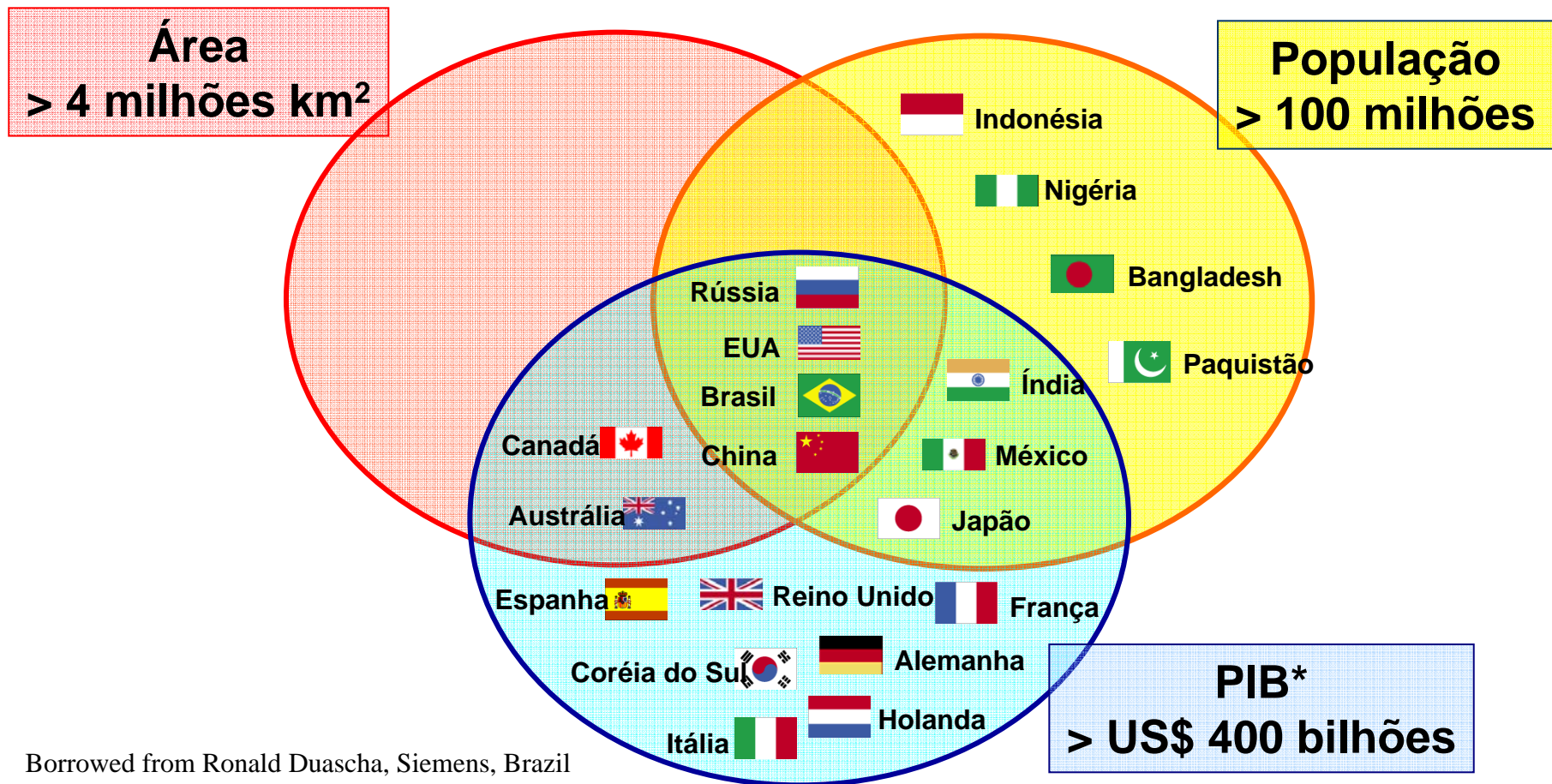

Support for business R&D in Brazil

Carlos H Brito Cruz
Diretor Científico
Fapesp

Brazil: 180 million people, 9th GNP (PPP, 2004)

