Creating Local Prosperity through World-class Science Based Business Development: Local Innovation in Brazilian and US

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Brazil: strengths & weakness

strengths

- Graduate system and research institutions
- Scientific production: international papers & diversification of competences
- Few, but very good enterprises
- National and States Agencies for Industrial and ST Policies - as BNDES, FINEP and FAPESP
- Window of opportunity: natural resources & internal market

weakness

- Asymmetric Innovation System: relative good academic production .. but weak results in business innovation
- Fragmentation and weak coordination of activities
- Secondary and third grade education enrollment
- Science and engineering degrees
- S&T not at core of development strategies
- Very recent policies for innovation
- Incomplete support for business innovation

Brazilian National Innovation System

- Incomplete – but many actors and institutions
- Complex framework (law and regulation)
- Institutional framework: historical heritage of four periods of reforms: superposition of institutional design created in the past (distinct generations of reforms with different objectives)
- 4 generation of institutions
  - 50's – first generation of policies agencies for science
  - Reforms of 70's – State Economy and National Institutes of Research (national development)
  - 80's – creation of Ministry of S&T
  - 90's and 00's : new PPP – innovation and new industrial policies

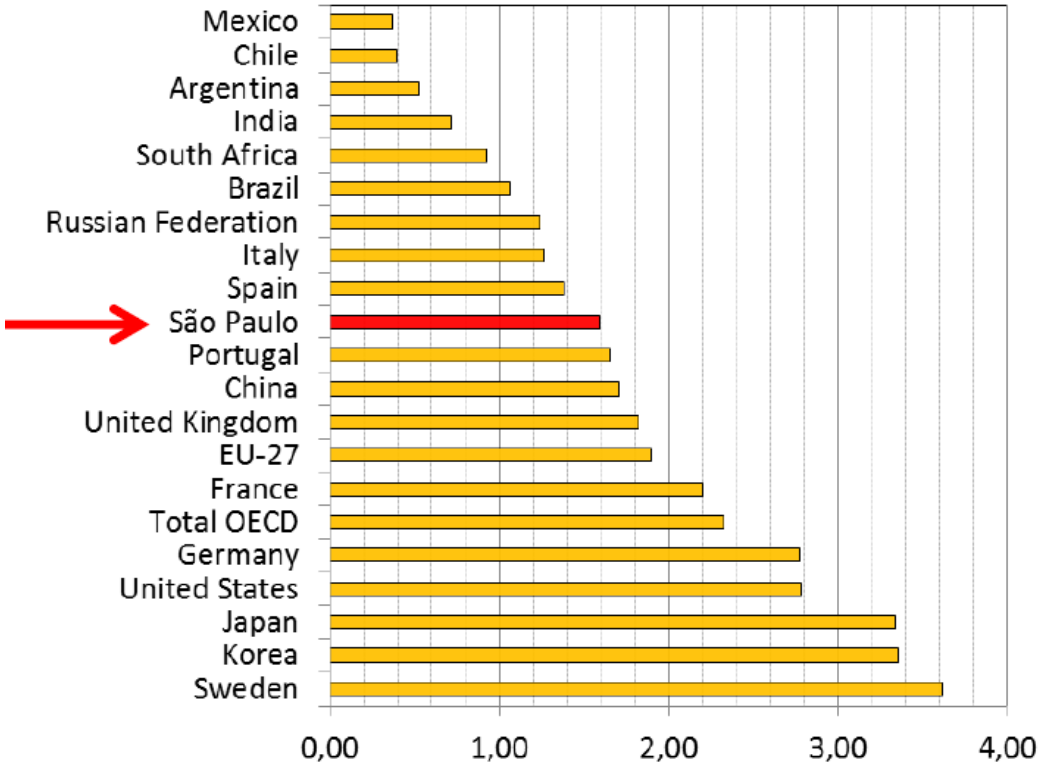
The Brazilian experience

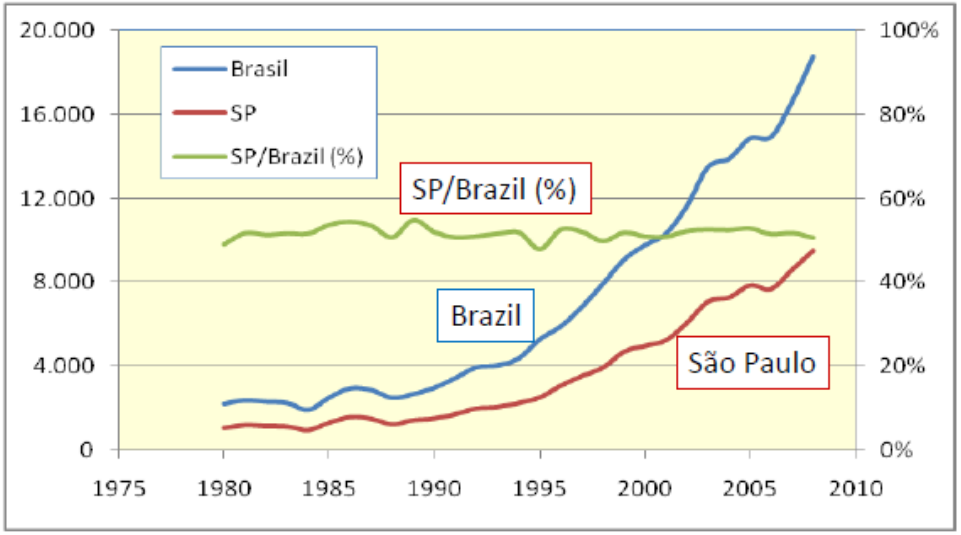
- Growing number of scientific articles in international journals and few but very good Universities and R&D Institutes
- There are news policies and institutions ... but coordination, management and evaluation are still weak
- There are very important Brazilian innovative companies ... but they are only 2% of all companies.
- There is a new interest in cooperation between universities and enterprises ... but it is almost really difficult.
- There are diversified financing tools. But it is hard to access credit and financing, mainly for SMEs
- Recent strategic align between public and private leaders about importance of innovation ... But few results

State of São Paulo

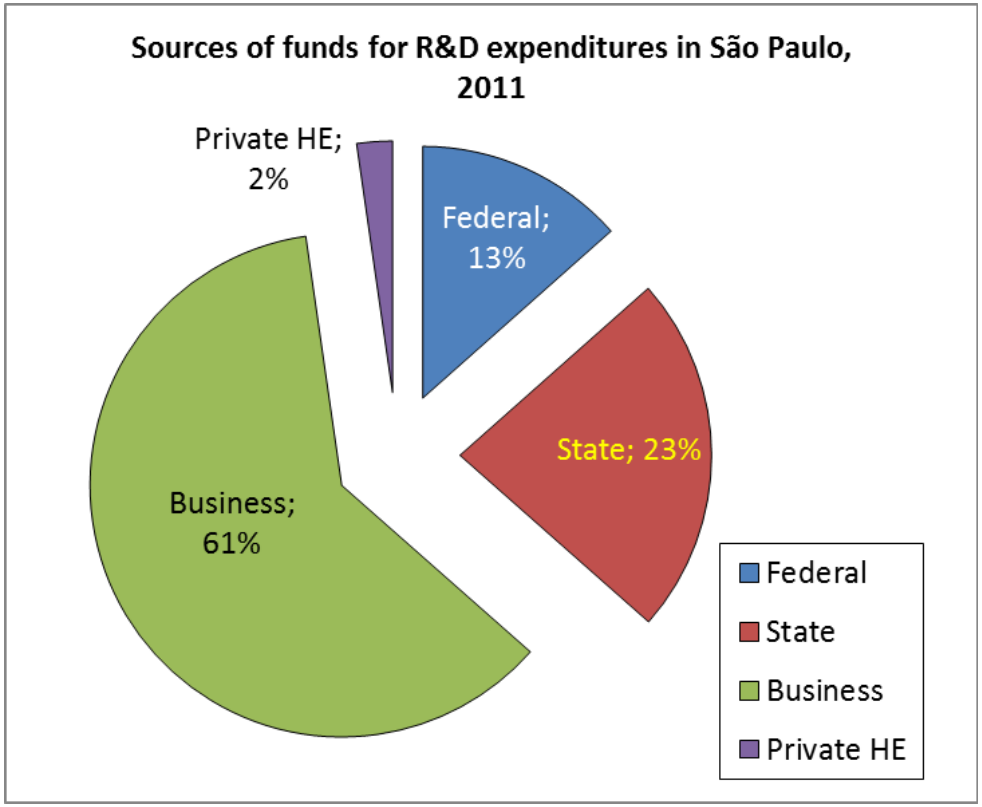
41	Million people
34%	of Brazil's GDP
50%	of Brazilian science
13%	of State budget to HE and R&D
1.6%	GDP for R&D
3	State Universities
3+1	Federal H.E. institutions
52	State Tech Faculties
45%	of the PhDs graduated in Brazil (4,937 in 2010)
22	Research Institutes (19 state/3 federal)

