: See Detailed Table 2.6.

**Table 2.10**  
Students completing undergraduate courses, by administrative nature of the institution – São Paulo State, 2008

Types of administration	Students completing undergraduate courses	
	Abs Nos	Relat Nos. (%)
<b>Total</b>	<b>239,601</b>	<b>100</b>
Public	31,553	13.2
Federal	1,599	0.7
State	18,684	7.8
Municipal	11,270	4.7
Private	208,048	86.8
For-profit	148,436	62.0
Community/faith-based/philanthropic	59,612	24.9

Sources: Inep/MEC.

### 3.5.1 Graduating students according to the day or evening period of classes

Another key variable that is relevant to social inclusion and differentiates higher education in São Pau-

lo State from that in other states, is the presence of evening courses. This characteristic is highlighted in Table 2.11, where graduating students are grouped according to their study period (day or night).

In Brazil, 64% of graduating students had evening

**Table 2.11**  
Students completing undergraduate courses, by administrative nature of the institution and period of classes – Brazil and São Paulo State, 2008

Type of administration	Students completing undergraduate courses, by period of classes			
	Daytime		Evening	
	Abs. Nos.	% total	Abs. Nos.	% total
<b>Total Brazil</b>	<b>284,697</b>	<b>36</b>	<b>515,621</b>	<b>64</b>
Public	119,531	64	68,227	36
Federal	64,031	76	20,005	24
State	49,374	63	29,505	37
Municipal	6,126	25	18,717	75
Private	165,166	27	447,394	73
For-profit	85,217	23	289,784	77
Community/faith-based/philanthropic	79,949	34	157,610	66
<b>Total SP State</b>	<b>58,401</b>	<b>24</b>	<b>181,200</b>	<b>76</b>
Public	14,977	47	16,576	53
Federal	1,219	76	380	24
State	11,770	63	6,914	37
Municipal	1,988	18	9,282	82
Private	43,424	21	164,624	79
For-profit	25,414	17	123,022	83
Community/faith-based/philanthropic	18,010	30	41,602	70

Source: Inep/MEC.

classes, whereas in São Paulo State the rate is 76%. The difference between those who attended private higher education is small: 73% of the graduating students in Brazil and 79% in São Paulo State. Regarding graduating students in public higher education, the difference is larger: 53% of the graduating students in São Paulo State studied at night and only 36% in Brazil. The difference between the rates for the state system (37%) and the federal system (24%) is remarkable; in addition, the high percentage of graduating students in evening courses in municipal HEIs is also noteworthy.

### 3.5.2 Graduating students in relation to the population: international comparison

Analyzing the number of graduates relative to the age cohort is better for understanding access to higher education than enrollment alone. One component that affects enrollment is the system of access to higher education. Certain countries (such as Brazil) select students at the end of secondary education via exit exam. Others admit all secondary education graduates into higher education, and in many cases, have high absenteeism

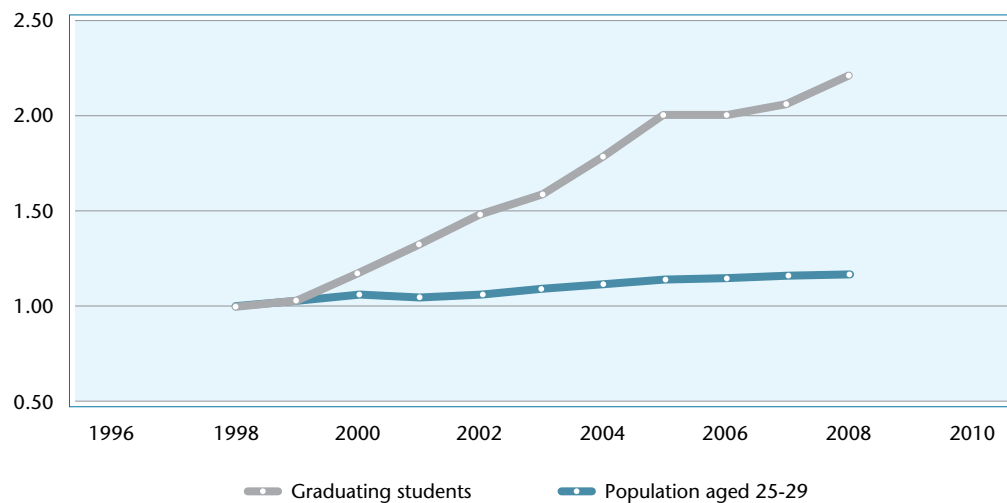
and dropout rates. For this reason, analysis of access using enrollment numbers can lead to wrong conclusions.

The next three figures illustrate patterns in graduation rates based on the appropriate age cohort for completing a first degree, defined here as 25-29. Selection of this range is arbitrary, but can be justified for Brazil because of the age-grade lag, which is carried from primary to higher education; in addition, use of any other age group (e.g., 20-24 years), does not cause a major change in the results.

Figure 2.10 shows that growth in the number of graduating students in São Paulo State has outstripped growth in the 25-29 age cohort. As a result, the graduation rate rose (Figure 2.11) in Brazil and SP State. This rate reached 33% in São Paulo State and 25% in Brazil for 2008.

In Figure 2.12, the graduation rates in São Paulo State and Brazil are compared with those of selected countries. Differently from what is observed in enrollment, the position of both Brazil and São Paulo State is better than that of other countries in Latin America (such as Argentina, Chile, and Mexico) but still far behind countries like UK and Australia.

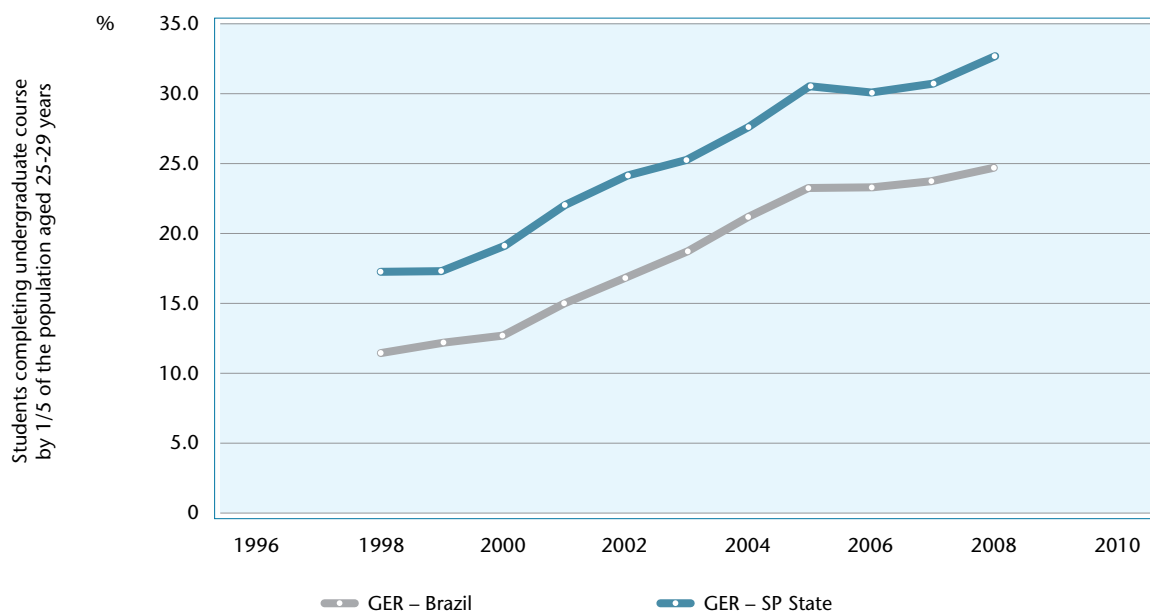
**Figure 2.10**  
Relative growth in the number of students completing higher education and the population aged 25-29 years – São Paulo State, 1998-2008



Source: INEP/MEC; SEADE Foundation.

Notes: 1. Base year 1998 = 1.  
2. See Detailed Table 2.7.

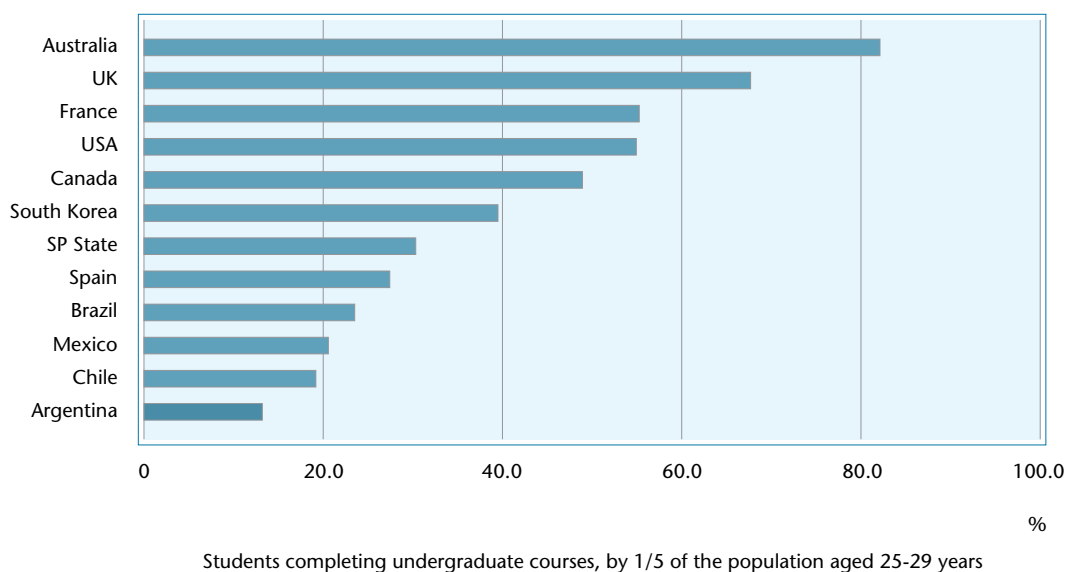
**Figure 2.11**  
Gross enrollment rate (GER) of students completing higher education – Brazil and São Paulo State, 1998-2008



Source: INEP/MEC; IBGE, projections of Brazilian population by sex and age for 1980-2050 (2004 revision).

Notes: 1. Gross rate of students completing higher education is herein calculated as a ratio between the number of graduates and 1/5 of the population with 25-29 years.  
2. See Detailed Table 2.7.

**Figure 2.12**  
Graduation rates in higher education – Brazil, São Paulo State, and selected countries, 2006



Source: Argentina, Chile and Mexico: RICYT, SP State, and Brazil: data of this chapter; other countries: OECD. Stats.

Note: See Detailed Table 2.8.



### 3.6 Undergraduate education: public and private systems

In São Paulo State, the development of the higher education system has the same general characteristics observed in the other states in Brazil as a whole. The difference is that in São Paulo State, these characteristics arose earlier and more intensely. These characteristics are discussed in detail below.

#### 3.6.1 Expansion in undergraduate education

The fast pace of expansion in the higher education system, which almost doubled in seven years (1999-2006), is the first characteristic of the recent growth in higher education. Table 2.12 on the evolution of enrollment in São Paulo State and Brazil shows that the state accounted for the highest total share of enrollment among all states. São Paulo State's enrollment ratios are also the highest.

On the other hand, analysis of this historical series shows that the difference between São Paulo State and other Brazilian states decreased considerably (1999-2005): São Paulo State's contribution to total enrollment dropped from 31.1% to 26.3% in the same period. In 2006, however, it edged back up to 26.9%.

Following the process in the next years will be important to verify whether the trend is continues. A similar phenomenon occurs with other indicators for both undergraduate and graduate studies.

It seems correct to state that all the main trends of the higher education system in Brazil, including the expansion in private sector, start in São Paulo state and then spread out to the rest of the country. Therefore, the trend is a decrease in regional imbalances, not a slower growth in the higher education system in São Paulo State.

Higher education enrollment ratios in Brazil are very low compared to that of Latin American and developed countries; moreover, the growth rates have declined in Brazil and São Paulo State. The previous edition of *Indicators of Science, Technology and Innovation in São Paulo State* (FAPESP, 2005) already pointed in that direction, allowing for anticipation of a period of stagnation. The highest growth occurred in the period 2001-2003, when enrollment in Brazil increased from 2,999,282 to 3,827,315 (Table 2.12); in the period 2003-2006, the growth rate was lower, but stagnation did not occur.

In addition to these general indicators, there are important differences between the public and private sectors in São Paulo State and Brazil, not only legal and

**Table 2.12**  
Enrollment in higher education – Brazil and São Paulo State, 1999-2006

Years	Enrollments in higher education (1)		
	Brazil (abs. nos.)	SP State (abs. nos.)	SP State / Brazil (%)
1999	2,350,461	731,522	31.1
2000	2,670,923	808,335	30.3
2001	2,999,282	887,448	29.6
2002	3,436,734	972,893	28.3
2003	3,827,315	1,027,010	26.8
2004	4,087,301	1,079,321	26.4
2005	4,369,937	1,150,021	26.3
2006	4,578,509	1,230,615	26.9
	Growth rate (%)		
1999-2001	27.6	21.3	
2001-2006	52.7	38.7	

Source: INEP, Higher Education Census (microdata).

Note: See Detailed Table 2.9.

(1) Enrollments in Technological Education Centers (CETs) and Colleges of Technology (FATECs) were excluded.

administrative differences but of quantity and quality. Therefore, growth in the system must be analyzed considering these sectors separately, given their very different trajectories.

### 3.6.2 Relationship between the public and private sectors

In the last years, a particularly interesting facet of the system is the continued decrease in enrollment in the public sector (relative to the private one), especially in São Paulo State, is a characteristic of particular interest in the system. In contrast to the private sector, the public sector provides free education and hosts almost all institutions that combine education and research.

Analysis of the dynamics in the undergraduate education system for a longer period (since 1933, when the first statistical studies were initiated) shows that the private sector already had significant share early on and recently began to predominate in the supply of undergraduate places. Another feature of this growth is that the private sector's relative weight is more pronounced in periods when the whole system (public and private) is growing rapidly.

Statistics indicates that both absolute and relative growth are not uniform over time, but occurs in cycles; currently, the system is emerging from a period of high growth to enter a period of deceleration. In the latter phase, the system is still growing, albeit at lower rates.

The first period of accelerated growth in private education occurred in the 1970-1980 period, when enrollment in the private sector surpassed the public sector, stabilizing around 64% (Table 2.13 and Figure 2.13). In the 1980-1995, an overall growth in higher education occurred and the private sector lost ground. From 1995 on, a new boom began and the private sector's share again rose. In the last decade, the development of public undergraduate education was comparable to that of the private sector in São Paulo State and Brazil (Table 2.14 and Figure 2.14). In Brazil, the private education sector's share of higher education enrollment has grown from 65.4% in 1999 to 74.6% in 2006, with proportional decrease in the public system's share. In São Paulo State, the percentage is even higher with an increase from 84.6% to 86.6% in the same period.

This trend can be visualized in Figure 2.13, which shows the distribution of enrollment in the public and private sectors.<sup>8</sup> The decrease in the public sector's

**Table 2.13**  
Distribution of enrollment in higher education, by type of administration – Brazil, 1933-2005

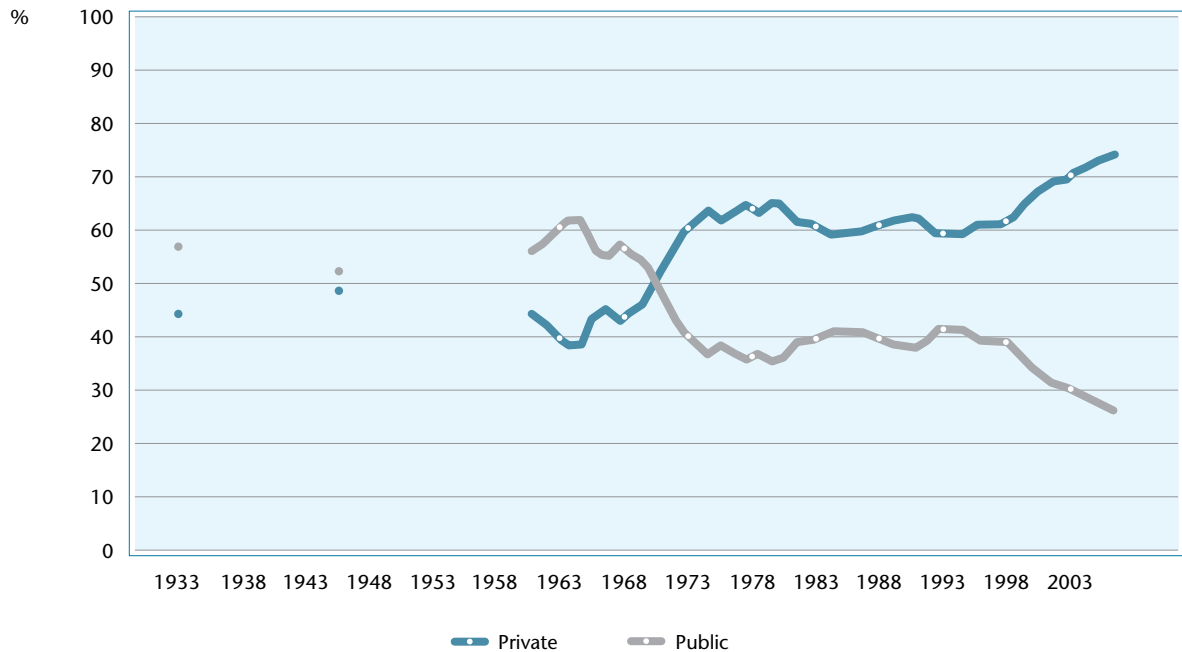
Year	Distribution of enrollment in higher education, by types of administration					
	Total		Public		Private	
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%
1933	33,723	100.0	18,986	56.3	14,737	43.7
1945	41,275	100.0	21,307	51.6	19,968	48.4
1960	101,691	100.0	59,624	58.6	42,067	41.4
1965	325,082	100.0	182,696	56.2	142,386	43.8
1970	425,478	100.0	210,613	49.5	214,865	50.5
1980	1,377,286	100.0	492,232	35.7	885,054	64.3
1990	1,540,080	100.0	578,625	37.6	961,455	62.4
1995	1,759,703	100.0	700,540	39.8	1,059,163	60.2
2000	2,694,245	100.0	887,026	32.9	1,807,219	67.1
2005	4,453,156	100.0	1,192,189	26.8	3,260,967	73.2

Source: INEP, Higher education Census (microdata).

Note: Based on Durham & Schwartzman (1992).

8. These data include courses for bachelor's and teaching degrees, and technology courses. These latter courses were not included in the statistics published by MEC until 2001 and constituted a small fraction of the total (usually, around 1%). In general, so small a fraction was not considered in the analysis. Its growth is a recent phenomenon, and has been given special treatment later in this chapter.

**Figure 2.13**  
Distribution of enrollment in higher education, by type of administration – Brazil, 1933-2003  
(selected years)



**Source:** Durham and Schwartzman (1992) for years 1933 and 1945; FAPESP (2005, ch.3, p.3-7) for the period 1960-1998; INEP. Higher Education Census (Microdata) for the period 1999-2006.

**Note:** Figure 3.1, published in *Indicators of Science, Technology and Innovation in São Paulo*, 2004 (FAPESP, 2005, ch.3, p.3-7) is used herein and complemented.

shares can be explained in part by the structural obstacles mentioned earlier.

The data on the private higher education sector reveal that the total enrollment in São Paulo State is higher than in other Brazilian states. The greater concentration of private schools in São Paulo State seems to be associated with two factors:

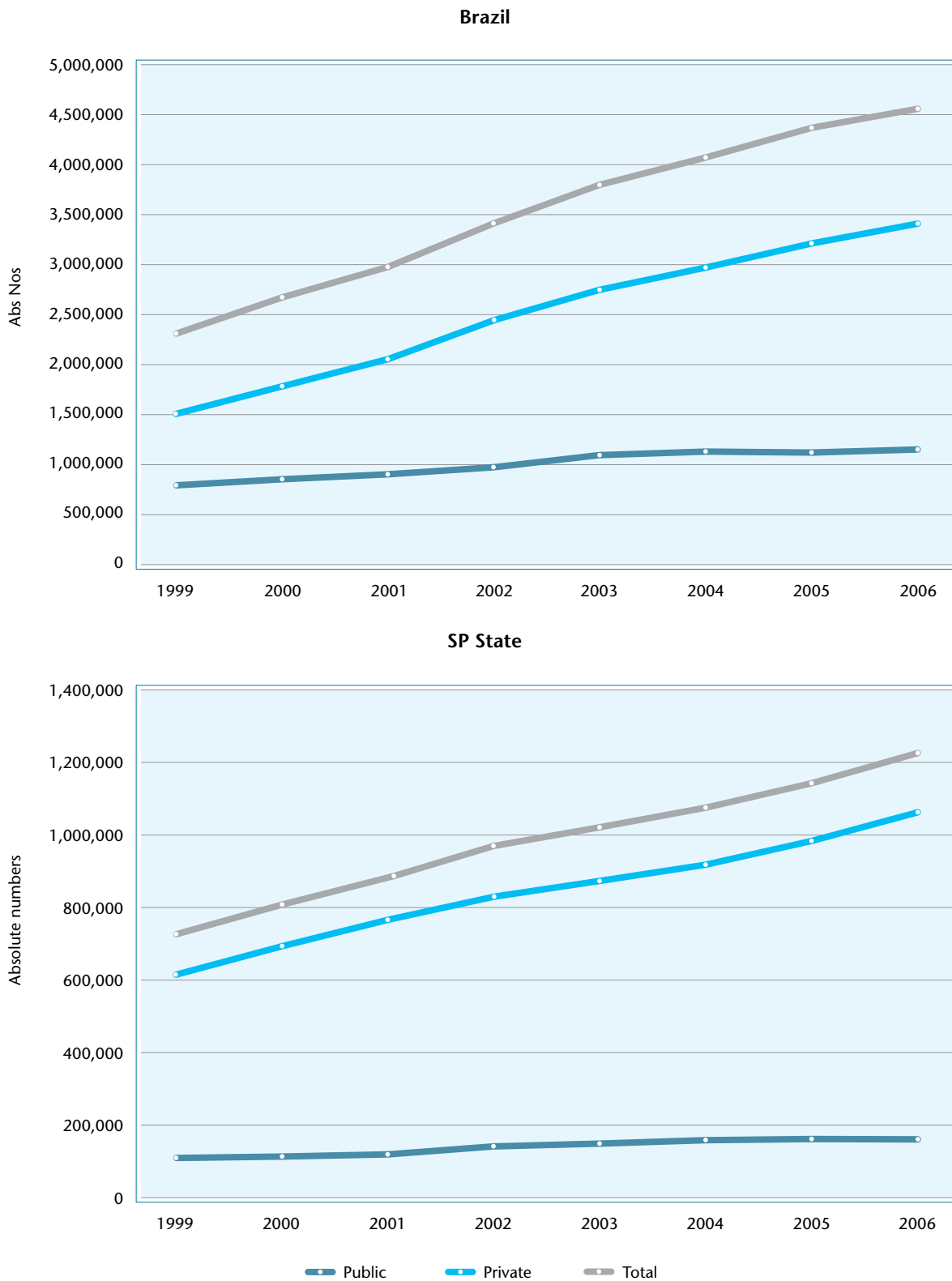
- since the highest-income segments of population (who are able to pay for private education) are concentrated in São Paulo State, the market is larger. Therefore, growth in this sector was initiated in São Paulo State; after the major part of the demand was met, it was extended to other states in Brazil in the search for new markets. Currently, the private sector seems to have reached the limits of expansion in São Paulo State;
- the federal government's contribution to public HEIs in São Paulo State is significantly lower than in the other states. Nationwide, the federal government accounted for 12.2% of total enrollment in 2006, being the leading provider of pub-

lic higher education. When Brazil, excluding São Paulo State, is taken into account, it increases to 16.4% (Table 2.15). In contrast, federal institutions in São Paulo State accounted for only 0.7% of total enrollment, whereas state institutions accounted for 7.8% (almost 12 times more than the federal government). Thus, the almost total dependence of public higher education in São Paulo State on state and municipal institutions is another characteristic.

In Brazil, private HEIs account for lofty portion of total enrollment, particularly in São Paulo State. This information fundamentally differentiates Brazil from countries in the European Union, where higher education is predominantly public. This model of education appears to be benchmark of researchers interested in Brazilian higher education. Still, Brazil is more similar Asian nations, such as Japan and South Korea, than to others with closer cultural affinities (Figure 2.15).

In Europe, public education is historically maintained by the State. Private education is almost entirely faith-based, receiving public subsidies equal or similar

**Figure 2.14**  
**Growth of enrollment in higher education, by type of administration – Brazil and São Paulo State, 1999-2006**

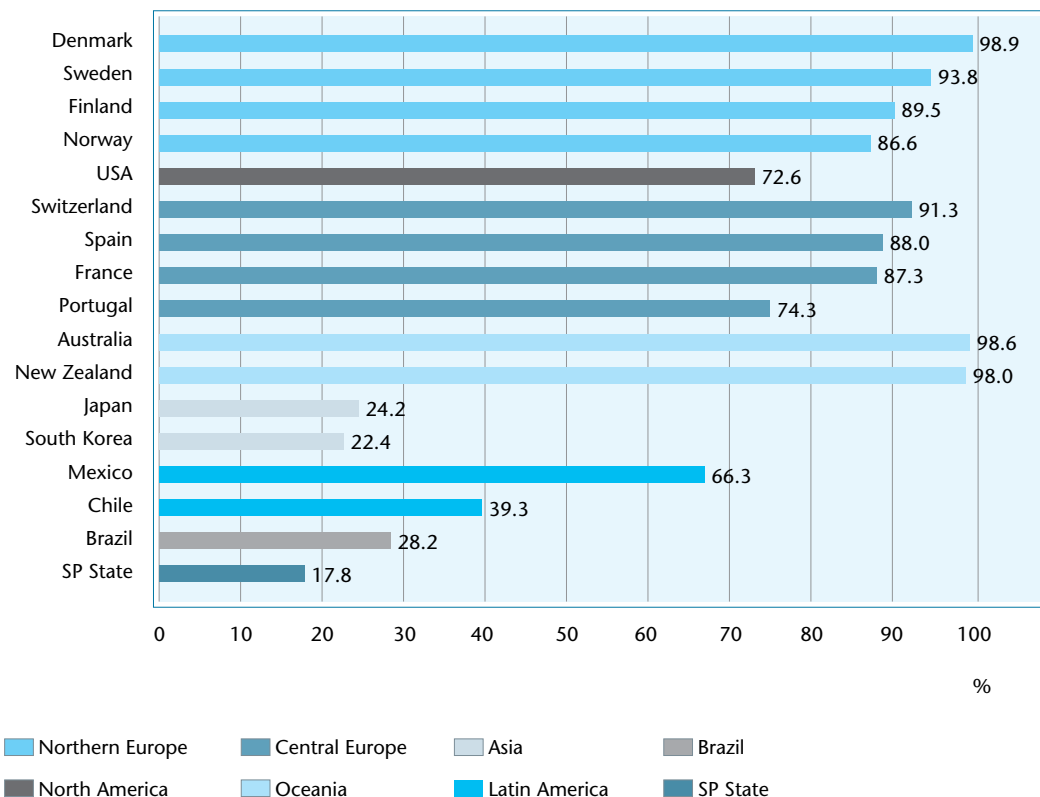


Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.9.

(1) Enrollments in Technological Education Centers (CETs) and Colleges of Technology (FATECs) were excluded.

**Figure 2.15**  
Rate of enrollment in type-A undergraduate courses of public HEI – Brazil, São Paulo State, and selected countries, 2005



Source: INEP, Higher education Census (microdata) for SP State and Brazil; Education at a Glance (OECD, 2008) for other countries.

(1) According to the classification adopted by the OECD (2003), "they are largely theory-based tertiary type-A programs, which offer qualification sufficient for entry into either an advanced research program or a profession with high skill requirements"; "in theory, they have a minimum duration, equivalent to a three-year full-time [teaching load], although in practice they last four or more years. "In Brazil, they are equivalent to academic tertiary courses (cf. ISCED 5A).

(2) Only non-technology (academic) courses are included.

to those offered to public institutions. Given these conditions, the two sectors are almost completely similar, especially because faith-based education is nonprofit and is largely restricted to religious universities.

Thus, in Denmark, Finland, Sweden, Switzerland, Australia and New Zealand, 90% or more of higher education is maintained by the public sector. Norway, Spain and France, where enrollment in public education accounts for 80%-90% of the system, can be added to those countries. In Portugal and the U.S., public education is in the range 70%-80%.

It is important to note that not all public education is free of charge. Tuition fees for undergraduate courses were recently introduced in many countries of the European Union where education had been free (as it is in Austria, Belgium, France, and Italy). Outside the European Union (but still within the OECD), in

the U.S., public education (72.6% of all enrollment) is fee-based. The same occurs in Japan, South Korea and, more recently, in China (OECD, 2007, p. 244).

In some countries, where demand for higher education is very heterogeneous, alternatives for young people with lower academic performance have successfully been adopted. Community colleges in the U.S. and technology education in Germany, France, and UK are examples of such systems. In Brazil, initiatives of this kind are still incipient and very recent, with São Paulo State in the lead.

These questions are relevant for analysis of the public education system in Brazil and São Paulo State. In fact, the difficulties that prevented public higher education from having accelerated growth (in order to accompany an increase in demand) are linked to the model of public education adopted in Brazil.

Public (both federal and state) universities in São Paulo State are among those closest to the European and North American models. They boast internationally competitive scientific production, absorbing a large proportion of graduate and undergraduate students.

Brazil undoubtedly needs institutions like these. However, this model does not allow HEIs to meet the large and heterogeneous demand found in Brazil. First, because only well-prepared students for the admission exam (Vestibular) have the solid educational foundation needed for the deeper, theory-based education. Therefore, these institutions need to be selective in the admission process, especially given the marked differences in academic performance of secondary school graduates. As discussed earlier, a large proportion of low-income students graduating from public secondary education face major difficulties entering such universities. Secondly, the cost of these universities is high since they require highly qualified and full-time academic staff with advanced degrees, as well as an infrastructure of laboratories and modern, permanently updated information networks and libraries.

Even with these difficulties, São Paulo State has maintained and even increased resources (by law a fraction of the Tax on Circulation of Goods and Services – ICMS) destined to state universities; in addition, public universities have substantially increased the number of undergraduate places and students including upping the number of undergraduate places in evening courses. According to data from São Paulo State

universities for the 1989-2005 period, across the board growth occurred in the number of undergraduate places in evening courses (124%), graduates (95%), undergraduate enrollment (72%), and the student/teacher ratio (104%). The number of teachers dropped 5%, however.