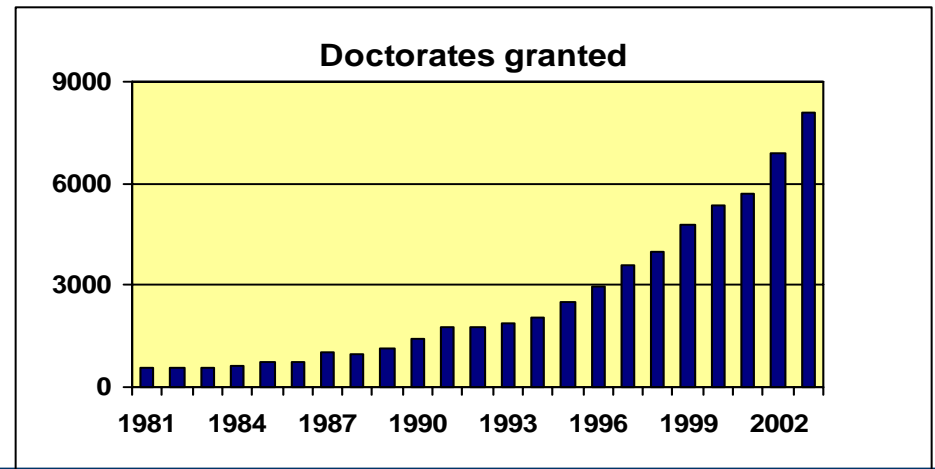
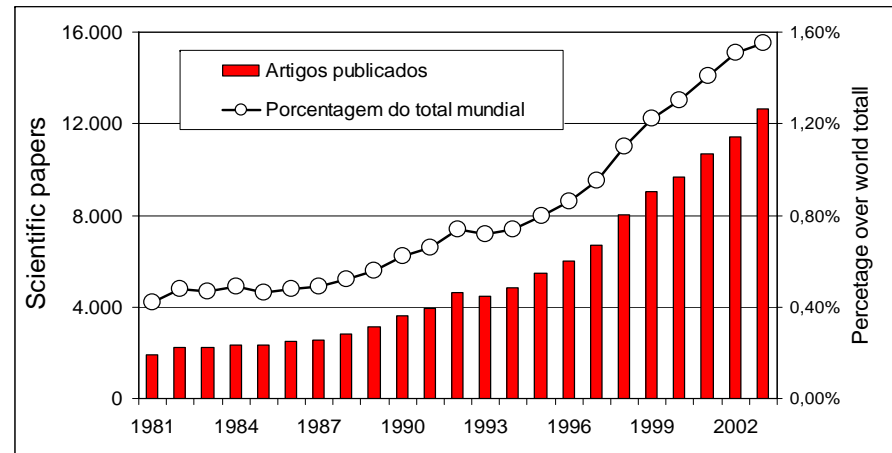
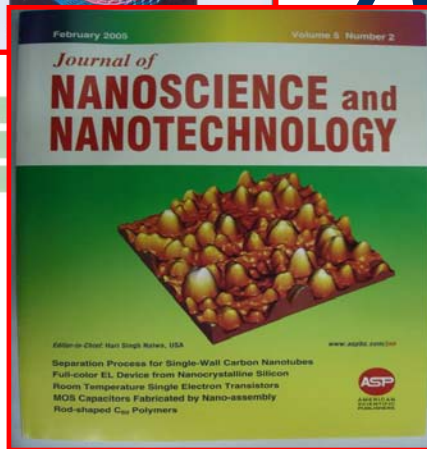
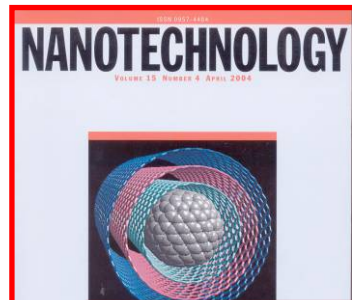