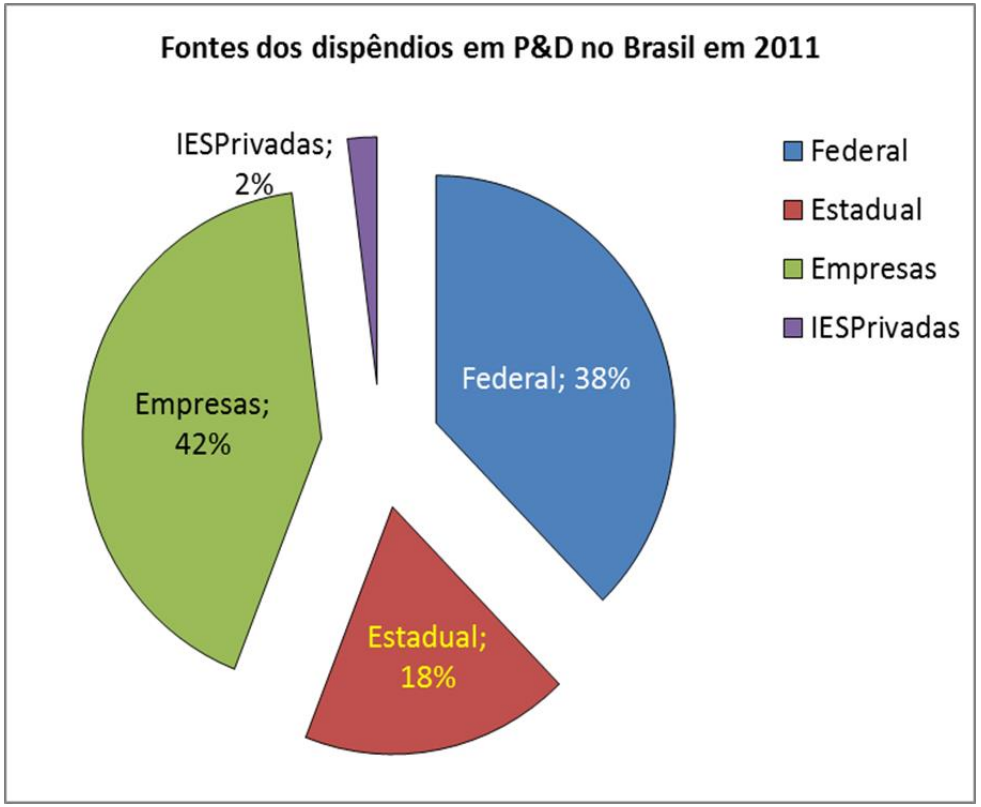
São Paulo R&D Expenditure (% of GDP) and Scientific Production





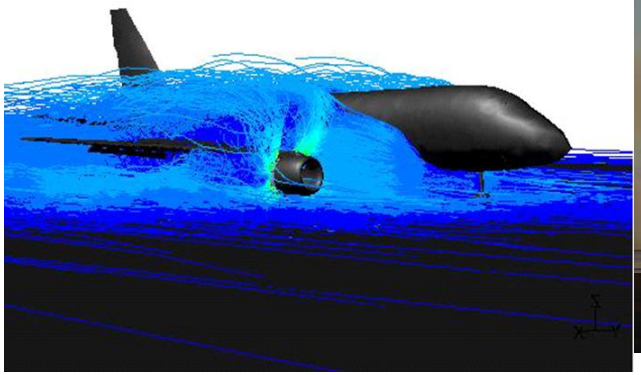
São Paulo & Brazil: R&D Expenditure per Source, 2011



