PRP USP
PRÓ-REITORIA DE PESQUISA
Universidade de São Paulo

Research Excellence at USP: a permanent challenge

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Provost of Research
University of São Paulo

Por que?

O MÉTODO CIENTÍFICO

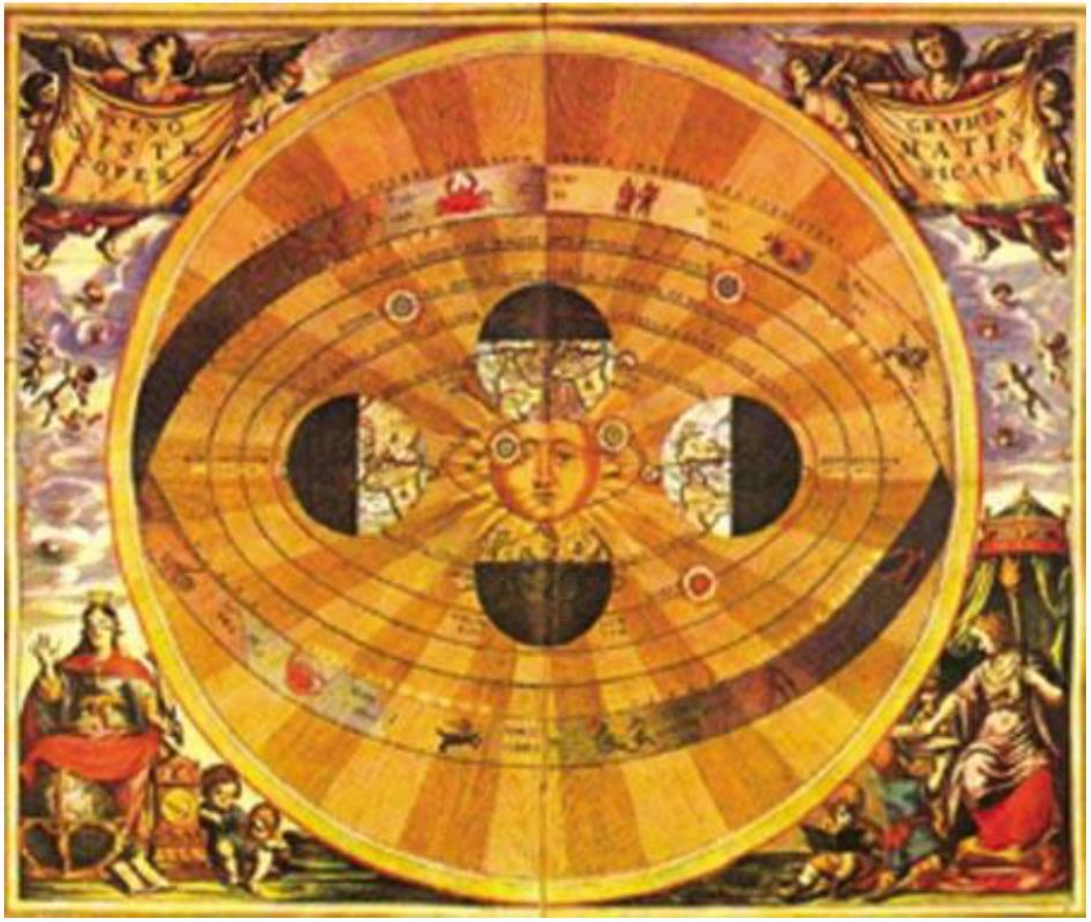
Definição Operacional:

É o conjunto de procedimentos de que se valem os cientistas para descobrir fatos novos e elaborar novas ideias.

MÉTODO CIENTÍFICO: DESCARTES

1. Não aceitar nada como verdadeiro que não possa ser comprovado (evidência).
2. Dividir o problema em partes (análise).
3. Começar pela parte mais simples e progressivamente estudar as mais complexas (síntese).
4. Recapitular para evitar omissões (enumeração).

COMEÇA A REVOLUÇÃO CIENTÍFICA



Nicolau Copérnico (1473-1543)

- **Teoria heliocêntrica**
- ***De revolutionibus orbium coelestium* (1543)**

A EVOLUÇÃO DO MÉTODO CIENTÍFICO

GREGOS	RENASCIMENTO
• O *porque*	• O *como*
• Lógica	• Observação controlada
• Lógica/verbal	• Racionalismo matemático
• Verdades	• Dúvidas
• Autoridade	• Objetividade
• *Especulação*	• *Método experimental*

Research Excellence at USP

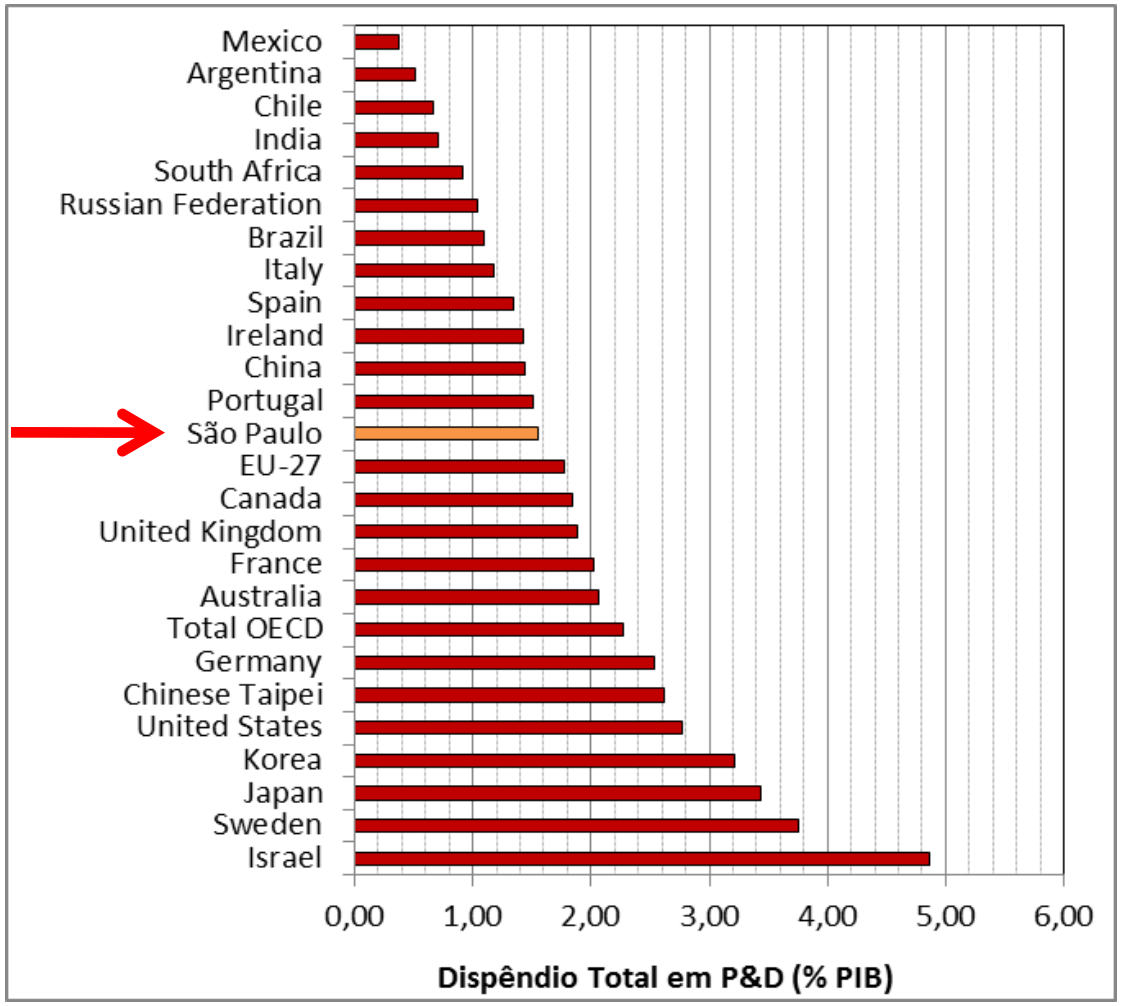
- Context
- Challenges

State of São Paulo, Brasil

41	Million people
34%	of Brazil's GDP
50%	of Brazilian science
13%	of State budget to HE and R&D
1.64% GDP for R&D	
3	State Universities
3	Federal Universities
52	State Tech Faculties
45%	of the PhDs graduated in Brazil (4,937 in 2010)
22	Research Institutes (19 state/3 federal)
1	Research Foundation