Land, population and production

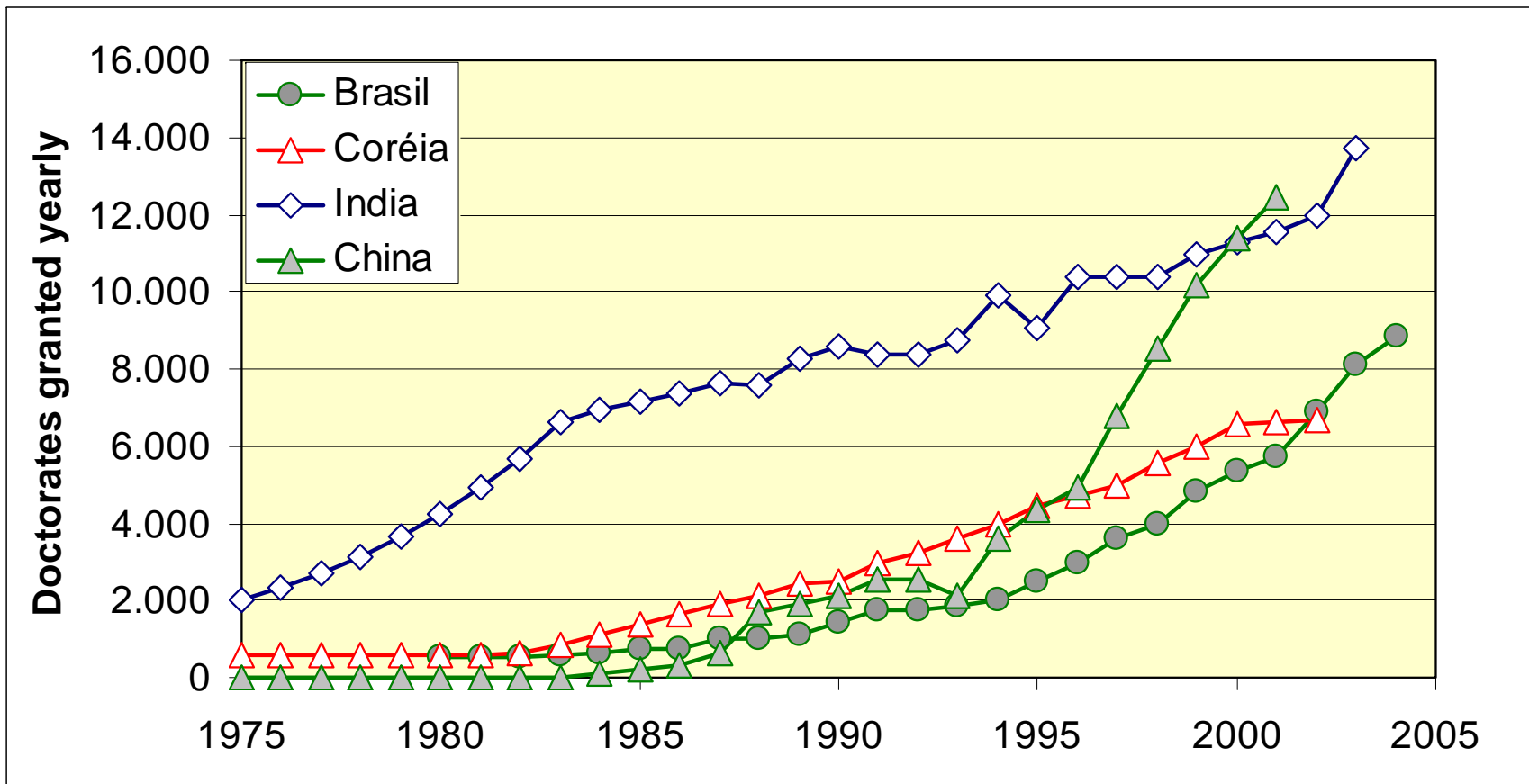


Borrowed from Ronald Dumas, Siemens, Brazil

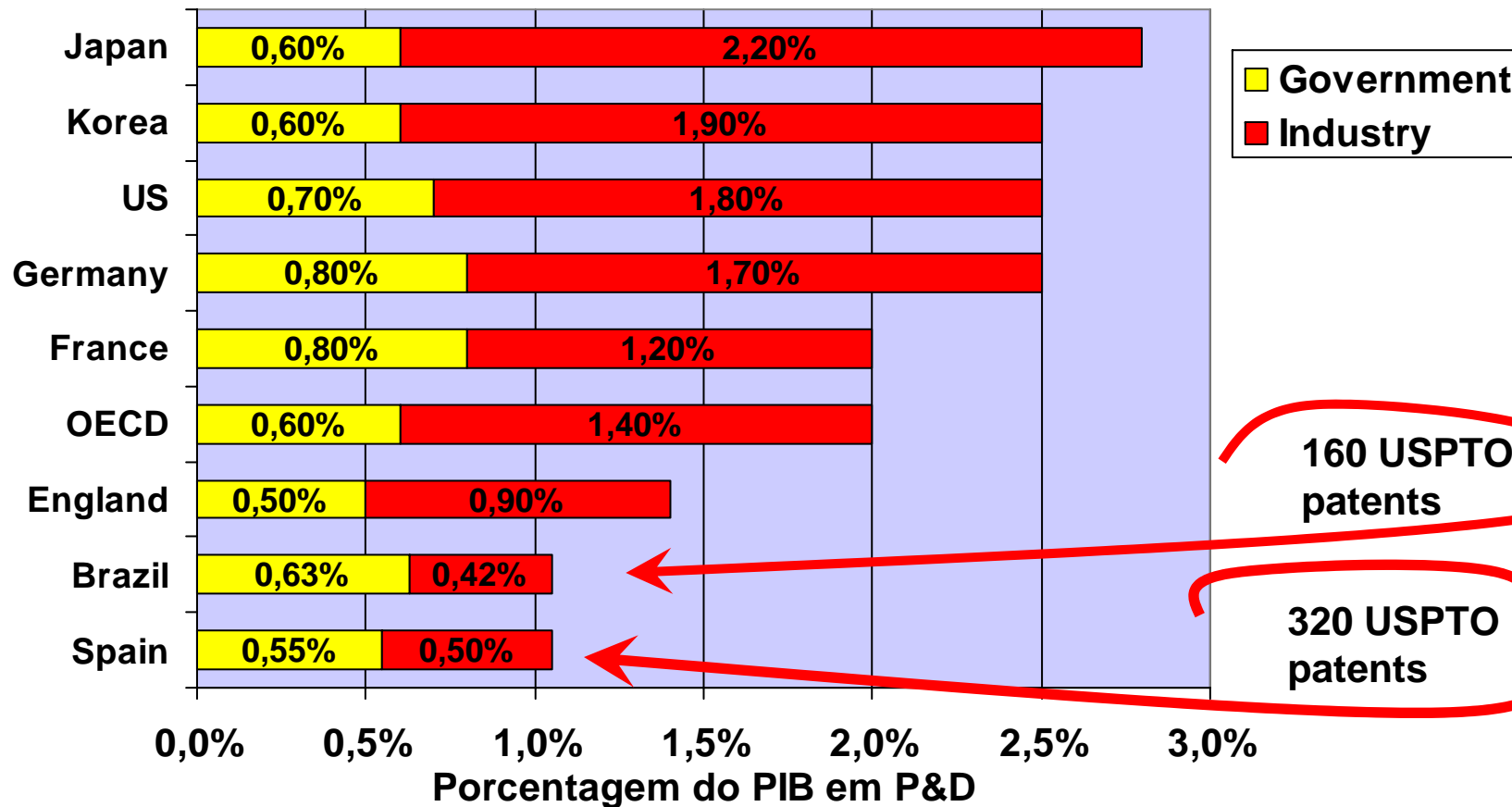
Brazil Academic Research



Doctorates granted: Brazil, Korea, India and China



R&D expenditures, 2003



Fonte: OECD Science, Technology and Industry Scoreboard 2004 e MCT, Brasil

Some of Brazil's R&D results

- Electronic elections
 - 100 millions voters, results by 11 P.M., same day
- Drilling oil at 5,000 ft under the sea
 - 100% of Brazilian consumption
- Best 50 seater jet – Embraer ERJ 145
 - Starting 2006: 90 -110 seat jet ERJ 190
- Largest and most efficient Ethanol producer in the world