This considerable expansion [was not enough to meet rapidly-growing demand, which gave the private sector the opportunity to provide higher education. Thus, the public sector's share in total enrollment in the higher education system decreased in the period (Table 2.14).

It should be noted that in all countries considered, admission into the most prestigious public institutions is highly selective, especially in universities where teaching and research are fostered. In France and Germany, selection of students who want to attend college happens at the end of secondary education through entrance exams, the *Baccalauréat* or *Abitur*, respectively. The selection process actually begins with the admission to *Licées* or *Gymnasiums* at the beginning of secondary education. In addition, in order for students to enter the *Grandes Écoles* such as the *École Normale Supérieure* and the *Institut d'Études Politiques* in France, they have preparatory classes in the *Licées*, increasing their pre-university instruction by at least one year. In England, students are also divided at the end of secondary education and those wishing to enter higher education prepare for a special examination. In the U.S., although the criterion is more diverse (including academic performance), students who wish to enter the best univer-

**Table 2.14**  
Distribution of enrollment in higher education, by type of administration – Brazil and São Paulo State, 1999-2006

Years	Distribution of enrollment in higher education, by types of administration											
	Total (1)				Public				Private			
	Brazil		SP State		Brazil		SP State		Brazil		SP State	
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%
1999	2,350,461	100.0	731,522	100.0	812,538	34.6	112,824	15.4	1,537,923	65.4	618,698	84.6
2000	2,670,923	100.0	808,335	100.0	863,704	32.3	115,584	14.3	1,807,219	67.7	692,751	85.7
2001	2,999,282	100.0	887,448	100.0	908,386	30.3	119,912	13.5	2,090,896	69.7	767,536	86.5
2002	3,436,734	100.0	972,893	100.0	1,014,540	29.5	142,047	14.6	2,422,194	70.5	830,846	85.4
2003	3,827,315	100.0	1,027,010	100.0	1,091,574	28.5	150,882	14.7	2,735,741	71.5	876,128	85.3
2004	4,087,301	100.0	1,079,321	100.0	1,128,254	27.6	159,531	14.8	2,959,047	72.4	919,790	85.2
2005	4,369,937	100.0	1,150,021	100.0	1,148,009	26.3	164,919	14.3	3,221,928	73.7	985,102	85.7
2006	4,578,509	100.0	1,230,615	100.0	1,161,360	25.4	164,795	13.4	3,417,149	74.6	1,065,820	86.6

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.9.

(1) [Enrollments in] Technological Education Centers (CETs) and Colleges of Technology (FATECs) were excluded.

**Table 2.15**  
**Distribution of enrollment in higher education, by type of administration – Brazil (excluding São Paulo State) and São Paulo State, 1996-2006**

Years	Distribution of enrollment in higher education, by types of administration (1)											
	Grand total		Public								Private	
			Total		Federal		State		Municipal			
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%
<b>Brazil (excl. SP State)</b>												
1999	1,618,939	100.0	699,714	43.2	424,915	26.2	222,881	13.8	51,918	3.2	919,225	56.8
2000	1,862,588	100.0	748,120	40.2	462,283	24.8	251,540	13.5	34,297	1.8	1,114,468	59.8
2001	2,111,834	100.0	788,474	37.3	475,374	22.5	273,780	13.0	39,320	1.9	1,323,360	62.7
2002	2,463,841	100.0	872,493	35.4	497,802	20.2	323,540	13.1	51,151	2.1	1,591,348	64.6
2003	2,800,305	100.0	940,692	33.6	525,468	18.8	346,314	12.4	68,910	2.5	1,859,613	66.4
2004	3,007,980	100.0	968,723	32.2	531,114	17.7	366,510	12.2	71,099	2.4	2,039,257	67.8
2005	3,219,916	100.0	983,090	30.5	543,627	16.9	365,166	11.3	74,297	2.3	2,236,826	69.5
2006	3,347,894	100.0	996,565	29.8	550,328	16.4	369,238	11.0	76,999	2.3	2,351,329	70.2
<b>SP State</b>												
1999	731,522	100.0	112,824	15.4	6,754	0.9	70,908	9.7	35,162	4.8	618,698	84.6
2000	808,335	100.0	115,584	14.3	7,114	0.9	70,595	8.7	37,875	4.7	692,751	85.7
2001	887,448	100.0	119,912	13.5	7,358	0.8	72,624	8.2	39,930	4.5	767,536	86.5
2002	972,893	100.0	142,047	14.6	7,570	0.8	81,176	8.3	53,301	5.5	830,846	85.4
2003	1,027,010	100.0	150,882	14.7	7,832	0.8	85,397	8.3	57,653	5.6	876,128	85.3
2004	1,079,321	100.0	159,531	14.8	7,729	0.7	90,818	8.4	60,984	5.7	919,790	85.2
2005	1,150,021	100.0	164,919	14.3	7,687	0.7	96,276	8.4	60,956	5.3	985,102	85.7
2006	1,230,615	100.0	164,795	13.4	8,111	0.7	95,956	7.8	60,728	4.9	1,065,820	86.6
<b>Growth rate (%)</b>												
<b>Brazil (excl. SP State)</b>												
1999-2001	30.4		12.7		11.9		22.8		-24.3		44.0	
2001-2006	58.5		26.4		15.8		34.9		95.8		77.7	
<b>SP State</b>												
1999-2001	21.3		6.3		8.9		2.4		13.6		24.1	
2001-2006	38.7		37.4		10.2		32.1		52.1		38.9	

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.9.

(1) [Enrollments in] Technological Education Centers (CETs) and Colleges of Technology (FATECs) were excluded.

sities prepare throughout secondary education seeking to develop a competitive resumé

International comparisons point to major gap in Brazilian higher education for a large portion of the population who want to a university degree and cannot afford tuition but did not pass the entrance exam at major public universities.. In São Paulo State, this gap could be filled by the municipal higher education system, which is more developed than in other states of Brazil. In 2006, the municipal system accounted 4.9% of enrollment in São Paulo State, corresponding to more than half of the undergraduate places offered by state universities (Table 2.15).

However, the status of these institutions is ambiguous. Although they formally integrate the state public system, to which they are subordinated, municipal institutions are framed in different legal categories: autarchies, foundations or associations. Although created by municipal law; they generally do not receive any funding from municipalities. The group includes only 2 universities, 3 university centers and 18 integrated and single-course colleges, schools and institutes (Detailed table 2.10); however, none of them pursues research on an institutional basis. Until publication of the National Education Guidelines and Foundations Act (LGB, 1996), these institutions were fee-paying and were supported by these resources, similar to private-law institutions. In fact, the municipal sector is very different from the state sector, being similar to private institutions when it comes to terms of teacher-student ratios, degrees held by academic staff and proportion of full-time staff.

The constitutional mandate of free education at public institutions meant that municipal HEIs nearly

faced extinction. The LDB opened an exception for the municipal institutions created before the law. This hindered the creation of new municipal institutions. The oscillations observed in recent statistics reflect the uncertainty about their status.

### 3.6.3 The new private education

The recent boom in private education in Europe and other countries (such as the U.S.) is related to the creation of one type of private institution, organized as a for-profit company, which did not exist in these regions until two decades ago (Altbach, 2000; Altbach; Peterson, 1999; Sampaio, 2000; Ruch, 2001).

Until the Constitution of 1988, for-profit HEIs were banned. Therefore, although such institutions already existed before 1988, no record of their existence was found. Even after the new Constitution was approved, educational institutions (that can be called education companies) are often included under the label of philanthropic institutions, which enjoy tax exemption. This new form of private education has become commonplace in Brazil, especially in São Paulo State.

These institutions have contributed to the creation of new courses, in areas unexplored by traditional education, attracting new segments of the population. Environmental management, design, fashion, hospitality, tourism, ecology, advertising and gastronomy (many of which are offered as bachelor's degrees) are examples of these courses.

Private institutions have also invested in offering sequential courses, created by LGB (See Box 4). These courses have a shorter duration and are more

## Box 4 – Sequential courses

Sequential courses were created by Law nº 9,394/96 (article 44.1). Besides undergraduate courses and graduate programs, they were defined as courses specific knowledge fields with differing levels of completeness” and as “open to candidates who fulfill the requirements established by the education institution concerned.” They were designed to expand and give flexibility to the supply of HEI courses, and were normalized by Decision nº 1 (1999) of the CES (*Câmara de Educação Superior*: Board of Higher Education). This decision made clearer the definition of sequential courses, stating that they constitute a “series of systematic training activities, alternative or complementary to under-

graduate courses” (article 1). They were classified into two types: “I – HEI courses for collective training and leading to a diploma”, and “II – HEI courses for collective or individuals supplementary studies and leading to a certificate” (3<sup>rd</sup> article).

Courses for specific training depend on authorization and recognition before they are offered to the population, similar to short-term courses at HEIs. On the other hand, the second type does not depend on prior authorization or recognition; thus, they could be used as supplementary studies by college graduates, graduate students or even high-school graduates. This flexibility created under the LDB has seemingly been ignored by public universities.



focused on the labor market. In the short term, they seemingly meet the demand for continuing education by a population of workers with secondary education. There are no statistics available to support a more detailed analysis; however, there are indications that their number is decreasing and they are being replaced by technology courses.

It is noteworthy that, contrary to what seems to be occurring in the educational systems in Mexico and the U.S., the private higher education sector in Brazil has rarely invested in elite education, although it has done so in secondary education. In São Paulo State, there are some good universities and specialized institutions offering high-level professional training; however, almost all of them are nonprofit institutions. In private education, there are no institutions on the frontiers of scientific or technological research. This characteristic can be better observed by analyzing both distribution of courses by knowledge area and Graduate indicators.

### 3.7 Educational institutions

In addition to enrollment, it is equally important to verify the growth in the number of HEIs and their share of enrollment.

In long-term stability in the number terms of HEIs in São Paulo State, as detailed in Table 2.16, is the most prominent feature for period considered. São Paulo State still boasts the same three state universities that existed four decades ago. In the federal sector, a new university opened in 2006, bringing the total in the state to 3. The private system has also remained stable, keeping the same 30 universities that existed in 1999.

In Brazil, the number of HEIs in federal higher education system expanded significantly from 1999 to 2006, climbing from 39 to 53. Outside São Paulo State, the

state system showed moderate growth, with the number of institutions varying from 27 (1999) to 31 (2006). In Brazil (excluding São Paulo State), the private sector witnessed growth as the number of universities edged up from 53 to 56 in the period.

Significant growth in the number of private institutions occurred in university centers, a category established soon after the LDB was approved; nationwide they increased from 39 to 115 in the period (Table 2.16). In São Paulo State, HEIs in this category grew from 19 to 44. There are no state-run or federal university centers in the state,<sup>9</sup> and the number of municipal university centers is miniscule. In fact, this type of institution is concentrated in the private sector: 115 of the 119 centers found in Brazil (2006) were private and only 4 were municipal (3 of them are in São Paulo State). In 1999, all of the 39 university centers were private.

With respect to colleges, schools and institutes, the same phenomenon is observed in São Paulo State (high growth and concentration rates in the private and municipal sectors). In São Paulo State, the number of private institutions (colleges, schools and institutes) increased from 269 to 379 in the 1999-2006 period. Municipal institutions decreased from 22 to 18 during the period. The number of state-run and federal institutions of this type is negligible. There is only 1 federal and 3 state institutions (the fourth state institution was established in 2005 and disappeared in 2006).

São Paulo State's share of these HEIs and enrollment therein throughout Brazil can be calculated using the above cited data. Integrated and single-course colleges, schools and institutes in São Paulo State accounted for 33.3% of Brazil's HEIs and 35.3% of all enrollment in 1999, dropping to 22.7% and 23.5% respectively in 2006. University centers represented the majority (about 40% in both 1999 and 2006; Table 2.17).

9. Only one federal university center operated in the period 2001-2004.

**Table 2.16**  
**Higher education institutions, by type of institution and administration – Brazil and São Paulo State, 1999-2006**

Geographic areas	Higher education institutions, by types of institution and administration																															
	Universities					University centers					Integrated colleges, single-purpose colleges, schools and institutes																					
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private																	
Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%																	
	<b>Grand Total</b>																															
(1)	<b>1999</b>																															
Brazil	1,081	100.0	155	100.0	39	25.2	30	19.4	3	1.9	83	53.5	39	100.0	*	*	*	*	*	*	887	100.0	11	1.2	36	4.1	57	6.4	783	88.3		
SP State	350	32.4	36	100.0	2	5.6	3	8.3	1	2.8	30	83.3	19	100.0	*	*	*	*	*	19	100.0	295	100.0	1	0.3	3	1.0	22	7.5	269	91.2	
	<b>2000</b>																															
Brazil	1,161	100.0	156	100.0	39	25.0	30	19.2	2	1.3	85	54.5	50	100.0	*	*	*	*	1	2.0	49	98.0	955	100.0	11	1.2	23	2.4	51	5.3	870	91.1
SP State	365	31.4	36	100.0	2	5.6	3	8.3	1	2.8	30	83.3	22	100.0	*	*	*	*	1	4.5	21	95.5	307	100.0	1	0.3	3	1.0	20	6.5	283	92.2
	<b>2001</b>																															
Brazil	1,357	100.0	156	100.0	39	25.0	30	19.2	2	1.3	85	54.5	66	100.0	1	1.5	*	*	1	1.5	64	97.0	1,135	100.0	10	0.9	24	2.1	50	4.4	1,051	92.6
SP State	396	29.2	36	100.0	2	5.6	3	8.3	1	2.8	30	83.3	30	100.0	*	*	*	*	1	3.3	29	96.7	330	100.0	1	0.3	3	0.9	19	5.8	307	93.0
	<b>2002</b>																															
Brazil	1,584	100.0	162	100.0	43	26.5	31	19.1	4	2.5	84	51.9	77	100.0	1	1.3	*	*	2	2.6	74	96.1	1,345	100.0	7	0.5	25	1.9	51	3.8	1,262	93.8
SP State	427	27.0	36	100.0	2	5.6	3	8.3	1	2.8	30	83.3	33	100.0	*	*	*	*	2	6.1	31	93.9	358	100.0	1	0.3	3	0.8	20	5.6	334	93.3

(CONTINUED ON NEXT PAGE)

**Table 2.16 (continued)**  
**Higher education institutions, by type of institution and administration – Brazil and São Paulo State, 1999-2006**

Geographic areas		Higher education institutions, by types of institution and administration																														
		Universities					University centers					Integrated colleges, single-purpose colleges, schools and institutes																				
		Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private											
Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%											
<b>2003</b>																																
Brazil	1,766	100.0	163	100.0	44	27.0	31	19.0	4	2.5	84	51.5	81	100.0	1	1.2	*	*	2	2.5	78	96.3	1,522	100.0	7	0.5	26	1.7	53	3.5	1,436	94.3
SP State	444	25.1	36	100.0	2	5.6	3	8.3	1	2.8	30	83.3	35	100.0	*	*	*	*	2	5.7	33	94.3	373	100.0	1	0.3	3	0.8	20	5.4	349	93.6
<b>2004</b>																																
Brazil	1,869	100.0	169	100.0	46	27.2	32	18.9	5	3.0	86	50.9	107	100.0	1	0.9	*	*	2	1.9	104	97.2	1,593	100.0	6	0.4	28	1.8	55	3.5	1,504	94.4
SP State	458	24.5	37	100.0	2	5.4	3	8.1	2	5.4	30	81.1	41	100.0	*	*	*	*	2	4.9	39	95.1	380	100.0	1	0.3	3	0.8	19	5.0	357	93.9
<b>2005</b>																																
Brazil	1,981	100.0	176	100.0	52	29.5	33	18.8	5	2.8	86	48.9	114	100.0	*	*	*	*	3	2.6	111	97.4	1,691	100.0	8	0.5	26	1.5	51	3.0	1,606	95.0
SP State	468	23.6	37	100.0	2	5.4	3	8.1	2	5.4	30	81.1	46	100.0	*	*	*	*	3	6.5	43	93.5	385	100.0	1	0.3	4	1.0	19	4.9	361	93.8
<b>2006</b>																																
Brazil	2,062	100.0	178	100.0	53	29.8	34	19.1	5	2.8	86	48.3	119	100.0	*	*	*	*	4	3.4	115	96.6	1,765	100.0	5	0.3	30	1.7	51	2.9	1,679	95.1
SP	486	23.6	38	100.0	3	7.9	3	7.9	2	5.3	30	78.9	47	100.0	*	*	*	*	3	6.4	44	93.6	401	100.0	1	0.2	3	0.7	18	4.5	379	94.5

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.10.

(1) Technological Education Centers (CETs) and Colleges of Technology (FATECs) were excluded.

**Table 2.17**  
Participation of the State of Sao Paulo in relation to Brazil in the number of institutions and enrollment in higher education institutions (HEI) – São Paulo State, 1999-2006

Years	SP State in relation to Brazil (%)					
	Universities		University centers		Integrated and single-course colleges, schools and institutes	
	HEI	Enrollments	HEI	Enrollments	HEI	Enrollments
1999	23.2	27.8	48.7	49.6	33.3	35.3
2000	23.1	27.0	44.0	44.6	32.1	34.2
2001	23.1	26.3	45.5	44.3	29.1	31.6
2002	22.2	25.3	42.9	42.5	26.6	28.6
2003	22.1	24.2	43.2	40.5	24.5	26.0
2004	21.9	23.7	38.3	38.3	23.9	25.5
2005	21.0	23.8	40.4	39.3	22.8	24.3
2006	21.3	24.6	39.5	40.8	22.7	23.5

Source: INEP, Higher Education Census (microdata).

Note: See Detailed Tables 2.9 and 2.10.

### 3.8 Distribution of enrollment by knowledge area

When data on distribution of enrollment by area of knowledge are compared, the contribution of different areas in São Paulo State is similar to that in the other states in Brazil (excluding São Paulo State) and has been very stable (Figure 2.16).

In this section, detailed analysis of data is focused on 2006. In terms of enrollment, the knowledge area classified as Social Sciences/Business/Law accounted for the largest share (40% of total). The largest discrepancy between São Paulo State and all other Brazilian states is in fields including Education and Health, which are ranked second and third in terms of enrollment. Education accounted for 20.8% of enrollment or 2nd place in Brazil (excluding São Paulo State) falling in 3rd place with 14.4% in São Paulo State. In the area of Health and Social Welfare, the order is reversed: São Paulo State has 15.1% (2nd place) and Brazil (except São Paulo state) has 14.8% (3rd place) of enrollment. Science/Mathematics/Computing absorbed 10.1% of enrollment in São Paulo State and 7.8% in Brazil (excluding São Paulo State). Engineering was close behind with 9.7% in São Paulo State and 7.3% in Brazil (excluding São Paulo state). All other fields represent less than 5% of all enrollment.

For Science/Mathematics/Computing, Engineering, Production and Construction, and Agriculture/Veterinary Medicine (Figure 2.16), São Paulo State has

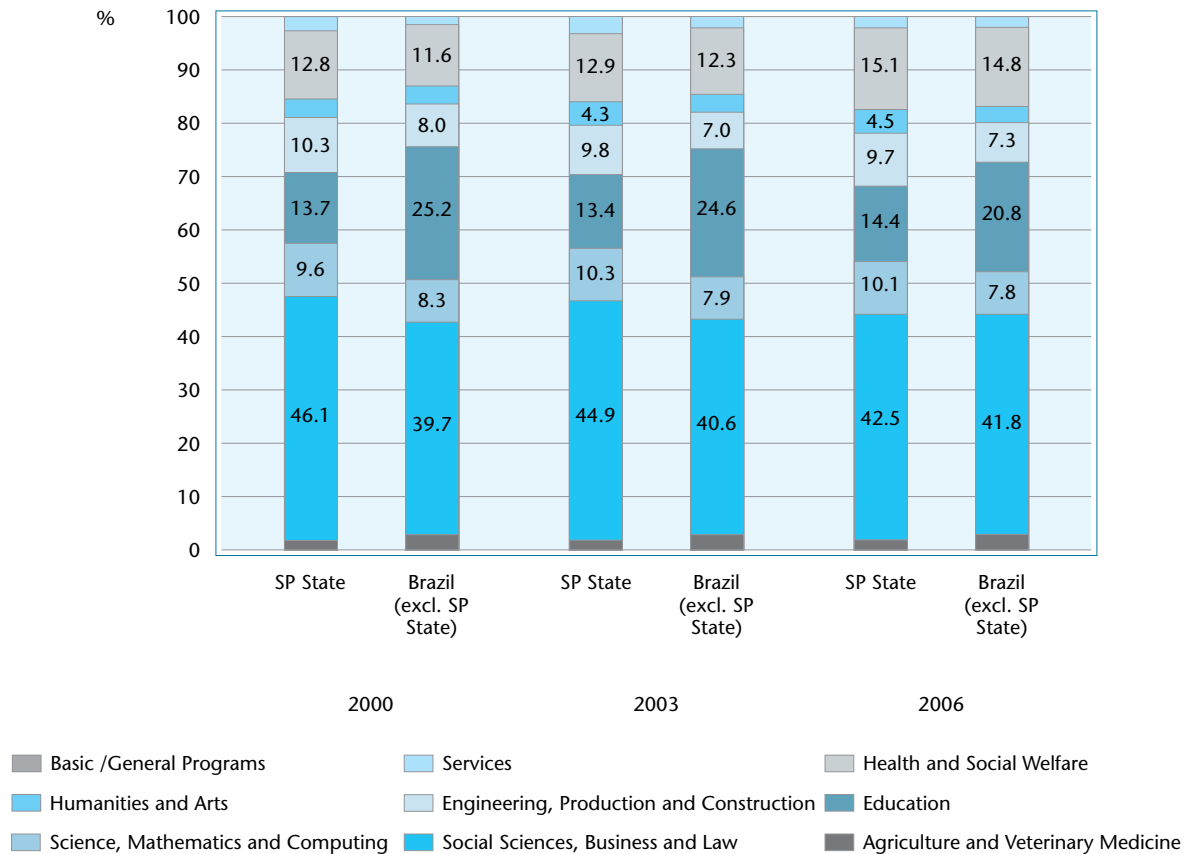
the highest enrollment ratios among all other states in Brazil, 21.4% and 17.6%, respectively.

If the comparison of enrollment by knowledge area in São Paulo State and Brazil shows similar figures, the same is not true when public and private education are compared. São Paulo State accounted for 40% of enrollment in public institutions (Figure 2.17) in the above-cited knowledge areas, while Brazil (excluding São Paulo State) represented 27%. In private education, this value is much lower: 18.2% for São Paulo State and 13.5% for Brazil (excluding São Paulo State). Figures 2.17 and 2.18 show that the profile of the municipal network is similar to private HEIs.

The most significant differences in public and private education are in the areas of Education and Social Sciences/Business/Law, with a large concentration of students in private HEIs. It is worth remembering that Social Sciences/Business/Law has smaller enrollment numbers than Education, while Business and Law are with the highest demand in Brazil. In 2006, São Paulo State public and private sector HEIs accounted for 24.9% and 45.5% of enrollment, respectively, in Social Sciences/Business/Law (Figure 2.17). In Brazil, these percentages were 22% and 50.3% in the public and private sectors, respectively.

From the European or the U.S. perspective it may seem strange that Law is the flagship among courses projected to absorb large numbers of higher education applicants, given varied performance of students on admission exams. In Brazil Law courses have low

**Figure 2.16**  
Distribution of enrollment in higher education, by knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 2000-2006



**Source:** INEP, Higher education Census (microdata).

**Note:** See Detailed Table 2.11.

academic requirements for both admission and degree completion. However, given the complexity of the Brazilian legal system, basic knowledge on laws offers an advantage in the labor market, with candidates being sought after at large or small companies and public administration. The massification of Law courses can be confirmed by the fact that often less than 15% of graduates pass the bar exam, which is required to practice.

In the field of Education, the public sector has the most marked difference between São Paulo State and all other Brazilian states, accounting with 14.2% of enrollment, compared 33.5% nationwide in 2006. In São Paulo State, enrollment figures for Education at public and private institutions are very similar, 14.2% and 14.4%, respectively (Figure 2.17).

In São Paulo State, two other findings deserve attention: first, the relatively small difference between

public and private sectors regarding the Health area (12.5% and 15.5% of enrollment in public and private systems, respectively). It should be noted that the private sector is interested not in Medicine courses (including research and graduate studies), but rather other professions such as physiotherapy, psychology and physical education. In São Paulo State, the private sector has invested heavily in Dentistry in the last ten years.

When it comes to enrollment in Science, Mathematics and Computer Sciences (2006), difference between public and private sectors in Brazil (excluding São Paulo State) was small, 10% and 6.8%, respectively. In São Paulo State, this difference was even more pronounced, 17.4% and 8.9%, respectively.

These numbers hide a great qualitative difference, however. In the field of Sciences, the private sector is largely concentrated on the licentiate (teaching degree),

**Figure 2.17**  
Distribution of enrollment in private and public HEI, by knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 2000-2006



Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.11.

which is less demanding than the public sector's bachelor's degree program. In Computer Sciences, which is in high demand, the private sector offers more basic and less stringent training than public institutions, which includes more advanced courses and research.

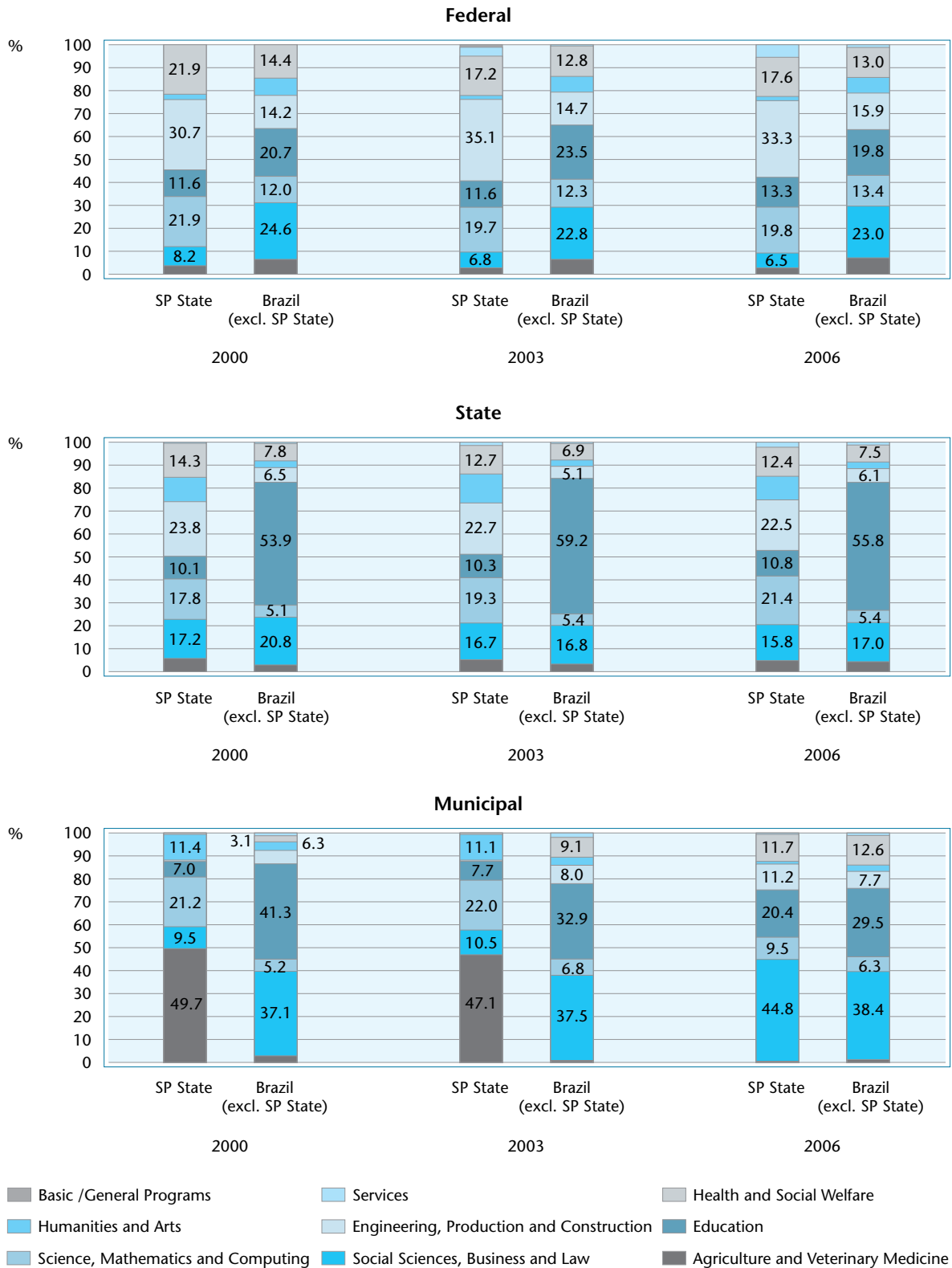
When a breakdown of enrollment by knowledge area in federal, municipal and state HEIs is compared with that of counterparts in other Brazilian states (Figure 2.18), the atypical character of the São Paulo State's federal institutions becomes apparent. In São Paulo State, federal institutions have enrollment concentrated in the areas of Health, Engineering and Science/Mathematics and Computing. Thus, despite a relatively small number of students, federal HEIs heavily influence these areas that are important for the state. Additionally, municipal institutions are very different from the state and federal HEIs, but very similar to private institutions.

It is important to remember that the public sector's share of enrollment in all higher education courses is small, so that enrollment private HEIs considerably exceeds that of public counterparts (Table 2.18).

It is interesting to compare these rates with those typical in OECD countries and European Union countries in the OECD.

Great diversity is observed among OECD countries. In the Health area (Table 2.19), the percentages vary between 4.8% (Greece) and 28.2% (Denmark). In the area of Science/Mathematics/Computing, the extremes are 2.5% (Italy) and 8.5% (Mexico). In the Engineering area, the percentages vary from 5.2% (New Zealand) to 27.1% (South Korea). However, it should be noted that in several countries there are high rates of tertiary Type-B courses (equivalent to technology courses in Brazil) in these area, which may have caused the rates to be underestimated in these knowledge ar-

**Figure 2.18**  
Distribution of enrollment in public HEI, by knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 2000-2006



Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.11.