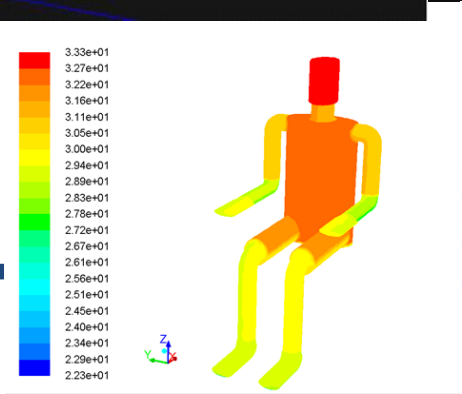


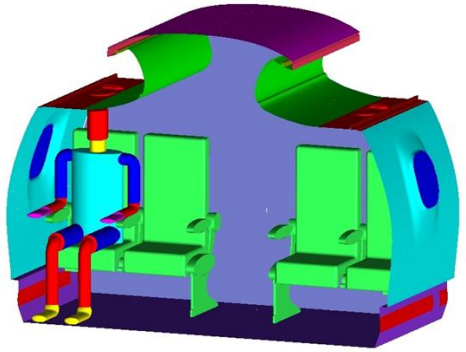
Public-Private Research Partnerships

- FAPESP-Industry Joint Research Program: Embraer, Natura, Ouro Fino, Oxiteno, Microsoft Research, Telefonica, Dedini, PadTec, Ci&T, Braskem, Whirlpool, Sabesp, Boeing, GSK, Vale, BP Biocombustíveis, BG, PSA
- FAPESP-Industry-University Engineering Research Centers: Embraer, Peugeot-Citroen, GSK, Natura, BG.



Embraer-FAPESP:
R&D to build an innovative jet:
Computational Fluid Dynamics (CFD) simulation and tests





FAPESP-Embraer-Poli, USP Research Center for Comfort Engineering

PIPE FAPESP

Special Program to Innovative SME

Evaluation of ST&I programs: a methodological approach to the Brazilian Small Business Program and some comparisons with the SBIR program

Sergio Salles-Filho, Maria Beatriz Bonacelli, Ana Maria Carneiro, Paula F Drummond de Castro and Fernando Oliveira Santos

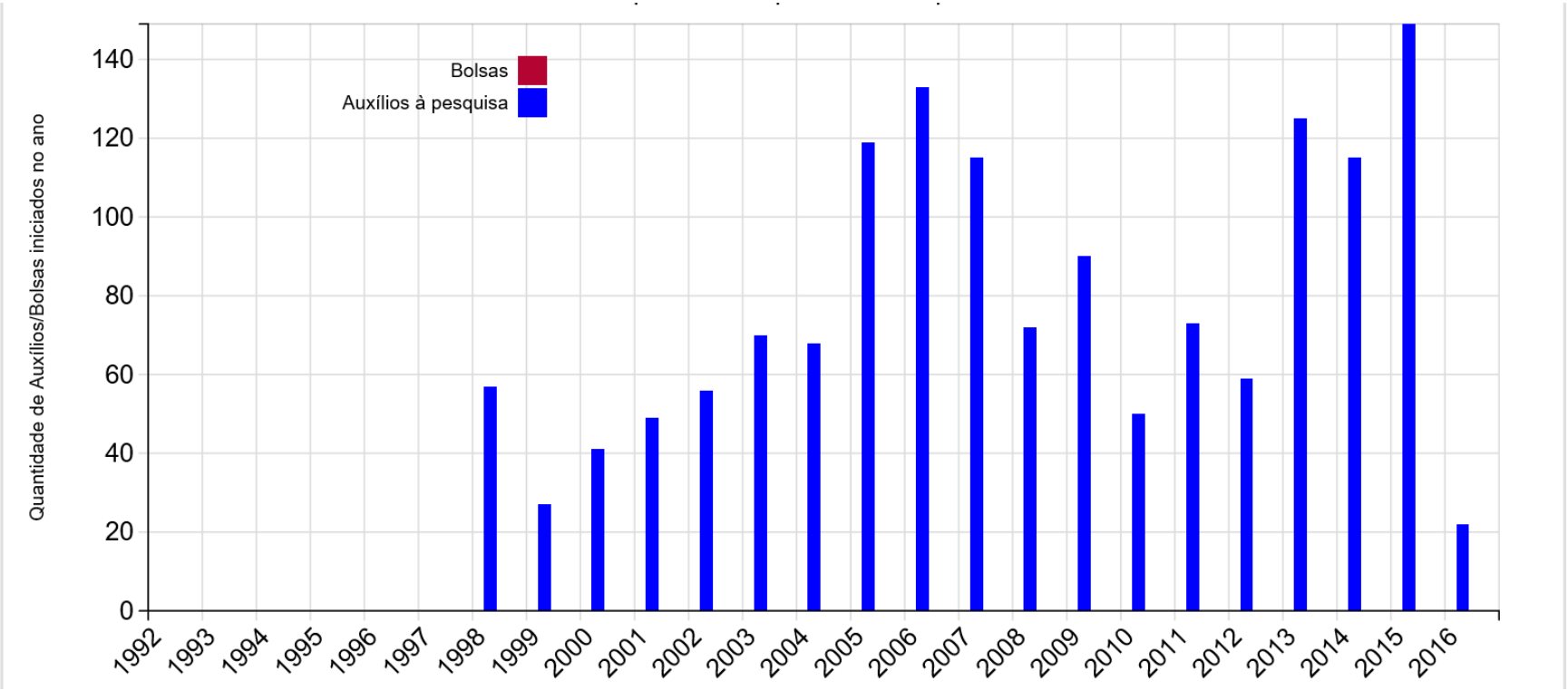
Table 2. Similarities between PIPE and SBIR