 - > 1 milion flex-fel vehicles, 90% of sales
- Most productive soybean in the world

Internet in Brazil

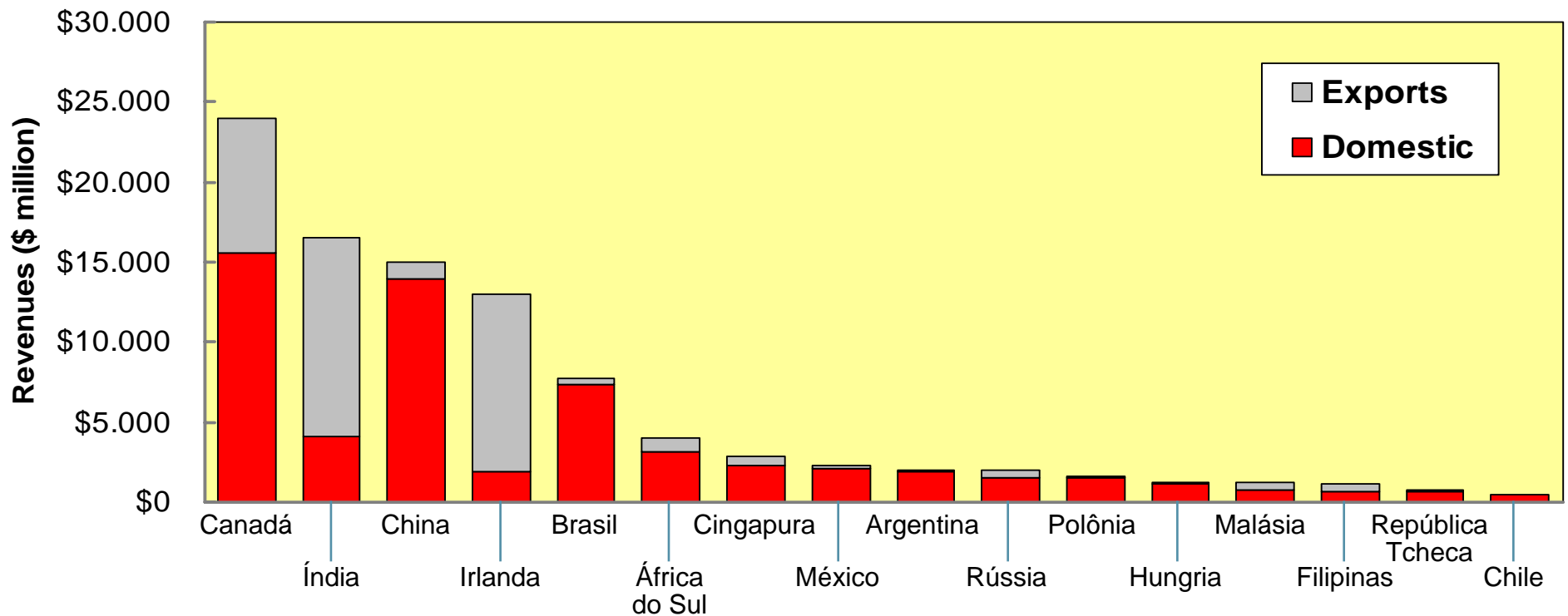
- 9th in connected hosts
- 9 million individual users
- 36 million inertial audience
- US\$ 10 billion inertial market for E-business
- 3rd biggest internet banking operation
- Major public (government) applications
 - Electronic elections
 - Income Tax Returns: 19 million; 97%
 - E-government

Software in Brazil

	Sales (millions USD, 2001)	Jobs
India	8,200	350,000
Brazil	7,700	158,000
China	7,400	186,000

F. Veloso, A.J. Botelho, T. Tschang and A. Amsden, "The software industry in India, Brazil and China", Sep. 2003 (MIT and Softex)