**Table 2.18** Enrollments in undergraduate courses with face-to-face classes, by type of administration and knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 2000-2006

Knowledge areas	Enrollments in undergraduate courses with face-to-face classes (1) by type of administration																								
	Grand total						Public						Private												
	Total		State		Municipal		Federal		State		Municipal		Brazil (excl. SP State)		Private										
	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%									
<b>Total</b>	1,875,941	100.0	818,304	100.0	761,473	100.0	125,553	100.0	475,636	100.0	7,114	100.0	251,540	100.0	80,564	100.0	34,297	100.0	37,875	100.0	1,114,468	100.0	692,751	100.0	
Agriculture and Veterinary Med.	50,272	2.7	12,988	1.6	36,788	4.8	4,831	3.8	28,333	6.0	229	3.2	7,425	3.0	4,464	5.5	1,010	2.9	138	0.4	13,504	1.2	8,157	1.2	
Education	472,180	25.2	112,484	13.7	248,359	32.6	16,957	13.5	98,655	20.7	822	11.6	135,545	53.9	8,117	10.1	14,159	41.3	8,018	21.2	223,821	20.1	95,527	13.8	
Engineering, Production and Construction	150,522	8.0	83,975	10.3	85,947	11.3	23,972	19.1	67,536	14.2	2,185	30.7	16,264	6.5	19,138	23.8	2,147	6.3	2,649	7.0	64,575	5.8	60,003	8.7	
Health and Social Welfare	218,540	11.6	104,656	12.8	89,330	11.7	17,416	13.9	68,609	14.4	1,558	21.9	19,665	7.8	11,557	14.3	1,056	3.1	4,301	11.4	129,210	11.6	87,240	12.6	
Humanities and Arts	59,425	3.2	29,134	3.6	43,541	5.7	8,981	7.2	35,729	7.5	176	2.5	6,692	2.7	8,634	10.7	1,120	3.3	171	0.5	15,884	1.4	20,153	2.9	
Science, Mathematics and Computing	155,337	8.3	78,389	9.6	71,548	9.4	19,497	15.5	57,021	12.0	1,561	21.9	12,728	5.1	14,326	17.8	1,799	5.2	3,610	9.5	83,789	7.5	58,892	8.5	
Services	24,965	1.3	19,236	2.4	4,041	0.5	657	0.5	2,848	0.6	-	-	901	0.4	495	0.6	292	0.9	162	0.4	20,924	1.9	18,579	2.7	
Social Sciences, Business and Law	744,700	39.7	377,442	46.1	181,939	23.9	33,242	26.5	116,905	24.6	583	8.2	52,320	20.8	13,833	17.2	12,714	37.1	18,826	49.7	562,761	50.5	344,200	49.7	
Basic / General Courses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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**Table 2.18 (continued)**  
**Enrollments in undergraduate courses with face-to-face classes, by type of administration and knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 2000-2006**

Knowledge areas	Enrollments in undergraduate courses with face-to-face classes (1) by type of administration																							
	Public																							
	Grand total			Total			Federal			State			Municipal			Private								
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%						
	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State						
<b>Total</b>	2,836,968	100.0	1,050,054	100.0	973,340	100.0	163,030	100.0	558,116	100.0	8,985	100.0	346,314	100.0	96,392	100.0	68,910	100.0	1,863,628	100.0	887,024	100.0		
Agriculture and Veterinary Med.	64,866	2.3	15,588	1.5	44,073	4.5	5,201	3.2	32,543	5.8	226	2.5	10,875	3.1	4,824	5.0	655	1.0	151	0.3	20,793	1.1	10,387	1.2
Education	696,935	24.6	141,167	13.4	358,723	36.9	23,635	14.5	131,202	23.5	1,039	11.6	204,850	59.2	9,890	10.3	22,671	32.9	12,706	22.0	338,212	18.1	117,532	13.3
Engineering, Production and Construction	198,647	7.0	102,511	9.8	105,260	10.8	29,459	18.1	82,097	14.7	3,158	35.1	17,640	5.1	21,890	22.7	5,523	8.0	4,411	7.7	93,387	5.0	73,052	8.2
Health and Social Welfare	348,775	12.3	135,222	12.9	101,453	10.4	20,265	12.4	71,178	12.8	1,548	17.2	24,007	6.9	12,289	12.7	6,268	9.1	6,428	11.1	247,322	13.3	114,957	13.0
Humanities and Arts	89,888	3.2	45,525	4.3	51,164	5.3	12,552	7.7	39,022	7.0	189	2.1	10,062	2.9	11,837	12.3	2,080	3.0	526	0.9	38,724	2.1	32,973	3.7
Science, Mathematics and Computing	225,226	7.9	108,333	10.3	92,016	9.5	26,453	16.2	68,638	12.3	1,770	19.7	18,706	5.4	18,608	19.3	4,672	6.8	6,075	10.5	133,210	7.1	81,880	9.2
Services	60,452	2.1	30,150	2.9	8,043	0.8	1,256	0.8	4,763	0.9	312	3.5	2,103	0.6	745	0.8	1,177	1.7	199	0.3	52,409	2.8	28,894	3.3
Social Sciences, Business and Law	1,150,656	40.6	471,223	44.9	211,138	21.7	43,874	26.9	127,203	22.8	611	6.8	58,071	16.8	16,106	16.7	25,864	37.5	27,157	47.1	939,518	50.4	427,349	48.2
Basic / General Courses	1,523	0.1	335	0.0	1,470	0	335	0	1,470	0.3	132	1.5	-	-	203	0.2	-	-	-	-	53	0.0	-	-

2003

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**Table 2.18 (continued)**  
**Enrollments in undergraduate courses with face-to-face classes, by type of administration and knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 2000–2006**

Knowledge areas	Enrollments in undergraduate courses with face-to-face classes (1) by type of administration																	
	Grand total					Public					Private							
	Total					Federal		State			Municipal		Private					
	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Total	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State	Brazil (excl. SP State)	SP State		
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	Abs. nos.	%	Abs. nos.	%	Abs. nos.	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%		
<b>Total</b>	<b>3,407,670</b>	<b>100.0</b>	<b>1,268,976</b>	<b>100.0</b>	<b>1,026,489</b>	<b>1,026,489</b>	<b>100.0</b>	<b>580,010</b>	<b>100.0</b>	<b>9,811</b>	<b>100.0</b>	<b>112,276</b>	<b>100.0</b>	<b>76,999</b>	<b>100.0</b>	<b>2,381,181</b>	<b>100.0</b>	
Agriculture and Veterinary Med.	86,554	2.5	19,204	1.5	55,181	5.4	6,107	3.3	37,676	6.5	245	2.5	5,498	4.9	1,228	1.6	31,373	1.3
Education	710,124	20.8	182,679	14.4	343,924	33.5	25,888	14.2	115,001	19.8	1,300	13.3	12,181	10.8	22,740	29.5	12,407	20.4
Engineering, Production and Construction	248,196	7.3	123,306	9.7	120,618	11.8	35,266	19.3	92,155	15.9	3,271	33.3	22,572	6.1	5,891	7.7	6,780	11.2
Health and Social Welfare	502,878	14.8	191,225	15.1	112,554	11.0	22,766	12.5	75,130	13.0	1,725	17.6	27,747	7.5	9,677	12.6	7,086	11.7
Humanities and Arts	108,613	3.2	57,049	4.5	54,306	5.3	12,495	6.8	41,453	7.1	165	1.7	10,606	2.9	2,247	2.9	666	1.1
Science, Mathematics and Computing	264,497	7.8	128,433	10.1	102,545	10.0	31,737	17.4	77,650	13.4	1,938	19.8	24,014	21.4	4,875	6.3	5,785	9.5
Services	63,499	1.9	27,448	2.2	11,202	1.1	2,853	1.6	7,026	1.2	533	5.4	1,908	1.7	782	1.0	412	0.7
Social Sciences, Business and Law	1,422,883	41.8	539,486	42.5	225,733	22.0	45,557	24.9	133,493	23.0	634	6.5	62,681	17.0	29,559	38.4	27,228	44.8
Basic / General Courses	426	0.0	146	0.0	426	0	146	0	426	0.1	-	-	146	0.1	-	-	-	-

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.11. Centers for Technological Education (CETs) and Colleges of Technology (FATs) were included.

**Table 2.19**  
**Distribution of enrollment in type-A higher education courses, by knowledge area and selected countries – Brazil, São Paulo State and selected countries, 2005**

Selected countries and SP State	Enrollments in type-A higher education courses (1), by knowledge area (%)					
	Total	Health and Social Welfare	Science, Mathematics and Computing	Engineering, Production and Construction	Social Sciences, Business and Law	Other
<b>Northern Europe</b>						
Denmark	100.0	28.2	4.7	9.8	27.1	30.2
Finland	100.0	19.0	5.5	21.3	28.8	25.5
Iceland	100.0	11.8	3.5	6.1	35.4	43.3
Norway	100.0	26.5	6.0	7.8	28.9	30.7
Sweden	100.0	25.7	3.8	17.9	24.4	28.2
<b>USA &amp; South Korea</b>						
USA	100.0	9.3	4.3	6.3	45.3	34.7
South Korea	100.0	8.4	5.0	27.1	26.1	33.5
<b>Central Europe</b>						
Germany	100.0	13.1	7.6	15.9	31.3	32.2
Spain	100.0	14.6	5.1	14.3	35.4	30.6
France	100.0	8.1	6.1	11.9	45.1	28.7
Greece	100.0	4.8	7.9	10.2	32.3	44.8
Netherlands	100.0	17.0	4.3	8.4	40.5	29.8
Italy	100.0	14.3	2.5	15.1	38.0	30.2
Portugal	100.0	17.7	5.7	11.3	30.5	34.8
UK	100.0	12.0	7.3	8.7	34.7	37.3
Switzerland	100.0	8.2	4.3	14.0	42.6	30.9
<b>Oceania</b>						
Australia	100.0	13.2	8.3	7.2	43.0	28.1
New Zealand	100.0	14.2	6.8	5.2	39.4	34.4
<b>Latin America</b>						
Chile	100.0	9.1	2.5	15.6	34.9	38.0
Mexico	100.0	8.4	8.5	14.3	46.8	21.9
Brazil	100.0	14.2	8.1	7.4	41.8	28.5
São Paulo State – Total	100.0	14.8	9.5	9.3	42.8	23.6
São Paulo State – Private	100.0	15.0	8.6	8.1	45.5	22.8
São Paulo State – Public	100.0	13.6	14.7	16.3	26.7	28.6

**Sources:** São Paulo State and Brazil: INEP. Higher Education Census (microdata). Other countries: OECD. Education at a Glance 2007 (OECD, 2008).

(1) According to the classification adopted by the OECD (2003), “they are largely theory-based tertiary type-A programs, which offer qualification sufficient for entry into either an advanced research program or a profession with high skill requirements”; “in theory, they have a minimum duration equivalent to a three-year full-time, although in practice they last four or more years. “In Brazil, they are equivalent to academic tertiary courses.

eas. This is not the case in Brazil, where there is a small number of these courses (Box 1).

When compared to other countries, distribution of courses in Brazil by knowledge area is not very different; in some areas, Brazil is more balanced than in the OECD. In addition, Brazil's public sector (mainly in São Paulo State) plays a crucial role in training specialized human resources in the areas of Science, Mathematics, Computing and Engineering.

Finally, in all systems considered in São Paulo State, the public sector shows a more balanced distribution of enrollment in all knowledge areas. Despite the increased enrollment in Social Sciences/Business/Law, concentration is much smaller than in other sub-systems.

### 3.9 Internalization of higher education

When higher education began in Brazil, it was concentrated in state capitals. Expansion outside the capitals occurred later as medium-sized cities grew and the supply of undergraduate places in HEI increased. The internalization of higher education has contributed to democratization of access, by making it easier for the population of interior towns to continue their studies and providing cities with important cultural resources.

São Paulo State was at the forefront of this process, largely led by the state government, which created in the 1950s a group of autonomous Colleges of Philosophy, Sciences and Letters in the interior, covering the municipalities of Araraquara, Rio Claro, Marília, Assis, Franca and São José do Rio Preto. In addition to these colleges, São Paulo State also opened the Schools of Pharmacy and Dentistry in Araraquara, Aracatuba and São José dos Campos; Agricultural Sciences and Veterinary Medicine in Jaboticabal; Engineering in Guaratinguetá; and Medicine in Botucatu. These were all isolated institutions, which were integrated into UNESP in 1976 as a multi-campus university.

In addition, municipal institutions were created in the interior and most of them were focused on teacher training. After these initiatives, internalization of public higher education in São Paulo State expanded mainly through installation of new campuses of existing universities, as well as by incorporation of private institutions located in interior cities. In São Paulo State,

UNESP spearheaded expansion, creating 32 units in 23 cities. In São Paulo city, USP followed suit, albeit more conservatively, implementing an old policy of internalization; in 2006, it had 6 campuses in interior cities, 1 in São Paulo city (East Zone), and 1 research base for Marine Biology in the north coast of São Paulo State. Recently, UNICAMP started an expansion program creating campuses in other municipalities (Piracicaba and Limeira).

In other Brazilian states, internalization of public education has also been led mainly by state governments. Federal institutions have done the same on a smaller scale, although in São Paulo State the situation has been different: besides UNIFESP formerly *Escola Paulista de Medicina* in São Paulo City, a federal university was established in São Carlos. More recently, the federal government stimulated creation of new UNIFESP sites in Santos, Guarulhos, Diadema, and São José dos Campos, and also created a new university in ABC Paulista.

This type of expansion of existing universities also has occurred in private universities, either with creation of new establishments or with acquisition or incorporation of other existing private institutions. However, internalization of private education occurred mainly by creation of single-purpose and integrated colleges, closely following the creation of public institutions in the interior, which acted as a magnet for private education (Cardoso; Sampaio, 1994).

The internalization of HEIs between capital and interior of São Paulo State appears to have stabilized in the 1999-2006 period (Table 2.20) corresponding to distribution of the population (Map 2.1). A breakdown of enrollment in the interior shows federal universities rising from 79% in 1999 to 82% in 2006, and state universities from 56% to 62%. The two municipal universities are in the interior. Private universities saw enrollment in interior vary from 53% to 56% in the same period.

In university centers (which are almost all private institutions), enrollment in the interior of São Paulo State accounted for 58% in 1999 and 2006, peaking at 62% in 2001. Three municipal university centers contributed to this total (2006).

However, the enormous disparity between enrollment in public and private sectors should be noted (Map 2.1).

**Table 2.20**  
**Enrollments in undergraduate courses in interior cities and state capitals, by type of institution and administration – Brazil and São Paulo State, 1999-2006**

Type of institution and enrollment in undergraduate courses at interior cities	Enrollment in undergraduate courses, by types of institution and administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Universities</b>										
<b>1999</b>										
Enrollments in interior cities and state capitals	1,619,734	421,353	264,938	38,891	894,552	450,869	6,235	68,761	10,846	365,027
Enrollments in interior cities (%)	50.0	29.8	77.3	100.0	51.8	54.9	79.2	55.7	100.0	53.0,
<b>2000</b>										
Enrollments in interior cities and state capitals	1,806,989	459,011	299,033	22,122	1,026,823	487,438	6,576	68,474	11,091	401,297
Enrollments in interior cities (%)	52.1	31.1	72.5	100.0	54.5	58.1	80.1	58.0	100.0	56.6
<b>2001</b>										
Enrollments in interior cities and state capitals	1,956,542	471,989	322,013	22,911	1,139,629	515,084	6,788	70,254	11,307	426,735
Enrollments in interior cities (%)	52.3	31.9	72.0	100.0	54.3	57.5	81.2	58.5	100.0	55.8
<b>2002</b>										
Enrollments in interior cities and state capitals	2,150,659	500,459	380,957	34,486	1,234,757	544,911	6,969	78,879	12,174	446,889
Enrollments in interior cities (%)	53.7	33.8	73.6	100.0	54.3	57.7	81.5	54.7	100.0	56.7
<b>2003</b>										
Enrollments in interior cities and state capitals	2,276,281	527,719	404,821	52,925	1,290,816	551,380	7,086	83,036	13,050	448,208
Enrollments in interior cities (%)	53.7	33.3	73.1	98.0	54.1	58.3	81.8	56.1	100.0	57.2
<b>2004</b>										
Enrollments in interior cities and state capitals	2,369,717	533,892	429,823	59,208	1,346,794	561,919	6,981	88,431	20,070	446,437
Enrollments in interior cities (%)	54.6	33.1	75.1	98.6	54.7	59.4	81.4	58.0	100.0	57.5
<b>2005</b>										
Enrollments in interior cities and state capitals	2,469,778	549,171	433,692	59,953	1,426,962	586,816	7,039	93,594	18,956	467,227
Enrollments in interior cities (%)	55.0	33.6	73.9	98.6	55.6	59.3	81.2	58.6	100.0	57.4
<b>2006</b>										
Enrollments in interior cities and state capitals	2,510,396	556,231	436,662	60,370	1,457,133	618,740	7,486	94,288	18,880	498,086
Enrollments in interior cities (%)	54.7	33.4	74.9	97.2	55.1	58.2	82.2	61.8	100.0	55.5

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**Table 2.20 (continued)****Enrollments in undergraduate courses in interior cities and state capitals, by type of institution and administration – Brazil and São Paulo State, 1999-2006**

Type of institution and enrollment in undergraduate courses at interior cities	Enrollment in undergraduate courses, by types of institution and administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>University centers</b>										
<b>1999</b>										
Enrollments in interior cities and state capitals	160,977	-	-	-	160,977	79,781	-	-	-	79,781
Enrollments in interior cities (%)	47.0	-	-	-	47.0	57.8	-	-	-	57.8
<b>2000</b>										
Enrollments in interior cities and state capitals	244,679	-	-	4,618	240,061	109,057	-	-	4,618	104,439
Enrollments in interior cities (%)	43.9	-	-	100.0	42.8	56.6	-	-	100.0	54.6
<b>2001</b>										
Enrollments in interior cities and state capitals	338,275	1,012	-	4,738	332,525	149,969	-	-	4,738	145,231
Enrollments in interior cities (%)	48.6	100.0	-	100.0	47.7	62.0	-	-	100.0	60.8
<b>2002</b>										
Enrollments in interior cities and state capitals	430,315	1,061	-	13,585	415,669	183,033	-	-	13,585	169,448
Enrollments in interior cities (%)	48.8	100.0	-	100.0	47.0	58.7	-	-	100.0	55.4
<b>2003</b>										
Enrollments in interior cities and state capitals	501,108	1,159	-	15,446	484,503	203,118	-	-	15,446	187,672
Enrollments in interior cities (%)	49.7	100.0	-	100.0	47.9	60.3	-	-	100.0	57.0
<b>2004</b>										
Enrollments in interior cities and state capitals	614,913	1,205	-	12,678	601,030	235,695	-	-	12,678	223,017
Enrollments in interior cities (%)	49.5	100.0	-	100.0	48.4	60.0	-	-	100.0	57.8
<b>2005</b>										
Enrollments in interior cities and state capitals	674,927	-	-	15,757	659,170	264,914	-	-	15,757	249,157
Enrollments in interior cities (%)	49.8	-	-	100.0	48.6	61.5	-	-	100.0	59.0
<b>2006</b>										
Enrollments in interior cities and state capitals	727,909	-	-	16,510	711,399	297,228	-	-	16,281	280,947
Enrollments in interior cities (%)	49.2	-	-	100.0	48.0	57.5	-	-	100.0	55.0

( CONTINUED ON NEXT PAGE )

**Table 2.20 (continued)**  
**Enrollments in undergraduate courses in interior cities and state capitals, by type of institution and administration – Brazil and São Paulo State, 1999-2006**

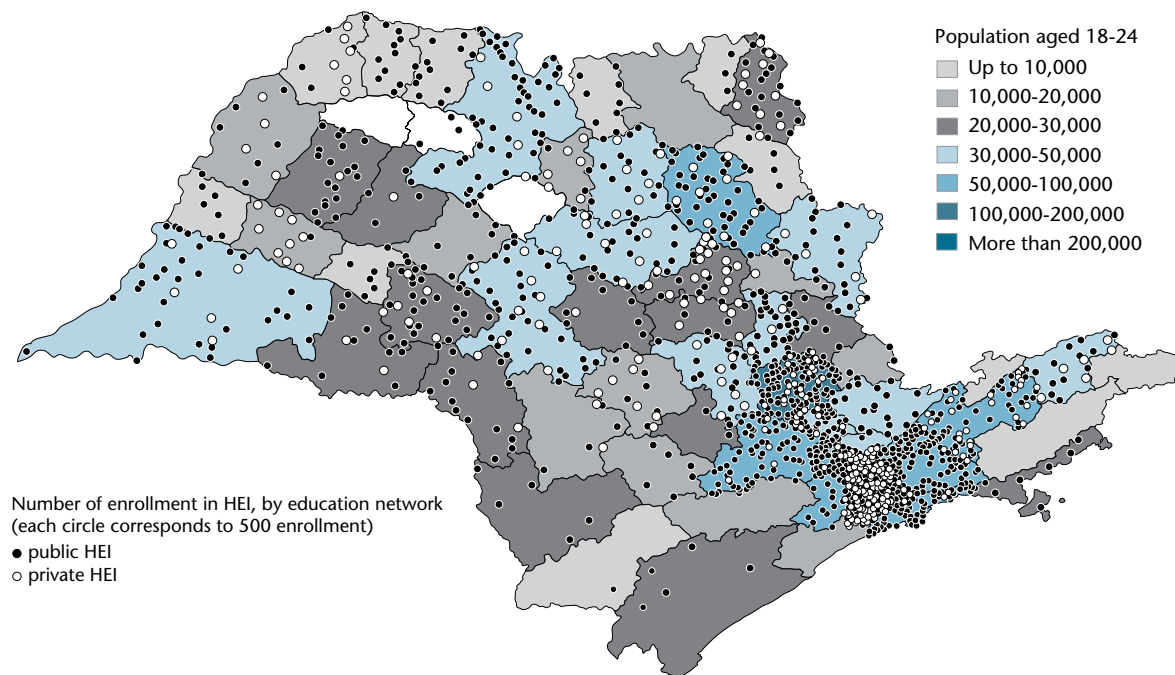
Type of institution and enrollment in undergraduate courses at interior cities	Enrollment in undergraduate courses, by types of institution and administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Integrated and single-purpose colleges, schools, institutes</b>										
<b>1999</b>										
Enrollments in interior cities and state capitals	569,750	10,316	28,851	48,189	482,394	200,872	519	2,147	24,316	173,890
Enrollments in interior cities (%)	62.0	73.5	80.8	100.0	56.8	72.1	100.0	100.0	100.0	67.8
<b>2000</b>										
Enrollments in interior cities and state capitals	619,255	10,386	23,102	45,432	540,335	211,840	538	2,121	22,166	187,015
Enrollments in interior cities (%)	62.5	75.6	78.6	100.0	58.4	72.6	100.0	100.0	100.0	69.0
<b>2001</b>										
Enrollments in interior cities and state capitals	704,465	9,731	24,391	51,601	618,742	222,395	570	2,370	23,885	195,570
Enrollments in interior cities (%)	59.7	71.9	75.2	100.0	55.5	70.5	100.0	100.0	100.0	66.4
<b>2002</b>										
Enrollments in interior cities and state capitals	855,760	3,852	23,759	56,381	771,768	244,949	601	2,297	27,542	214,509
Enrollments in interior cities (%)	60.0	65.1	78.9	100.0	56.4	74.9	100.0	100.0	100.0	71.4
<b>2003</b>										
Enrollments in interior cities and state capitals	1,049,926	4,422	26,890	58,192	960,422	272,512	746	2,361	29,157	240,248
Enrollments in interior cities (%)	59.3	69.0	79.6	100.0	56.2	76.0	100.0	100.0	100.0	72.7
<b>2004</b>										
Enrollments in interior cities and state capitals	1,102,671	3,746	27,505	60,197	1,011,223	281,707	748	2,387	28,236	250,336
Enrollments in interior cities (%)	60.5	62.6	81.1	100.0	57.6	78.0	100.0	100.0	100.0	74.7
<b>2005</b>										
Enrollments in interior cities and state capitals	1,225,232	2,143	27,750	59,543	1,135,796	298,291	648	2,682	26,243	268,718
Enrollments in interior cities (%)	61.1	31.3	85.0	100.0	58.5	77.5	100.0	100.0	100.0	75.1
<b>2006</b>										
Enrollments in interior cities and state capitals	1,340,204	2,208	28,532	60,847	1,248,617	314,647	625	1,668	25,567	286,787
Enrollments in interior cities (%)	60.6	28.3	86.3	100.0	58.2	79.1	100.0	100.0	100.0	77.0

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.12.

**Map 2.1**

Population aged 18-24 and distribution of enrollment in HEI, by type of administration and microregions – São Paulo State, 2006



Sources: Inep – Higher Education Census (microdata); Seade Foundation - Information System of Municipalities in SP State.

### 3.10 Evening courses

One characteristic of the Brazilian higher education system, which also developed quickly in São Paulo before expanding to other states, is the large number of evening courses (practically inexistent in Europe, except in continuing education). OECD statistics do not cover this type of course. In the U.S., evening courses are practically restricted to community colleges, serving a population with precarious prior academic performance.

In Brazil and São Paulo State, evening courses (mainly private) are one of the main mechanisms of social inclusion in higher education, focusing primarily on young people and adults who work during the day. In many cases, evening courses are hampered by the fact that students have less time available to dedicate to studies because they work during the day. In private institutions, supportive infrastructure (e.g., libraries and laboratories) has important shortcomings. The fact that these courses do not offer the best conditions graduates of these institutions to compete and occupy positions that require higher qualifications, does not their contribution to raising the average level of education in the workforce and creating better-informed citizens.

Moreover, several state university professors affirmed that many times students in evening classes are more dedicated than their colleagues in daytime classes.

Considering private night schools in Brazil (Table 2.21), their share of enrollment is not only extremely high (to the point that there are institutions where daytime courses are not offered) but they are also still growing, climbing from 64.8% in 1999 to 69% in 2006. These data indicate a prevalence of courses with lower academic requirements. However, a breakdown of enrollment in evening courses at private HEIs shows that there are marked differences between universities, university centers and other institutions. For Brazil, these values were 56.3%, 72.7%, and 77.9%, respectively in 1999. In the following period through 2006, private universities offering evening courses saw a large overall increase in their share of enrollment, rising from 56.3% to 63.3%.

In São Paulo State, enrollment in evening courses at private HEIs grew less in the 1999-2006, but the percentage (rising from 68.6% to 73.9%) is still higher than that recorded in Brazil. São Paulo State's position in private education was similar to the trends observed for Brazil. While enrollment in evening courses at private universities in Brazil accounted for 63.3% of the total in



**Table 2.21**  
Enrollments in evening undergraduate courses relative to total enrollment, by type of institution and administration – Brazil and São Paulo State, 1999-2006

Enrollments in evening undergraduate courses relative to total enrollment, by types of institution and administration (%)														
Years	Public									Private				
	Total	Federal			State			Municipal			Total	Univer- sities	Univer- sity centers	Other (1)
		Univer- sities	Univer- sity centers	Other (1)	Univer- sities	Univer- sity centers	Other (1)	Univer- sities	Univer- sity centers	Other (1)				
<b>Brazil</b>														
1999	35.1	20.0	-	25.5	43.1	-	75.9	59.2	-	81.6	64.8	56.3	72.7	77.9
2000	34.7	21.6	-	25.9	42.4	-	70.2	63.3	82.3	80.9	66.2	59.1	70.0	78.0
2001	35.5	22.6	4.1	27.0	42.5	-	66.3	64.2	84.8	80.0	66.6	59.9	67.4	78.5
2002	35.0	23.2	5.7	4.9	37.9	-	67.5	68.3	75.6	80.1	66.9	59.9	65.8	78.8
2003	35.0	23.6	6.7	5.0	36.2	-	63.6	67.1	74.9	79.5	67.6	60.6	65.1	78.4
2004	35.3	23.2	6.6	4.2	37.1	-	64.7	68.3	67.1	78.5	67.9	60.9	67.3	77.4
2005	36.5	24.2	-	8.4	39.2	-	66.1	68.4	70.4	76.0	68.4	61.8	67.7	77.3
2006	36.5	24.1	-	9.0	39.2	-	66.7	67.8	77.7	75.3	69.0	63.3	67.6	76.5
<b>SP State</b>														
1999	42.3	15.9	-	0.0	29.7	-	21.5	70.0	-	74.8	68.6	64.4	73.5	75.2
2000	43.5	17.5	-	0.0	30.3	-	20.6	69.2	82.3	74.2	68.8	64.6	70.8	76.6
2001	44.1	18.0	-	0.0	30.8	-	24.1	70.5	88.7	72.1	70.3	66.3	69.1	79.8
2002	47.1	18.3	-	0.0	32.2	-	22.9	73.3	75.6	74.2	71.0	66.7	69.6	81.0
2003	48.5	18.2	-	0.0	34.7	-	21.1	74.0	74.9	73.5	72.2	67.7	70.5	81.8
2004	48.4	17.9	-	0.0	34.6	-	20.7	77.1	67.1	74.2	72.5	67.8	71.7	81.7
2005	48.2	18.2	-	0.0	34.8	-	23.9	78.3	70.4	72.6	73.4	68.6	72.5	82.6
2006	49.1	17.5	-	0.0	35.6	-	13.2	78.3	77.3	72.1	73.9	70.1	71.4	83.1

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.15.

(1) Integrated colleges, single-purpose colleges, schools and institutes.

2006, the proportion in São Paulo State was 70.1%. In university centers, the figures were 67.6% and 71.4% in Brazil and São Paulo State, respectively. For other HEIs, they were 76.5% and 83.1%, respectively (Table 2.21).

At municipal university centers, enrollment in evening courses as a proportion of the total fell from 82.3% to 67.1% in the 2000-2004 period; however, it increased in the following years, climbing 70.4% in 2005 and 77.3% in 2006. This is hard to explain, as it seems reasonable to expect enrollment in daytime courses at university centers or universities to be equal to enrollment in evening courses, rather than lower, given that these institu-

tions are required to achieve excellence in undergraduate courses. If enrollment figures are already high in the private sector, they are even higher in municipal HEIs.

In most other municipal institutions in São Paulo State (integrated colleges, schools, and institutes) a small decrease in enrollment was observed (74.8% -72.1%) in evening courses in the 1999-2006 period. On the other hand, it is surprising that the two municipal universities, which already had percentages as high as 70% in 1990, have consistently increased enrollment in evening courses, surpassing other public institutions in 2004 and reaching 78.3% in 2006.

State and federal public institutions,<sup>10</sup> face an inverse problem: the small number of evening courses seems to indicate absence of a greater effort to expand opportunities for access to higher education.