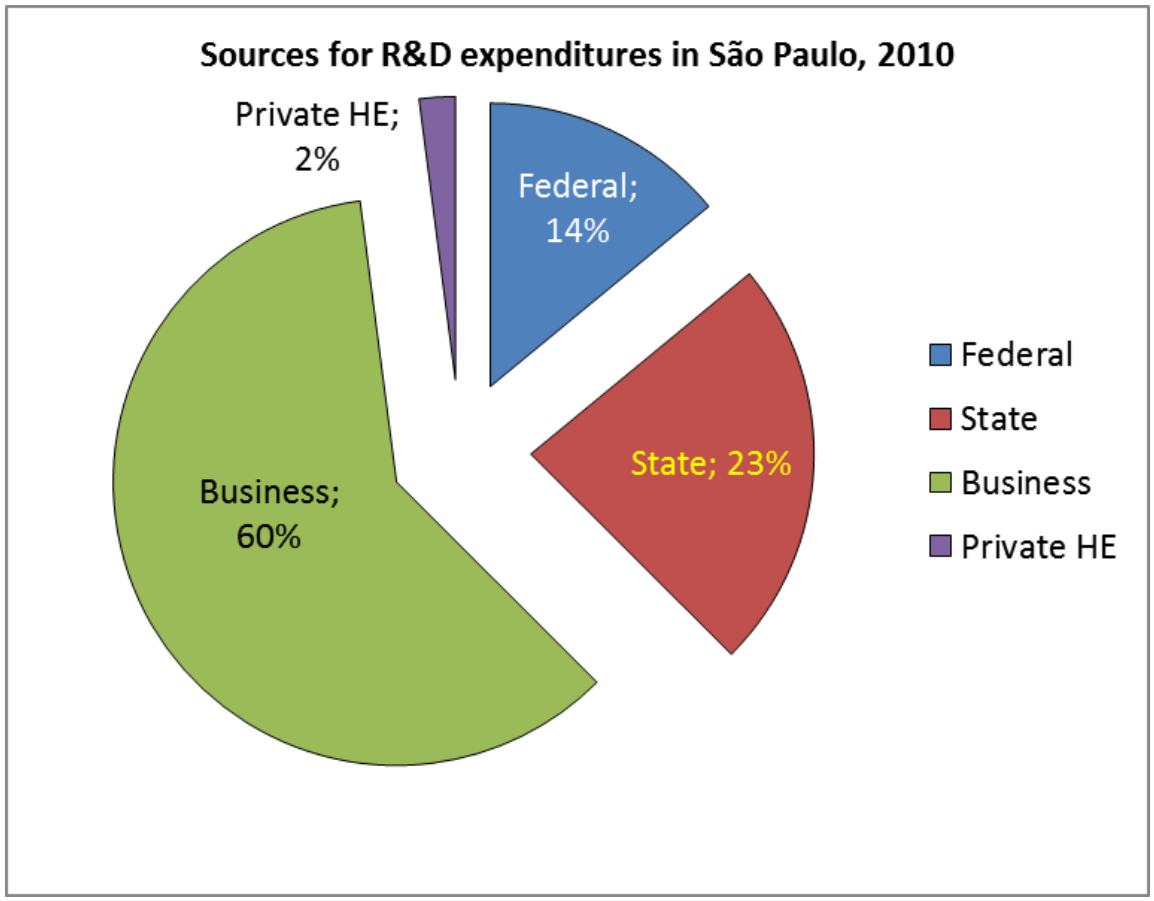
Brito Cruz e Fapesp

São Paulo vs. International R&D Expenditure



C.H. Brito Cruz e Fapesp

R&D Expenditures by source 2010 São Paulo



- R&D expenditure = 1.64% of state GDP from 1.52% in 2008
- Public expenditure
  - State 62%
  - Federal 38%