Relative size of IT markets, 2003



Source: AT Kearney, "Desenvolvimento de uma agenda para o setor de IT Outsourcing", 2006

Support for business R&D

- Tax incentives
- Subvention
- Subsidized loans and participations
- Funding for university-business cooperative R&D
- Special programs in the State of São Paulo

Tax incentives

Law 11.196/2005, chapter III

- Accelerated depreciation – 2x
- Income Tax return
 - Deduction as operational expense
 - Internal R&D expenses
 - Payments to small business for contract R&D
 - Payments to universities for contract R&D
 - Additional deduction of up to 80% according to number of hired scientists
 - Additional deduction of 20% if a patent is obtained
- Automatic access to benefits – no pre-submission

Subvention

Law 11.196/2005, Chapter III

- Subvention by federal agencies for hiring scientists
 - MSc's and PhD's
 - 40% of salary and benefits
 - 60% of salary and benefits in Ne and Amazon

BNDES

Subsidized loans for R&D

- BNDES – national development bank
- Innovation Program launched Feb, 2006
- PDI – Prgm for Innovation Development
 - 6% interest rate + 0.8-1.8% spread

Support for Cooperative R&D

- Fapesp (State of São Paulo)
 - Partnership funding
 - University - enterprise
 - 20% to 70% of R&D costs covered
- Sectoral Funds (Federal government)
 - R\$ 1 billion / year
 - Telecom, IT, Materials, Oil, Aeronautics, Space, Health, Mining, Water, Transportation, General Tech

State of São Paulo



38% of Brazil's GNP
38 million people
60% of Brazilian science
13% of State budget for Higher Education and R&D funding

Telefônica

- **Telefônica SP**
 - 12,4 million fixed terminals
 - 33% of the company operation
- **VIVO**
 - 27 million mobiles
- 11 BUS\$ in 2004

Fapesp – State Foundation for supporting R&D

- Annual budget
 - **1% of all state taxes**
 - **US\$ 300 M**
- Academic R&D
- Fellowships
- Industry R&D
 - **Small bussiness R&D**
 - **>500 SBE's – SBIR like.**
 - **Cooperative R&D**
 - **Embraer, Petrobras, VW, Rhone Poulenc ...**

www.nytimes.com

The New York Times
ON THE WEB

April 24, 2001

Model for Research Rises in a Third World City, By LARRY ROHTER

Increasingly, Fapesp's accomplishments are also making it the standard for scientific research in the third world. In an editorial last year, the magazine Nature called the genome work here "a political as well as a scientific achievement" that refutes the "common misconception that only advanced industrialized nations have the wherewithal and skilled human resources needed to achieve cutting edge science."

<http://www.fapesp.br/english/index.php>

University-Industry Cooperative R&D: Fapesp, PITE

- Cooperative R&D
 - University (Institutes too) - Industry
 - Fapesp funds (non refundable) - 20 to 70%
 - Industry funds the complement
 - Submissions open all year
 - Intellectual Property as agreed between partners
- Since 1995
 - 100 projects contracted
 - Fapesp: 49%/Industry: 51%
 - Project value: 100 kUS\$ to 4MUS\$

Fapesp PITE: Collaborative R&D

- Type 1: routine development, $\downarrow R \uparrow D$
 - Fapesp 30% or less
- Type 2: incremental R&D
 - Small technology risk
 - Fapesp ~ 50%
- Type 3: radical innovation, $\uparrow R \downarrow D$
 - Large risk
 - Fapesp up to 70%

Joint R&D: criteria for selection

- Peer-reviewed selection (NDA's required)
- Project: objectives, methodology, targeted innovation
- Project staff
 - Qualification of the scientific leadership
 - Qualification of the scientific and technical team
- Technological and Commercial risk
- Adequation of company's share of costs