In Sao Paulo State, federal universities had the lowest offer of evening courses. There, enrollment in evening classes increased from 15.9% (1999) to 18.3% (2002), fluctuating downward to 17.5% in 2006. In Brazil, the corresponding rates were higher, with growth from 20% in 1999 to 24.1% in 2006.

Both in Brazil and in São Paulo State, enrollment in evening courses at state universities was higher than at the federal HEIs. In São Paulo State, it rose from witnessed a 29.7% in 1999 to 35.6% in 2006. In Brazil, the figure dropped from 43.1% in 1999 to 39.2% in 2006 usually tended to occur (albeit with marked variations), very close to that 35.6% in São Paulo State universities.

### 3.11 The quality of higher education

The former undergraduate course exit exam (ENCC, for Exame Nacional de Conclusão de Curso) was a powerful tool for evaluating the quality of higher education, allowing for cross referencing of student data not only by institution types, but also with other socioeconomic variables.<sup>11</sup> It was replaced in 2003 with the National Higher Education Assessment System (SINAES), of which the National Student Performance Exam (ENADE) is a key component. The results of both exams are not comparable for several reasons. Institutional evaluation with SINAES combines different variables so that any variation in the quality of education itself is not clear. On the other hand, ENADE which is taken by a sample of students at each institution, combines the scores of freshmen and graduates and does not distinguish between large and small institutions. Finally, state and municipal universities in São Paulo State do not participate in the ENADE and are not under institutional evaluation (except a small number of courses). Despite the importance of the entire higher education system in São Paulo State, these facts impair a global vision.

The quality of the higher education system does not, however tend to change in the short-term. Thus, although the conclusions in the previous edition of this book (FAPESP,2005) are valid, there is no doubt that changes in quality have occurred in the specific courses of some institutions.

The 2022 ENCC results show differences between the public and private institutions as well as great heterogeneity among private HEIs (Table 2.22 and Detailed tables 2.13 and 2.14).

In 2002, more than half (52.5%) of courses offered by federal institutions in Brazil scored A or B and only 15.7% obtained D or E. Among state institutions, dispersion was greater: with about one-third in each score category of A or B, C, and D or E (Detailed table 2.14). Once again, major differences in state institutions in Brazil and São Paulo State should be noted; therefore, averaging masks a broad array of differing situations.

Thus, 71.7% of courses in São Paulo State HEIs attained scores of A and B (Detailed table 2.13). These scores were much higher than those for state and federal institutions in Brazil. In São Paulo State, the scores for courses offered by federal institutions were also much higher than in all other states in Brazil (81.3% of courses were rated A and B); in addition, they are still higher than for state-run HEIs in São Paulo State (Table 2.22). On the other hand, federal HEIs offer a limited number of courses: Agronomy, Nursing, Engineering (Civil, Electrical, Mechanical, and Chemical), Physics, Mathematics, Medicine, Psychology, and Chemistry.

The private and municipal sectors play similar profiles, and differ sharply from state and federal institutions. In Brazil, only 19.2% of courses at private institutions scored A or B (2002), while 33% were rated D or E. Furthermore, not a single knowledge area had more than 30% of courses scoring A or B at private institutions in that year (Detailed tables 2.13 and 2.14). The worst results were observed at municipal institutions in São Paulo State: the percentage of courses ranked A or B was slightly lower (17.6%); therefore, the percentage of courses scoring D or E was much higher (43.2%).

When absolute values for private institutions in Brazil are examined, although there are 1,019 courses with grades D or E, there are 592 rated A or B, more than in all federal institutions in Brazil (where 462 courses attained such level).

In São Paulo State, besides the 371 courses rated D or E in the private sector (2002), there were 176 scoring A or B (double the 81 courses with these scores at state HEIs).

Courses scoring D or E can be considered poor quality, serving a broad base, though having lax admission requirements and offering very precarious training. In Brazil, 1,530 courses were ranked accord-

10. In the previous edition of Indicators of Science, Technology and Innovation in São Paulo (FAPESP, 2005), these data were widely used in order to assess the quality of higher education in Brazil.

11. For this sector, analysis is restricted to the case of universities because university centers and other institutions are rare in the system.

**Table 2.22**  
Distribution of undergraduate courses, by type of administration and scores in the National Examination of Courses – Brazil and São Paulo State, 2002

ENC scores (1)	Distribution of undergraduate courses, by types of administration									
	Total		Federal		State		Municipal		Private	
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%
<b>Brazil</b>										
<b>Total</b>	4,989	100.0	880	100.0	861	100.0	163	100.0	3,085	100.0
A+B	1,361	27.3	462	52.5	285	33.1	22	13.5	592	19.2
C	2,098	42.1	280	31.8	273	31.7	71	43.6	1,474	47.8
D+E	1,530	30.7	138	15.7	303	35.2	70	42.9	1,019	33.0
<b>SP State</b>										
<b>Total</b>	1,268	100.0	16	100.0	113	100.0	74	100.0	1,065	100.0
A+B	283	22.3	13	81.3	81	71.7	13	17.6	176	16.5
C	557	43.9	-	-	10	8.8	29	39.2	518	48.6
D+E	428	33.8	3	18.8	22	19.5	32	43.2	371	34.8

**Source:** INEP. Board of Higher Education Assessment (DAES). This Table was prepared on the basis of Indicators of Science, Technology and Innovation in São Paulo State 2004 (FAPESP, 2005).

**Note:** See Detailed Tables 2.13 and 2.14.

(1) ENC = National Examination of Courses (Exame Nacional de Cursos, or “provão”). The scores range from A (best) to E (worst).

ingly (428 in São Paulo State), almost all of them in the private sector. On the other hand, Brazil had 1,361 courses rated A or B in 2002, with 283 in São Paulo State (Table 2.22).

The fact that there are 138 courses scoring D or E in federal institutions (Brazil, 2002) is striking. In São Paulo State, 22 courses at state-run universities also received these scores.

Other indicators associated with the quality of education can help in updating and validating the previous evaluation (2002). Two of these indicators academic degrees held by faculty and faculty work regimes are especially important. A third indicator, the percentage of students enrolled in daytime courses, could be included. Graduate programs (and their evaluation by CAPES) is also an indicator for the quality of education. These indicators will be analyzed separately (chapter 2, section 4).

### 3.11.1 Degrees held by faculty

Formal teacher or faculty qualifications are a relevant measure of the quality of education, not so much

as an indicator of the performance of individual teachers (or at least not alone) but above all when the system is evaluated as a whole.

Still, it should be noted that academic degrees do not have the same relevance in basic areas and professional courses (such as Administration, Law, Engineering, Architecture and even Medicine), in which experience and professional practice outside academia are not only required, but also necessary.

Altogether, the level of teacher/faculty qualification as measured by degrees held has improved in the last two decades, but is not distributed uniformly across different states in Brazil and the various types of HEI.

The largest asymmetries are between federal and state institutions on one hand, and municipal and private HEIs on the other. At the lower end of the scale, the numbers of faculty without additional certification apart from a bachelor's or teaching degree<sup>12</sup> has fallen consistently at all types of institutions, except federal HEIs in São Paulo State. In this case, the increase seems to result from a recent expansion in enrollment and types of courses (Table 2.23).

12. The lowest end of the scale begins in 2001 because the categories “without graduate degree” and “with specialization” were added together in 2000.

**Table 2.23**  
**Distribution of teachers (in service) in higher education, by type of administration and their highest degree – Brazil (excluding São Paulo State) and São Paulo State, 1999-2006**

Year	Distribution of teachers (in service) in higher education, by types of administration (%)									
	Brazil (excl. SP State)					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
	<b>Total</b>									
1999	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2002	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2003	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2004	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2005	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2006	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	<b>Only bachelor or teaching degree</b>									
1999	16.6	16.9	20.8	10.0	15.3	14.7	1.5	4.9	16.8	18.1
2000 (1)	...	...	...	...	...	...	...	...	...	...
2001	14.9	17.3	15.6	9.9	13.5	14.7	5.5	7.6	14.1	16.8
2002	13.8	16.3	12.5	11.8	13.0	15.0	3.0	6.0	12.2	17.4
2003	14.2	16.9	15.8	10.1	12.9	13.7	3.3	4.9	12.3	15.8
2004	13.8	18.2	14.8	10.3	12.0	13.8	8.4	3.9	11.3	16.1
2005	12.9	18.0	12.9	7.3	11.2	12.2	5.1	4.1	5.6	14.5
2006	11.7	15.1	11.1	8.7	10.6	10.9	4.9	3.3	5.6	13.0
	<b>Specialization</b>									
1999	36.1	17.3	41.1	59.1	48.3	30.7	2.9	3.1	49.3	39.0
2000 (1)	...	...	...	...	...	...	...	...	...	...
2001	34.0	16.6	38.7	59.6	41.6	25.6	2.9	1.9	41.1	31.1
2002	32.6	14.8	36.4	55.2	39.5	24.1	5.8	2.5	41.4	28.4
2003	31.5	12.4	32.7	49.2	38.5	23.4	5.5	2.4	32.3	27.7
2004	32.1	12.2	31.8	49.1	39.0	23.5	11.6	3.1	30.5	27.4
2005	31.9	11.9	32.2	48.9	38.6	23.1	10.3	2.9	27.1	27.4
2006	32.1	11.1	31.2	47.4	39.4	23.6	9.0	3.1	23.3	28.3

( CONTINUED ON NEXT PAGE )

Out of the total faculty in the São Paulo State system, 14.7% had no graduate degree in 1999. This number was stable until 2001, increasing to 15% in 2002 before beginning to slowly decline as of 2003 and reaching 10.9% in 2006. In Brazil (excluding São Paulo State), the percentages were higher and the decline sharper, moving from 16.6% in 1999 to 11.7% in 2006.

The percentage of faculty with specialization courses in São Paulo State also consistently declined, falling

from 30.7% to 23.6% in 2006. For all other states in Brazil, the rates were 36.1% and 32.1%, respectively.

In São Paulo State, the highest growth occurred among those holding master's degrees, climbing from 25.8% to 35.5% in the 1999-2006 period.

For Brazil, the numbers were 30.6% and 36.3% in the same period (Table 2.23). This growth is associated with a reduction in the number of specialists, many of whom likely completed master's programs in this period.

**Table 2.23 (continued)**  
**Distribution of teachers (in service) in higher education, by type of administration and their highest degree – Brazil (excluding São Paulo State) and São Paulo State, 1999-2006**

Year	Distribution of teachers (in service) in higher education, by types of administration (%)									
	Brazil (excl. SP State)					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Master's</b>										
1999	30.6	35.8	26.3	25.4	28.3	25.8	20.9	15.4	22.9	29.3
2000	30.4	30.8	27.2	23.2	31.4	28.3	11.1	15.4	24.5	32.8
2001	32.6	29.1	30.1	24.2	35.4	30.4	14.8	11.9	31.9	35.2
2002	34.6	28.8	33.0	25.9	37.8	32.5	14.3	10.3	33.9	37.8
2003	35.4	28.4	31.6	31.0	39.2	34.3	11.9	9.9	40.1	39.6
2004	35.8	27.1	34.1	30.0	39.6	34.0	12.7	10.5	40.9	38.9
2005	36.1	26.7	33.9	34.1	40.0	35.5	15.5	11.6	44.4	40.5
2006	36.3	27.2	35.2	34.0	39.8	35.5	18.4	11.1	47.7	40.4
<b>PhD</b>										
1999	16.7	30.1	11.9	5.5	8.2	28.7	74.6	76.5	11.0	13.7
2000	18.5	36.0	14.5	5.8	8.9	29.0	80.2	73.5	12.6	15.7
2001	18.5	36.9	15.7	6.3	9.4	29.2	76.8	78.6	12.9	16.9
2002	19.0	40.1	18.0	7.2	9.7	28.4	76.9	81.2	12.5	16.4
2003	18.8	42.3	20.0	9.7	9.4	28.6	79.3	82.8	15.4	16.9
2004	18.3	42.4	19.3	10.6	9.4	28.7	67.3	82.5	17.4	17.6
2005	19.2	43.4	21.0	9.7	10.2	29.2	69.2	81.5	22.8	17.7
2006	20.0	46.6	22.5	9.9	10.1	30.0	67.7	82.6	23.3	18.2

Source: INEP, Higher education Census (microdata).

Note: See Detailed Tables 2.16a and 2.16b.

(1) The numbers for teachers without graduate degree and with specialization were added together.

On the other end of the scale, the percentage of doctors showed little variation with on slight oscillations in São Paulo State (edging up from 28.7% in 1999 to 30% in 2006) and other states (from 16.7% to 20.0%).

The sharpest contrasts also occur in São Paulo State: on one hand, between federal and state institutions, and on the other hand, between private and municipal HEIs. In Brazil, federal and state HEIs in São Paulo State were in fact pioneers in increasing in average faculty qualifications as measured by degrees held.

At the three state universities, 76.5% of the faculty held doctoral degrees in 1999. The two federal HEIs showed similar percentages: 74.6%. In subsequent years, the state HEIs increased the numbers holding doctorates, reaching 82.8% in 2003, before stabilizing until 2006.

However, federal HEIs witnessed significant variation, climbing from 74.6% in 1999 to peak at 80.2%

in 2000, before declining to 67.7% in 2006. This performance also appears to be related to the expansion enrollment, courses and faculty mentioned earlier.

These data appear to indicate that SP State's public universities are in far better shape when it comes to faculty qualifications as measured by degrees held by faculty in comparison to all types of HEIs in other Brazilian states. Even federal universities in São Paulo State have faculty with relatively higher degrees, although this lead is declining. The difference between state-run colleges is greater, especially when data for Brazil (excluding São Paulo State) are observed. In sum, São Paulo State outperforms Brazil as a whole on this criterion, and especially so in the case of its state universities.

Despite recent progress at private institutions (in terms of degrees held by the faculty), there is still plenty of room for progress. Even with the small in-

crease in the number of doctorates held by faculty, the percentages are very small (although slightly higher in SP State), which indicates that private HEIs are still institutions primarily focused on teaching, and do not conduct research.

In São Paulo State, the percentage of faculty at federal and state-run HEIs holding master's degrees has decreased, while the proportion holding doctorates has increased. Faculty holding master's degrees is still the most numerous category, however, and the one that has most grown in both municipal and private institutions. It is important to note that municipal HEIs have outperformed private HEIs in terms of growth in the proportions of teachers with master's degrees and doctorates.

### 3.11.2 Faculty work regimes

Another useful indicator for evaluating quality at HEIs is the proportion of full-time faculty. While this indicator is more relevant to research than to teaching, Yet, it may have influence in education, because it indicates work regimes in which teachers are responsible for smaller classes and have more time to prepare lectures, correct essays or test papers, supervise students, and participate in institutional life.

In 2006 full-time faculty accounted for 54.6% of instructors at universities in Brazil, 19.3% at university centers, and 10.1% at other institutions (Table 2.24).

The major contrasts appeared not among the dif-

**Table 2.24**  
Teachers (in-service and retired) and full-time teachers in higher education, by type of administration and institution – Brazil and São Paulo State, 1999-2006

Teachers in-service and retired and employed full time (%)	Teaching staff in higher education, by type of administration (%)									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Universities</b>										
<b>1999 (1)</b>										
Teachers	124,780	44,435	26,197	2,490	51,658	31,483	1,203	9,646	845	19,789
full-time (%)	53.6	82.7	73.6	22.0	19.8	41.5	97.5	86.3	15.4	17.4
<b>2000</b>										
Teachers	139,531	47,922	31,053	1,618	58,938	34,462	1,290	10,139	913	22,120
full-time (%)	54.2	84.9	71.7	22.4	20.8	40.6	89.4	82.3	17.7	19.6
<b>2001</b>										
Teachers	148,219	48,926	31,830	1,705	65,758	35,987	1,273	9,935	907	23,872
full-time (%)	53.4	84.2	72.2	24.8	22.0	39.7	89.9	83.4	21.3	19.5
<b>2002</b>										
Teachers	153,003	48,056	32,447	2,424	70,076	36,497	1,281	10,013	894	24,309
full-time (%)	52.5	84.4	75.8	27.0	20.8	39.7	92.0	83.5	30.2	19.2
<b>2003</b>										
Teachers	158,702	48,570	33,126	3,963	73,043	36,980	1,246	10,106	928	24,700
full-time (%)	50.6	83.0	75.6	20.4	19.5	38.7	90.0	82.9	21.9	18.6
<b>2004</b>										
Teachers	165,171	49,104	34,804	4,007	77,256	37,566	1,246	9,946	1,079	25,295
full-time (%)	50.8	82.6	76.2	32.6	20.1	40.3	86.7	82.9	26.0	21.9
<b>2005</b>										
Teachers	167,969	51,838	36,588	3,800	75,743	36,555	1,314	10,376	972	23,893
full-time (%)	53.8	83.6	73.6	28.0	25.1	44.3	87.7	81.9	36.4	25.9
<b>2006</b>										
Teachers	168,481	52,881	37,482	3,841	74,277	35,655	1,373	10,694	1,058	22,530
full-time (%)	54.6	83.4	75.6	27.9	24.9	46.7	86.7	82.2	29.0	28.2

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ferent types of institutions, but between the public and private sectors.

Any comparison must take into account the fact that almost all federal and state HEIs are universities; there are no university centers and there are very few colleges, institutes and schools. The latter three are predominantly private with a small contribution from municipal institutions in São Paulo State.

Therefore, it is important to analyze work regimes at public and private universities on the hand, and the private sector as a whole on the other.

At universities, full-time faculty accounted for 83.4% of instructors at federal universities, 75.6% at state universities, 27.9% at municipal universities, and 24.9% at private institutions (Table 2.24).

In terms of growth, the number of full-time faculty remained stable from 1999-2006. At federal universities, it oscillated slightly around 83%, shifting more significantly at state universities from 71.7% to 76.2%.

However, there was consistent growth in the percentage of full-time faculty at municipal and private universities. Municipal universities witnessed a 6-percentage point increase in full-time faculty from 1999-2006 (22%-27.9%); while private universities saw a 5-percentage point increase from 19.8% to 24.9% in the same period).

Considering changes in the private sector (the only one well represented among the three types of institutions), the number full-time faculty was highest at universities (24.9%), followed by university

**Table 2.24 (continued)**  
Teachers (in-service and retired) and full-time teachers in higher education, by type of administration and institution – Brazil and São Paulo State, 1999-2006

Teachers in-service and retired and employed full time (%)	Teaching staff in higher education, by type of administration (%)									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>University centers</b>										
<b>1999 (1)</b>										
Teachers	8,563	-	-	-	8,563	4,090	-	-	-	4,090
full-time (%)	11.7	-	-	-	11.7	11.9	-	-	-	11.9
<b>2000</b>										
Teachers	13,505	-	-	128	13,377	5,852	-	-	128	5,724
full-time (%)	14.0	-	-	18.0	14.0	12.5	-	-	18.0	12.4
<b>2001</b>										
Teachers	18,918	126	-	158	18,634	8,349	-	-	158	8,191
full-time (%)	14.0	94.4	-	24.7	13.4	11.4	-	-	24.7	11.2
<b>2002</b>										
Teachers	23,925	134	-	477	23,314	10,296	-	-	447	9,849
full-time (%)	17.7	75.4	-	18.9	17.3	18.1	-	-	20.1	18.0
<b>2003</b>										
Teachers	27,307	135	-	553	26,619	11,315	-	-	553	10,762
full-time (%)	13.7	94.8	-	17.4	13.2	11.1	-	-	17.4	10.8
<b>2004</b>										
Teachers	33,305	133	-	407	32,765	11,997	-	-	407	11,590
full-time (%)	14.9	95.5	-	17.2	14.6	11.6	-	-	17.2	11.4
<b>2005</b>										
Teachers	34,033	-	-	526	33,507	12,581	-	-	526	12,055
full-time (%)	17.7	-	-	16.2	17.7	18.5	-	-	16.2	18.6
<b>2006</b>										
Teachers	36,024	-	-	558	35,466	13,142	-	-	546	12,596
full-time (%)	19.3	-	-	19.4	19.3	21.8	-	-	19.0	21.9

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centers (19.3%) and other institutions (8.4%). From 2000 to 2006, both university centers and universities saw their full-time faculty grow, up from 14% to 19.3% and 20.8% to 24.9%, respectively. On the contrary, other institutions saw their full-time faculty numbers dwindle from (10.7% to 8.4% in the same period (Table 2.24).

Just as the proportion of full-time teachers can be considered an ad hoc partial indicator of quality in higher education, it can be argued that a high proportion of hourly-paid teachers is associated with poor

quality. Supporting this assumption is the fact that the salaries of hourly-paid teachers are generally low. In order to increase their income, many work at multiple institutions where they can teach up to 40 hours of classes a week (usually to large classes). It is likely that these working conditions discourage efforts to meet students' needs, including careful evaluation of student performance.

An analysis of growth in the percentage of hourly-paid faculty can be conducted from 2002 on, when INEP began to disclose these data.

**Table 2.24 (continued)**  
Teachers (in-service and retired) and full-time teachers in higher education, by type of administration and institution – Brazil and São Paulo State, 1999-2006

Teachers in-service and retired and employed full time (%)	Teaching staff in higher education, by type of administration (%)									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Integrated colleges, colleges, schools &amp; institutes</b>										
<b>1999 (1)</b>										
Teachers	39,257	1,405	2,555	2,565	32,732	13,508	129	584	1,188	11,607
full-time (%)	13.0	81.9	37.6	8.1	8.5	11.4	97.7	45.2	9.3	8.9
<b>2000</b>										
Teachers	43,259	1,371	2,132	2,513	37,243	14,210	110	560	1,175	12,365
full-time (%)	15.2	88.9	47.0	14.2	10.7	12.5	90.9	52.1	10.9	10.2
<b>2001</b>										
Teachers	50,816	1,390	2,213	2,704	44,509	15,995	118	597	1,347	13,933
full-time (%)	14.9	80.9	46.4	21.5	10.9	11.3	95.8	56.3	9.5	8.9
<b>2002</b>										
Teachers	62,227	810	2,383	2,940	56,094	18,065	117	587	1,618	15,743
full-time (%)	12.9	77.3	54.2	11.0	10.4	11.1	96.6	57.4	8.1	9.1
<b>2003</b>										
Teachers	78,092	841	2,447	3,143	71,661	20,088	114	585	1,733	17,656
full-time (%)	12.5	80.5	57.4	7.9	10.4	9.2	95.6	56.1	5.9	7.5
<b>2004</b>										
Teachers	85,997	716	2,553	3,389	79,339	21,171	114	585	1,500	18,972
full-time (%)	10.9	80.6	58.4	6.8	8.9	8.9	94.7	57.6	7.1	7.0
<b>2005</b>										
Teachers	94,623	519	2,344	3,448	88,312	22,123	137	646	1,730	19,610
full-time (%)	10.3	83.4	64.6	9.1	8.5	9.5	97.8	54.2	10.9	7.3
<b>2006</b>										
Teachers	101,659	523	2,657	3,515	94,964	23,323	136	574	1,575	21,038
full-time (%)	10.1	81.1	57.5	9.1	8.4	9.4	97.1	50.2	6.7	7.9

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.17.

(1) Only in-service teachers.



From 2002-2006, the percentage of hourly-paid faculty was small at federal and state universities in São Paulo State. In contrast, the percentage at private universities was consistently high (always above 44%), peaking at 53.5% in 2003 and oscillating slightly

thereafter (Table 2.25). At municipal universities in São Paulo State (2004 and 2005), the figure was much lower (23.9% and 25.1%, respectively), leaping 43.7% in 2006. In municipal non-university institutions, the percentage was always greater than 41%, peaking at

**Table 2.25**  
Teachers (in-service and retired) and hourly teaching staff in higher education, by type of administration and institution – Brazil and São Paulo State, 2002-2006

Teachers in-service and retired and hourly paid teachers (%)	Teaching staff in higher education, by type of administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Universities</b>										
<b>2002</b>										
Teachers	153,003	48,056	32,447	2,424	70,076	36,497	1,281	10,013	894	24,309
hourly paid teachers (%)	24.6	1.2	3.1	29.3	50.5	32.3	0.0	0.0	0.0	48.5
<b>2003</b>										
Teachers	158,702	48,570	33,126	3,963	73,043	36,980	1,246	10,106	928	24,700
hourly paid teachers (%)	28.4	2.8	3.0	53.1	55.6	35.7	0.0	0.0	0.0	53.5
<b>2004</b>										
Teachers	165,171	49,104	34,804	4,007	77,256	37,566	1,246	9,946	1,079	25,295
hourly paid teachers (%)	28.6	1.6	5.9	33.0	55.8	36.0	9.1	0.0	23.9	52.0
<b>2005</b>										
Teachers	167,969	51,838	36,588	3,800	75,743	36,555	1,314	10,376	972	23,893
hourly paid teachers (%)	24.0	0.3	5.8	51.2	47.7	34.4	10.4	0.0	25.1	51.1
<b>2006</b>										
Teachers	168,481	52,881	37,482	3,841	74,277	35,655	1,373	10,694	1,058	22,530
hourly paid teachers (%)	23.4	3.3	5.6	52.9	45.2	29.6	9.8	0.0	43.7	44.3
<b>University centers</b>										
<b>2002</b>										
Teachers	23,925	134	-	477	23,314	10,296	-	-	447	9,849
hourly paid teachers (%)	53.9	17.2	-	81.1	53.5	60.6	-	-	79.9	59.7
<b>2003</b>										
Teachers	27,307	135	-	553	26,619	11,315	-	-	553	10,762
hourly paid teachers (%)	55.4	0.0	-	41.8	56.0	56.3	-	-	41.8	57.0
<b>2004</b>										
Teachers	33,305	133	-	407	32,765	11,997	-	-	407	11,590
hourly paid teachers (%)	55.4	-	-	72.7	55.4	59.1	-	-	72.7	58.6
<b>2005</b>										
Teachers	34,033	-	-	526	33,507	12,581	-	-	526	12,055
hourly paid teachers (%)	53.7	-	-	66.0	53.5	54.5	-	-	66.0	54.0
<b>2006</b>										
Teachers	36,024	-	-	558	35,466	13,142	-	-	546	12,596
hourly paid teachers (%)	58.5	-	-	76.7	58.2	58.3	-	-	77.8	57.5

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**Table 2.25 (continued)**  
**Teachers (in-service and retired) and hourly teaching staff in higher education, by type of administration and institution – Brazil and São Paulo State, 2002-2006**

Teachers in-service and retired and hourly paid teachers (%)	Teaching staff in higher education, by type of administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>Integrated and single-course colleges, schools and institutes</b>										
<b>2002</b>										
Teachers	62,227	810	2,383	2,940	56,094	18,065	117	587	1,618	15,743
hourly paid teachers (%)	60.0	2.1	8.0	60.6	63.0	63.9	0.0	0.2	67.3	66.4
<b>2003</b>										
Teachers	78,092	841	2,447	3,143	71,661	20,088	114	585	1,733	17,656
hourly paid teachers (%)	61.7	3.2	6.1	64.5	64.1	67.9	0.0	0.3	72.5	70.1
<b>2004</b>										
Teachers	85,997	716	2,553	3,389	79,339	21,171	114	585	1,500	18,972
hourly paid teachers (%)	70.7	3.1	4.5	72.6	70.2	70.5	0.0	0.0	73.5	72.8
<b>2005</b>										
Teachers	94,623	519	2,344	3,448	88,312	22,123	137	646	1,730	19,610
hourly paid teachers (%)	68.6	0.2	5.2	72.2	70.5	67.7	0.0	5.3	67.6	70.3
<b>2006</b>										
Teachers	101,659	523	2,657	3,515	94,964	23,323	136	574	1,575	21,038
hourly paid teachers (%)	70.9	0.0	4.0	72.9	73.1	73.3	0.0	5.9	74.2	75.5

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.17.

79.9% in 2002. The same occurred in the private non-university sector in which the percentage of hourly-paid faculty was higher than that recorded in universities of this sector (more than 54%).

An analysis of these data in conjunction with selection/admission data and the proportion of students enrolled in evening courses shows that most private and municipal HEIs continue to play the role of meeting low-quality demand, in particular by admitting applicants who are relatively ill-prepared and have less time available to study, and by employing academic staff with low qualifications and high teaching workloads. On the other hand, there are a large number of well-prepared students to enter and successfully complete quality undergraduate courses, although many are unsuccessful in the competitive selection processes at public universities due to the sheer numbers of applicants. State and federal public HEIs are able to fill this gap offering innovative and effective models of higher education.

### 3.12. Technology education

Technological education can be extremely important in the socioeconomic development of countries because it contributes directly to the qualification of workers according to specific needs of the market. In Brazil, it has received little attention from the public sector and almost none from the private sector until recently, accounting for only 2.1% of total enrollment in higher education in Brazil. In São Paulo State (Table 2.26), its share was a little higher at 3%).

These numbers were underestimated because they only incorporate courses offered at in technology education centers (CETs) and technology colleges (FATECS). There is a number of technology courses given in institutions that offer bachelor's degrees. However, this is more common in private education. Still, as most courses are in fact offered in CETs and FATECs, the indicator is reasonably acceptable.

**Table 2.26**  
**Enrollments in higher education, distribution of enrollment in Centers for Technology Education (CETs) and Colleges of Technology (FATECs), and enrollment ratios in relation to the total, by type of administration – Brazil and São Paulo State, 1999-2006**

Years	Total enrollment in higher education	Enrollments in CETs and FATECs (1)								Enrollments in CETs and FATECs (1), % of total			
		Total		Federal		State		Private		Total	Federal	State	Private
		Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%				
<b>Brazil</b>													
1999	2,369,945	19,484	100.0	10,893	55.9	8,591	44.1	-	-	0.82	0.46	0.36	0.00
2000	2,694,245	23,322	100.0	13,353	57.3	9,969	42.7	-	-	0.87	0.50	0.37	0.00
2001	3,030,754	31,472	100.0	20,228	64.3	10,611	33.7	633	2.0	1.04	0.67	0.35	0.02
2002	3,479,913	43,179	100.0	26,262	60.8	10,853	25.1	6,064	14.0	1.24	0.75	0.31	0.17
2003	3,887,022	59,707	100.0	33,801	56.6	10,995	18.4	14,911	25.0	1.54	0.87	0.28	0.38
2004	4,163,733	76,432	100.0	35,741	46.8	14,333	18.8	26,358	34.5	1.84	0.86	0.34	0.63
2005	4,453,156	83,219	100.0	28,273	34.0	15,907	19.1	39,039	46.9	1.87	0.63	0.36	0.88
2006	4,676,646	98,137	100.0	31,382	32.0	16,562	16.9	50,193	51.1	2.10	0.67	0.35	1.07
<b>SP State</b>													
1999	740,113	8,591	100.0	-	-	8,591	100.0	-	-	1.16	0.00	1.16	0.00
2000	818,304	9,969	100.0	-	-	9,969	100.0	-	-	1.22	0.00	1.22	0.00
2001	898,643	11,195	100.0	391	3.5	10,611	94.8	193	1.7	1.25	0.04	1.18	0.02
2002	988,696	15,803	100.0	532	3.4	10,853	68.7	4,418	28.0	1.60	0.05	1.10	0.45
2003	1,050,054	23,044	100.0	1153	5.0	10,995	47.7	10,896	47.3	2.19	0.11	1.05	1.04
2004	1,109,693	30,372	100.0	1209	4.0	14,333	47.2	14,830	48.8	2.74	0.11	1.29	1.34
2005	1,185,028	35,007	100.0	1276	3.6	15,907	45.4	17,824	50.9	2.95	0.11	1.34	1.50
2006	1,268,976	38,361	100.0	1700	4.4	16,320	42.5	20,341	53.0	3.02	0.13	1.29	1.60

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.9.