Scholarly Research

Graduate Students vs. Post-docs

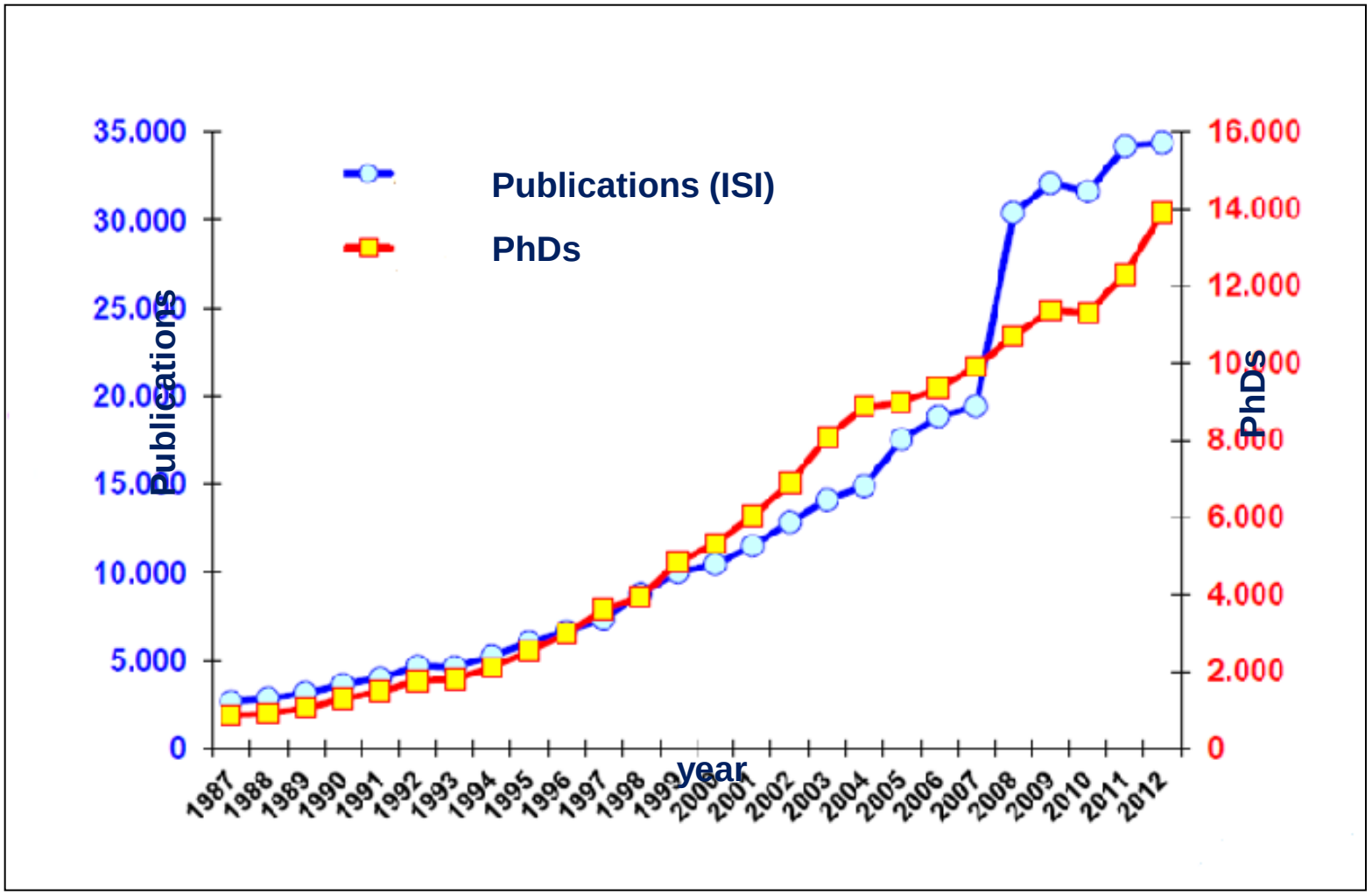
Internationalization

Scholarly Research

Graduate Students vs. Post-docs

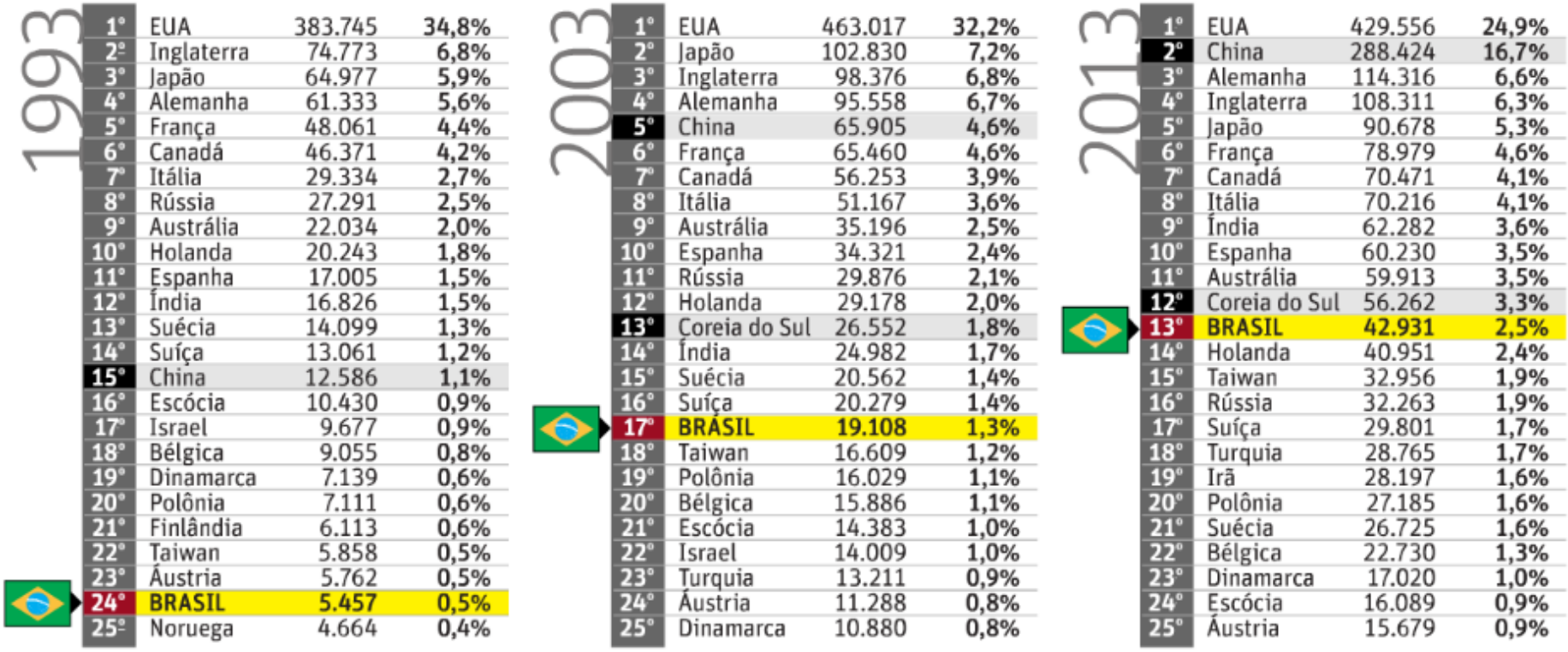
Internationalization

Scholarly Research in Brazil in the last 30 years (a success story?)



Brazil: Scientific & Scholarly Research 1993-2013

(number of publications & % of world)



1993

1°	EUA	383.745	34,8%
2°	Inglaterra	74.773	6,8%
3°	Japão	64.977	5,9%
4°	Alemanha	61.333	5,6%
5°	França	48.061	4,4%
6°	Canadá	46.371	4,2%
7°	Itália	29.334	2,7%
8°	Rússia	27.291	2,5%
9°	Austrália	22.034	2,0%
10°	Holanda	20.243	1,8%
11°	Espanha	17.005	1,5%
12°	Índia	16.826	1,5%
13°	Suécia	14.099	1,3%
14°	Suíça	13.061	1,2%
15°	China	12.586	1,1%
16°	Escócia	10.430	0,9%
17°	Israel	9.677	0,9%
18°	Bélgica	9.055	0,8%
19°	Dinamarca	7.139	0,6%
20°	Polônia	7.111	0,6%
21°	Finlândia	6.113	0,6%
22°	Taiwan	5.858	0,5%
23°	Áustria	5.762	0,5%
24°	BRASIL	5.457	0,5%
25°	Noruega	4.664	0,4%

2003

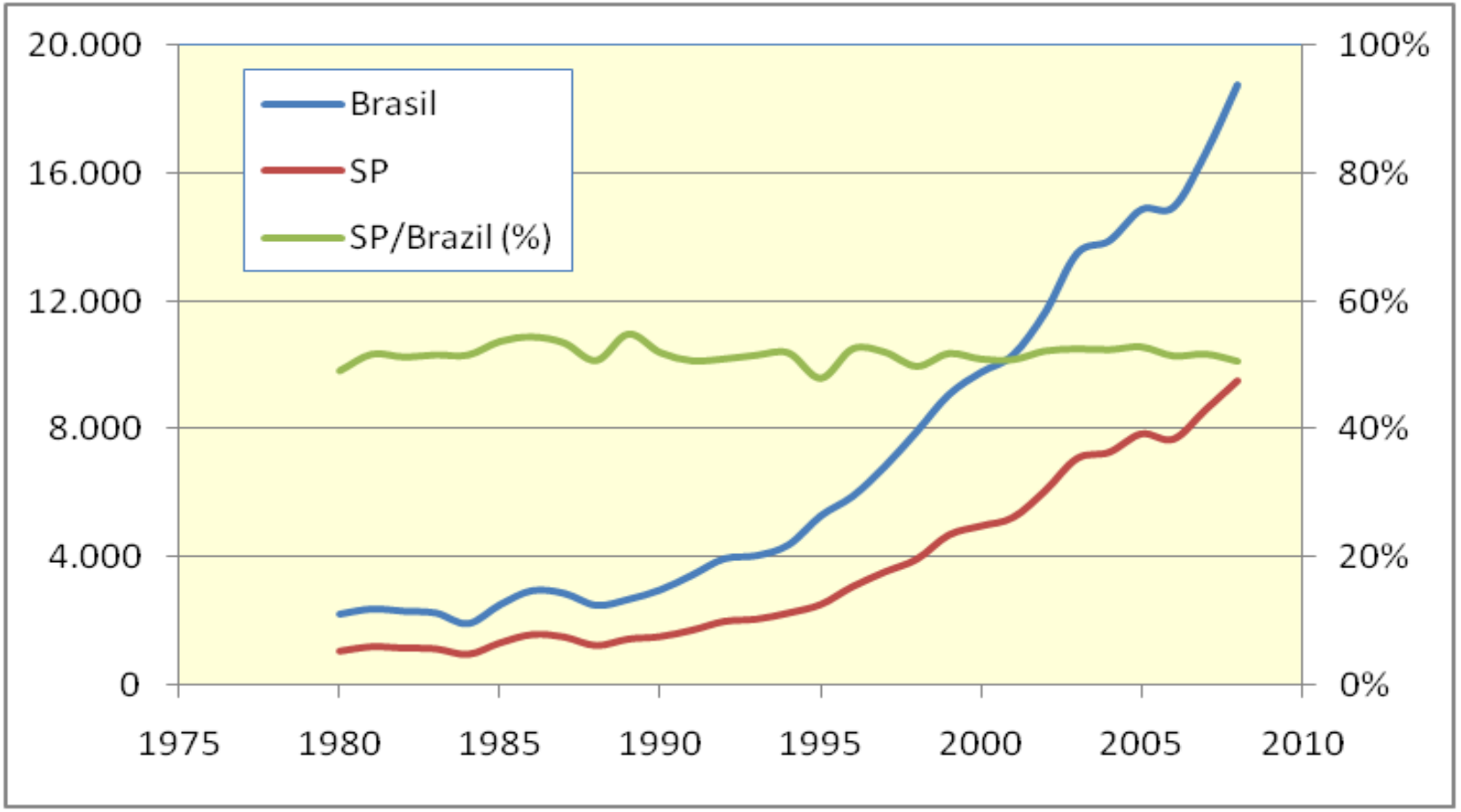
1°	EUA	463.017	32,2%
2°	Japão	102.830	7,2%
3°	Inglaterra	98.376	6,8%
4°	Alemanha	95.558	6,7%
5°	China	65.905	4,6%
6°	França	65.460	4,6%
7°	Canadá	56.253	3,9%
8°	Itália	51.167	3,6%
9°	Austrália	35.196	2,5%
10°	Espanha	34.321	2,4%
11°	Rússia	29.876	2,1%
12°	Holanda	29.178	2,0%
13°	Coreia do Sul	26.552	1,8%
14°	Índia	24.982	1,7%
15°	Suécia	20.562	1,4%
16°	Suíça	20.279	1,4%
17°	BRASIL	19.108	1,3%
18°	Taiwan	16.609	1,2%
19°	Polônia	16.029	1,1%
20°	Bélgica	15.886	1,1%
21°	Escócia	14.383	1,0%
22°	Israel	14.009	1,0%
23°	Turquia	13.211	0,9%
24°	Áustria	11.288	0,8%
25°	Dinamarca	10.880	0,8%