Joint R&D: examples

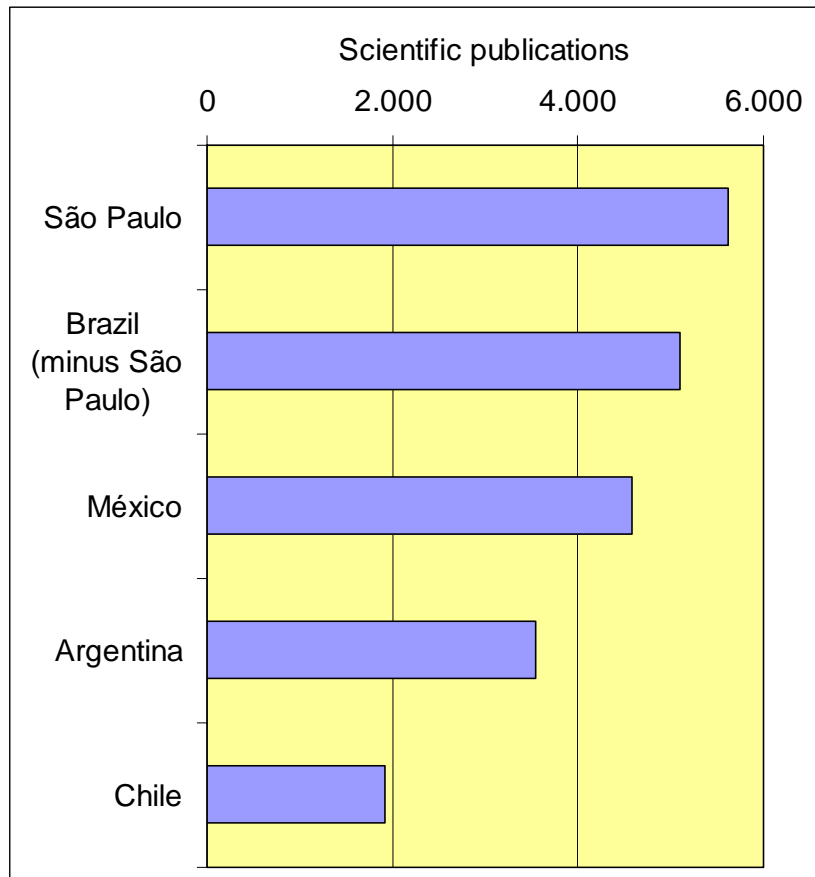
Coordenador	Univ ou Inst./Empresa	Título
Fernando Landgraf	IPT/CSN 120k/150k	Steel for electric applications
Cláudio Augusto Oller do Nascimento	USP/Petrobrás 520k/570k	Optimization of Oil Refineries
João Filgueiras Ramos	ITA/Embraer 4,9M/3,8M	Advanced Computational Fluid Dynamics for Modelling High Performance Aircraft
Alberto J. Carneiro	Unesp/Natura 45k/45k	Validation of <i>Sclerobium</i> spp. As a source for cosmetic natural antioxidants

University partners

Three State Universities

USP, Unicamp and Unesp

10,000 faculty/130,000 students



Brasil	EUA	Doutorados
USP		2.041
Unicamp		873
	U. CA, Berkeley	769
	U. TX-Austin	702
	U. CA, Los Angeles	664
	U. MI	658
	Nova Southeastern U.	645
	U. WI-Madison	627
	Stanford U.	591
	PA State U., The	580
	Harvard U.	579
	U. IL-Urbana-Champaign	574
	U. MN	565
	OH State U., The	560
	U. FL	522
Unesp		522
	U. WA	506

Dados de 2004 do Survey of Earned Doctorates, 2004, Table 3.

USP, Unesp: 2004 ou mais recente; Unicamp 2005

Small Bussiness Innovative Research (PIPE)

■ SBIR

- Innovative content
- Commercial potential of associated R&D
- Increase company competitiveness
- Foster an “innovation culture” in small businesses in SP

■ Conditions

- Non refundable funding
- Up to US\$ 200.000 per project
- Principal Investigator must be an employee of SB

PIPE: 531 contracts awarded since 1998

Township	Quantity
São Paulo	135
Campinas	93
São Carlos	71
S. J. dos Campos	38
R. Preto	13
Other	180
Total	531

More than one award per week since 1998

Technology Parks in SP

- State Government Program operated by Fapesp
 - Business and investment plans, real state operations, infrastructure
- 4 locations
 - Campinas
 - São José dos Campos
 - São Carlos
 - São Paulo