(1) There is no record of CET or FATEC with municipal administration in Brazil.

Although tech course represent a small share of higher education special treatment (Schwartzman, Christophe, 2005) including comparison with other nations.

In OECD and partner countries, enrollment in technology education is not very high: these courses accounted for less than 20% in 2006 among two-thirds of these countries (Table 2.27). The share of Type-B courses (or technology courses) varies greatly in different countries, including those where enrollment is high, such as Belgium, Greece and South Korea, where it is above 30%. In Turkey, Northern Ireland, New Zealand, France, Japan, UK, and the U.S., tech courses accounted for 20% to 30% of enrollment in 2006.

The development of technological education has been very irregular and tended to decrease in the last

five years, especially in Ireland and Denmark. The largest increases in enrollment in Type-B higher education were reported in Turkey, Greece, Spain, and Hungary. On the other hand, when 25-34 age cohort completing higher education in 2006 is analyzed (Table 2.28), it was observed that graduates of Type-B courses represented 35% of the total in 5 of 6 countries with higher percentages of graduating students.

With regard to the relationship between public and private education, OECD and partner countries also varied significantly. Much like Type-A courses in the European Union (Table 2.29), the public sector predominates in technology education, accounting for 47% in Belgium and 99.1% in Denmark. There are countries where combining the numbers for public HEIs

**Table 2.27**  
**Enrollments in type-B (technology) higher education, by selected countries - Brazil, São Paulo State and selected countries, 2000-2006**

Selected countries and SP State	Enrollments (%) in type-B higher education	
	2000	2006
Belgium	51.10	51.73
Greece	32.04	37.39
South Korea	40.76	36.96
Turkey	21.48	29.24
Northern Ireland	40.68	29.09
New Zealand	25.10	26.64
France	24.29	24.33
Japan	26.79	23.69
UK	30.24	21.91
USA	20.94	20.99
Switzerland	22.00	17.40
Australia	22.62	15.29
Germany	15.21	14.67
Spain	8.72	13.42
Denmark	43.86	12.46
Austria	9.57	9.46
Czech Republic	12.75	9.45
Hungary	1.15	5.71
Sweden	4.00	4.82
Mexico	2.23	3.28
<b>SP State (1) (2)</b>	<b>1.22</b>	<b>3.02</b>
Iceland	8.58	2.47
<b>Brazil (1) (3)</b>	<b>0.87</b>	<b>2.10</b>
Slovakia	4.12	1.43
Portugal	5.01	1.15
Poland	1.14	1.08
Norway	8.09	0.91
Italy	1.52	0.69
Finland	5.64	0.04
Canada	25.80	...
Luxembourg	77.39	...
Netherlands	1.53	...

**Source:** SP State and Brazil: INEP. Higher Education Census (microdata). Other countries: OECD Stat. OECD Educational Database.

(1) Enrollments in Centers for Technology Education (CETs) and Colleges of Technology (FATECs).

(2) Enrollments (%) in type-B (technology) higher education in relation to the total in SP State.

(3) Enrollments (%) in type-B (technology) higher education in relation to the total in Brazil.

**Table 2.28**  
**Population aged 25-34 years who completed higher education, by type of course and selected countries – Brazil and selected countries, 2005**

Selected countries	Population (%) who completed higher education, by type of course		
	Total	Technology (type B) courses (ISCED 5B)	Undergraduate (type A) courses (ISCED 5A)
<b>More than 40%</b>			
Canada	53.8	25.6	28.2
Japan	53.2	25.3	27.9
South Korea	51.0	19.3	31.7
Norway	40.9	1.9	38.9
Ireland	40.6	14.4	26.2
Belgium	40.6	21.5	19.1
<b>35-40%</b>			
Denmark	39.8	9.1	30.7
Spain	39.7	12.8	27.0
France	39.3	17.0	22.3
Australia	38.1	8.9	29.2
Finland	37.5	11.0	26.6
Sweden	37.3	8.9	28.4
Luxembourg	37.0	13.2	23.8
Iceland	35.8	3.3	32.5
Netherlands	35.4	1.6	33.8
United Kingdom	35.0	8.1	26.9
<b>Less than 35%</b>			
Switzerland	31.0	9.1	21.9
New Zealand	30.8	4.6	26.2
Poland	25.5	-	25.5
Greece	25.4	8.4	17.0
Germany	22.5	7.4	15.1
Austria	19.7	8.1	11.6
Hungary	19.6	0.5	19.1
<b>Brazil (1)</b>	<b>7.9</b>	<b>...</b>	<b>...</b>

Source: OECD, Education at a Glance 2007 (OECD, 2008).

Notes: 1. Only countries with 20% or more of students completing higher education courses were included. 2. U.S. data were excluded due to a conflict with recent literature.

(1) In 2004.

**Table 2.29**  
**Distribution of students enrolled in type-B higher education, by type of administration, region, and selected countries – Brazil, São Paulo State and selected countries, 2005**

Region / Selected countries and SP State	Students (%) enrolled in type-B higher education, by type of administration			
	Total	Public	Private – Governmental	Private – Independent
<b>Oceania</b>				
Australia	100.0	97.7	1.3	1.1
New Zealand	100.0	69.8	28.5	1.7
<b>Northern Europe</b>				
Denmark	100.0	99.1	0.9	...
Finland	100.0	92.6	7.4	...
Iceland	100.0	66.8	33.2	...
Sweden	100.0	62.4	37.6	...
<b>Central Europe</b>				
UK	100.0	...	100.0	...
Italy	100.0	84.8	...	15.2
Spain	100.0	78.4	15.7	5.9
France	100.0	71.9	8.4	19.7
Austria	100.0	68.7	31.3	...
Portugal	100.0	56.0	...	44.0
Belgium	100.0	47.0	53.0	...
Switzerland	100.0	30.4	38.9	30.8
<b>USA &amp; Asia</b>				
USA	100.0	84.8	...	15.2
Israel	100.0	34.3	65.7	...
South Korea	100.0	15.8	...	84.2
Japan	100.0	7.3	...	92.7
<b>OECD average</b>	-	<b>65.5</b>	<b>18.5</b>	<b>13.9</b>
<b>Average EU 19</b>	-	<b>67.4</b>	<b>20.6</b>	<b>7.2</b>
<b>Latin America</b>				
Chile	100.0	7.3	3.0	89.7
Mexico	100.0	95.9	...	4.1
<b>Brazil</b>	<b>100.0</b>	<b>53.1</b>	<b>...</b>	<b>46.9</b>
<b>SP State</b>	<b>100.0</b>	<b>49.1</b>	<b>...</b>	<b>50.9</b>

**Source:** SP State and Brazil: INEP. Higher Education Census (microdata). Other countries: OECD. Education at a Glance 2007 (OECD, 2008).

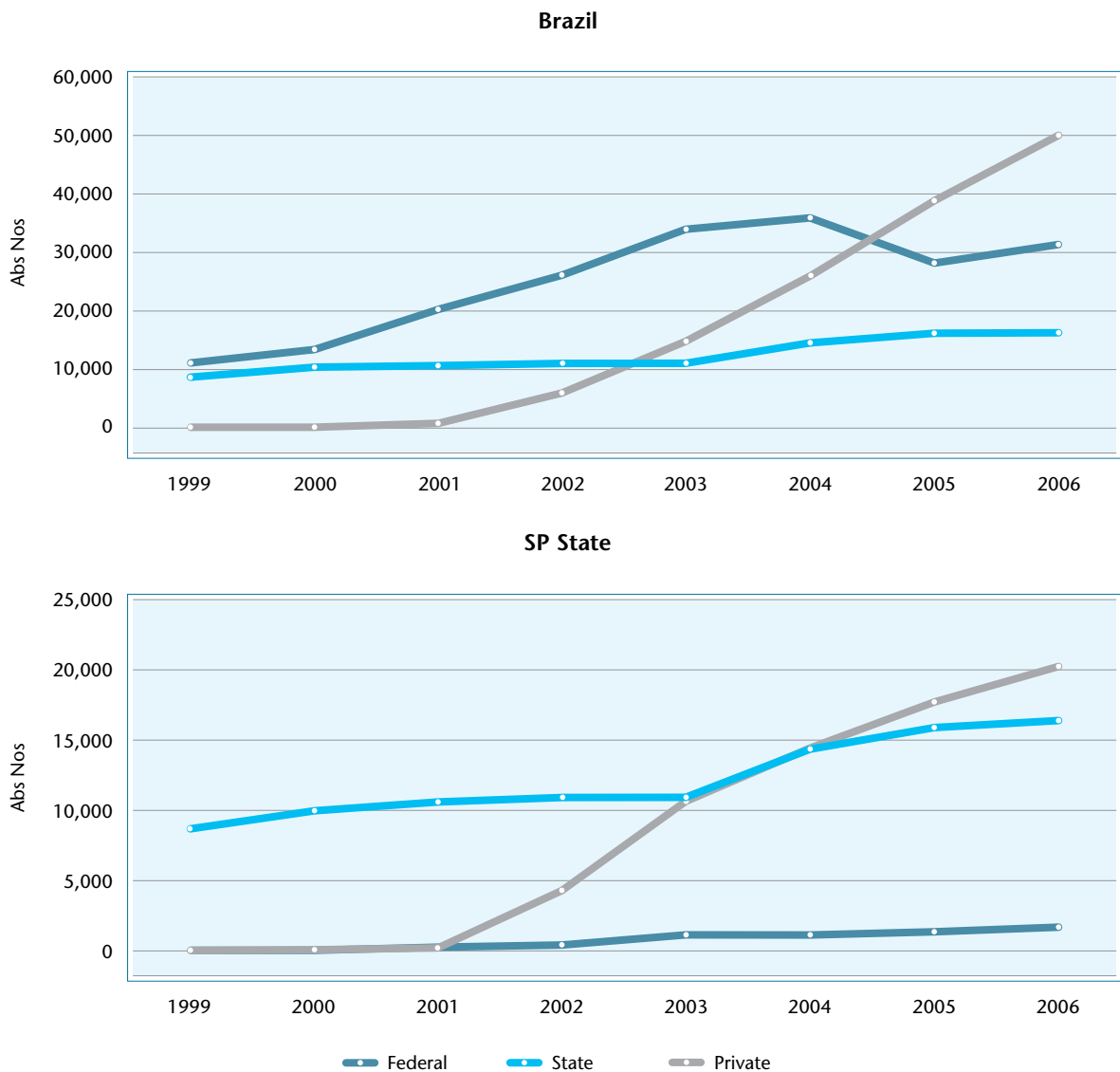
**Note:** OECD data do not mention technology education, but type-B education, which is reasonably equivalent to it.

and private education (funded by the government) is necessary, for example: Austria (68.7+31.3%), Belgium (47%+53%), and Iceland (66.8%+33.2%), where both categories add up to 100%. Only in very few countries, including France (19.7%), Italy (15.2%), Portugal (44.0%) and Switzerland (30.8%), is the private sector not dependent on government support. One example is South Korea where 84.2% of students enrolled in Type-B higher education are concentrated in the independent private sector and the public sector has only 15.8%.

It should be observed that in Brazil statistics refer almost exclusively to formal Type-A courses. Technology courses are probably underestimated (less than 3%). When Brazil and those countries are compared based on enrollment in Type-A courses, differences decrease significantly.

The growth in technological education is recent and has been very fast in Brazil, especially in São Paulo State (Figure 2.19). Until 2000, technology education in São Paulo State was limited and fully funded by the state government. Enrollment in state institutions grew

**Figure 2.19**  
Enrollments in Technology Education Centers (CETs) and Colleges of Technology (FATs), by type of administration – Brazil and São Paulo State, 1999-2006



Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.9.

considerably from 8,591 in 1999 to 16,320 in 2006, i.e., almost doubling in seven years (Table 2.26). This phenomenon was a characteristic of São Paulo State in this period and continued in the following year.

Until 2005, Brazil had no state-run tech education institutions outside São Paulo State. In other South-eastern states, data enrollment (242 students) only began to be collected after 2006.

Until 2000, the technological education system in Brazil (excluding São Paulo State) was exclusively federal. In that year, enrollment reached 13,353 (just one-third more than the 9,969 at state-run HEIs in São Paulo State). In Brazil, enrollment in the federal sector grew until 2004, peaking at 35,741 student, dropping to 28,273 in 2005 before making a partial recovery in 2006, when it hit 31,382.

In São Paulo State, enrollment in the federal sector began in 2001, totaling 391, and grew continually through 2006 to 1,700. The federal sector's share in the São Paulo State tech education sector continued low, however, moving from 3.5% of enrollment in 2001 to 4.4% in 2006, with an isolated peak at 5% in 2003.

In both Brazil and São Paulo State, the presence of the private sector was incipient in 2001, with only 193 students enrolled in São Paulo State and 633 in Brazil. In the following years, this sector grew vigorously reaching 50,193 students or 51.1% of enrollment in technology education in Brazil by 2006. In São Paulo State, 20,341 students were enrolled (53% of the total).

It is also worth mentioning that part of the enrollment (listed as being in the private tech education sector in São Paulo State) involves courses and institutions created since then by SENAI and SENAC (which could be classified as semi-public education institutions).

The growth in the private sector comes in direct response to social demands for education and indicates a major transformation in the orientation of demand. Until a few years ago, technological education in Brazil enjoyed little prestige, which explained low student demand. The growth in the private sector (which is typically sensitive to demand for higher education) indicates the population's change in attitude.

This is supported by data on the number of applicants per place in entrance exams for FATECs. Although the applicant/place ratio has decreased, from 11.2 per place to 7.6 per place in 1995-2007 period (Table 2.30),<sup>13</sup> it is very similar to the ratio at universities, which also decreased in the period.

Although the percentages are still small, the technology sector is currently a very dynamic part of the

higher education system in São Paulo State. At state-funded institutions in São Paulo State, enrollment in technology institutions (Table 2.31) increased from 10.8% of the total in 1999 to 14.5% in 2006.

The importance of government action in São Paulo State since 2002 is worth mentioning. After long-period stagnation, the government began increasing investments in the technology sector. As a result, enrollment increased sharply, driven largely by the Paula Souza Foundation.

In contrast to the state university system (which has consisted of the same universities since UNESP was founded), the number of establishments in the technology sector is increasing as education is interiorized. The data indicate that a new policy has been adopted. From 1995 to 2001, FATECs were restricted to 9 municipalities. Five new municipalities were added in 2002, followed by another three in 2004 and one more in 2005. The years 2006 and 2007 saw creation of 7 and 8 new units, respectively, bringing the total to 26 in 2006.<sup>14</sup> In São Paulo State (Table 2.32), the proportion of state-run tech HEIs in the interior was 57.0% in 2006, which compared favorably to private HEIs in São Paulo State (36.0%) and Brazil (37%) and the federal system in all states of Brazil (26%).

Data from the São Paulo State Education Council and Paula Souza Foundation indicate that the growth remains accelerated, as accreditation of new courses and institutions has increased since 2006.

In the 1995-2000 period, enrollment grew slowly, rising from 8,462 to 10,080, but exploding in the 2001-2007 period, when the number doubled from 10,159 to 21,372 (Table 2.33).

In terms of faculty, the percentage of full-time teachers at federal technology institutions in Brazil was very high. Small variations occurred in the 2000-2005 period, but the average remained in the range of 77% to 92%. In 2006, the figure stood at 87% (Table 2.34).

At state-run HEIs, the percentages were much lower (10% to 16%) with sharp variations in the 1999-2006 period. A large number of full-time teachers in tech education is not necessary, because it is essential that instructors have past and ongoing experience in the marketplace in order to have know-how central to this type of education. Full-time positions can be restricted to teachers involved in administration, research and coordination of the system, with no loss in quality. This characteristic of technology education lends itself to constant faculty in-service training and refreshers and is one factor that allows for an increasing supply of free quality education.

13. Only [entrance] examinations performed in the first semester were included because they are more competitive.

14. The most recent data were provided by the Paula Souza Foundation.



**Table 2.30**  
Places, applicants, and demand for entrance examinations at FATECs, by semester – São Paulo State, 1995-2007

Year	Entrance examinations at FATECs								
	Total			1st semester			2nd semester		
	Undergraduate places	Applicants	Applicants per place	Undergraduate places	Applicants	Applicants per place	Undergraduate places	Applicants	Applicants per place
1995	3,140	30,346	9.7	1,570	17,547	11.2	1,570	12,799	8.2
1996	3,140	28,487	9.1	1,570	17,015	10.8	1,570	11,472	7.3
1997	3,110	25,508	8.2	1,570	14,266	9.1	1,540	11,242	7.3
1998	3,080	25,701	8.3	1,540	14,460	9.4	1,540	11,241	7.3
1999	3,080	29,175	9.5	1,540	14,778	9.6	1,540	14,397	9.3
2000	3,080	31,770	10.3	1,540	15,683	10.2	1,540	16,087	10.4
2001	3,080	34,034	11.1	1,540	17,548	11.4	1,540	16,486	10.7
2002	4,480	48,247	10.8	1,700	23,725	14.0	2,780	24,522	8.8
2003	5,280	52,633	10.0	2,480	28,620	11.5	2,800	24,013	8.6
2004	5,680	48,695	8.6	2,640	30,521	11.6	3,040	18,174	6.0
2005	5,920	42,219	7.1	2,640	21,111	8.0	3,280	21,108	6.4
2006	7,720	50,410	6.5	3,780	28,647	7.6	3,940	21,763	5.5
2007	8,860	59,915	6.8	4,170	31,648	7.6	4,690	28,267	6.0

Source: Paula Souza Center. AESU – Office for Higher Education Affairs.

**Table 2.31**  
Enrollments in higher education institutions administered by the São Paulo State government, by type of institution – SP State, 1999-2006

Year	Total enrollment in higher education	Enrollments administered by the SP State government							
		Total		Universities		CETs and FATECs (1)		Other (2)	
		Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%
1999	740,113	79,499	100.0	68,761	86.5	8,591	10.8	2,147	2.7
2000	818,304	80,564	100.0	68,474	85.0	9,969	12.4	2,121	2.6
2001	898,643	83,235	100.0	70,254	84.4	10,611	12.7	2,370	2.8
2002	988,696	92,029	100.0	78,879	85.7	10,853	11.8	2,297	2.5
2003	1,050,054	96,392	100.0	83,036	86.1	10,995	11.4	2,361	2.4
2004	1,109,693	105,151	100.0	88,431	84.1	14,333	13.6	2,387	2.3
2005	1,185,028	112,183	100.0	93,594	83.4	15,907	14.2	2,682	2.4
2006	1,268,976	112,276	100.0	94,288	84.0	16,320	14.5	1,668	1.5
Growth rate (%)									
1999-2002	33.6	15.8		14.7		26.3		7.0	
2002-2006	28.3	22.0		19.5		50.4		(27.4)	

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.9.

(1) Centers for Technology Education (CETs) and Colleges of Technology (FATs).

(2) Integrated and [single-course] colleges, schools, and institutes.

**Table 2.32**  
**Enrollments in technology HEI (CETs and FATs) in interior cities, by type of administration and institution –**  
**Brazil and São Paulo State, 1999-2006**

Enrollments	Enrollment in CETs & FATs by type of administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>1999</b>										
Total enrollment	19,484	10,893	8,591	*	*	8,591	*	8,591	*	*
enrollment in interior [cities] (%)	25.1	12.7	40.8	*	*	40.8	*	40.8	*	*
<b>2000</b>										
Total enrollment	23,322	13,353	9,969	*	*	9,969	*	9,969	*	*
enrollment in interior [cities] (%)	35.7	26.5	49.3	*	*	48.0	*	48.0	*	*
<b>2001</b>										
Total enrollment	31,472	20,228	10,611	*	633	11,195	391	10,611	*	193
enrollment in interior [cities] (%)	34.2	24.6	50.4	*	69.5	47.8	*	50.4	*	*
<b>2002</b>										
Total enrollment	43,179	26,262	10,853	*	6,064	15,803	532	10,853	*	4,418
enrollment in interior [cities] (%)	37.3	36.0	49.7	*	20.5	35.6	*	49.7	*	5.0
<b>2003</b>										
Total enrollment	59,707	33,801	10,995	*	14,911	23,044	1,153	10,995	*	10,896
enrollment in interior [cities] (%)	31.0	30.5	49.8	*	18.3	29.2	*	49.8	*	11.6
<b>2004</b>										
Total enrollment	76,432	35,741	14,333	*	26,358	30,372	1,209	14,333	*	14,830
enrollment in interior [cities] (%)	34.3	29.7	53.2	*	30.1	34.4	6.2	53.2	*	18.6
<b>2005</b>										
Total enrollment	83,219	28,273	15,907	*	39,039	35,007	1,276	15,907	*	17,824
enrollment in interior [cities] (%)	34.3	21.7	56.8	*	34.2	40.5	9.4	56.8	*	28.2
<b>2006</b>										
Total enrollment	98,137	31,382	16,562	*	50,193	38,361	1,700	16,320	*	20,341
enrollment in interior [cities] (%)	36.8	26.4	56.5	*	36.8	43.6	9.2	57.2	*	35.5

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.12.

**Table 2.33**  
Average number of students enrolled in Colleges of Technology (FATECs) – São Paulo State, 1995-2007

FATECs in cities of SP State	Average number of students enrolled in FATECs (1)												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total</b>	<b>8,462</b>	<b>9,187</b>	<b>9,666</b>	<b>9,916</b>	<b>9,951</b>	<b>10,080</b>	<b>10,159</b>	<b>11,055</b>	<b>13,147</b>	<b>14,896</b>	<b>16,330</b>	<b>18,736</b>	<b>21,372</b>
São Paulo	4,910	5,173	5,256	5,220	5,160	5,223	5,305	5,430	5,643	5,558	5,469	5,516	5,318
Sorocaba	1,273	1,337	1,385	1,479	1,472	1,506	1,475	1,494	1,501	1,462	1,467	1,488	1,485
Americana	520	584	649	701	697	728	733	717	714	805	836	803	785
Baixada Santista	464	475	513	507	519	521	493	545	762	957	1,078	1,114	1,143
Taquaritinga	463	576	631	630	617	590	568	608	767	930	1,106	1,238	1,401
Guaratinguetá	45	91	142	197	235	261	273	265	275	287	333	556	778
Indaiatuba	58	119	168	228	287	302	335	346	356	361	368	485	628
Jaú	302	316	349	370	375	383	392	453	618	779	957	1096	1250
Ourinhos	430	519	575	586	592	569	587	768	1,042	1,024	931	850	870
Zona Leste	*	*	*	*	*	*	*	272	709	1066	1,267	1,522	1,440
Mauá	*	*	*	*	*	*	*	40	186	317	430	463	525
Jundiaí	*	*	*	*	*	*	*	40	191	333	438	560	646
Botucatu	*	*	*	*	*	*	*	40	193	336	447	464	482
Praia Grande	*	*	*	*	*	*	*	40	193	332	423	490	511
São José do Rio Preto	*	*	*	*	*	*	*	*	*	119	258	386	429
Mococa	*	*	*	*	*	*	*	*	*	119	241	372	415
Garça	*	*	*	*	*	*	*	*	*	115	246	360	475
São B. do Campo	*	*	*	*	*	*	*	*	*	*	40	236	408
Zona Sul	*	*	*	*	*	*	*	*	*	*	*	118	259
Cruzeiro	*	*	*	*	*	*	*	*	*	*	*	59	131
Carapicuíba	*	*	*	*	*	*	*	*	*	*	*	116	292
Itapetininga	*	*	*	*	*	*	*	*	*	*	*	117	252
Itaquaquecetuba	*	*	*	*	*	*	*	*	*	*	*	*	118
Marília	*	*	*	*	*	*	*	*	*	*	*	117	243
Pindamonhangaba	*	*	*	*	*	*	*	*	*	*	*	59	132
Presidente Prudente	*	*	*	*	*	*	*	*	*	*	*	*	99
Santo André	*	*	*	*	*	*	*	*	*	*	*	*	60
São José dos Campos	*	*	*	*	*	*	*	*	*	*	*	117	327
Tatuí	*	*	*	*	*	*	*	*	*	*	*	40	236
Guarulhos	*	*	*	*	*	*	*	*	*	*	*	*	40
Jales	*	*	*	*	*	*	*	*	*	*	*	*	40
Mogi Mirim	*	*	*	*	*	*	*	*	*	*	*	*	60
São Caetano do Sul	*	*	*	*	*	*	*	*	*	*	*	*	100

Source: Paula Souza Center. AESU – Office for Higher Education Affairs.

(1) Average enrollment in the 1st and 2nd semesters.

**Table 2.34**  
**Teachers (in-service and retired) and full-time teachers in technology higher education (CETs and FATECs),**  
**by type of institution and administration – Brazil and São Paulo State, 1999-2006**

Teachers (in-service and retired) and employed full-time (%)	Teaching in CETs and FATECs, by type of administration									
	Brazil					SP State				
	Total	Federal	State	Municipal	Private	Total	Federal	State	Municipal	Private
<b>1999</b>										
Teachers (1)	1,236	847	389	*	*	389	*	389	*	*
Full-time Teachers (%)	58.0	80.0	10.0	*	*	10.0	*	10.0	*	*
<b>2000</b>										
Teachers	1,417	872	545	*	*	545	*	545	*	*
Full-time Teachers (%)	55.4	77.3	20.4	*	*	20.4	*	20.4	*	*
<b>2001</b>										
Teachers	1,994	1,323	575	*	96	693	56	575	*	62
Full-time Teachers (%)	65.0	78.2	45.4	*	0.0	40.5	35.7	45.4	*	0.0
<b>2002</b>										
Teachers	3,320	2,020	524	*	776	1,250	94	524	*	632
Full-time Teachers (%)	55.4	79.6	32.3	*	8.1	21.4	94.7	32.3	*	1.4
<b>2003</b>										
Teachers	4,715	2,560	525	*	1,630	1,719	94	525	*	1,100
Full-time Teachers (%)	51.6	83.9	24.6	*	9.5	17.0	94.7	24.6	*	6.8
<b>2004</b>										
Teachers	8,769	4,486	825	*	3,458	2,733	355	825	*	1,553
Full-time Teachers (%)	45.8	79.3	19.0	*	8.7	19.0	97.2	19.0	*	1.0
<b>2005</b>										
Teachers	9,335	4,208	848	*	4,279	2,866	326	848	*	1,692
Full-time Teachers (%)	46.6	92.4	15.4	*	7.7	16.5	100.0	15.4	*	1.0
<b>2006</b>										
Teachers	10,718	4,674	868	*	5,176	3,147	349	846	*	1,952
Full-time Teachers (%)	43.1	87.3	15.9	*	7.8	10.1	49.3	14.1	*	1.4

Source: INEP, Higher education Census (microdata).

Note: See Detailed Table 2.17.

(1) Only in-service teachers.

The fact that the establishments are organized under a single foundation (Paula Souza) contributes to agility of the public technology education system in São Paulo State. This allows teachers to be hired under the regular labor laws (CLT) rather than the more bureaucratic process for the employment of civil servants and is an important recent innovation in São Paulo's higher education system.

### 3.13 Distance education

One common characteristic of distance education is that a single public institution typically effectively covers the entire nation and may even export courses to other countries. Its internal organization is independent from traditional on-site universities, although the most qualified personnel is recruited from the latter to design distance-learning programs. Each new course involves training a new team. In fact, the permanent staff at the UK's Open University (which does the programming, administers the institution, and organizes the activities of teaching and evaluation) is composed of personnel specialized in multimedia distance learning. These programs are, therefore, different from traditional programs and are truly innovative.

In Brazil, this model uncommon. Most distance education initiatives target federal universities, which establish separate networks for distance learning. Cre-

ating an Open University would be very costly. In São Paulo State, the Department Higher Education Secretariat is now organizing a distance-learning system that seems to follow the same guidelines for collaboration with universities focused on on-site courses, whereby a separate tract for distance-learning is created.

Due to significant private sector interest, distance-learning courses have shown marked growth, especially in São Paulo State, which has posed challenges to the evaluation system and quality control. Existing data is still very precarious and is restricted to the information shown in Table 2.35.

Recently, the federal government created a distance-learning program that is specifically for teacher training. Rather than create a system along the lines of the Open University (or the Open Institute), the government preferred to assign preparation, organization, and administration of courses to CAPES (an agency specialized in evaluating and fostering graduate education, but with no previous history of evaluation and management of undergraduate courses). This initiative can only be evaluated after publication of its programs and results.

Measuring the success of these initiatives and problems created by the distance-education model is objective of a study planned by the São Paulo Department Education, which will allow for more accurate evaluation of its potential.

**Table 2.35**  
Distance-learning higher education: courses, undergraduate places, applications, and admissions (per entrance examination and other selection processes); students enrolled and undergraduates who completed a course – Brazil, 2001-2006

Years	Distance-learning undergraduate courses					
	Courses	Places offered	Applicants	Admissions per entrance exam and other selection processes	Enrollments (June 30)	Undergraduates who completed a course
2001	-	6,856	13,967	6,618	5,359	131
2002	46	24,389	29,702	20,685	40,714	1,712
2003	52	24,025	21,873	14,233	49,911	4,005
2004	107	113,079	50,706	25,006	59,611	6,746
2005	189	423,411	233,626	127,014	114,642	12,626
2006	349	813,550	430,229	212,246	207,206	25,804

Source: INEP, Higher education Census (microdata).

## 4. Graduate education

Of all the levels of education in Brazil, graduate education is the best organized. It compares favorably with not only other Latin American countries, but also a majority of those in the OECD. It is also the most directly associated with scientific development in Brazil, given the substantial amount of academic research done at this level, which is where most researchers are trained.