2013

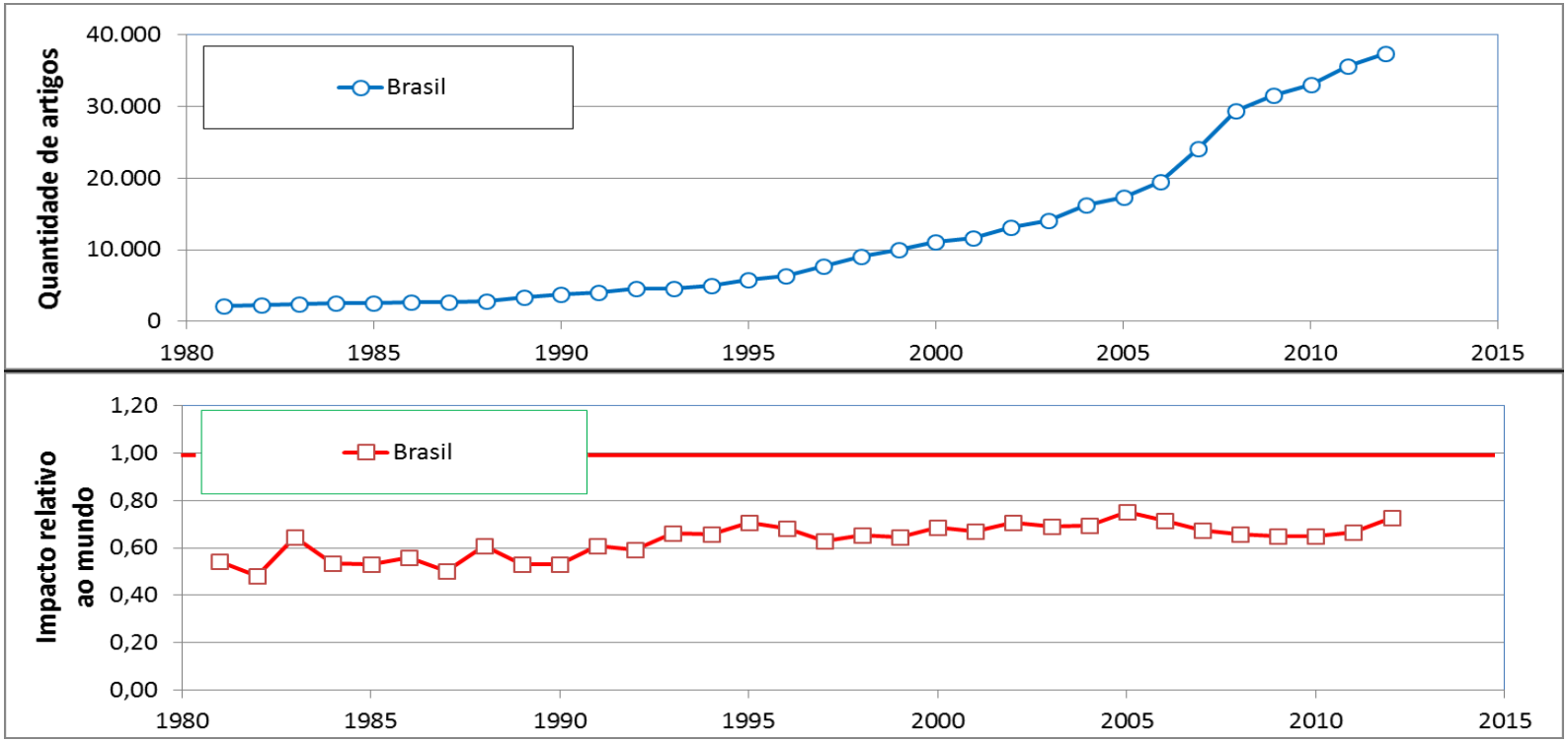
1°	EUA	429.556	24,9%
2°	China	288.424	16,7%
3°	Alemanha	114.316	6,6%
4°	Inglaterra	108.311	6,3%
5°	Japão	90.678	5,3%
6°	França	78.979	4,6%
7°	Canadá	70.471	4,1%
8°	Itália	70.216	4,1%
9°	Índia	62.282	3,6%
10°	Espanha	60.230	3,5%
11°	Austrália	59.913	3,5%
12°	Coreia do Sul	56.262	3,3%
13°	BRASIL	42.931	2,5%
14°	Holanda	40.951	2,4%
15°	Taiwan	32.956	1,9%
16°	Rússia	32.263	1,9%
17°	Suíça	29.801	1,7%
18°	Turquia	28.765	1,7%
19°	Irã	28.197	1,6%
20°	Polônia	27.185	1,6%
21°	Suécia	26.725	1,6%
22°	Bélgica	22.730	1,3%
23°	Dinamarca	17.020	1,0%
24°	Escócia	16.089	0,9%
25°	Áustria	15.679	0,9%

Thomson Reuters/Folha SP

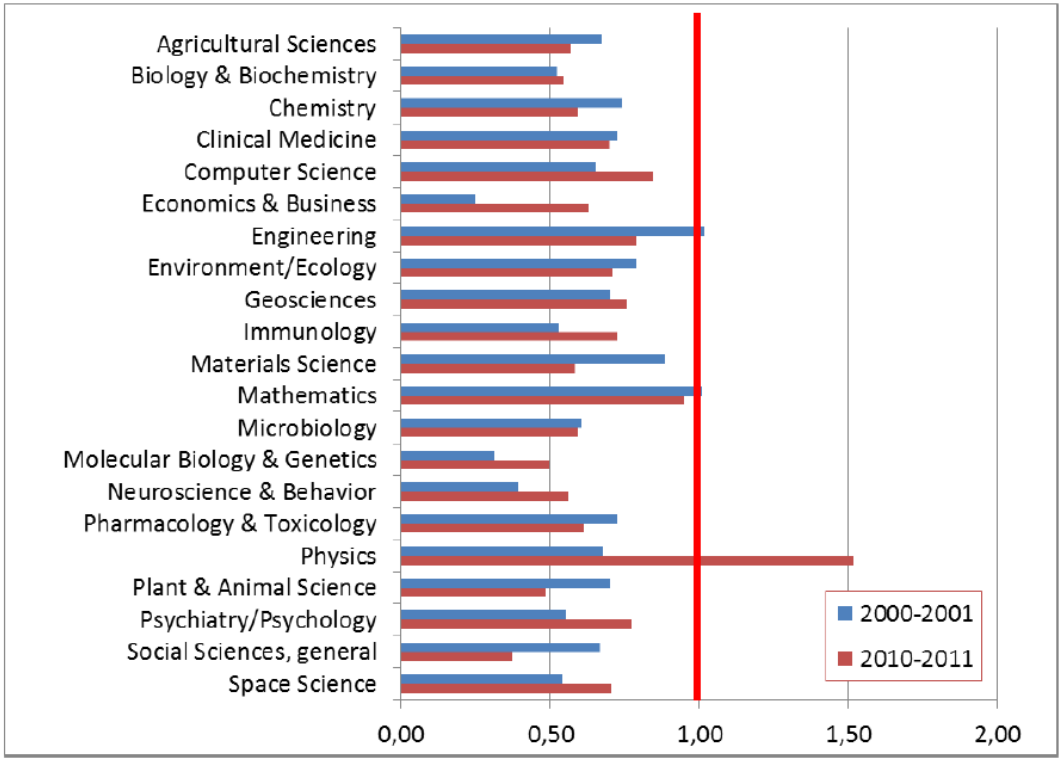
Brazil: growing number of scientific articles in international journals