TIC: Tech Park in Campinas

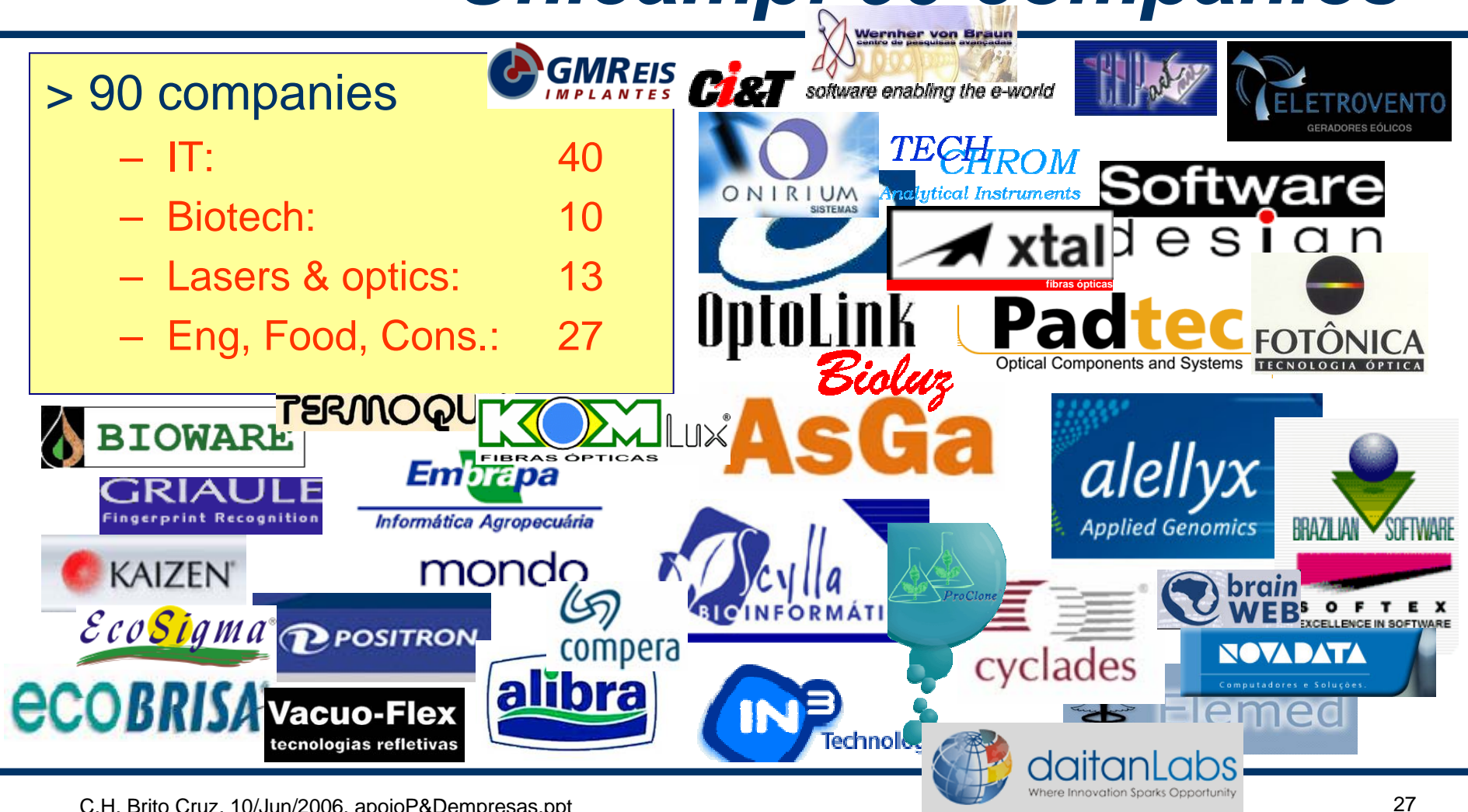
- Campinas
 - 1 million people; 90 km west of São Paulo
- TIC
 - CPqD Foundation (former Telebrás R&D)
 - 800 researchers
 - Unicamp
 - 1800 faculty/15,000 undergrads/15,000 grads
 - Photonics, software, telecom