The existence or lack of graduate programs, especially doctoral programs, is one of the best indicators for classification of HEIs regardless of legal status. If in undergraduate education, the private sector dominates the market, the opposite is true on the graduate level.

Graduate education followed a very different direction from undergraduate education in Brazil. Firstly, graduate education established neither curriculum guidelines determining training areas nor the curricula to be followed. Secondly, since graduate education, the entire process (establishment, accreditation, and renewal of accreditation) has been based on a national peer review system, associated with a system of incentives in the form of scholarships and research grants. Lastly, creation and development of graduate programs depended little on initiatives by educational institutions (or political demands), but rather the initiatives of the researchers themselves (i.e., of the scientific community).

The graduate education system is growing consistently and continuously in Brazil. From 2000-2006 (Detailed table 2.18), the number of doctoral programs increased from 811 to 1,154 and master's programs ex-

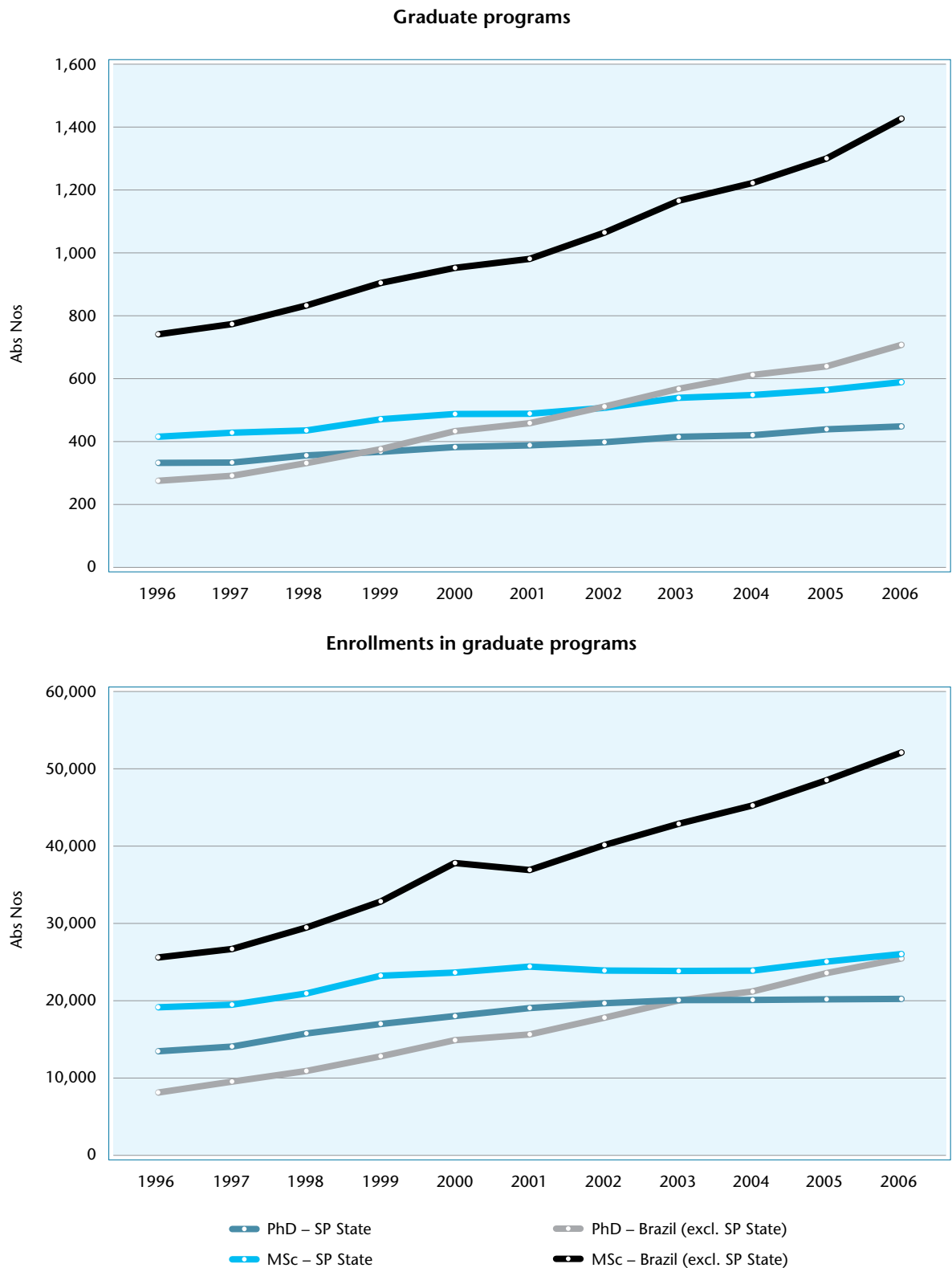
panded from 1,440 to 2,022. During the evolution of this system, graduate programs usually begin with a master's program, and doctoral programs emerge as a result of the development of the latter (Figure 2.20).

In this context, São Paulo State occupies a privileged position although its importance in terms of percentages is waning. When compared with other states in Brazil, São Paulo State had lower relative growth in the 2000-2006 period.

In 1996, there were 333 doctoral programs in São Paulo State, compared to 277 in other Brazilian states. Therefore, São Paulo State had more programs than the rest of Brazil combined. In 2000, the situation inverted with São Paulo State having 380 programs and Brazil (excluding São Paulo) some 431 programs. In 2003, the numbers for graduate programs were as follows: 413 for São Paulo State and 567 for Brazil. Finally in 2006, São Paulo State had climbed to 446 programs and other states in Brazil had 708 graduate programs.

A similar trend occurred in master's programs, but in this case it began earlier. In 1996 (Detailed table 2.18), São Paulo State had 420 master's programs, while all other states combined already had a much larger number (739). In 2006, the difference was much more pronounced: all other states had a combined 1,430 master's programs, much more than double the 592 in São Paulo State. The state's share of enrollment in graduate studies of all kinds also fell. It should be noted that the number of graduate programs has increased continuously in São Paulo State since they were first institutionalized, even though the state's national share is decreasing. In some areas, the number of students has fallen, as can be seen below.

**Figure 2.20**  
 Growth in the numbers of graduate programs and enrollment in graduate programs, by degree – Brazil (excluding São Paulo State) and São Paulo State, 1996-2006



Source: CAPES (Coordination of Information Management).

Note: See Detailed Table 2.18.

#### 4.1 Graduate education in São Paulo State: the importance of state universities

This section analyzes distribution of programs and the role of public universities in São Paulo State in constructing the graduate system.

As can be seen in Table 2.36 and in the list of institutions that offer graduate education (Detailed table 2.19), São Paulo State not only offers more graduate programs than any other Brazilian state, but its public universities are also the main centers of graduate education. In 2006, the three state-run universities offered 340 doctoral programs serving 16,033 students (79% of the total in São Paulo State). These data put USP ahead of the other two state institutions, with 203 programs and 9,235 students (more than half of the total). UNESP contributed 79 programs and 2,808 students. UNICAMP had a smaller number of programs (58), but served a higher number of students (3,990) compared to UNESP.

In São Paulo State, the three state universities offered 370 master's programs, led by USP (207), UNESP (103), and UNICAMP (60). Enrollment in these programs totaled 9,070, 3,287, and 3,097 students, respectively, in 2006.

These universities also offered five professional graduate courses, serving a total of 121 students.

Besides universities, other state institutions also offered graduate programs:

- Lorena School of Chemical Engineering (FAENQUIL),<sup>15</sup> with two doctoral programs (59 students), in addition to three master's programs (serving 69 students);
- São José do Rio Preto School of Medicine at (FAMERP), with one doctoral program (serving 66 students) and one master's program (serving 74 students);
- The Office of Disease Control (CCD – Coordenação de Controle de Doenças) of the São Paulo State Health Secretariat, with one doctoral program (18 students) and one master's program (serving 78 students).
- Other state institutions, with one doctoral program (37 students) and five master's programs (243 students).

Thus, the state government funded 345 doctoral programs serving 16,213 students and 380 master's programs serving 15,918 students.

In 2006, students enrolled in doctoral programs at state-run HEIs accounted for 79.9% of doctoral students in São Paulo State and 35.4% of doctoral students in Brazil. These numbers reflect the importance of the

three state-run universities in São Paulo State (Table 2.37). Regarding master's programs, state-run HEIs institutions accounted 64.2% of programs offered in São Paulo State. These institutions have seen their participation decline in recent years, both in Brazil and in São Paulo State itself. This is reflected in a relative fall in the contribution of São Paulo State relative to Brazil.

On one hand, the two federal universities contribute little to meeting the demand for undergraduate courses. On the other hand, they offer a significant number of master's and doctoral programs. Together, these two offered 53 doctoral programs: UNIFESP (38) and UFSCAR (15). They also had 60 master's programs: UNIFESP (39) and UFSCAR (21). Two isolated federal institutions also offered programs: the National Institute for Space Research (INPE), with 6 doctoral and 6 master's programs; and Aeronautics Technological Institute (ITA), with three doctoral, four master's, and one professional master's program. Thus, federal institutions (Table 2.36) offered 62 doctoral programs (serving 2,113 students).

As discussed earlier, accreditation of an institution to become a university requires provision of undergraduate and graduate education along with research and this can only be obtained through creation of graduate programs, especially doctoral programs. In the private sector, institutions that meet this criteria are rare. By law, few institutions can therefore be classified as universities.

In fact, only 9 in 92 private HEIs in São Paulo State (of which 30 are universities) offer doctoral programs. Of these, the Pontifical Catholic University of São Paulo (PUC-SP) offers 16 courses (serving 1,335 students), close to half of all graduate programs offered by the private sector. PUC-SP is the only university that can be framed in Type-1 or Type-2 institutions (as defined earlier in this chapter). The other universities offer only one or two programs (at most). On the other hand, two institutions that are not universities offer more than two doctoral programs: Santa Casa School of Medical Sciences (FCMSCSP) with five courses and serving 79 students; and Getulio Vargas Foundation (FGV) with three courses and serving 120 students), which would be Type 3 of categories proposed earlier in this chapter. Another institution, São Leopoldo Mandic Dental Research Center (SLMANDIC), with one doctoral program, is moving in that direction. Therefore, based on the data on Table 2.36 and Detailed table 2.19, private HEIs offering doctoral programs are predominantly nonprofit and faith-based. University of Mogi das Cruzes and São Leopoldo Mandic Center for Dental Research (which offer only one doctoral pro-

15. See footnote 2.



**Table 2.36**  
**Enrollments, scholarships, and graduate programs in HEI, by type of course, administration, and institution – São Paulo State, 2006**

Types of administration and institution	Enrollments, scholarships (1), and graduate programs in HEI, by type of course														
	Total			Doctoral			Master's			Vocational					
	Enrollments	Grants	Programs	Enrollments	Grants	Programs	Enrollments	Grants	Programs	Enrollments	Grants	Programs	Enrollments	Grants	Programs
<b>Grand total (listed and unlisted HEI)</b>	<b>48,219</b>	<b>6,733</b>	<b>1,075</b>	<b>20,297</b>	<b>2,495</b>	<b>446</b>	<b>25,767</b>	<b>4,210</b>	<b>592</b>	<b>2,155</b>	<b>28</b>	<b>37</b>			
Total listed HEI	45,339	6,562	1,001	20,297	2,495	446	23,251	4,044	526	1,791	23	29			
Total unlisted HEI	2,880	171	74	0	0	0	2,516	166	66	364	5	8			
<b>State HEI</b>															
USP	18,376	2,546	412	9,235	1,115	203	9,070	1,431	207	71	0	2			
Unesp	6,131	1,187	184	2,808	427	79	3,287	759	103	36	1	2			
Unicamp	7,101	1,009	119	3,990	476	58	3,097	533	60	14	0	1			
Faenquili / EEL	128	23	5	59	10	2	69	13	3	0	0	0			
Engenharia de Lorena															
Famerp	140	5	2	66	0	1	74	5	1	0	0	0			
Ibot	87	13	2	37	0	1	50	13	1	0	0	0			
Ambiente de São Paulo															
SES	96	2	2	18	0	1	78	2	1	0	0	0			
Coordenadoria de Controle de Doenças da Secretaria de Estado da Saúde de São Paulo															
Hospital Heliópolis	25	2	1	0	0	0	25	2	1	0	0	0			
IAC	67	15	1	0	0	0	67	15	1	0	0	0			
Iampspe	57	0	1	0	0	0	57	0	1	0	0	0			
Instituto de Assistência Médica ao Servidor Público Estadual															
IP	44	0	1	0	0	0	44	0	1	0	0	0			
Instituto de Pesca															
Ceeteps	29	0	1	0	0	0	0	0	0	29	0	1			
Centro Estadual de Educação Tecnológica Paula Souza															
Ipen	18	0	1	0	0	0	0	0	0	18	0	1			
Instituto de Pesquisas Energéticas e Nucleares															
IPT	433	0	4	0	0	0	0	0	0	433	0	4			
Instituto de Pesquisas Tecnológicas															

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**Table 2.36 (continued)**  
**Enrollments, scholarships, and graduate programs in HEI, by type of course, administration, and institution – São Paulo State, 2006**

Types of administration and institution	Enrollments, scholarships (1), and graduate programs in HEI, by type of course											
	Total			Doctoral			Master's			Vocational		
	Enrollments	Grants	Programs	Enrollments	Grants	Programs	Enrollments	Grants	Programs	Enrollments	Grants	Programs
	<b>Federal HEI</b>											
Unifesp	1,928	232	82	930	102	38	908	130	39	90	0	5
UFSCar	1,586	294	36	761	109	15	825	185	21	0	0	0
Inpe	380	53	12	207	14	6	173	39	6	0	0	0
ITA	965	55	8	215	11	3	471	44	4	279	0	1
	<b>Municipal HEI</b>											
Unitau	314	20	5	0	0	0	121	20	2	193	0	3
Imes	54	1	1	0	0	0	54	1	1	0	0	0
	<b>Private HEI</b>											
PUC/SP	4,281	631	42	1,335	172	16	2,792	447	25	154	12	1
FCMSCSP	285	59	12	79	17	5	184	33	6	22	9	1
UPM	591	91	11	50	1	3	541	90	8	0	0	0
FCV/SP	409	69	8	120	23	3	105	46	3	184	0	2
Unesp	422	55	8	98	3	2	324	52	6	0	0	0
Unimep	375	47	9	81	2	2	262	45	6	32	0	1
UMC	99	24	4	22	0	2	77	24	2	0	0	0
Univap	207	35	7	30	0	1	131	35	5	46	0	1
PUCCAMP	208	51	6	47	7	1	134	44	4	27	0	1
Unaerp	115	11	5	15	0	1	80	10	3	20	1	1
USF	120	16	4	28	0	1	92	16	3	0	0	0
FAP	112	16	2	55	6	1	57	10	1	0	0	0
SJMANDIC	156	0	3	11	0	1	2	0	1	143	0	1

Source: CAPES (Coordination of Information Management).

Note: See Detailed Table 2.19.

(1) Number of scholarships provided by CAPES.

**Table 2.37**  
**Enrollments in graduate programs, by type of administration – Brazil (excluding São Paulo State)**  
**and São Paulo State, 1996-2006**

Year	Enrollments in graduate programs, by type of administration																			
	Doctoral										Master's									
	Total		Federal		State		Municipal		Private		Total		Federal		State		Municipal		Private	
	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%
<b>Graduate programs</b>																				
<b>Brazil (excl. SP State)</b>																				
1996	277	100.0	238	85.9	8	2.9	*	*	31	11.2	739	100.0	630	85.3	47	6.4	*	*	62	8.4
1997	289	100.0	250	86.5	8	2.8	*	*	31	10.7	772	100.0	653	84.6	51	6.6	*	*	68	8.8
1998	330	100.0	285	86.4	9	2.7	*	*	36	10.9	836	100.0	703	84.1	56	6.7	*	*	77	9.2
1999	375	100.0	317	84.5	18	4.8	*	*	40	10.7	904	100.0	738	81.6	72	8.0	1	0.1	93	10.3
2000	431	100.0	363	84.2	22	5.1	*	*	46	10.7	950	100.0	761	80.1	79	8.3	1	0.1	109	11.5
2001	458	100.0	385	84.1	25	5.5	*	*	48	10.5	966	100.0	757	78.4	84	8.7	1	0.1	124	12.8
2002	514	100.0	432	84.0	31	6.0	*	*	51	9.9	1,066	100.0	815	76.5	99	9.3	3	0.3	149	14.0
2003	567	100.0	472	83.2	36	6.3	*	*	59	10.4	1,171	100.0	882	75.3	119	10.2	4	0.3	166	14.2
2004	610	100.0	510	83.6	38	6.2	*	*	62	10.2	1,228	100.0	915	74.5	128	10.4	6	0.5	179	14.6
2005	641	100.0	533	83.2	44	6.9	*	*	64	10.0	1,303	100.0	950	72.9	145	11.1	7	0.5	201	15.4
2006	708	100.0	577	81.5	53	7.5	*	*	78	11.0	1,430	100.0	1,013	70.8	174	12.2	9	0.6	234	16.4
<b>SP State</b>																				
1996	333	100.0	45	13.5	267	80.2	*	*	21	6.3	420	100.0	57	13.6	326	77.6	*	*	37	8.8
1997	332	100.0	42	12.7	268	80.7	*	*	22	6.6	431	100.0	56	13.0	334	77.5	*	*	41	9.5
1998	354	100.0	53	15.0	279	78.8	*	*	22	6.2	437	100.0	63	14.4	330	75.5	*	*	44	10.1
1999	369	100.0	55	14.9	290	78.6	*	*	24	6.5	472	100.0	63	13.3	352	74.6	1	0.2	56	11.9
2000	380	100.0	57	15.0	299	78.7	*	*	24	6.3	490	100.0	64	13.1	358	73.1	1	0.2	67	13.7
2001	384	100.0	53	13.8	307	79.9	*	*	24	6.3	489	100.0	60	12.3	352	72.0	2	0.4	75	15.3
2002	398	100.0	54	13.6	317	79.6	*	*	27	6.8	508	100.0	60	11.8	359	70.7	2	0.4	87	17.1
2003	413	100.0	60	14.5	323	78.2	*	*	30	7.3	537	100.0	67	12.5	368	68.5	3	0.6	99	18.4
2004	419	100.0	63	15.0	323	77.1	*	*	33	7.9	547	100.0	69	12.6	366	66.9	3	0.5	109	19.9
2005	437	100.0	61	14.0	339	77.6	*	*	37	8.5	568	100.0	67	11.8	375	66.0	3	0.5	123	21.7
2006	446	100.0	62	13.9	345	77.4	*	*	39	8.7	592	100.0	70	11.8	380	64.2	3	0.5	139	23.5

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gram) are the only exceptions. Large private universities, which are focused on mass education, do not offer doctoral programs.

The supply of master's programs (49 institutions) is greater. In this group, PUC-SP also stands out with 25 programs (serving 2,792 students). Mackenzie Presbyterian University comes in second place with 8 programs (541 students). Three other universities (also faith-based) follow: the Methodist Universities

(UMESP and UNIMEP) and PUC-Campinas. There are also two non-university institutions (FGV and FC-MSCSP) that offer master's programs. Altogether, the other institutions offer 59 master's programs.

It is worth mentioning, however, that in terms of number of master's programs, the private sector (Table 2.37) in SP State (23.5%) outperforms that of other Brazilian states, accounting for 23.5% compared to the 16.4% nationwide.

**Table 2.37 (continued)**  
Enrollments in graduate programs, by type of administration – Brazil (excluding São Paulo State) and São Paulo State, 1996-2006

Enrollments in graduate programs, by type of administration																				
Year	Doctoral										Master's									
	Total		Federal		State		Municipal		Private		Total		Federal		State		Municipal		Private	
	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%	Abs. nos	%
<b>Graduate programs</b>																				
<b>Brazil (excl. SP State)</b>																				
1996	8,221	100.0	7,191	87.5	115	1.4	*	*	915	11.1	25,616	100	21,655	84.5	1,233	4.8	*	*	2,728	10.6
1997	9,437	100.0	8,368	88.7	150	1.6	*	*	919	9.7	26,663	100	22,492	84.4	1,327	5.0	*	*	2,844	10.7
1998	11,028	100.0	9,750	88.4	203	1.8	*	*	1,075	9.7	29,405	100	24,639	83.8	1,530	5.2	*	*	3,236	11.0
1999	12,854	100.0	11,240	87.4	409	3.2	*	*	1,205	9.4	32,757	100	26,576	81.1	2,150	6.6	41	0.1	3,990	12.2
2000	14,867	100.0	12,961	87.2	538	3.6	*	*	1,368	9.2	37,751	100	30,444	80.6	2,410	6.4	46	0.1	4,851	12.8
2001	15,496	100.0	13,237	85.4	745	4.8	*	*	1,514	9.8	36,929	100	28,428	77.0	2,690	7.3	52	0.1	5,759	15.6
2002	17,804	100.0	15,204	85.4	1,028	5.8	*	*	1,572	8.8	39,867	100	30,075	75.4	3,003	7.5	168	0.4	6,621	16.6
2003	19,766	100.0	16,609	84.0	1,314	6.6	*	*	1,843	9.3	42,552	100	31,707	74.5	3,439	8.1	200	0.5	7,206	16.9
2004	21,203	100.0	17,925	84.5	1,414	6.7	*	*	1,864	8.8	45,071	100	33,174	73.6	3,890	8.6	228	0.5	7,779	17.3
2005	23,450	100.0	19,702	84.0	1,655	7.1	*	*	2,093	8.9	48,124	100	34,894	72.5	4,339	9.0	284	0.6	8,607	17.9
2006	25,497	100.0	21,230	83.3	1,855	7.3	*	*	2,412	9.5	51,933	100	37,054	71.3	5,219	10.0	314	0.6	9,346	18.0
<b>SP State</b>																				
1996	13,453	100.0	1,161	8.6	11,157	82.9	*	*	1,135	8.4	19,267	100	1,669	8.7	14,341	74.4	*	*	3,257	16.9
1997	14,011	100.0	1,236	8.8	11,524	82.2	*	*	1,251	8.9	19,716	100	1,641	8.3	14,670	74.4	*	*	3,405	17.3
1998	15,721	100.0	1,459	9.3	12,827	81.6	*	*	1,435	9.1	21,074	100	1,930	9.2	15,462	73.4	*	*	3,682	17.5
1999	16,932	100.0	1,538	9.1	13,802	81.5	*	*	1,592	9.4	23,158	100	1,976	8.5	16,524	71.4	27	0.1	4,631	20.0
2000	18,055	100.0	1,624	9.0	14,712	81.5	*	*	1,719	9.5	23,651	100	2,082	8.8	16,376	69.2	48	0.2	5,145	21.8
2001	18,978	100.0	1,690	8.9	15,448	81.4	*	*	1,840	9.7	24,439	100	2,062	8.4	16,634	68.1	68	0.3	5,675	23.2
2002	19,692	100.0	1,760	8.9	16,130	81.9	*	*	1,802	9.2	23,754	100	1,963	8.3	15,766	66.4	74	0.3	5,951	25.1
2003	20,140	100.0	1,838	9.1	16,380	81.3	*	*	1,922	9.5	23,864	100	1,981	8.3	15,535	65.1	131	0.5	6,217	26.1
2004	19,985	100.0	1,961	9.8	15,950	79.8	*	*	2,074	10.4	23,849	100	2,065	8.7	14,917	62.5	161	0.7	6,706	28.1
2005	20,292	100.0	1,945	9.6	16,270	80.2	*	*	2,077	10.2	24,958	100	2,152	8.6	15,577	62.4	183	0.7	7,046	28.2
2006	20,297	100.0	2,113	10.4	16,213	79.9	*	*	1,971	9.7	25,767	100	2,377	9.2	15,918	61.8	175	0.7	7,297	28.3

Source: CAPES (Coordination of Information Management).

None of the municipal institutions offer a doctoral program and only two offer master's programs: University of Taubaté (UNITAU), with two programs, and São Caetano do Sul Municipal Higher Education Institute (IMES), with only one program (Table 2.36).

Thus, state-run HEIs (Table 2.37) in São Paulo State (2006) accounted for 77.4% of doctoral programs, following by federal institutions with 13.9% and private HEIs some 8.7% in 2006. For master's programs,

state-run institutions had a lower share, accounting for 64.2%, followed by federal HEIs with 11.8%. Private HEIs, on the other hand, saw their share of master's programs nearly triple from 8.8% in 1996 to reach 23.5% in 2006. The contribution of municipal institutions has been negligible.

Two features of higher education in São Paulo State that have already been noted can be seen most clearly in the graduate sector. First, the state plays

a leading role (in other Brazilian states this role belongs to the federal government). Second, there is a major difference between state-run HEIs in São Paulo State and in other Brazilian states. The three state-run universities in São Paulo State have more graduate programs and students than state-run HEIs in all the other states put together. In fact, state universities in São Paulo State offered 345 doctoral and 380 master's programs in 2006 whereas all other state-run HEIs in Brazil offered only 53 doctoral and 174 master's programs (Table 2.37).

When growth in the number of students is analyzed, a weakening of São Paulo State's dominance is apparent. For example in 1996, São Paulo State had 13,453 resident doctoral students, compared to 8,221 doctoral students in the rest of Brazil (i.e., slightly more than half). A decade later in 2006, the number of students in Brazil (excluding São Paulo State) reached 25,437, exceeding that of São Paulo State (20,297).

Master's programs developed differently. São Paulo State's dominance weakened in the period prior to the 1996-2006 study. In 1996, the number of master's students in São Paulo State was 19,267, already lower than the 25,616 in the rest of Brazil ( ). The gap continued to widen until 2006, when São Paulo State's share was half (25,767) the number (51,933) for the rest of Brazil. In this period, the slower decrease in enrollment in master's programs can be ascribed to the growing contribution of the private sector graduate programs in São Paulo State, which is still incipient in other states.

## 4.2 The quality of the graduate system

Assessments by CAPES show that the quality of the post-graduate system is good and has improved over the years in both master's and doctoral programs, so much so that it has had to introduce a new scale from one to seven instead of five.<sup>16</sup> From 2000 to 2006, the number of courses with scores of 1 to 3 has decreased, while those with scores of 5 to 7 have increased (Figure 2.21).

In this period, most doctoral programs scored 4 or 5 in both São Paulo State and Brazil. However, the number of programs scoring 4 in São Paulo State (not observed in Brazil) dropped, as those with scores in the range 5 to 7 increased.

## 4.3 Professional master's programs

Creation of professional master's programs under Parecer no. 977, CFE/CES, 03 Dec 1995 (the same directive that regulates graduate programs in Brazil) was the major innovation in the 1996-2006 period, despite enormous resistance from the scientific community. Graduate education is important not only for training researchers but also for professional development. In spite of the efforts undertaken by CAPES (1990) to recognize and promote of this type of course, they were only included in statistics as of 1999, when one state course and three private ones were established in São Paulo State. In 1999, the first four federal courses were initiated in other Brazilian states; a year later in 2000, the first federal course was launched in São Paulo State (Table 2.38).

State-run HEIs in São Paulo State experienced systematic growth in the 1999-2003 period, where the number of programs rose from one to 11. The number of programs at federal HEIs expanded from one to six in the period. The municipal sector, which has a very small number of graduate programs, created one course in 2002 and another two in 2004, without any further additions since then.

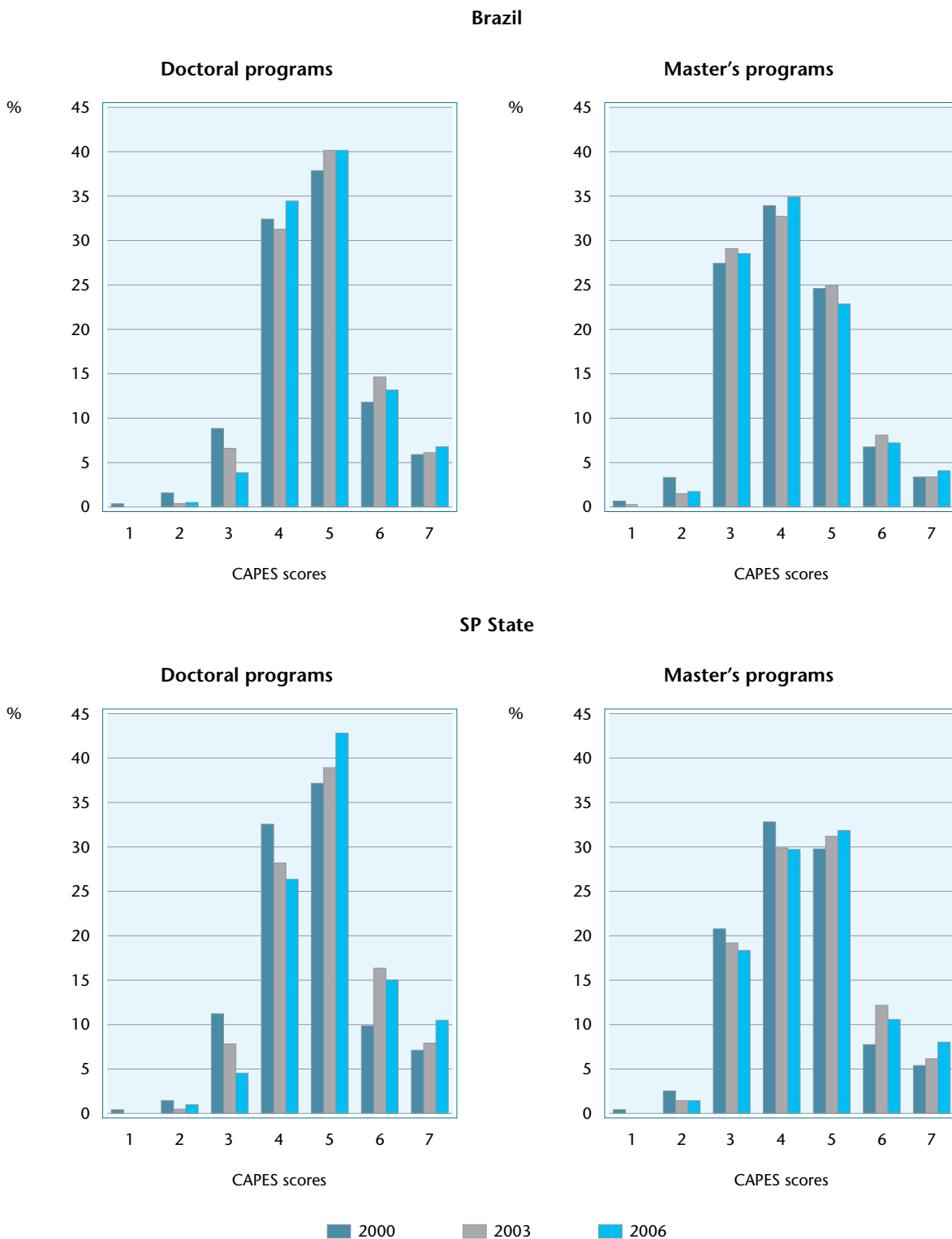
São Paulo State's private sector showed the greatest growth in professional master's programs. Another 14 programs were added to the three initial courses (1999), bringing the total to 17 in 2004. This number was stable in the two subsequent years, representing 45.9% of the total programs offered in São Paulo State in 2006. In that year, the state, federal, and municipal sectors for 29.7%, 16.2%, and 8.1%, respectively of the professional master's programs (Table 2.38).