Challenge: to improve quality

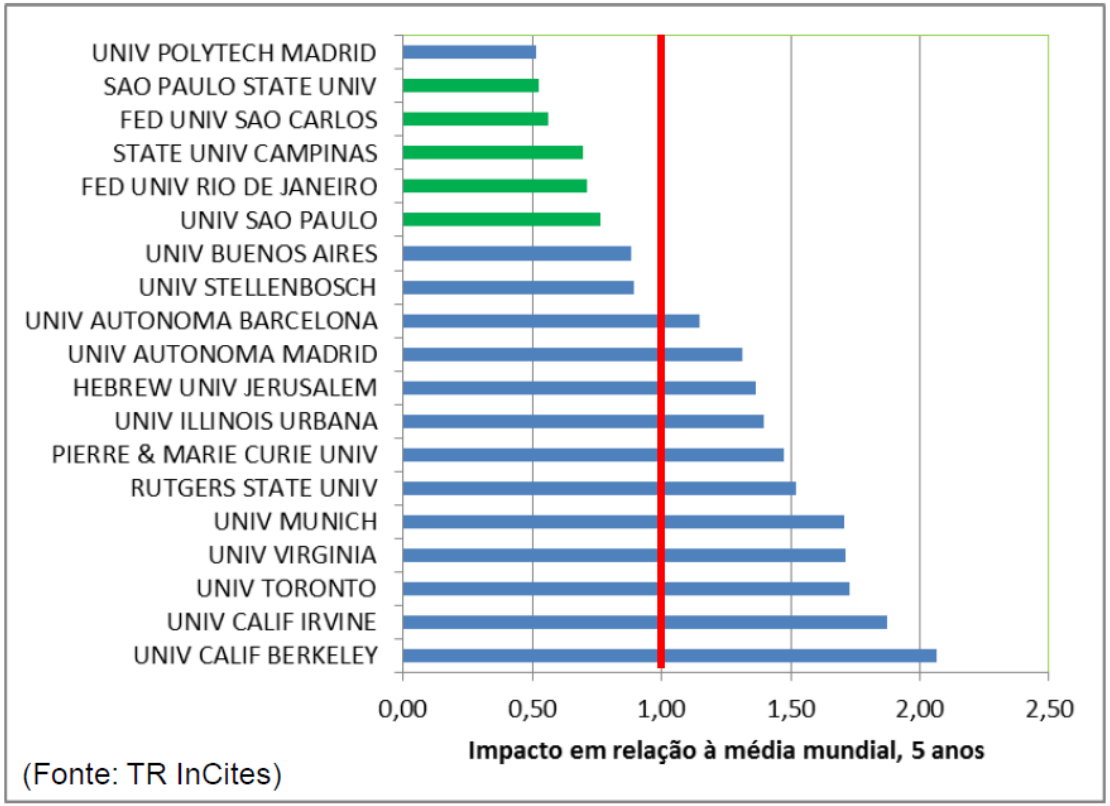


Impacto em relação à média mundial: 2000-2001 e 2010-2011



Brito Cruz/FAPESP

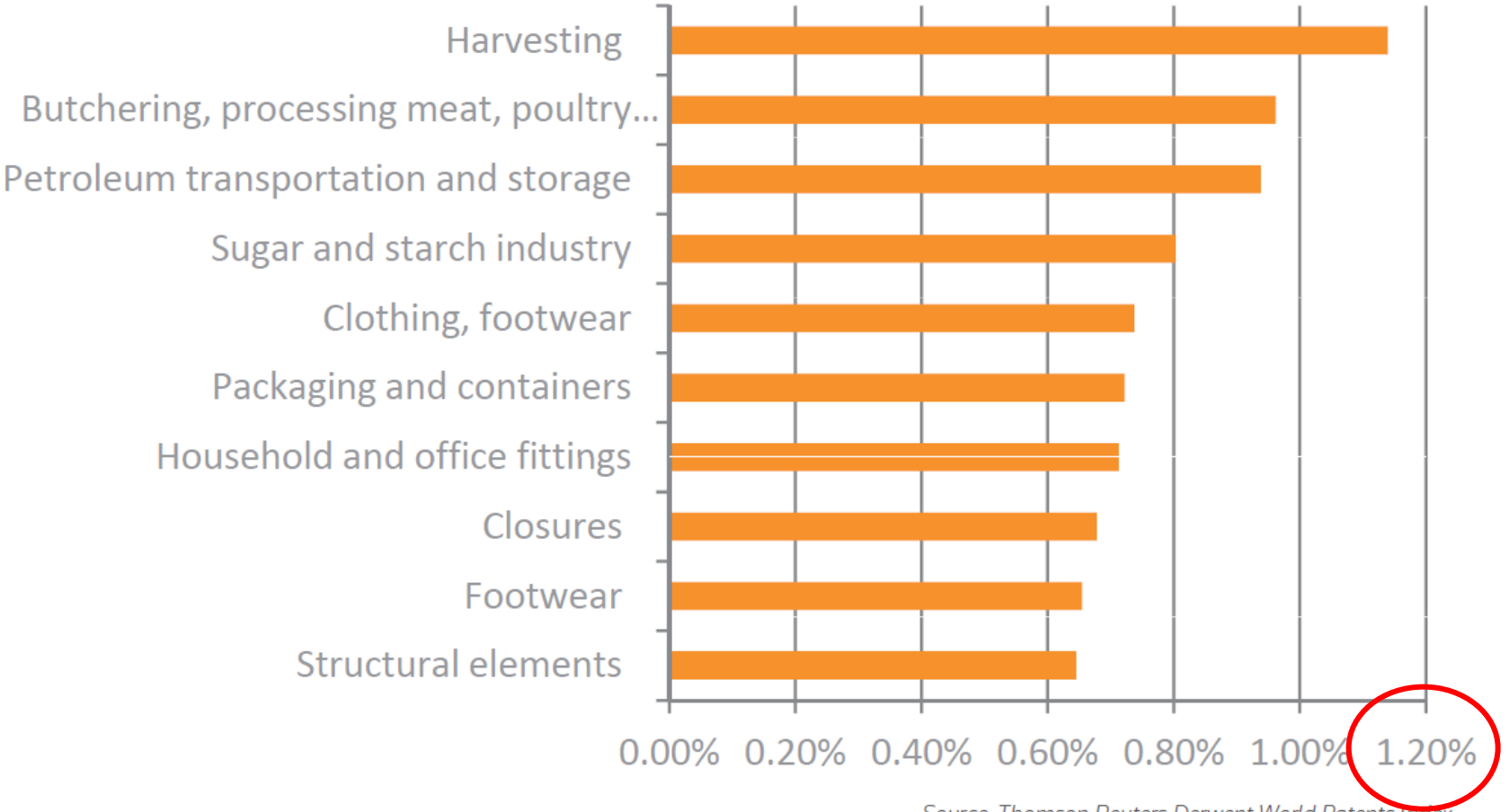
Impacto em relação à média mundial
5 anos de 2005 a 2009



Intellectual Property Research

Brazil: Intellectual Property Research

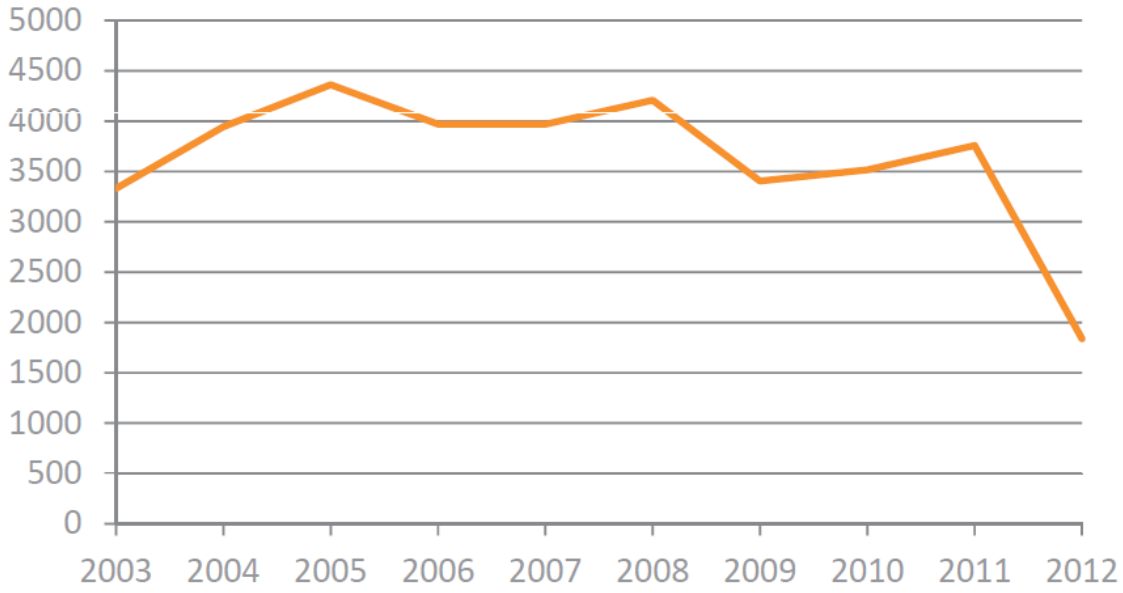
Share of Global Inventions 2012



Source: Thomson Reuters Derwent World Patents Index

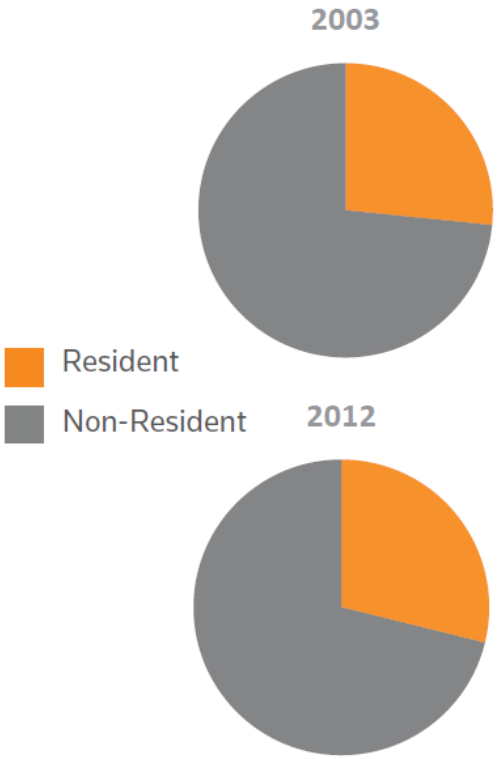
Brazil: Intellectual Property Research

BR Patent Applications with BR Priority 2003-2012



Source: Thomson Reuters Derwent World Patents Index

Resident vs. Non-Resident



Source: Thomson Reuters Derwent World Patents Index

Brazil & S. Korea: Intellectual Property Research

COMPANY - FOREIGN & RESIDENT	ALL BR INVENTIONS 2012
PETROBRAS PETROLEO BRASIL SA	30
UNIV SAO PAULO USP	23
WHIRLPOOL SA	18
UNICAMP UNIV ESTADUAL CAMPINAS	15
UNIV FEDERAL DO RIO GRANDE DO SUL	14
UNIV FEDERAL MINAS GERAIS	13
GRENDENE SA	8
JOBE IND E COMERCIO PLASTICOS LTDA	7
UNIV FEDERAL LAVRAS	7
COMISSAO NACIONAL ENERGIA NUCLEAR	6