University spin-offs

Unicamp: 90 companies

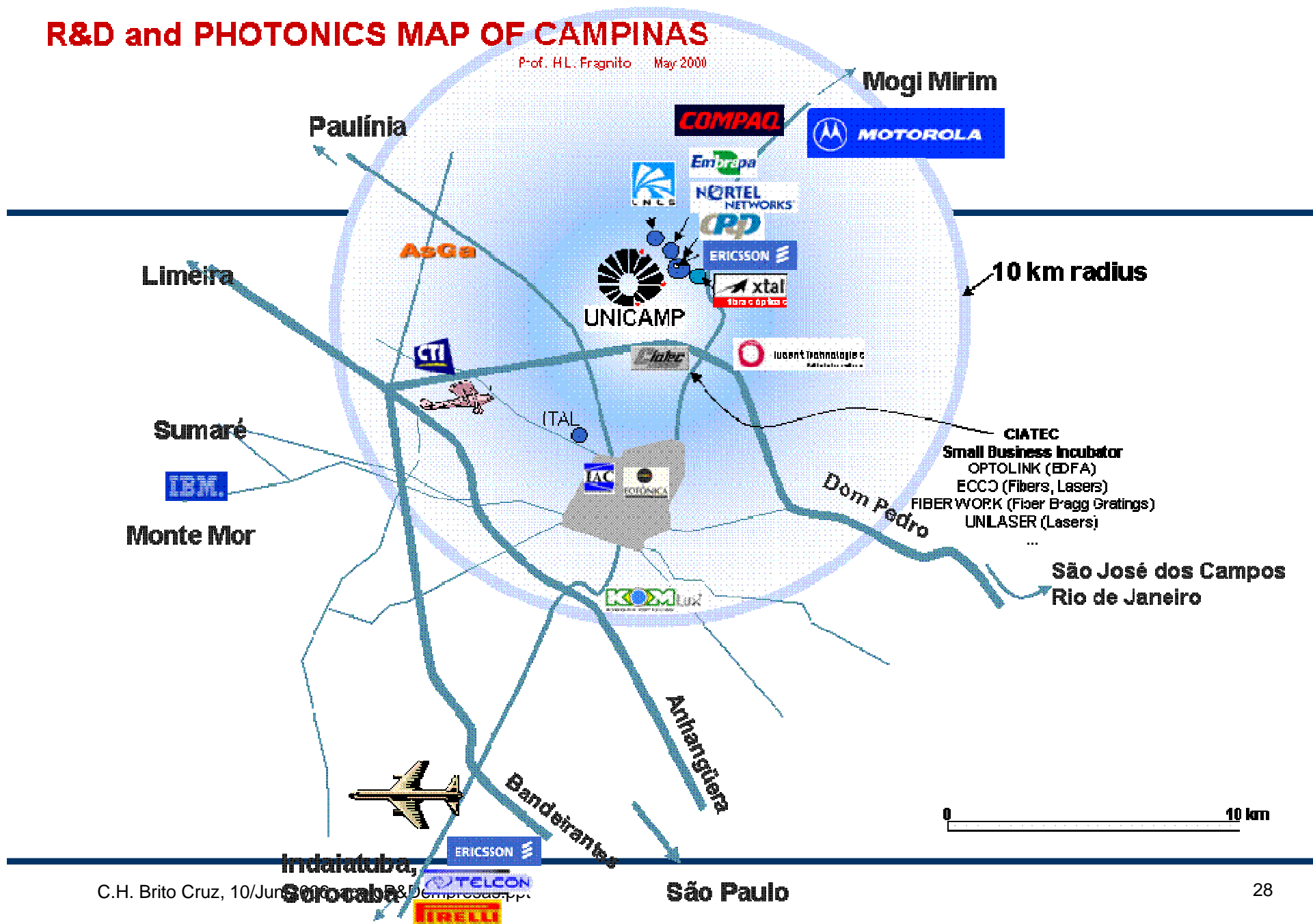
> 90 companies

- IT: 40
- Biotech: 10
- Lasers & optics: 13
- Eng, Food, Cons.: 27



R&D and PHOTONICS MAP OF CAMPINAS

Prof. H.L. Fragnito May 2000



TIDIA: IT and Advanced Internet

(hardware and soft)

- **Foster academic and business R&D on topics related to a very high speed optical network**
- **Foster cooperation between academy and industry**
- **Study the economic and social impacts of very high speed networks**

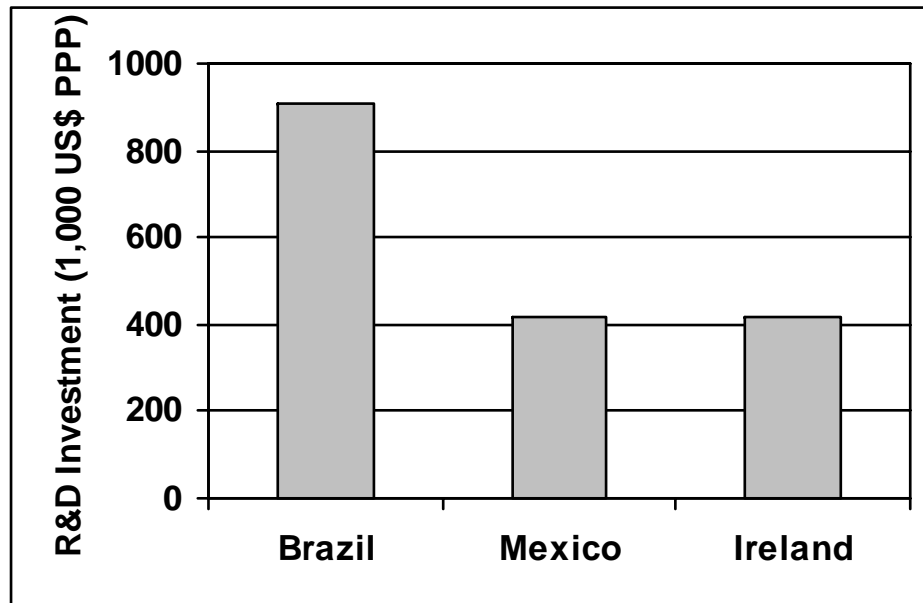
<http://www.tidia.fapesp.br/portal-en>

TIDIA: three projects

- KyaTera: Terabit/s stable network
 - 27 laboratories (14 EE, 4 CS, 4CE, 3 Phys., 1 ME, 1 Biomed. Eng.), >100 PhD's
- E-learning
 - 15 laboratories, > 60 PhD's
- Content incubator
 - Foster cooperative software development
 - Open source software
 - 54 research groups as users

<http://www.tidia.fapesp.br/portal-en>

Foreign R&D investment in Brazil



Compared R&D investment by majority owned affiliates of US companies in Brazil, Mexico and Ireland, in 2002 (Source: US Bureau of Economic Analysis, Direct Investment Abroad)

The Economist Intelligence Unit, Oct, 2004:
In which of the following countries does your company plan to spend the most on R&D in the next three years (excluding your domestic market)? (Top ten locations out of 54.)

1. China	39
2. US	29
3. India	28
4. UK	24
5. Germany	19
6. Brazil	11
7. Japan	10
8. France/Italy	9
10. Czech Republic	8

Source: The Economist Intelligence Unit

R&D in Brazil

- A strong academic base
 - 10,000 Doctorates granted yearly
 - 12,000 scientific papers published yearly
- Growing intensity of industry R&D
 - Brazilian companies:
 - Petrobrás: 11st in R&D in Oil Sector
 - Embraer: 17th in R&D in Aerospace
 - Embrapa: agrobusiness driver (Brazil 1st in soy productivity, 1st in meat exports, 1st ethanol prod.,...)