In the rest of Brazil, the municipal system did not offer professional master's programs in this period; state institutions offered only 6 (5.6% of the total) by 2006. On the other hand, there were 47 federal and 54 private programs or 43.9% and 50.5% of the total, respectively.

Based on these numbers it can be inferred that: (1) in São Paulo the state government also plays the role played by the federal government elsewhere with regard to professional master's programs (2) the private sector, which has a small contribution in research-based graduate (master's and doctoral) programs, found opportunities for a major development in professional programs. This can be explained by its curricular structure, which is better suited to the needs of the labor market.

16. In this scale, grades 6 and 7 are assigned to program programs of international excellence; 3-5, to reasonable and good program programs, and < 3, to program programs not recommended by CAPES and whose diplomas are not considered valid.

**Figure 2.21**  
Distribution of doctoral and master’s programs, by CAPES scores – Brazil and São Paulo State, 2000-2006



Source: CAPES (Coordination of Information Management).

Notes: 1. In this scale, grades 6 and 7 are assigned to programs of international excellence; 3-5, to reasonable to good programs, and < 3, to programs not recommended by CAPES and whose diplomas are not considered valid.  
2. See Detailed Table 2.20.

**Table 2.38**  
Enrollments in professional graduate programs, by type of administration - Brazil (excluding São Paulo State) and São Paulo State, 1996-2006

Year	Enrollments in professional graduate programs, by type of administration																			
	Brazil (excl. SP State)										SP State									
	Total		Federal		State		Municipal		Private		Total		Federal		State		Municipal		Private	
	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%	Abs. nos.	%
	<b>Programs</b>																			
1996	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1999	7	100.0	4	57.1	*	*	*	*	3	42.9	4	100.0	*	*	1	25.0	*	*	3	75.0
2000	19	100.0	13	68.4	*	*	*	*	6	31.6	8	100.0	1	12.5	2	25.0	*	*	5	62.5
2001	31	100.0	19	61.3	1	3.2	*	*	11	35.5	15	100.0	2	13.3	7	46.7	*	*	6	40.0
2002	55	100.0	30	54.5	1	1.8	*	*	24	43.6	25	100.0	5	20.0	8	32.0	1	4.0	11	44.0
2003	64	100.0	36	56.3	1	1.6	*	*	27	42.2	32	100.0	7	21.9	11	34.4	1	3.1	13	40.6
2004	75	100.0	39	52.0	2	2.7	*	*	34	45.3	35	100.0	5	14.3	10	28.6	3	8.6	17	48.6
2005	83	100.0	39	47.0	3	3.6	*	*	41	49.4	36	100.0	6	16.7	10	27.8	3	8.3	17	47.2
2006	107	100.0	47	43.9	6	5.6	*	*	54	50.5	37	100.0	6	16.2	11	29.7	3	8.1	17	45.9
	<b>Students enrolled</b>																			
1996	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1999	351	100.0	264	75.2	*	*	*	*	87	24.8	228	100.0	*	*	84	36.8	*	*	144	63.2
2000	1,324	100.0	854	64.5	*	*	*	*	470	35.5	425	100.0	16	3.8	165	38.8	*	*	244	57.4
2001	1,603	100.0	1,116	69.6	8	0.5	*	*	479	29.9	776	100.0	97	12.5	420	54.1	*	*	259	33.4
2002	2,595	100.0	1,381	53.2	20	0.8	*	*	1,194	46.0	1,312	100.0	294	22.4	613	46.7	36	2.7	369	28.1
2003	2,817	100.0	1,454	51.6	31	1.1	*	*	1,332	47.3	1,733	100.0	449	25.9	732	42.2	52	3.0	500	28.9
2004	3,431	100.0	1,505	43.9	56	1.6	*	*	1,870	54.5	2,332	100.0	473	20.3	695	29.8	203	8.7	961	41.2
2005	3,653	100.0	1,390	38.1	92	2.5	*	*	2,171	59.4	2,347	100.0	390	16.6	670	28.5	246	10.5	1,041	44.4
2006	4,246	100.0	1,454	34.2	161	3.8	*	*	2,631	62.0	2,155	100.0	369	17.1	601	27.9	193	9.0	992	46.0

Source: CAPES (Coordination of Information Management).

#### 4.4 Distribution of enrollment by knowledge area

The importance of graduate education must be evaluated not only in terms of number of programs and students, but also in terms of distribution by knowledge area. Herein, such analysis is based not on the number of programs, but on student enrollment, which allows for appropriate visualization of the total number receiving advanced training in different areas (Tables 2.39a and 2.39b).

Given the distribution of courses and enrollment by knowledge area, two initial observations must be made: First, distribution of students by graduate program is more uniform when compared to undergraduate education, without an excessive concentration of students in a single area. Second, rank order is similar in doctoral and master's programs. However, the relative weight of certain areas reveals some differences in São Paulo State and Brazil.

Starting with doctoral programs (Tables 2.39a and 2.39b), the knowledge areas in which São Paulo's

**Table 2.39a**  
**Growth in enrollment at the end of the year in graduate programs, by knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 1996-2006**

Knowledge areas	Enrollments at the end of the year in graduate programs (Abs Nos.)								Growth rate (%)					
	1996		2000		2003		2006		1996-2000		2000-2003		2003-2006	
	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral
<b>Brazil (excl. SP State)</b>														
<b>Total</b>	24,831	8,405	37,034	14,934	42,947	19,666	53,104	26,086	49.1	77.7	16.0	31.7	23.7	32.6
Agrarian sciences	2,698	826	3,561	1,618	4,220	2,329	5,070	3,092	32.0	95.9	18.5	43.9	20.1	32.8
Applied social sciences	3,679	469	6,187	1,101	6,443	1,574	7,057	1,962	68.2	134.8	4.1	43.0	9.5	24.7
Biological sciences	1,989	1,162	2,366	1,962	2,966	2,672	3,902	3,370	19.0	68.8	25.4	36.2	31.6	26.1
Engineering	3,841	1,794	7,302	3,080	7,351	2,951	8,905	4,084	90.1	71.7	0.7	-4.2	21.1	38.4
Exact and earth sciences	2,726	1,558	3,940	2,120	4,399	2,676	5,077	3,132	44.5	36.1	11.6	26.2	15.4	17.0
Health sciences	2,705	774	3,387	1,318	4,005	1,806	5,812	2,759	25.2	70.3	18.2	37.0	45.1	52.8
Human sciences	4,668	1,172	6,240	2,419	7,906	3,461	9,941	4,753	33.7	106.4	26.7	43.1	25.7	37.3
Ling., lit. and arts	1,884	507	2,354	900	3,134	1,490	3,866	1,957	24.9	77.5	33.1	65.6	23.4	31.3
Multidisciplinary	641	143	1,697	416	2,523	707	3,474	977	164.7	190.9	48.7	70.0	37.7	38.2
<b>SP State</b>														
<b>Total</b>	19,691	13,793	23,701	18,070	24,012	20,140	26,007	20,486	20.4	31.0	1.3	11.5	8.3	1.7
Agrarian sciences	1,412	1,184	1,605	1,701	1,523	1,923	1,806	1,913	13.7	43.7	-5.1	13.1	18.6	-0.5
Applied social sciences	3,575	1,404	4,417	1,767	4,228	1,918	4,366	1,627	23.6	25.9	-4.3	8.5	3.3	-15.2
Biological sciences	1,378	1,530	1,519	1,902	1,435	2,408	1,586	2,259	10.2	24.3	-5.5	26.6	10.5	-6.2
Engineering	2,695	1,803	3,571	2,426	3,599	2,720	3,528	2,649	32.5	34.6	0.8	12.1	-2.0	-2.6
Exact and earth sciences	1,796	1,863	1,879	2,218	1,887	2,340	2,033	2,228	4.6	19.1	0.4	5.5	7.7	-4.8
Health sciences	3,673	2,571	4,592	3,538	4,453	3,848	4,767	4,372	25.0	37.6	-3.0	8.8	7.1	13.6
Human sciences	3,701	2,642	3,892	3,452	4,234	3,709	4,677	3,798	5.2	30.7	8.8	7.4	10.5	2.4
Ling., lit. and arts	1,269	738	1,570	989	1,644	1,093	1,953	1,243	23.7	34.0	4.7	10.5	18.8	13.7
Multidisciplinary	192	58	656	77	1,009	181	1,291	397	241.7	32.8	53.8	135.1	27.9	119.3

Source: CAPES (Coordination of Information Management).

Note: See Detailed Tables 2.21a and 2.21b.

share of the Brazilian total was smallest in 2006 were as follows: Multidisciplinary (28.9%), Agricultural Sciences (38.2%), Linguistics, Literature and Arts (38.8%), and Engineering (39.3%). All others oscillated between 40.1% and 45.3%, except Health Sciences (61.3%).

In São Paulo State, doctoral programs show a concentration that favors the Natural Sciences over Human Sciences. Considering the areas of the Agrarian, Biological, Exact and Earth, and Health Sciences and the Engineering sections, 13,421 students were enrolled at the end of 2006. On the other hand, in the

Human and Applied Social Sciences, and Linguistics, Literature and Arts, student enrollment totaled only 6,668 students in the same period.

In all other Brazilian states, the scenario was similar in 2006: 16,437 students were enrolled in Natural Sciences, compared to 8,672 in Human Sciences.

In relation to master's programs, this gap shrank in the period in both São Paulo State and Brazil, and Natural Sciences remained predominant. In São Paulo State, there were 13,720 students enrolled in Natural Sciences and 10,996 in Human Sciences in 2006. In Brazil, there were 28,766 students enrolled in pro-



**Table 2.39b**  
Students enrolled in graduate programs in São Paulo State in relation to Brazil, by knowledge area – São Paulo State, 1996-2006

Knowledge areas	Students (%) enrolled in graduate programs in São Paulo State in relation to Brazil							
	1996		2000		2003		2006	
	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral	Master's	Doctoral
<b>Total</b>	44.2	62.1	39.0	54.8	35.9	50.6	32.9	44.0
Agrarian sciences	34.4	58.9	31.1	51.3	26.5	45.2	26.3	38.2
Applied social sciences	49.3	75.0	41.7	61.6	39.6	54.9	38.2	45.3
Biological sciences	40.9	56.8	39.1	49.2	32.6	47.4	28.9	40.1
Engineering	41.2	50.1	32.8	44.1	32.9	48.0	28.4	39.3
Exact and earth sciences	39.7	54.5	32.3	51.1	30.0	46.7	28.6	41.6
Health sciences	57.6	76.9	57.6	72.9	52.6	68.1	45.1	61.3
Human sciences	44.2	69.3	38.4	58.8	34.9	51.7	32.0	44.4
Ling., lit. and arts	40.2	59.3	40.0	52.4	34.4	42.3	33.6	38.8
Multidisciplinary	23.0	28.9	27.9	15.6	28.6	20.4	27.1	28.9

Source: CAPES (Coordination of Information Management).

Note: See Table 2.39a and Detailed Tables 2.21a and 2.21b.

grams in the area of Natural Sciences and 20,864 in Human Sciences that same year.

In terms of the number of students enrolled in master's and doctoral programs in Brazil (excluding São Paulo State; 2006), Human Sciences came in the first place with 14,694 students, followed by Engineering with 12,989, the Applied Social Sciences with 9,019, Health Sciences with 8,571, Exact and Earth Sciences (8,209), and Agrarian Sciences with 8,162. Linguistics, Literature and Arts with 5,823 students enrolled and Multidisciplinary Studies with 4,451 were the smallest areas.

In São Paulo State, the series is different: Health Sciences came in first with 9,139 students, followed by Human Sciences (8,475), Engineering (6,177), the Applied Social Sciences (5,993 students), Exact and Earth Sciences (4,261), Biological Sciences (3,845), Agrarian Sciences (3,719) and Linguistics, Literature and Arts (3,196).

The historical series reveals a decrease São Paulo State's participation in the national graduate education system regardless of the knowledge area along with lower growth in enrollment, compared to Brazil. In Brazil, the advances occurred mainly in three areas: Human Sciences, Engineering, and Health Sciences.

In 2006, the state's smaller relative participation in master's programs was most notable in the following courses: Agrarian Sciences (26.3%), Engineering

(28.4%), and the Exact and Earth Sciences (28.6%) and Biological Sciences (28.9%). In 1996, São Paulo accounted for 34.4%, 41.2%, 39.7%, and 40.9%, respectively (Figure 2.22).

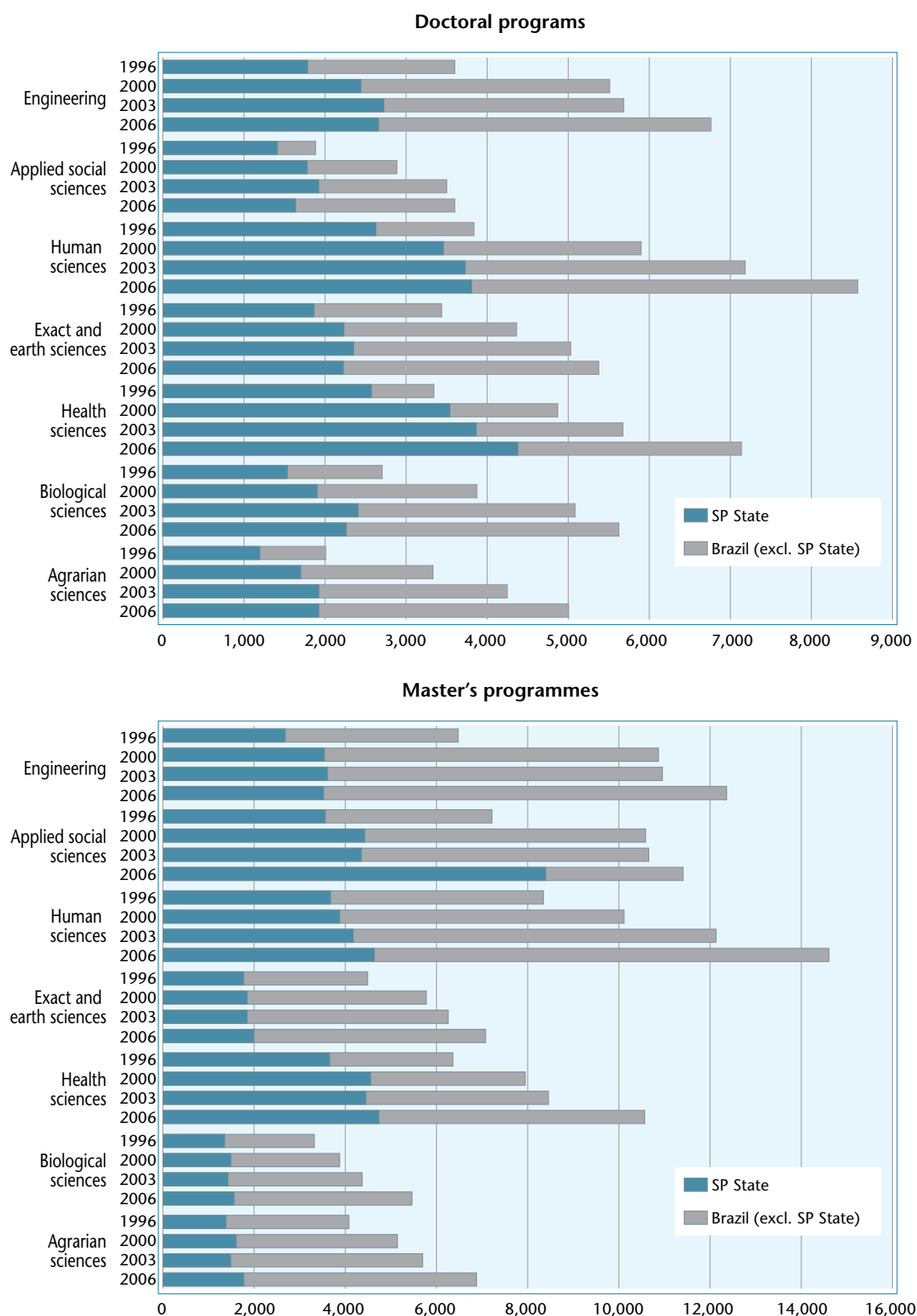
However, a comparison of the performance of graduate systems in São Paulo State and the rest of Brazil must take into account the different stages of development of these programs. In São Paulo State, many of them are already consolidated, graduating significant numbers of students and regularly conducting quality research, whereas in the rest of Brazil many programs are still in development and in the process of constituting permanent centers.

Not only was growth small in some important area between 2003 and 2006, but enrollment also decreased in other during the period. In overall terms, São Paulo State's post-graduate system experienced negative growth for the first time ever.

In doctoral programs (2003-2006), a significant loss of students occurred in three areas: Biological Sciences, dropping from 2,408 to 2,259; and Exact and Earth Sciences, which saw numbers slide from 2,340 to 2,228; and Engineering, moving from 2,720 to 2,649. In the same period, Applied Social Sciences also witnessed dwindling student numbers, dropping from 1,918 to 1,627 students (Figure 2.22).

Thus, it is not only a matter of a lower growth rate

**Figure 2.22**  
**Students enrolled at the end of the year in doctoral and master's programs, by knowledge area – Brazil (excluding São Paulo State) and São Paulo State, 1996-2006**



Source: CAPES (Coordination of Information Management).

Note: See Detailed Tables 2.21a and 2.21b.

or indeed a decrease in São Paulo State's share in Brazilian graduate education. The issue is that the number of students in areas crucial to the state's scientific and technological development is actually declining. This situation must be analyzed in a greater depth, in order to develop a policy for both the state government and education and research institutions.

It is worth underscoring the increased enrollment in the "Multidisciplinary" category in 2003-2006 period, rising from 181 to 397, which may be associated with innovative development of interdisciplinary programs. This growth seems to correspond to a global trend in science education and research, involving the exploration of areas that are on the frontiers of traditional disciplines and offer potential technological innovation. This hypothesis must be confirmed by further studies, however.

Data on the number of students who received master's and doctoral degree seem coherent with those

of students enrolled in graduate programs (Detailed tables 2.22a and 2.22b).

## 4.5 Fellowships and grants

The progress of Brazilian graduate education is largely due to the system of fellowships and research grants, which are awarded on the basis of master's and doctoral program assessments.

In São Paulo, there are three very important agencies (CNPq, CAPES, and FAPESP) that award fellowships/grants and operate independently in the state. Despite their autonomy there is an informal effort to coordinate their actions. In addition, CAPES's assessment of graduate programs is the benchmark for establishing the common criteria used by other agencies.

Tables 2.40a e 2.40b show the evolution of scholarships awarded by these three agencies to students in São

**Table 2.40a**  
Enrollments in graduate programs, and master's and PhD scholarships provided by CAPES, CNPq and FAPESP – São Paulo State, 1996-2008

Years	Enrollments in graduate programs			Master's and PhD scholarships											
				Grand total (1)			CAPES scholarships (2)			CNPq scholarships (3)			Fapesp scholarships (4)		
	Total	Doctoral	Master's	Total	Doctoral	Master's	Total	Doctoral	Master's	Total	Doctoral	Master's	Total	Doctoral	Master's
1996	32,720	13,453	19,267	12,839	4,644	8,195	3,791	1,070	2,721	6,583	2,621	3,962	2,465	953	1,512
1997	33,727	14,011	19,716	14,566	5,867	8,699	4,639	1,449	3,190	5,961	2,849	3,112	3,966	1,569	2,397
1998	36,795	15,721	21,074	15,355	6,447	8,908	5,107	1,705	3,402	4,597	2,418	2,179	5,651	2,324	3,327
1999	40,090	16,932	23,158	17,882	7,822	10,060	5,755	1,993	3,762	5,105	2,663	2,442	7,022	3,166	3,856
2000	41,706	18,055	23,651	18,478	8,217	10,261	5,983	1,996	3,987	4,075	2,192	1,883	8,420	4,029	4,391
2001	43,417	18,978	24,439	18,548	8,819	9,729	6,331	2,323	4,008	4,231	2,218	2,013	7,986	4,278	3,708
2002	43,446	19,692	23,754	18,016	8,905	9,111	6,595	2,403	4,192	4,114	2,136	1,978	7,307	4,366	2,941
2003	44,004	20,140	23,864	17,310	8,982	8,328	6,910	2,650	4,260	4,194	2,197	1,997	6,206	4,135	2,071
2004	43,834	19,985	23,849	16,227	8,531	7,696	5,784	2,388	3,396	4,549	2,328	2,221	5,894	3,815	2,079
2005	45,250	20,292	24,958	16,988	8,472	8,516	6,675	2,674	4,001	4,884	2,513	2,371	5,429	3,285	2,144
2006	46,064	20,297	25,767	17,735	8,390	9,345	6,717	2,495	4,222	5,248	2,725	2,523	5,770	3,170	2,600
2007	48,390	21,214	27,176	19,145	8,897	10,248	7,076	2,630	4,446	5,430	2,810	2,620	6,639	3,457	3,182
2008	49,216	21,752	27,464	20,519	9,212	11,307	7,323	2,617	4,706	5,567	2,837	2,730	7,629	3,758	3,871

**Sources:** CNPq. AEI – Office for Statistics and Information (Data Warehouse of CNPq); CAPES. Coordination of Information Management; FAPESP.

(1) This value is the sum of scholarships provided by CNPq, CAPES, and FAPESP, although the number of scholarships has been calculated using different criteria.

(2) These numbers refer to the use of scholarships provided by CAPES. It should be emphasized that they are underestimated since some CAPES strategies to promote graduate programs have not yet been computed. Therefore, they were not included in the survey. These values differ from data found in the GeoCapes system, which refers to scholarships awarded (but not used) in all strategies held by the agency to promote graduate programs.

(3) The value for scholarships/year is an arithmetic mean of monthly payment paid in the period Jan-Dec: the number of monthly payments paid in the year/12 months = number of scholarships/year. Thus, the number of scholarships can be fractional. E.g., 18 monthly payments/12 months = 1.5 scholarships/year.

(4) Number of actual scholarships, including scholarships paid and discontinued each year.

**Table 2.40b**  
**Master's and PhD scholarships provided by CAPES, CNPq and FAPESP, per students enrolled in graduate programs – São Paulo State, 1996-2008**

Years	Master's and PhD scholarships (%) per students enrolled in graduate programs											
	Grand total (1)			CAPES scholarships (2)			CNPq scholarships (3)			Fapesp scholarships (4)		
	Total	Doctoral	Master's	Total	Doctoral	Master's	Total	Doctoral	Master's	Total	Doctoral	Master's
1996	39.2	34.5	42.5	11.6	8.0	14.1	20.1	19.5	20.6	7.5	7.1	7.8
1997	43.2	41.9	44.1	13.8	10.3	16.2	17.7	20.3	15.8	11.8	11.2	12.2
1998	41.7	41.0	42.3	13.9	10.8	16.1	12.5	15.4	10.3	15.4	14.8	15.8
1999	44.6	46.2	43.4	14.4	11.8	16.2	12.7	15.7	10.5	17.5	18.7	16.7
2000	44.3	45.5	43.4	14.3	11.1	16.9	9.8	12.1	8.0	20.2	22.3	18.6
2001	42.7	46.5	39.8	14.6	12.2	16.4	9.7	11.7	8.2	18.4	22.5	15.2
2002	41.5	45.2	38.4	15.2	12.2	17.6	9.5	10.8	8.3	16.8	22.2	12.4
2003	39.3	44.6	34.9	15.7	13.2	17.9	9.5	10.9	8.4	14.1	20.5	8.7
2004	37.0	42.7	32.3	13.2	11.9	14.2	10.4	11.7	9.3	13.4	19.1	8.7
2005	37.5	41.7	34.1	14.8	13.2	16.0	10.8	12.4	9.5	12.0	16.2	8.6
2006	38.5	41.3	36.3	14.6	12.3	16.4	11.4	13.4	9.8	12.5	15.6	10.1
2007	39.6	41.9	37.7	14.6	12.4	16.4	11.2	13.2	9.6	13.7	16.3	11.7
2008	41.7	42.4	41.2	14.9	12.0	17.1	11.3	13.0	9.9	15.5	17.3	14.1

Source: CNPq. AEI – Office for Statistics and Information (DataWarehouse of CNPq); CAPES. Coordination of Information Management; FAPESP.

Note: See Table 2.40a.

Paulo State. It is important to emphasize that the definition of scholarship (fellowship and research grants) varies according to the agency, and therefore the volume of scholarships awarded has some distortion.<sup>17</sup>

With the caveats aforementioned, the total doctoral and master's fellowships awarded to graduate students in São Paulo State) was approximately 20,519 (11,307 and 9,212, respectively) in 2008.

In terms of meeting the demand for (master's and doctoral) scholarships/fellowships by agency in the 1996-2008 period (Tables 2.40a and 2.40b), it is possible to infer that:

- the percentage of students supported by CAPES increased from 11.6 to 14.9%;
- the percentage of students receiving awards from CNPq decreased 20.1% to 11.3%;
- the percentage of students funded by FAPESP increased from 7.5% to 15.5%.

Given that in 2008 there were 20,752 doctoral and 27,464 master's students in São Paulo State (and with equal caution regarding the concepts of student and scholarship/fellowship), the award to student ratio was around 42% and 41%, respectively.

In the 1996-2008 period, important changes occurred in the number of awards by the different agencies. CAPES' awards grew consistently from 1996 to 2003, reaching 6,910. The following year marked a sharp decrease and the number fell to 5,784. The number rebounded in 2005 to 6,675 awards and continued to increase slightly until 2008, but never returned to 2003 levels.

CNPq's awards witnessed much greater the annual variation: in 1996 it accounted for 51.3% of total graduate scholarships awarded in São Paulo State in 1996, a number that was never reached in the following years. The 2000-2002 period marked CNPq's lowest partici-

17. The criteria used by CAPES were not explained. They are supposed to be similar to those of FAPESP, which calculates the total effective scholarships throughout the school year. On the other hand, a scholarship is computed by CNPq as being equivalent to a 12-month pay. Thus, two one-semester scholarships, or four one-trimestre scholarships, count as only one scholarship. Therefore, the number of scholarships funded by CNPq may be underestimated when compared with those by CAPES and FAPESP. In addition, these agencies include other types of scholarships and grants. In this chapter, only master's (including the professional ones) and doctoral scholarships were calculated.

pation levels, with awards moving from 4,075 to 4,231. A gradual recovery began in the next three-year period (2003-2005), and awards reached 5,248 in 2006. In the following years (2007-2008), a new relative drop (27.1%; 5,567 scholarships) occurred.

As for FAPESP, the number of scholarships registered and upward trend in the 1996-2008 period, although intermediate variations have been recorded. The lowest number of awards (2,465) occurred 1996, peaking at 8,420 in 2000. From this point on the number of awards continuously declined, hitting 5,429 (master's and doctoral) scholarships in 2005, before rebounding to 7,629 in the 2006-2008 period.

Despite the ups-and-downs in the scholarships offered by the three agencies, the total number of students benefited in the period 1996-2008 was consistently greater than 37%, increasing to 39.2% (1996) and 41.7% (2008). From this, it can be inferred that mutual compensation between the agencies occurred in the period in order to maintain the percentage of students served.

One important observation is that these agencies have different institutional policies. CAPES has consistently prioritized master's programs. In some years, the number of master's scholarships was double that of doctoral scholarships. CNPq, which favored master's programs in 1997, began to offer a greater number of doctoral awards from 1998 on. The number of FAPESP master's scholarships was higher than doctoral awards in the 1996-2000 period. Although the number of scholarships granted to both doctoral and master's programs varied between agencies, the number of master's awards has not exceeded doctoral awards since 1998. The same can be said for FAPESP. (Tables 2.40a and 2.40b).

Prioritizing doctoral over master's programs follows a global trend that began very early in the U.S. and is more pronounced in Europe, following changes that were introduced in the Bologna Process.<sup>18</sup> CAPES' persistence in encouraging master's programs seems to be related to its policy for development of graduate programs all over Brazil. Since the creation of new programs is usually initiated with master's programs, this policy for decentralization of graduate education in Brazil seems consistent.

It could be argued that autonomy of these agencies has been a positive factor in fostering training of high-level personnel. Although these agencies have been under pressure, they have been able to avoid any sudden drops in total investment.

A more comprehensive analysis should involve not only scholarship awards, but also total available funds for research at higher education institutions (Chapter 3) since the latter is directed to teaching and training activities. However, it is worth emphasizing the importance of CNPq's so-called "productivity scholarships", which have had a key role in maintaining the best researchers in academic careers, partially offsetting occasional drops in salary and ensuring that earnings are at least fairly competitive with that of private enterprise and in areas of economic significance as well as at foreign HEIs.

As Brazil's academic graduate programs are successful and are the only internationally competitive higher education programs, the interests of the academic community tend to turn to these programs, especially because academic rewards are more tangible.

However, international consideration on the roles and functions of higher education in the new knowledge society has emphasized the importance of continuing education for constant recycling of the labor force. Although this function should be performed by professional graduate education, it seems to have received less attention in Brazil. Broader discussions on the need to offer of this type of instruction by the academic community at public universities, who have an active role in formulating public education policies, is warranted.

In São Paulo State, public HEIs seem to have taken a hiatus in the area of continuing education. Private institutions have filled this gap with specialization courses, as well as and professional development and training, especially MBAs.

These programs were once important to public HEIs, too. Although they did not enjoy the academic recognition afforded to the regular degree programs termed "stricto sensu" and were not included in official teaching workloads, the public HEIs charged tuition fees for "lato sensu" programs and were therefore able, especially in key areas for economic development, to offer teachers extra pay and use the revenue generated by these programs to fund research centers.