COMPANY - FOREIGN & RESIDENT	ALL KR INVENTIONS 2012
LG ELECTRONICS INC	6009
SAMSUNG IND CO LTD	3669
HYUNDAI MOTOR CO LTD	1729
POSCO	1498
HYUNDAI STEEL CO	1031
HYUNDAI HEAVY IND CO LTD	974
ELECTRONICS&TELECOM RES INST	848
KOREA ADV INST SCI&TECHNOLOGY	845
SK HYNIX INC	787
HYUNDAI MOBIS CO LTD	732

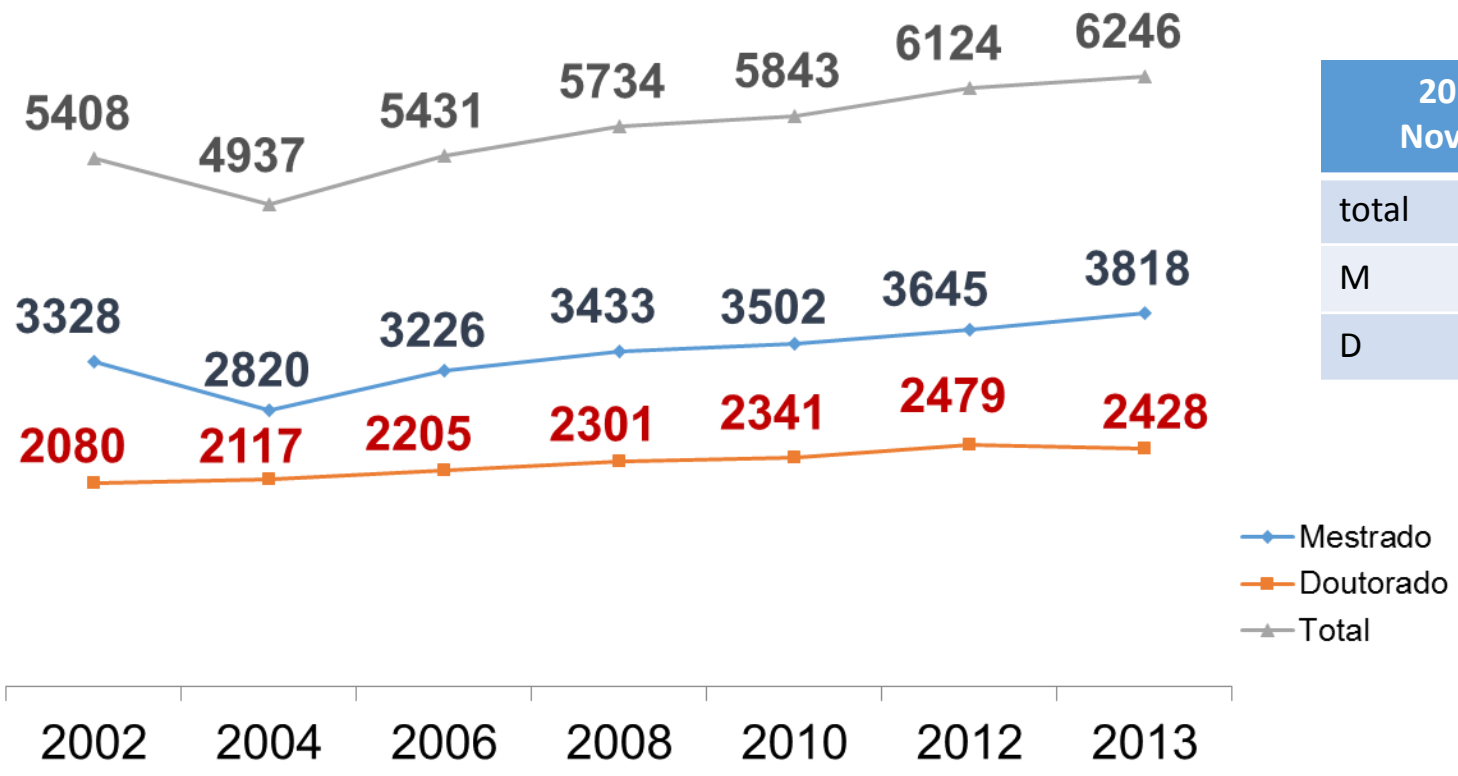
Thomson-Reuters, 2014

Scholarly Research

Graduate Students vs. Post-docs

Internationalization

