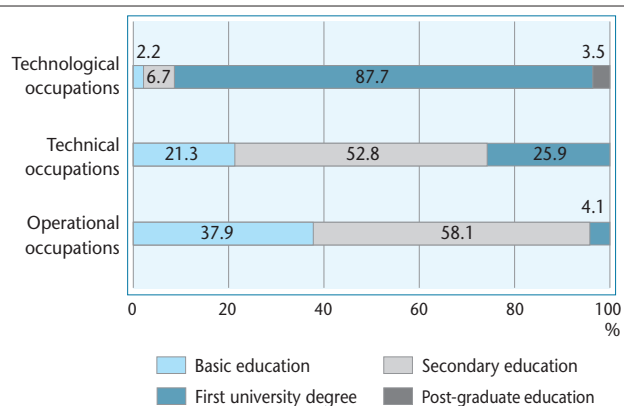


- The number of jobs in ST&I-related occupations in São Paulo State amounted to 1,274,617, or 12.4% of jobs in the formal sector of the economy (10,315,118) in 2006. Jobs in technological occupations accounted for 34.6% (440,523), technical occupations for 38.5% (491,215), and operational occupations for 26.9% (342,879).
- A very high proportion (91.2%) of employees in technological occupations had a university degree or incomplete tertiary education, while a large majority (78.5%) of those in technical occupations had complete secondary education (52.8%) or a degree (25.9%). The average level of educational attainment among employees in operational occupations was higher than expected: 37.9% had only basic education, meaning that almost two-thirds had a higher level of formal education than required by their job.
- Acquisition of plant and equipment was the main innovative activity in all mesoregions of São Paulo State except those of Assis and Presidente Prudente between 2003 and 2005, followed by training. This reflects a pattern of passive and short-range technological effort.
- In-house R&D is more important to firms in São Paulo State (23.5%) than firms in other states of Brazil (16.6%). The mesoregions of São Paulo State with a large proportion of firms that attribute high priority to in-house R&D include metropolitan São Paulo (27.0%) and Campinas (26.2%). These mesoregions are home to a significant number of corporate R&D units, which take advantage of the presence of leading universities and research institutions.
- Statistics from INPI, the national patent office, show an overall increase in patenting activity in São Paulo State. The number of patent applications filed in the period 2002-05 totalled 12,663, up from 10,069 in the period 1998-2001.
- The regions with the largest numbers of patent applications filed in the period 2002-05 were the city of São Paulo with 5,280, and Campinas with 1,054, followed by three regions in metropolitan São Paulo: the so-called ABCD (Santo André, São Bernardo do Campo, São Caetano do Sul and Diadema) with 828, Osasco with 481, and Guarulhos with 282. This shows concentration of technology production along the São Paulo-Campinas axis, which can be explained by the higher density of firms and their technology development units in this region.
- INPI statistics on patent applications can be used to gauge the level of technological specialisation in the various regions of São Paulo State and to identify the areas of greatest patenting activity by technology domain.

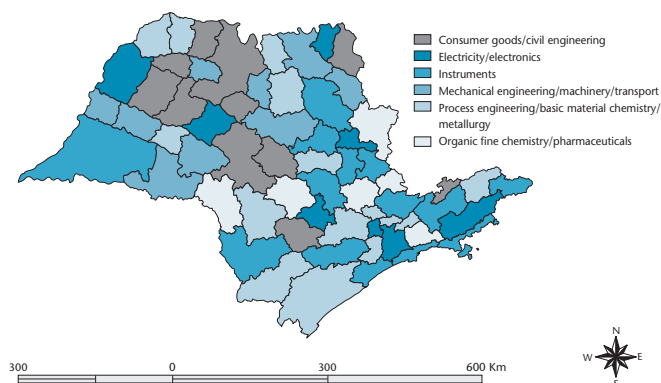
São Paulo State: Breakdown of employment in ST&I-related occupations by level of education, 2006



Source: Ministry of Labour & Employment (MTE), RAIS 2006.

- São Paulo State displays a high level of geographical concentration of employment in general, and of ST&I-related jobs in particular. Ten microregions (São Paulo, Campinas, Osasco, São José dos Campos, Sorocaba, Guarulhos, Santos, Ribeirão Preto, Mogi das Cruzes, and Itapeverica da Serra) account for 72.2% of all jobs, and for 80.7%, 74.8% and 73.7% of jobs in technological, technical and operational occupations respectively.
- The relatively large share of technological occupations in the São Paulo microregion (53%) and in the metropolitan area, and the smaller share of operational occupations (38.8%), reflect regional deconcentration strategies pursued by firms, whereby production units are transferred to other parts of the state and indeed to other states, while research labs and higher corporate functions remain concentrated in metropolitan São Paulo and more specifically in the city of São Paulo.
- The geographical distribution of technical and operational occupations displays greater relative density in the interior of the state, especially São José dos Campos, Rio Claro, Piracicaba and Sorocaba. This matches perceptions that manufacturing and other industrial activities, the main sources of jobs in technical occupations, have moved into the interior.
- Regionalised data from the PINTEC survey show that the São Paulo mesoregion, a good approximation to the São Paulo metropolitan area, accounts for over 50% of innovative firms in the state and for almost 20% of all innovative firms in Brazil, displaying an innovation rate of 33.1% (firms introducing innovations as a percentage of total firms). As for innovation types and coverage, process innovations are more important than product innovations while innovations for the firm are more frequent than innovations for the domestic market, showing that firms' innovative strategies are much more imitative than groundbreaking in almost all regions of the state.