To justify tuition fees despite the legal requirement to provide education free of charge, the public HEIs claimed that this requirement applied only to regular undergraduate programs and academic graduate ("stricto sensu") programs. Non-academic and vocational post-graduate programs ("lato sensu"), which are not permanent and vary considerably in terms of content, are not part of their obligation to provide free education, they argued. This argument has been met

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18. The Bologna Process is a consequence of an agreement between member countries of the European Community for a comprehensive reform in the structure of higher education curriculum. As part of this reform, undergraduate courses now have three years, followed by another year after which a master's degree is awarded.

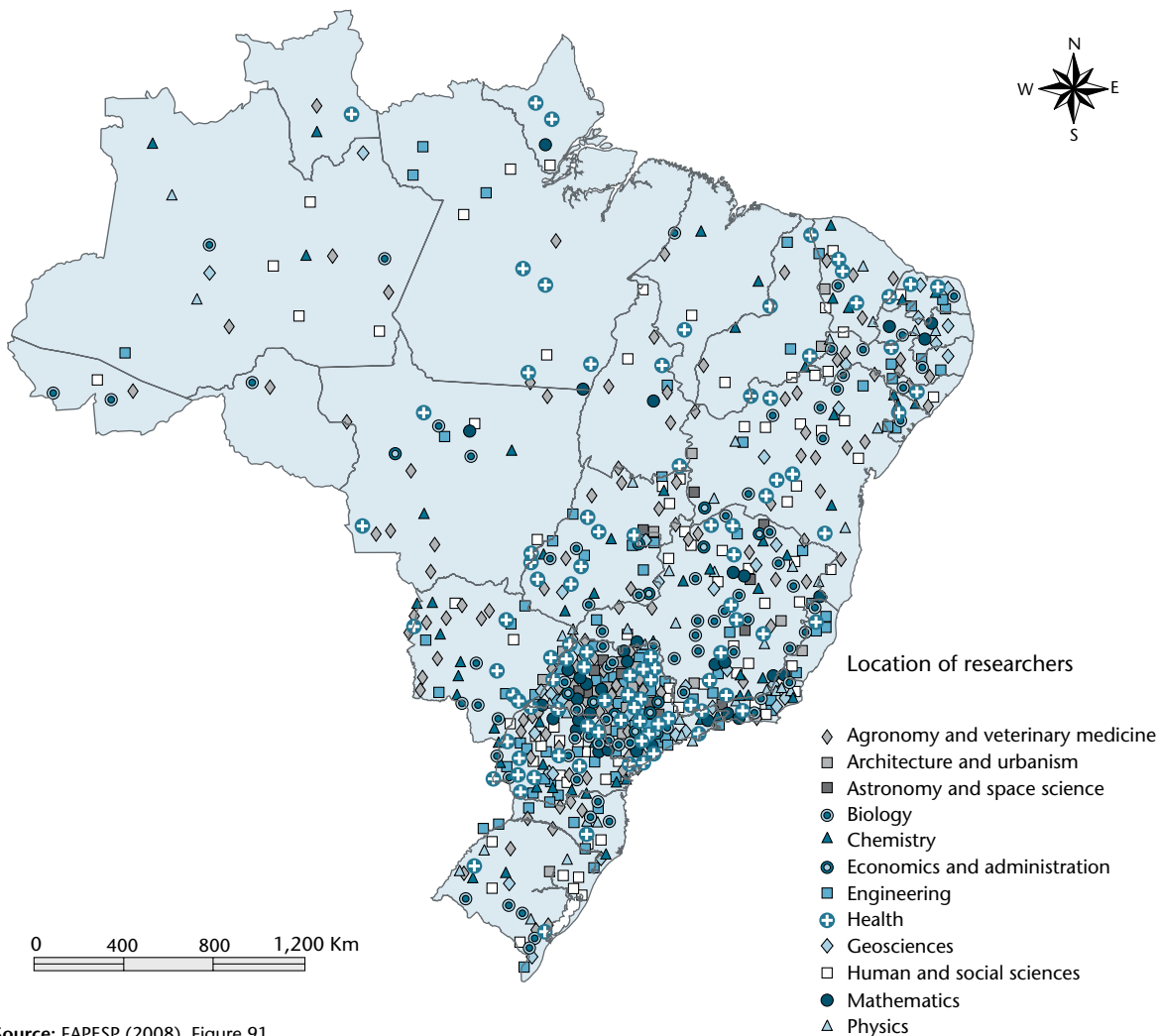
recently by strong opposition from trade and student unions, forcing the public HEIs to shut these programs down, but the change has not been accompanied by a strategy of introducing non-monetary academic incentives for their expansion. This has had a negative impact on the provision of high-level professional and executive education, despite the fact that these students could easily afford the fees. The higher education system has not been affected because it is funded by public money, mainly from state governments.

This practice jeopardized permanent links between the university with the business sector and professional communities, who stimulated a continuous updating of courses, teachers, and research projects.

### 4.5.1 Trajectory of FAPESP fellows

A recent study conducted by FAPESP clarifies an important feature of its scholarship programs to graduate students, which could be extrapolated to the scholarship programs of other agencies in São Paulo State. One of the main conclusions of this study was that about 20% of FAPESP former fellows establish links with institutions outside São Paulo State (Map 2.2). It can be assumed that the former fellows of the other two important agencies (CNPq and CAPES) have a similar behavior. This shows that graduate programs in São Paulo State institutions have an important role in disseminating scientific activity in Brazil.

**Map 2.2**  
Places where FAPESP former fellows have employment bond, by area of activity



Source: FAPESP (2008), Figure 91.

## 4.6 Graduate degrees awarded

Table 2.41 shows master's and doctoral degrees awarded in São Paulo State and Brazil (1996-2008).

Figure 2.23 shows how growth in master's degrees awarded has leveled off since 2003, in contrast with Brazil, where growth has also slowed.

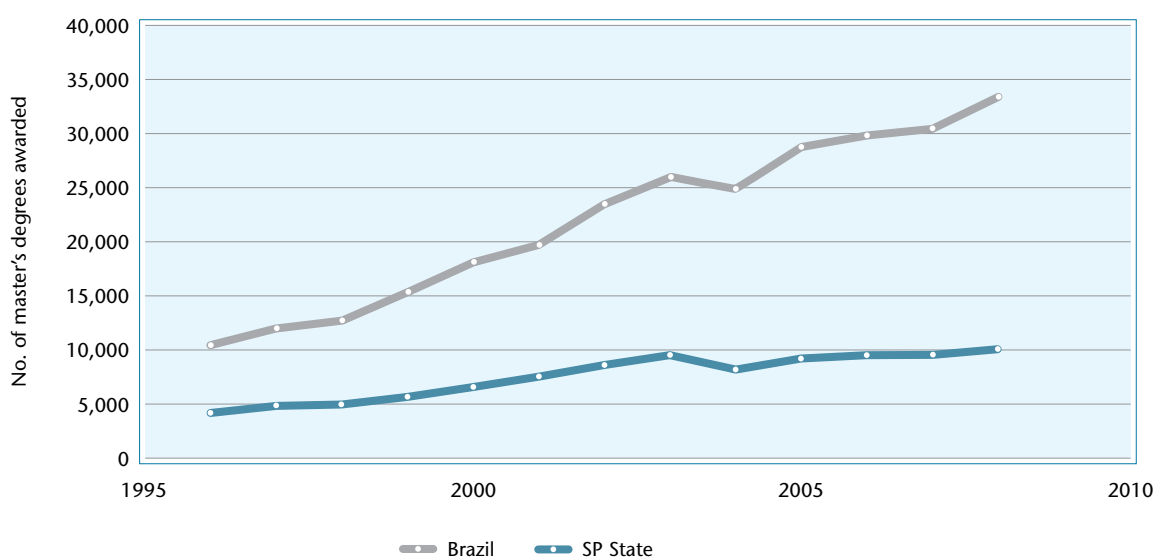
A similar trend was observed in doctoral degrees (Figure 2.24).

**Table 2.41**  
Degrees awarded in Master's and PhD programs – Brazil and São Paulo State, 1996-2008

Level / Geographic area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>PhD degrees</b>													
Brazil	2,985	3,620	3,949	4,853	5,344	6,040	6,894	8,094	8,109	8,991	9,366	9,919	10,711
SP State	1,961	2,341	2,622	3,049	3,167	3,616	4,055	4,489	4,331	4,792	4,683	4,730	4,824
SP/BR %	65.7	64.7	66.4	62.8	59.3	59.9	58.8	55.5	53.4	53.3	50.0	47.7	45.0
<b>Master's degrees</b>													
Brazil	10,499	11,922	12,681	15,324	18,140	19,651	23,457	25,997	24,894	28,675	29,761	30,568	33,360
SP State	4,066	4,643	4,955	5,663	6,616	7,434	8,533	9,386	8,188	9,249	9,415	9,471	9,959
SP/BR %	38.7	38.9	39.1	37.0	36.5	37.8	36.4	36.1	32.9	32.3	31.6	31.0	29.9

Sources: CAPES; FAPESP (2005).

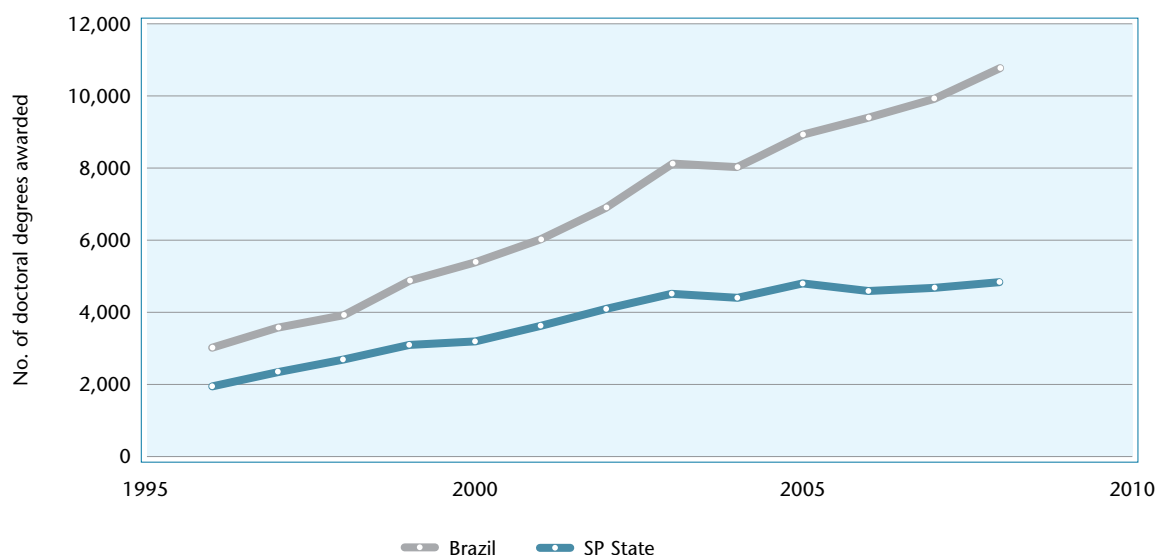
**Figure 2.23**  
Growth in the number of degrees awarded in master's programs – Brazil and São Paulo State, 1996-2008



Source: CAPES; FAPESP (2005).

Note: See Table 2.41.

**Figure 2.24**  
Growth in the number of degrees awarded in doctoral programs – Brazil and São Paulo State, 1996-2008



Source: CAPES; FAPESP (2005).

Note: See Table 2.41.

#### 4.6.1 Graduate degrees awarded: main institutions

In 2007, 15 Brazilian universities accounted for 75% of doctoral degrees awarded (Table 2.42). Six of them are in São Paulo State (USP, Unicamp, UNESP, PUC-SP, UNIFESP, and UFSCar). The top three are state universities in São Paulo State, which account for 38% of students with doctoral degrees in Brazil.

In 2007, São Paulo State HEIs and research institutions accounted for 47.5% of doctoral degrees awarded

in Brazil. USP, Unicamp, UNESP, PUC-SP, UNIFESP, and UFSCar are the main institutions that award doctoral degrees in São Paulo State (Table 2.43). In 2007, these six universities trained 95.1% of students with doctorate degrees in São Paulo State and 45% of all students in Brazil. It is noteworthy that no private for-profit university awarded a significant number of these degrees in São Paulo State or Brazil. The contribution of nonprofit universities is also much reduced, with the honorable exception of PUC-SP.



**Table 2.42**  
Fourteen universities that awarded 75% of PhD degrees in Brazil, 2007

HEI	PhD degrees awarded in 2007
USP	2,252
Unicamp	803
Unesp	717
UFRJ	698
UFMG	510
UFRGS	448
PUC/SP	318
UFSC	285
Unifesp	236
UnB	235
UFPE	221
UFPR	193
UERJ	176
UFBA	176
UFSCar	174
<b>Total</b>	<b>7,442</b>
<b>Total Brazil</b>	<b>9,919</b>
<b>% total Brazil</b>	<b>75%</b>

Source: CAPES.

**Table 2.43**  
Number and percentage of PhD degrees awarded by main institutions in São Paulo State, in relation to degrees awarded in Brazil and São Paulo State, 2000-2008

HEI	No. of PhD degrees awarded									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	
USP	1,549	1,705	2,013	2,164	2,041	2,270	2,194	2,266	2,295	
Unicamp	554	731	698	743	739	873	791	795	748	
Unesp	388	521	540	641	522	687	670	694	765	
PUC/SP	198	246	265	313	330	345	343	318	318	
Unifesp	200	216	203	263	207	259	279	236	235	
UFSCar	106	112	170	152	184	163	158	187	187	
<b>Total 6 HEIs</b>	<b>2,995</b>	<b>3,531</b>	<b>3,889</b>	<b>4,276</b>	<b>4,023</b>	<b>4,597</b>	<b>4,435</b>	<b>4,496</b>	<b>4,548</b>	
<b>Total Brazil</b>	<b>5,344</b>	<b>6,040</b>	<b>6,893</b>	<b>8,094</b>	<b>8,856</b>	<b>8,991</b>	<b>9,366</b>	<b>9,919</b>	<b>10,711</b>	
<b>% 6 HEI / Brazil</b>	<b>56.0</b>	<b>58.5</b>	<b>56.4</b>	<b>52.8</b>	<b>45.4</b>	<b>51.1</b>	<b>47.4</b>	<b>45.3</b>	<b>42.5</b>	
<b>Total SP State</b>	<b>3,167</b>	<b>3,616</b>	<b>4,055</b>	<b>4,489</b>	<b>4,331</b>	<b>4,792</b>	<b>4,683</b>	<b>4,730</b>	<b>4,824</b>	
<b>% 6 HEI / SP State</b>	<b>94.6</b>	<b>97.6</b>	<b>95.9</b>	<b>95.3</b>	<b>92.9</b>	<b>95.9</b>	<b>94.7</b>	<b>95.1</b>	<b>94.3</b>	

**Sources:**

USP yearbook, 2008; informed by phone with the Dean's Office for Graduate Studies, 2008.

UNICAMP yearbook, 2008; informed by phone with the Dean's Office for Graduate Studies, 2008.

UNESP yearbook, 2008; informed by phone with the Dean's Office for Graduate Studies, 2008.

Informed by the Rector's Office of PUC-SP.

Dean's Office for Graduate Studies of UNIFESP in [www.posgrad.epm.br/EstTese.asp](http://www.posgrad.epm.br/EstTese.asp).

UFSCar yearbook in [www.ufscar.br/~spdi/arquivos/indicadores/dissertacoes\\_e\\_teses.pdf](http://www.ufscar.br/~spdi/arquivos/indicadores/dissertacoes_e_teses.pdf).

#### 4.6.2 Doctorate degrees awarded: international comparison

Table 2.44 shows the main HEIs in São Paulo State and the U.S. where doctoral degrees are awarded. The comparison is not unfavorable for São Paulo State institutions on an individual basis, since the number of doctoral degrees awarded per year and per supervisor in São Paulo State is comparable to that of universities in the U.S. In this case, the challenge is expanding the quality of doctors educated in São Paulo state and making it internationally competitive.

The total number of doctorate degrees awarded in São Paulo State is shown together with that of degrees awarded in countries or regions with comparable char-

acteristics (Table 2.45). Although São Paulo State outperforms Latin American countries and roughly equals Canada and Italy, it has some way to go if it is to catch up with Australia, California, Spain or South Korea, let alone the U.K. Indeed, São Paulo State's ratio would have to rise 20% to equal that of France, and 50%-60% to equal those of Spain or California, for example.

Pursuing an increase in the number of doctorate degrees awarded per year in São Paulo State involves three challenges:

- The first is the fact that there is a virtual saturation in the number of degrees awarded in two (USP and Unicamp) of the three major educational institutions, as indicated by the number of degrees per supervisor. Table 2.44 seems to

**Table 2.44**

**Number of professors and PhD degrees awarded (total and per professor) – major universities that awarded PhD degrees in São Paulo State and in the U.S., 2008 (or latest year available)**

HEI in SP	HEI in USA	PhD degrees awarded	Professors	PhD degrees / professors
<b>USP</b>		2,265	5,434	0.42
	U. California, Berkeley	802	2,028	0.40
<b>Unesp</b>		765	3,554	0.22
<b>Unicamp</b>		748	1,743	0.43
	U. Texas Austin	716	2,500	0.29
	U. Michigan, Ann Arbor	711	-	-
	U. Wisconsin, Madison	664	2,033	0.33
	U. California, Los Angeles	651	4,016	0.16
	U. Minnesota, Twin Cities	644	4,088	0.16
	Stanford U.	642	1,878	0.34
	U. Illinois, Urbana-Champaign	637	3,081	0.21
	Pennsylvania State U. main campus	606	4,049	0.15
	Ohio State U. main campus	591	5,272	0.11
	MIT	581	1,725	0.34
	U Florida	574	-	-
	U. Southern California	554	3,200	0.17
	Purdue U. main campus	522	2,616	0.20
<b>PUCSP</b>		318	1,406	0.23
<b>Unifesp</b>		235	775	0.30
<b>UFSCar</b>		187	832	0.22

**Sources:**

USA, 2005: SandE Doctorate Awards, 2005, Table 12.

Number of teachers in the USA: obtained from university websites in the USA.

No. of teachers; state universities in SP State: Yearbooks, 2008.

No. of teachers UNIFESP e UFSCar: informed by the Dean's Offices for Graduate Studies and Research.

No. of teachers PUC-SP: data from the DGP, 2006.

**Table 2.45**  
Number of PhD degrees awarded – São Paulo State and some other countries/regions with similar size, 2007 (or latest year available)

Countries / Regions	Population	PhD degrees awarded	PhD degrees / 1000 inhabitants
UK	61,113,205	15,260	0.25
France	64,057,792	8,420	0.13
South Korea	48,508,972	7,946	0.16
Spain	40,525,002	7,159	0.18
Italy	58,126,212	6,351	0.11
California	36,553,215	6,203	0.17
Australia	21,262,641	4,763	0.22
<b>SP State</b>	<b>41,537,772</b>	<b>4,730</b>	<b>0.11</b>
Canada	33,487,208	3,709	0.11
Mexico	111,211,789	2,325	0.02
Argentina	40,913,584	685	0.02
Chile	16,601,707	188	0.01

**Sources:**

Population of SP State: Seade Foundation; other countries: CIA Factbook.

PhD degree awards:

Spain: Ministry of Science and Innovation. Indicators of Spanish System of Science and Technology, 2007.

France, Australia, South Korea, and England: data for 2004 in NSB (2008). App. Tbl 2-40.

Argentina: RICYT (2006).

SP State: CAPES.

indicate that most of the expansion that can be expected will occur at UNESP and PUC-SP, followed by UNIFESP and UFSCar. If these institutions reach rates similar to those of USP and Unicamp (0.42 and 0.43 PhD degrees per supervisor, respectively), the annual number of degrees awarded will rise by 1,200, a 26% increase over the number of degrees (4,730) awarded in 2007.

- The second challenge (a bottleneck) is the number of doctoral fellowships available for students in SP State.
- The third one is increasing the quality and internationalization of graduate programs either by attracting students from other countries or guaranteeing greater availability of international internships for Brazilian students.

Table 2.45 compares the amount of doctoral degrees awarded in São Paulo State with countries and regions of similar populations or other characteristics. The proportion of degrees awarded per population in São Paulo State is much higher than in other Latin American countries, nearing that of Canada, Italy, and France, but much lower than in Australia, South Korea, California (U.S.), Spain, and England.

## 5. Summary and conclusions

This chapter presents a diagnosis of the situation of São Paulo State HEIs in the 2003-2006 period.

In general, it confirms the conclusions of Science, Technology, and Innovation in the State of São Paulo (2004), but analysis of some specific features of higher education in São Paulo State has been expanded.

Initially, the chapter presents an overview of the system in terms of types of institutions and courses as well as distribution of undergraduate places among federal, state, and municipal institutions, highlighting the fact that official classifications do not always correspond to real differences. Whenever possible, the data are interpreted in light of these differences.

A comparative approach is used in the following analyses. Data from the 2003-2006 period are compared with those of the previous period (1999-2002). The characteristics of São Paulo State are compared with those of Brazil and, whenever possible, with those of other countries, allowing some important peculiarities of the São Paulo State system to be elucidated.

The supply of undergraduate education is examined under the light of indicators such as GER and NER. Analysis of growth in enrollment ratios confirms

the conclusion of the 2004 edition that the pace of growth has declined in recent years, drawing attention to the fact that enrollment ratios in São Paulo State are lower than those of other OECD countries (including those of most countries in Latin America) although they are higher than throughout the country.

A diagnosis of the causes of this phenomenon notes the structural obstacles to the expansion of higher education were indicated, which are external to the system and derive from the social characteristics of Brazil, initially affecting elementary education. The first is the significant economic inequality. High levels of poverty, which are generally associated with low levels of education, indicate that democratization in the access to higher education in Brazil cannot occur without a policy to reduce the high inequality in the Brazilian society. Secondly, the poor average performance of students in basic education (which is mostly public in Brazil and São Paulo State) is an obstacle associated with economic inequality. Special attention is paid to enrollment in secondary schools and the poor performance of graduates from this level of the education system, very few of whom had the necessary competencies to gain admission to HEIs of reasonable quality in the period analyzed. As a result, a paradoxical situation occurred in which there were more undergraduate places available than high school graduates with the competitions to compete for them.

The question of increasing access to higher education requires first an analysis of the system's internal differences, especially the public-private divide.

There are three important characteristics of this gap between the public and private HEIs in Brazil affecting enrollment in São Paulo State, all are highlighted in this chapter.

The first one is related to the private sector's increasing predominance in the supply of undergraduate places in São Paulo State, which is much higher than in Brazil. In fact, enrollment ratios in São Paulo State's public HEIs stood at 15.4% (1999), falling from 14.7% in 2003 to 13.4% in 2006.

Second, it is worth recalling that the public sector was concentrated on universities whereas the private sector proved to be much more diversified (including universities, university centers, integrated colleges, and isolated institutions). In the private sector, the institutions offering good undergraduate and graduate courses and selecting better students were in the minority. This in contrast to the majority that absorbs most applicants regardless of academic record or progress as long as students can afford the tuition. These institutions adopted a massified approach that is suited to existing demand.

Third, the system was expanded since all public and private institutions offer the same type of diploma

regardless of the quality of education provided. The differences between systems regarding supply and performance are masked by the formal equality of the degrees awarded to students.

Public education has focused on creation and maintenance of highly selective universities that offer undergraduate education of higher quality, train researchers and conduct their own research with high scientific production and significant investment in developing graduate programs. These universities are expensive and are completely dependent on public resources since they do not charge tuition. Therefore, they can neither expand at the same rate private sector HEIs nor are oriented to absorb the diversity of high school graduates. These include young people with very diverse prior training, vocations, and interests, heterogeneity that is exacerbated by great social, cultural, and ethnic differences within the population.

The obstacles to expansion of enrollment are concentrated in the public sector. State and federal universities in São Paulo State are crucial for the social, scientific and technological development of Brazil, because they are able to act on the frontiers of knowledge, which is essential for insertion of the country in scientific and technological competition that characterizes the globalized world. São Paulo State benefits from these institutions that promote local economic development. However, they consume a significant amount of public resources, because they require complex, costly, and constantly updated laboratories and highly trained staff engaged in the international scientific community. The staff is few in number, but require attractive salaries and relatively small undergraduate teaching workloads in order to devote more time to research. Their core concern is with the scientific production and training researchers. Furthermore, formation of a body of researchers with these qualities requires a long maturation time and abundant and stable research funds. Institutions of this kind are a minority in the higher education system worldwide.

With these characteristics, research universities become inadequate to absorb the large heterogeneous population of high school graduates, for whom school instruction must be strengthened since their interests and vocations are often limited to obtaining training that facilitates their immediate entry into the labor market in a position with a more attractive salary. The private sector satisfies this second function of higher education, offering a formally similar training although with lower quality.

Another important characteristic of higher education in São Paulo State is the early advances and the later development of evening courses, serving the lower income population who need to work in order to fund their studies. Evening courses have been widely

explored by the private sector, tending to outstrip day courses in enrollment. This is further evidence that the private sector is geared toward quantity over quality.

It is important to establish an international comparison to propose paths that have been tried in other countries. In fact, an analysis of countries with the highest enrollment ratios in higher education showed that these rates are due to internal diversification of courses and institutions focused on technological education (Type-B courses, according to OECD terminology). These institutions absorb about half the students enrolled. The greater flexibility of these courses allows for their constant adaptation to a dynamic and constantly changing labor market.

These international experiences seem to have inspired a recent policy in São Paulo State to diversify public investments in higher education (until now concentrated in state universities), guiding part of them to expand the technology sector. An entire section of this chapter is dedicated to this initiative, which may mark a turning point in public higher education in São Paulo State. It is also noteworthy that the private sector is also expanding its offer of this type of course.

From the perspective of scientific and technological development, graduate programs are the prime focus. In contrast to undergraduate education (dominated by the private sector), graduate education is predominantly public in São Paulo State and led by the three state universities with smaller contribution from federal universities.

The graduate sector is the most successful segment of higher education in São Paulo State. Its development shows the pioneering role played by São Paulo State in relation to other states of Brazil.

In both undergraduate and graduate education, São Paulo's state-run HEIs play a role that is occupied by the federal government in other states. The presence of federal institutions in São Paulo State is relatively small.

Examining graduate education based on distribution of courses by knowledge area, Exact Sciences (which contribute most to technological development), stands out.

The São Paulo State higher education system, like the rest of Brazil, differs greatly from the U.S. and Europe in that it prioritizes master's programs. Proposals to reduce enrollment in master's programs, with direct passage to PhD programs, have found little support in the Brazilian scientific community. Similarly, professional graduate programs, which are essential for improvement and upgrading of professionals with undergraduate degrees, have not been stimulated by public universities. Moreover, universities have historically given little attention to professional master's programs, which contribute to train professionals for the labor

market. On the other hand, these latter two types of courses have been the object of great interest by the private sector, which has been more responsive than public institutions to the needs of the labor market.

Expansion of technological education has a long history in Europe. Still, no recent attempts have been made to change undergraduate offerings at universities.

In the 50s however, the European Union proposed a reform movement known as the Bologna Process, which was supported by UNESCO. It consisted of an adopting a model similar to the U.S. system, which is organized around colleges that offer an initial training (in 2-4 years). The colleges are organized not by career but by knowledge area, and do not offer professional degrees (as in Brazil) but generic bachelor's degrees. The originality of this system consists of an offer of general education, with a large number of options for study areas and academic requirements. Thus, this system is able to absorb the demand for higher education by a public with very diverse skills and interests. Academic graduate education and vocational training courses complement the education offered by colleges in both master's level (such as MBAs) and more traditional careers.

The reform proposed in the Bologna Process was resumed in 1999 with one of the objectives being to offer more general and flexible training in order to facilitate the adaptation of higher education graduates to a rapidly changing labor market.

Although initiatives of this type have had little impact in Brazil, some of them deserve mention. A common feature is that they do not advocate curriculum reformation in the entire university, but creation of new campuses where curriculum structure can be different.

One initiative is the creation of the campus of USP Leste (in the East Zone of São Paulo city), an initiative that tried to approach the ongoing reforms in Europe. In this campus, the goal is to offer a more inter-and multi-disciplinary education, with a basic part in common to all students and a pedagogical Organization that includes interdisciplinary seminars focused on problem analysis throughout the course.

Undergraduate courses at in this campus are not the same as those offered in at the main campus, because current law prohibits the same institution from offering identical courses in the same municipality. In addition, an effort was made to meet local educational demands. However, as teaching careers are the same at all campuses, pressure to develop graduate courses has already emerged, undermining the original effort to offer undergraduate education to students with weaker academic backgrounds. Thus, the pressure is jeopardizing the objective of serving a more heterogeneous community. An evaluation would be premature in this stage of implementation, but the new campus

has fulfilled at least in part the original goals: offering of educational opportunities for young public high school graduates in the East Zone of São Paulo City, a region where until then there was no public higher education.

A similar model was adopted at the Campinas State University (UNICAMP), which opened a new campus in Limeira. Federal universities have also followed this trend, with the creation of new campuses as in the case of UNIFESP.

The most innovative recent initiative is the Federal University of ABC. Its goal, as well as that of USP Leste, was also creating educational opportunities for courses for the lower income population of this metropolitan area. This initiative followed the reforms of the Bologna Process and was more ambitious, proposing a flexible three-year bachelor's course directed not to a specific profession but to a large knowledge area, with various program path options. Traditional bachelor's and teaching degrees directed to a professional area could be obtained with an additional year of study. This new university is also an innovation inasmuch as it prioritizes science and technology, but its courses require sound prior knowledge of mathematics and science, so that it will be difficult to improve access in this way for poor students who have graduated from public secondary schools.

It is worth noting that expansion of enrollment in higher education was bolstered by the federal ProUni program, offering grants for private education. It is

not an innovative program because it operates strictly within and indeed reinforces the traditional structure of the private-sector curriculum.

Nevertheless, it managed to increase access to free education at a much larger scale than the increase of undergraduate places at public institutions, except technological education.

From a broader perspective, the initiatives outlined above still leave open the question about improved access to higher education. Inclusion of social groups with lower incomes and those with less academic vocation to higher education cannot occur without: a more profound change in the institutional structure of undergraduate course offerings, and creating new types of institutions tailored to the expectations, requirements and capabilities of a contingent who finish secondary-level education with a generally weak foundation for further study. The same occurs in private education, which follows the structure prioritized by public universities, whose ideal is an education coupled with research, undergraduate and graduate education, and concentration on courses that correspond to regulated careers.

Finally, there are great expectations for distance learning. In Brazil, it is not monopolized by the public sector, and has attracted great interest from the private sector. As these initiatives are still very recent, a more rational evaluation depends on the development of comprehensive and updated databases, as well as on further research.

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## Online data sources