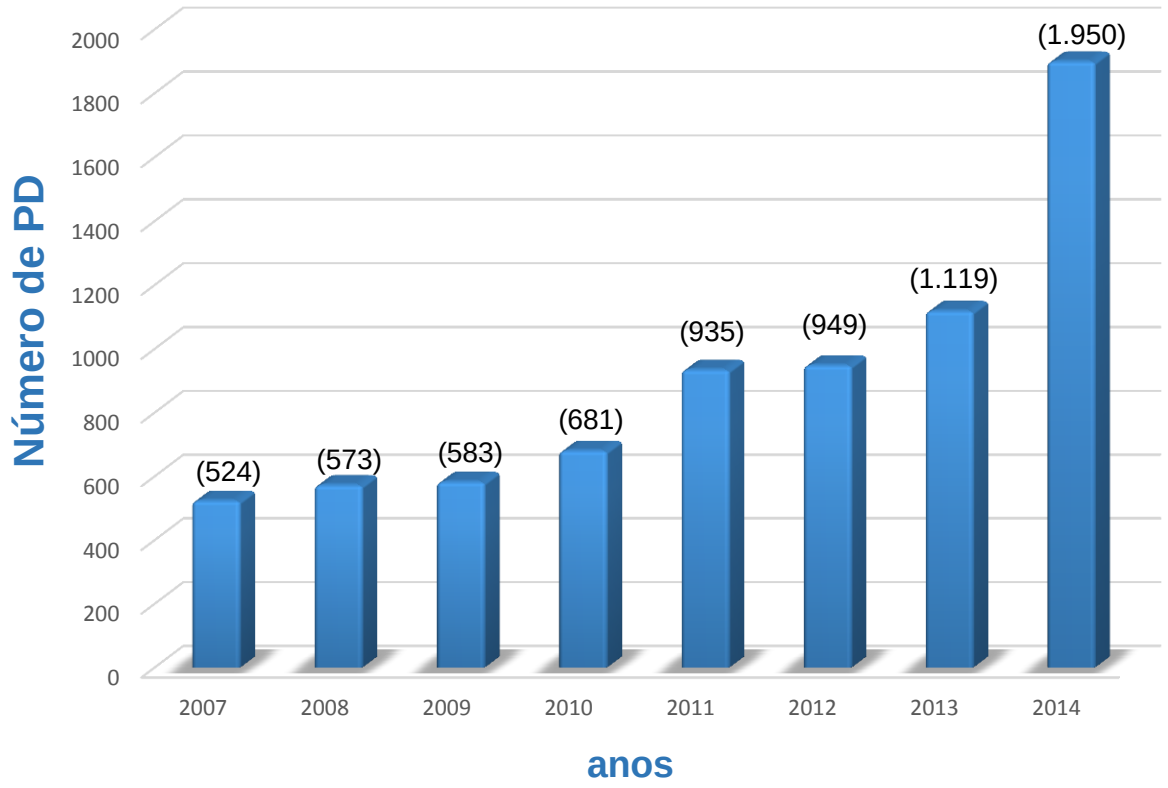
Masters and PhDs Students USP

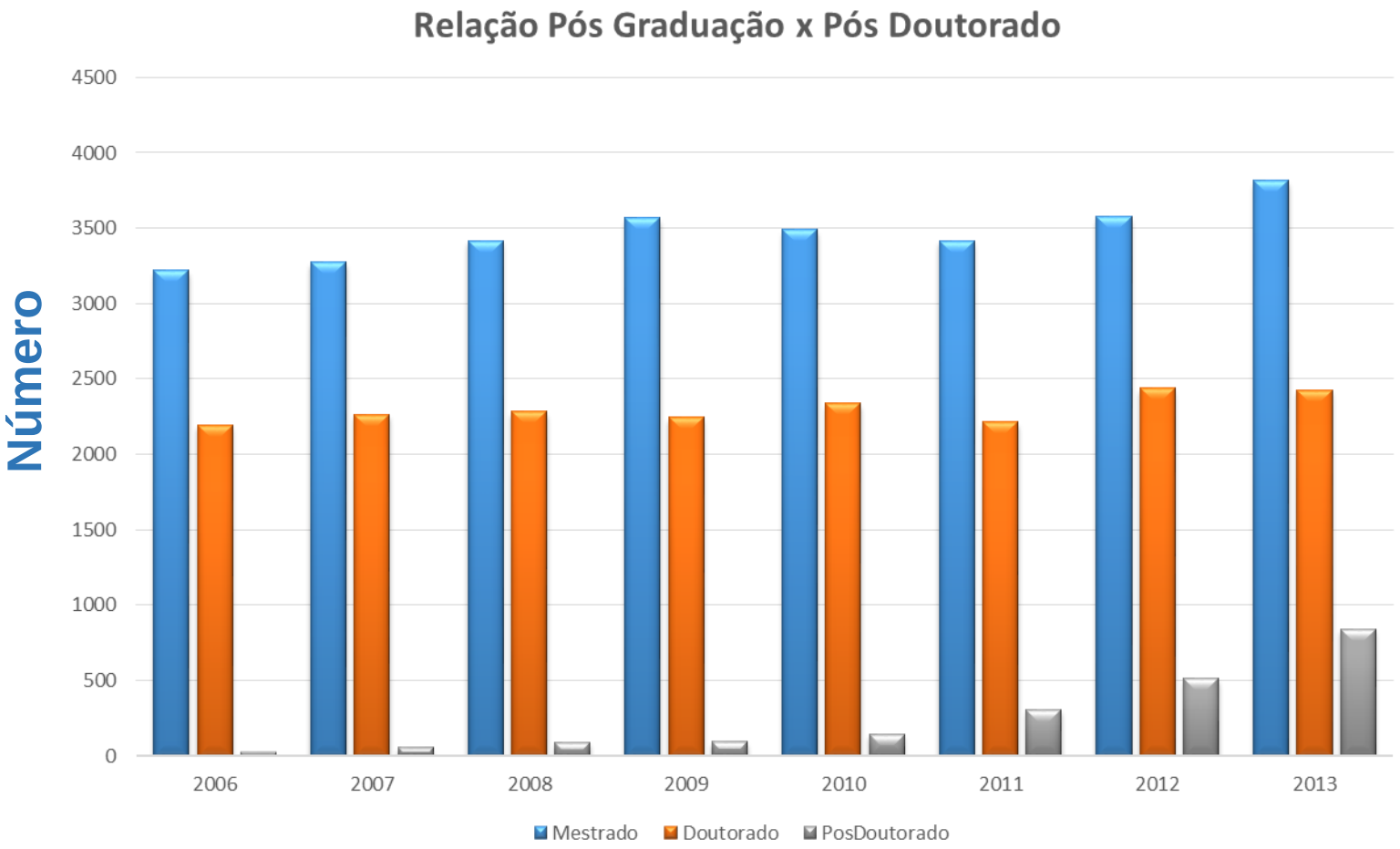


2014 till November	
total	4880
M	2808
D	2075

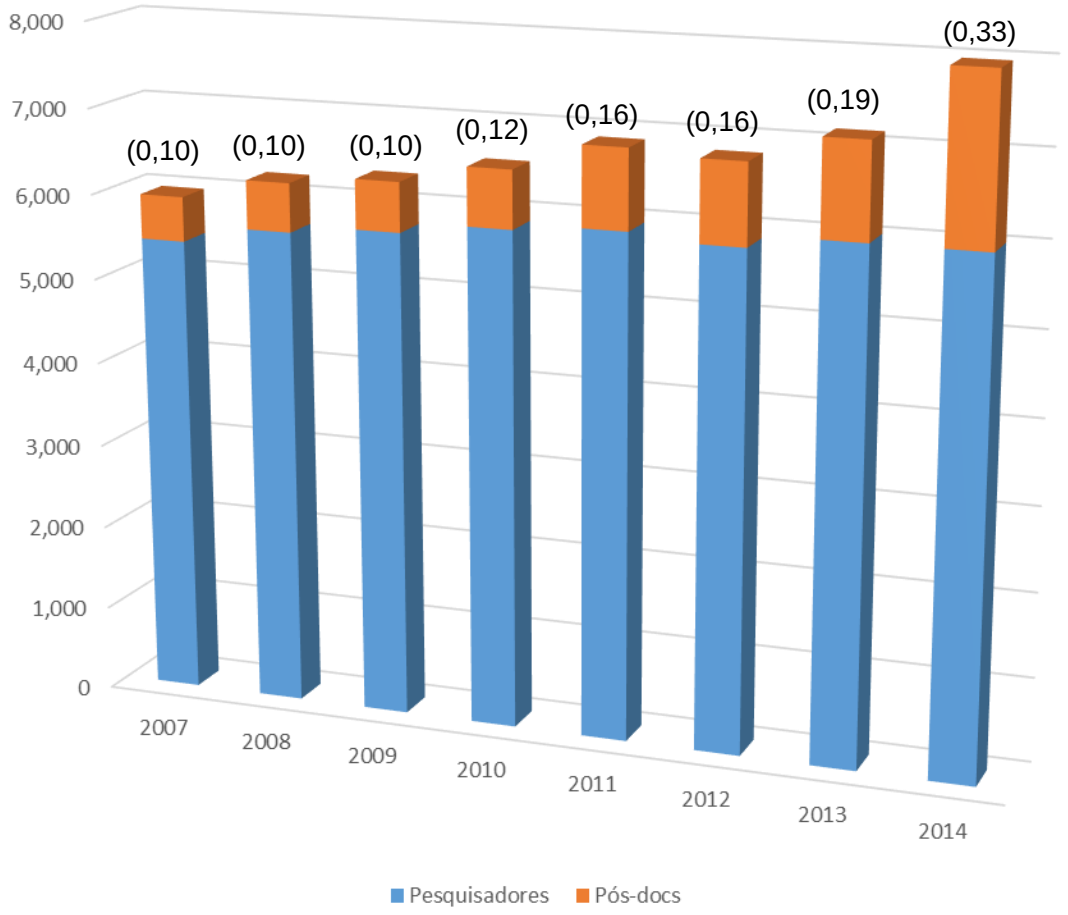
Source: Sistema Janus, 02 novembro 2014

Post-Docs at USP

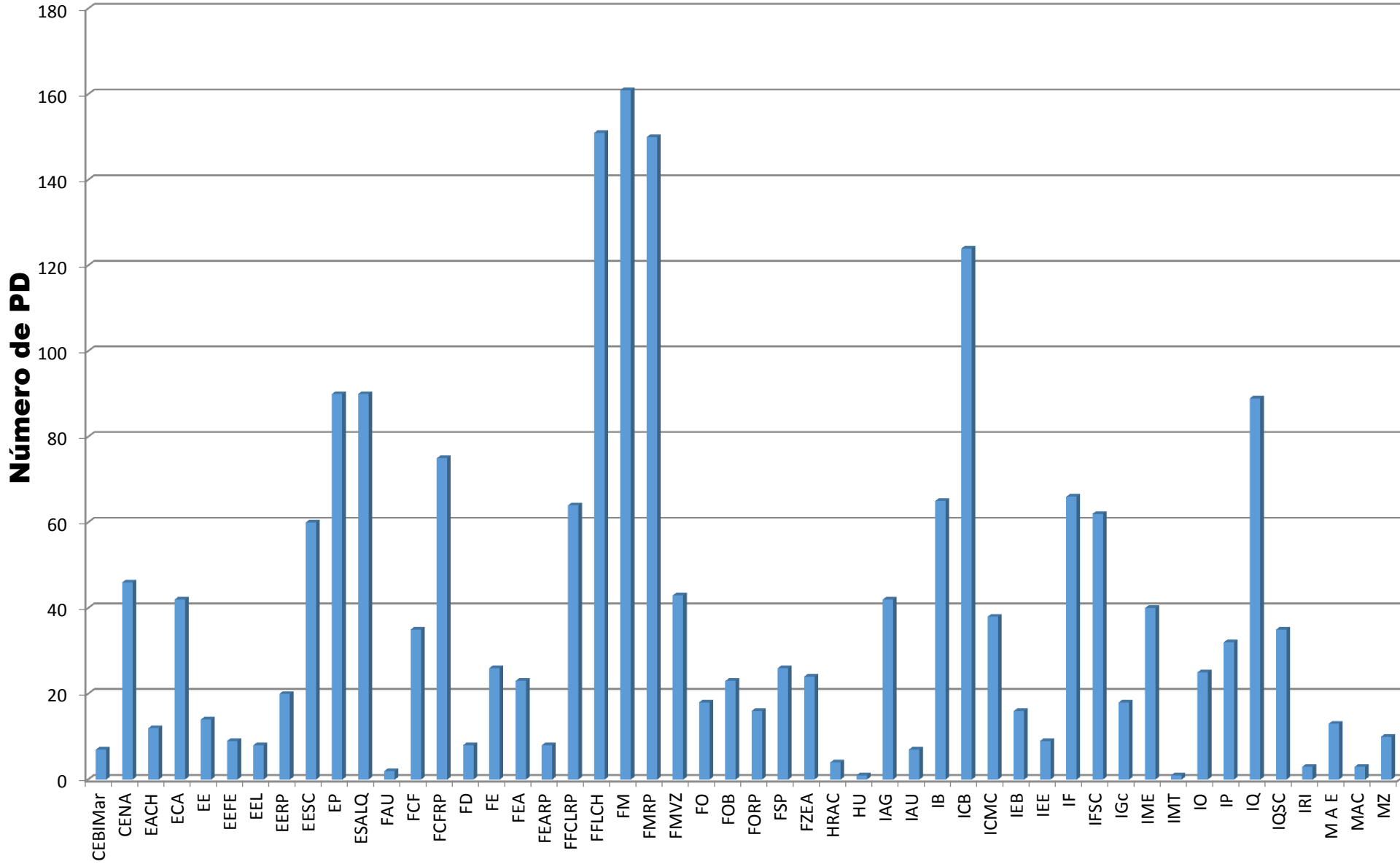



Relação Pós Graduação x Pós Doutorado
Número
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2006
2007
2008
2009
2010
2011
2012
2013
Mestrado
Doutorado
PosDoutorado