Indicators	PIPE	SBIR
Revenues derived from the projects	40%	40%
Revenues of the 5% biggest firms	R$20 to 5 million	US$ 25 million
Projects with patents	29%	30%
Projects that would not be developed without the support of PIPE/SBIR	1/2	2/3
Projects that get more financial resources other than PIPE/SBIR grants	52%	56%

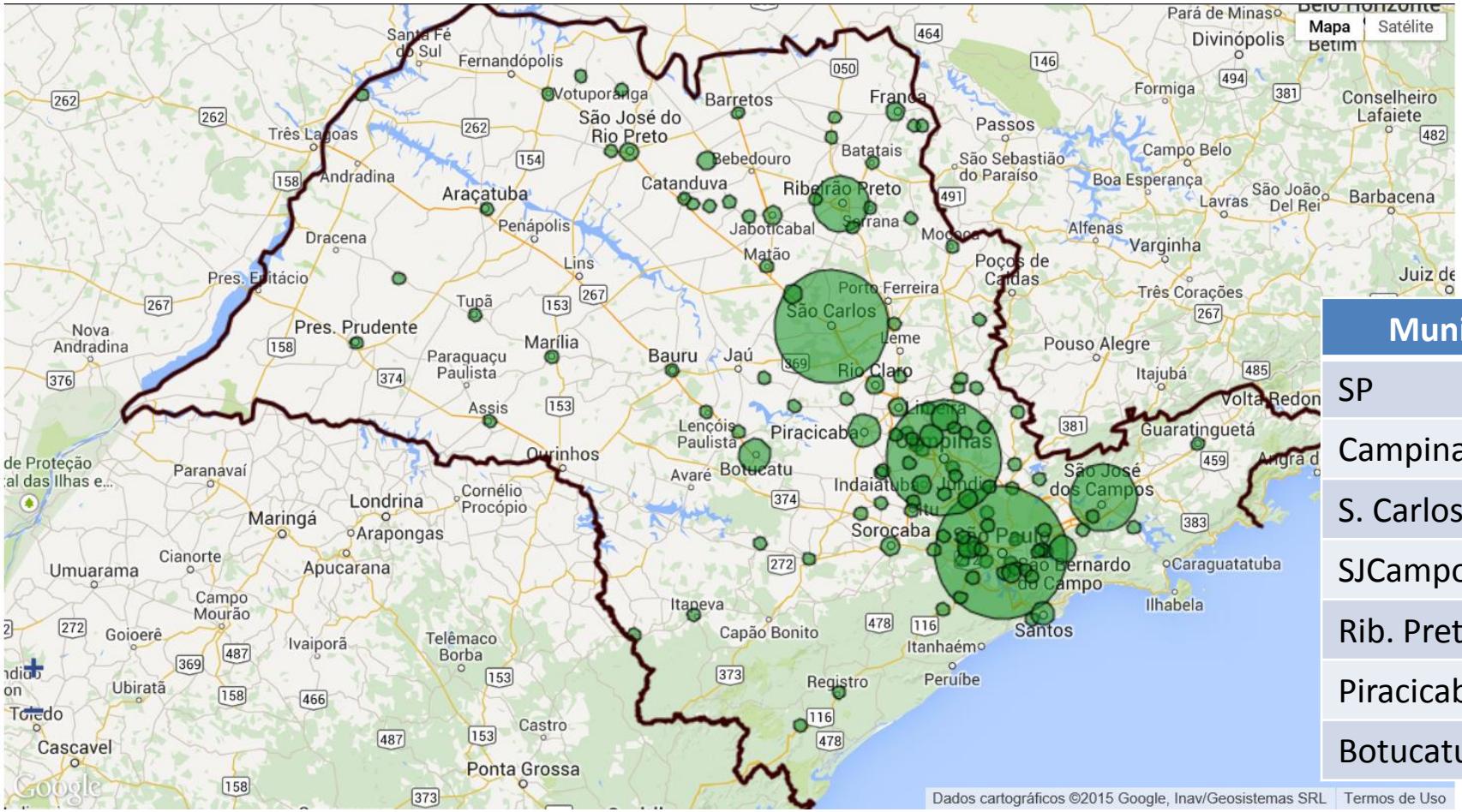
Table 3. Differences between PIPE and SBIR