São Paulo State: Technological specialisation of microregions by technology domain, 2002-05

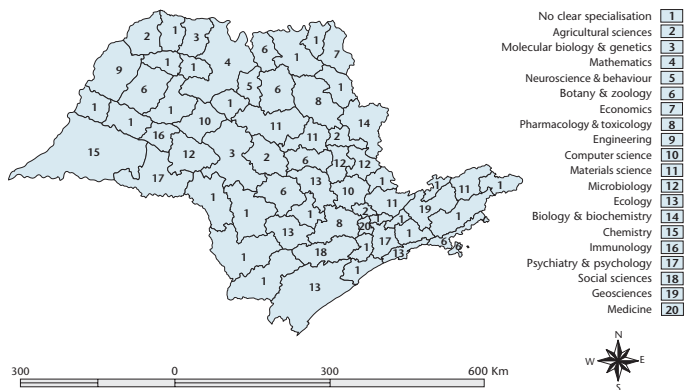


Source: INPI (special extraction 2006).

- In the period 2003-06, the number of SCIE- and SSCI-indexed scientific articles by authors affiliated to institutions in São Paulo State totalled 33,819, or 51% of Brazilian scientific output in the period.
- The microregions with the largest scientific output were those containing cities with the most intense academic activity: São Paulo (17,672 articles), Campinas (6,614), São Carlos (3,732), Ribeirão Preto (2,546), Piracicaba (1,494), and São José dos Campos (1,390). These six regions together accounted for 99% of the state's scientific output in the period 2003-06.
- The scientific specialisation indicator shows the share of each knowledge area in a region's scientific output in comparison with the same knowledge area's share for the entire state. Specialisation is low in the São Paulo region (all indicators below 2). The Campinas region, which ranks second in terms of the number of scientific articles published, displays specialisation in three main areas:

computer science (2.01), agricultural sciences (1.73), and chemistry (1.63). For São Carlos, indexed articles were identified in 22 knowledge areas, especially materials sciences (2.80), chemistry (2.56), and engineering (1.69). In Ribeirão Preto, the highest specialisation indicators are for pharmacology and toxicology (3.34), neuroscience and behaviour (2.50), and immunology (1.81).

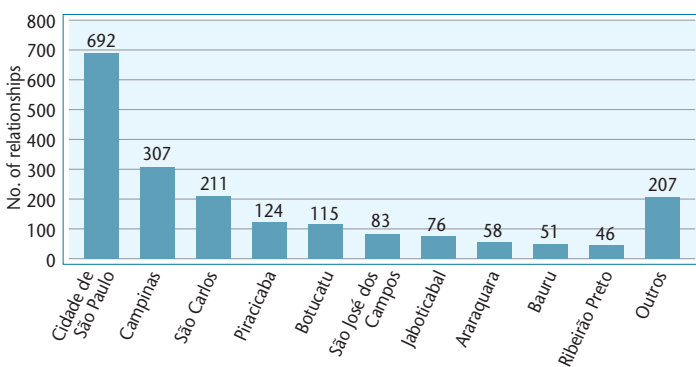
São Paulo State: Scientific specialisation by microregion, 2002-05



Source: ISI via Web of Science. SCIE & SSCI (extraction 2008).

- The 2006 CNPq Research Group Directory Census lists 528 research groups in 59 institutions located in São Paulo State, with 1,970 relationships with firms. The city of São Paulo and the Campinas and São Carlos microregions had the most interactive research groups in the state, with some 60% of the total.
- Among cities, São Paulo has the most interactive firms (278, or about 40% of all interactive firms in the state), followed by Campinas (68), São José dos Campos (35) and São Carlos (34).
- The cities ranked highest in terms of the number of university-business relationships identified are São Paulo (692), Campinas (307) and São Carlos (211).

São Paulo State: Number of relationships between research groups & firms by microregion, 2006



Source: CNPq (2006 Census, Research Group Directory).

- The predominant type of relationship between research groups and firms in São Paulo State is scientific research with immediate application of results (552 in 1,970 interactions).
- The second most frequent type of relationship is scientific research without immediate application of results (272). This is a more interactive type of relationship and can often lead to the development of new university-business collaborative research lines. Interaction of this kind tends to be most productive in generating two-way knowledge flows.
- Tertiary-level technology courses in São Paulo State have increased significantly in recent years. The number of graduates rose 39.0% between 2002 and 2006, from 12,881 to 17,899. The number of courses in engineering (all modalities and specialisms), pharmacy and biochemistry, chemistry, biology and agronomy rose 91.6% from 249 to 477. In the São Paulo microregion, the number of graduates rose 36.3% and the number of courses 41.3%, while in all other microregions in aggregate the number of graduates and courses rose 42.8% and 113.3% respectively. The leading microregions on this measure were São José dos Campos (272.7%) and São Carlos (262.5%).
- In technical education, present in 62 of São Paulo State's 63 microregions, the leading microregions in 2006 were Rio Claro (1,836.05 enrolments per 100,000 inhabitants), Adamantina, São José dos Campos, Catanduva, Barretos, Dracena, Lins and Guaratinguetá, all with enrolment densities above 1,030, compared with a state average of 605.55.
- The number of calibration and testing labs and R&D labs has increased significantly in all microregions of São Paulo State. In 2008, there were 409 Inmetro-certified calibration and testing labs in the state, 57% located in the São Paulo microregion. Despite the importance of the state capital's share, however, many other labs were dispersed throughout the other microregions. This is because many of these labs are linked to local producer specialisation and cater for specific requirements of the firms concerned in terms of lab testing and calibration.