Indicators	PIPE	SBIR
Firms that were created to receive PIPE/SBIR funds	12%	20%
Projects that received venture capital	12%	25%
Commercial exploration of intellectual property rights	4%	16%

Number of PIPE Projects: 149 new projects in 2015



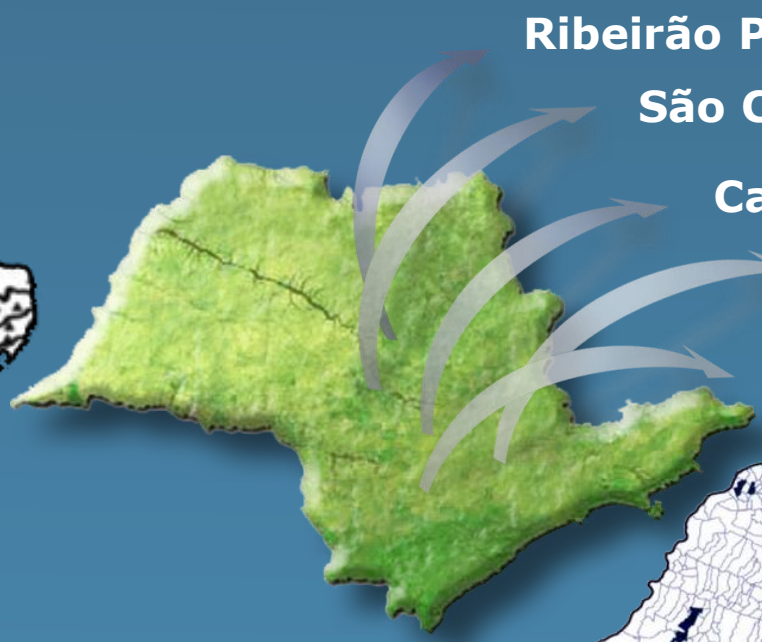
Geography of Innovation - PIPE (close to the best Universities)

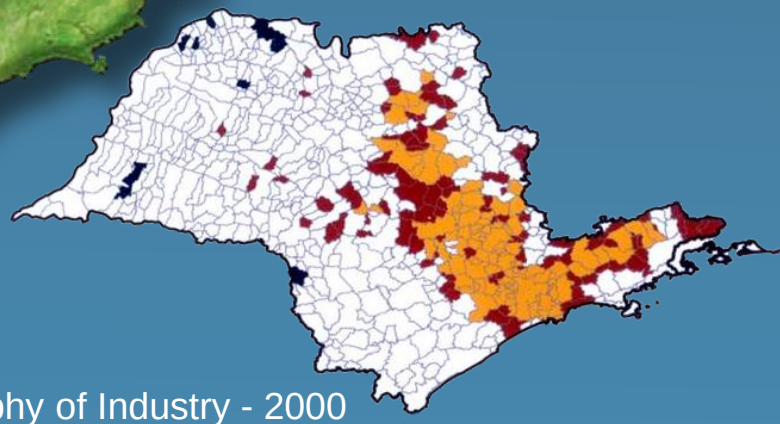


Munic.	Qtd
SP	386
Campinas	240
S. Carlos	230
SJCampos	104
Rib. Preto	65
Piracicaba	29
Botucatu	24

São Paulo System of Technological Parks

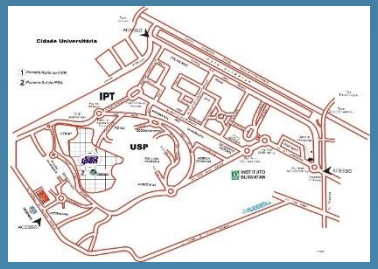
Brazil Geography of
Innovative Industry - 2000

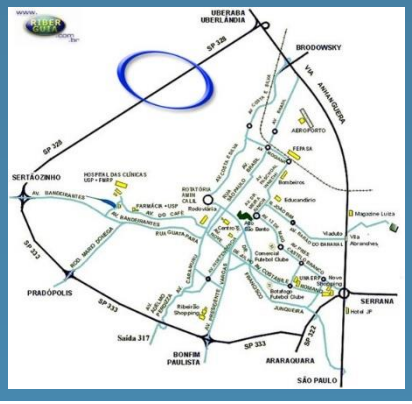




Geography of Industry - 2000

São Paulo System of Technological Parks

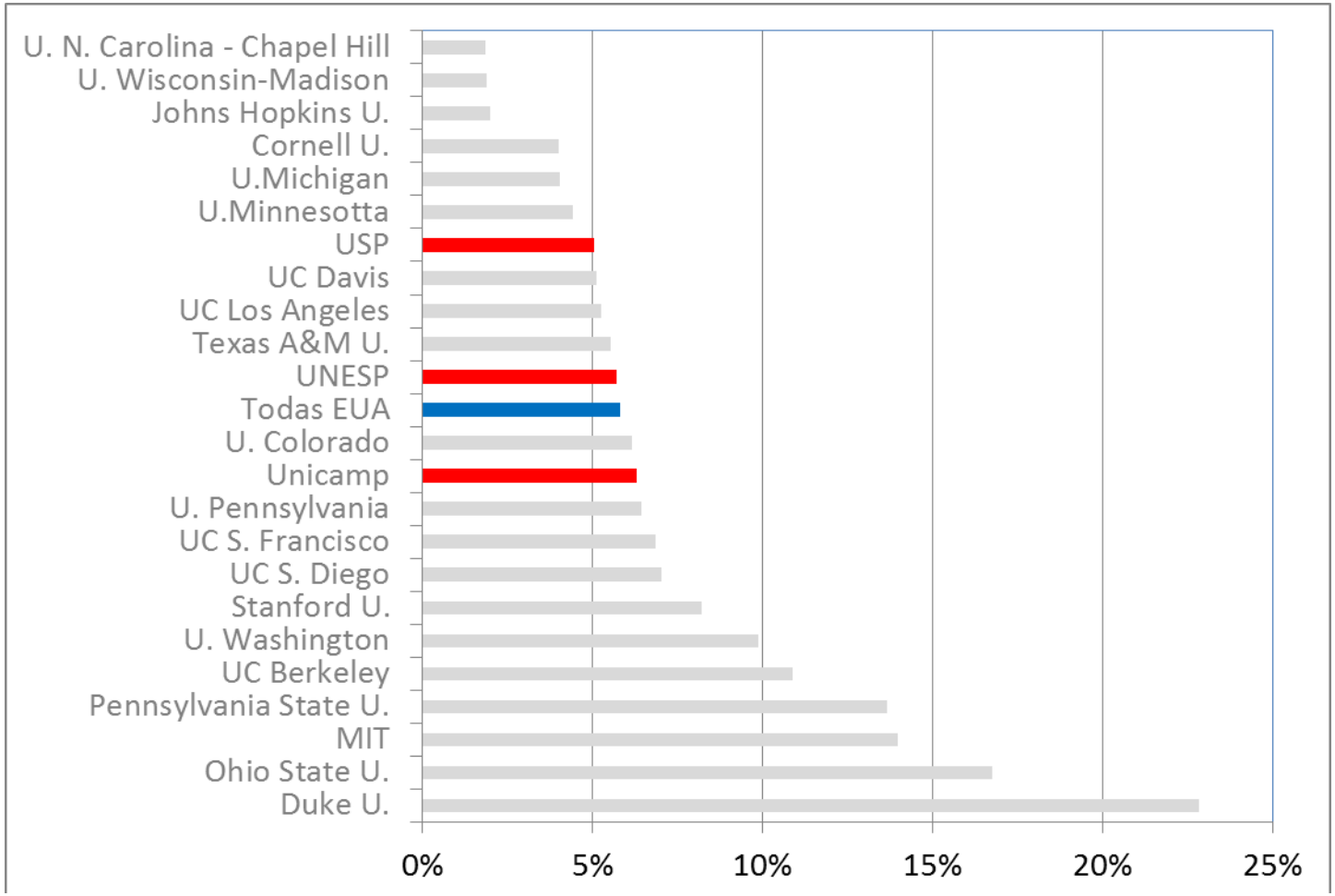




Santos, Piracicaba, Botucatu, São José do Rio Preto e Santo André

28 initiatives: 12 with the status of SPTec Parks (State Gov) in 9 municipalities

Private Resources for University-Industry Cooperative R&D: São Paulo & US



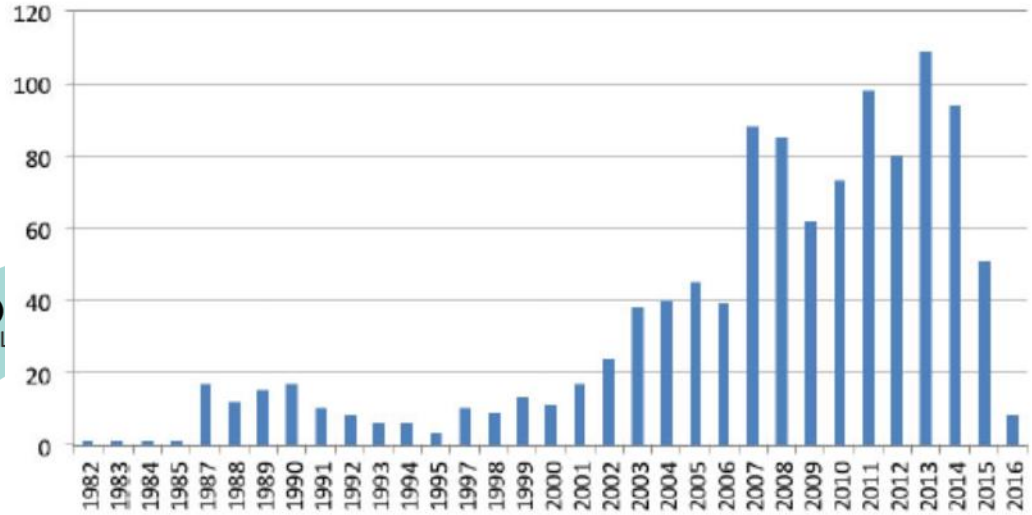
% of total R&D Resources

UNICAMP: 286 start-ups, 19,000 jobs, with R$ 3 bi annual revenue (2015)

USP –TTO Offices and Patents

CIETEC Start-ups

patents applications



CIETEC Start-ups

New Start-ups

2011	2012	2013	2014
25	33	26	41

Total de Empresas Incubadas 1998-2014	496
Candidatos inscritos nos processos seletivos 1998-2014	1059

The Geography of S&T in São Paulo

- The Geography of Innovation is very close to the Geography of Excellent Science
- Universities and R&D Institutes (more and more) as Hubs of Innovation (entrepreneurship and start-ups)
- Relatively good cooperation between Universities & Industry ... but it is almost difficult, specially to SME
- Innovative PPP to promote collaborative R&D activities but it is still hard to access credit and financing, mainly for SMEs
- New local initiatives to enforce and to create Innovation Environments but few instruments to support these initiatives at State and Federal level