Ratio of Post-Docs/Faculty at USP

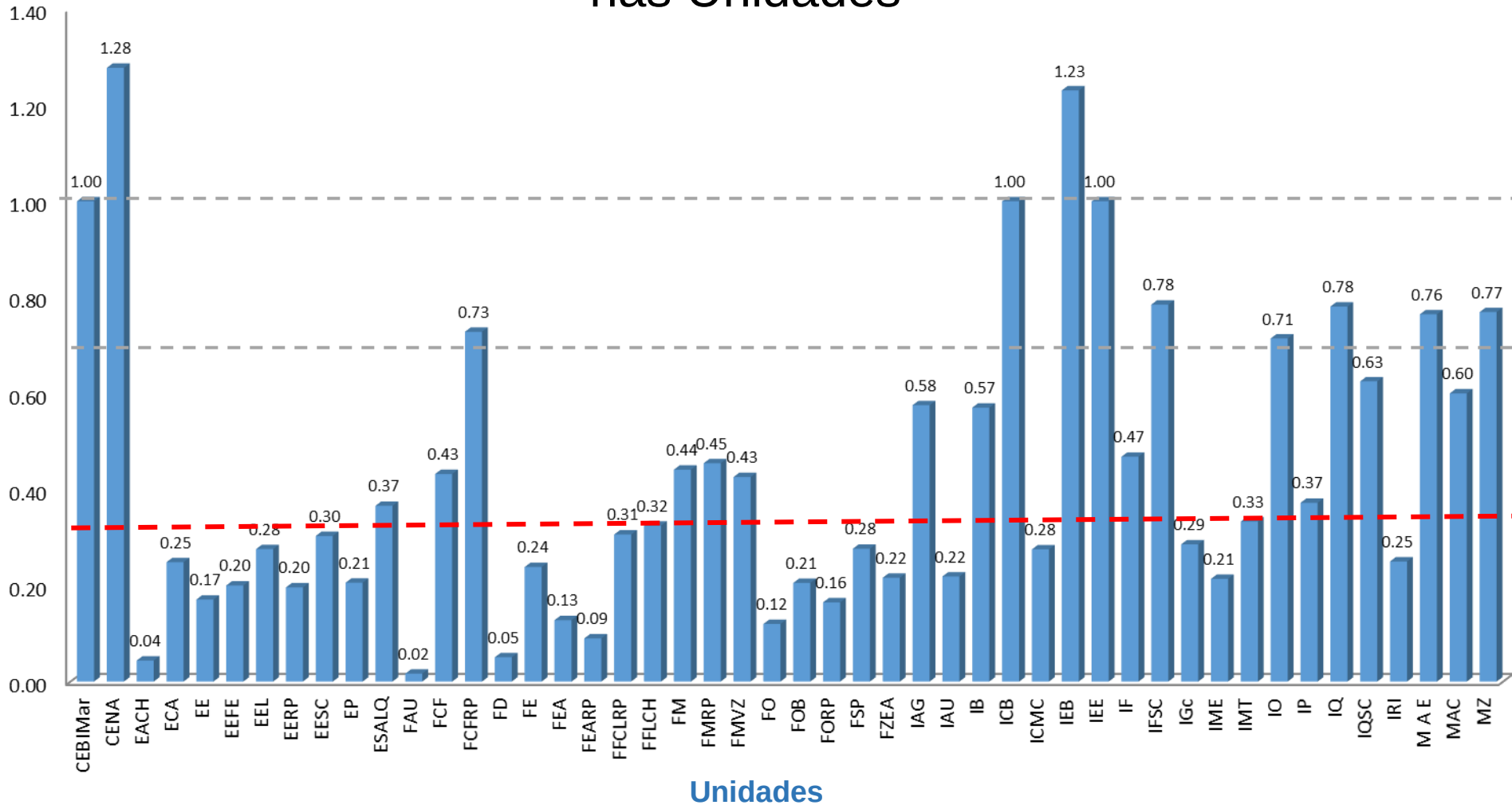


Distribuição dos Pós-Doutorandos Ativos nas Unidades da USP



No. Total de pós-doutorandos da USP (2014) – 1954

Relação Docente/Pós-doutorandos nas Unidades



Scholarly Research

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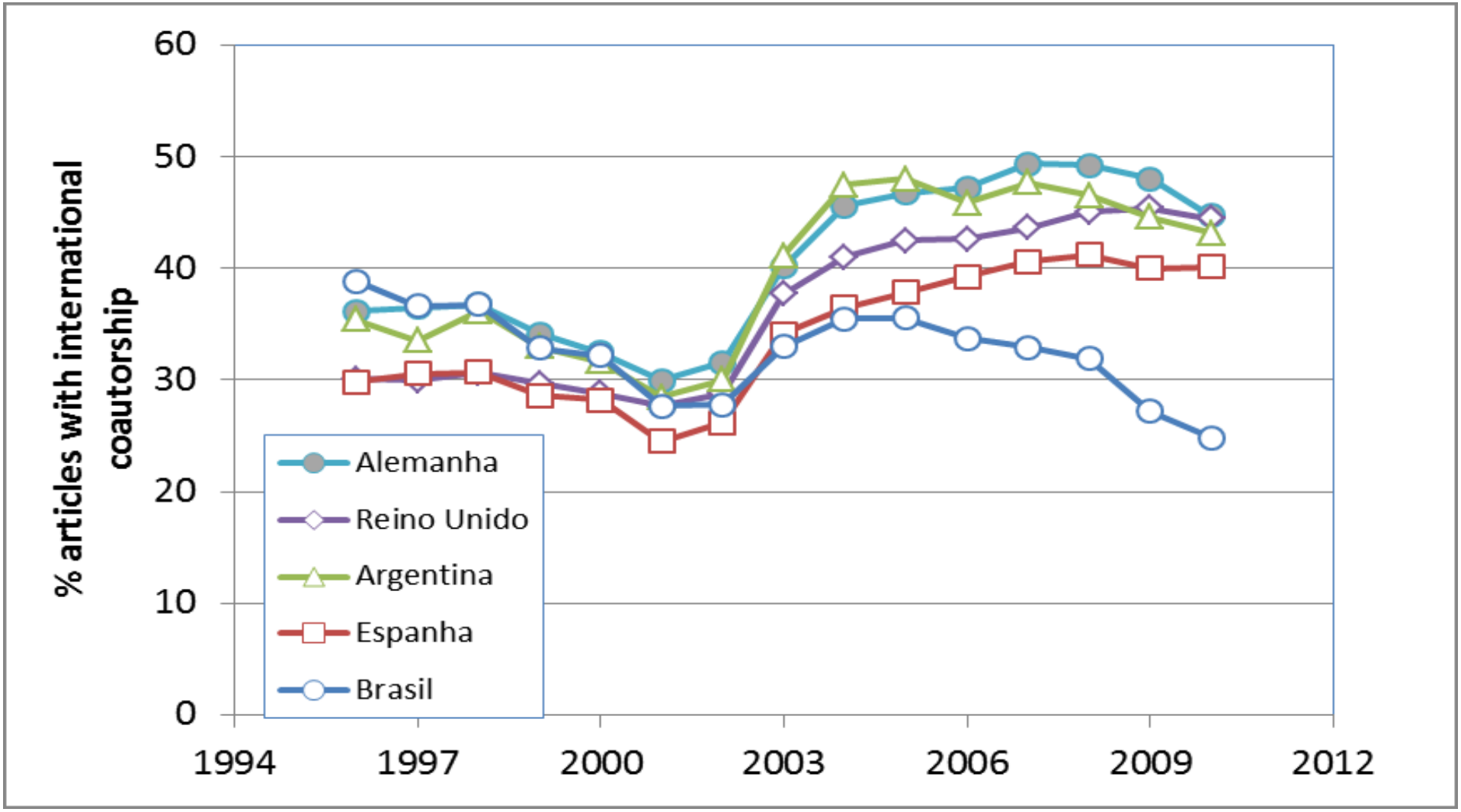
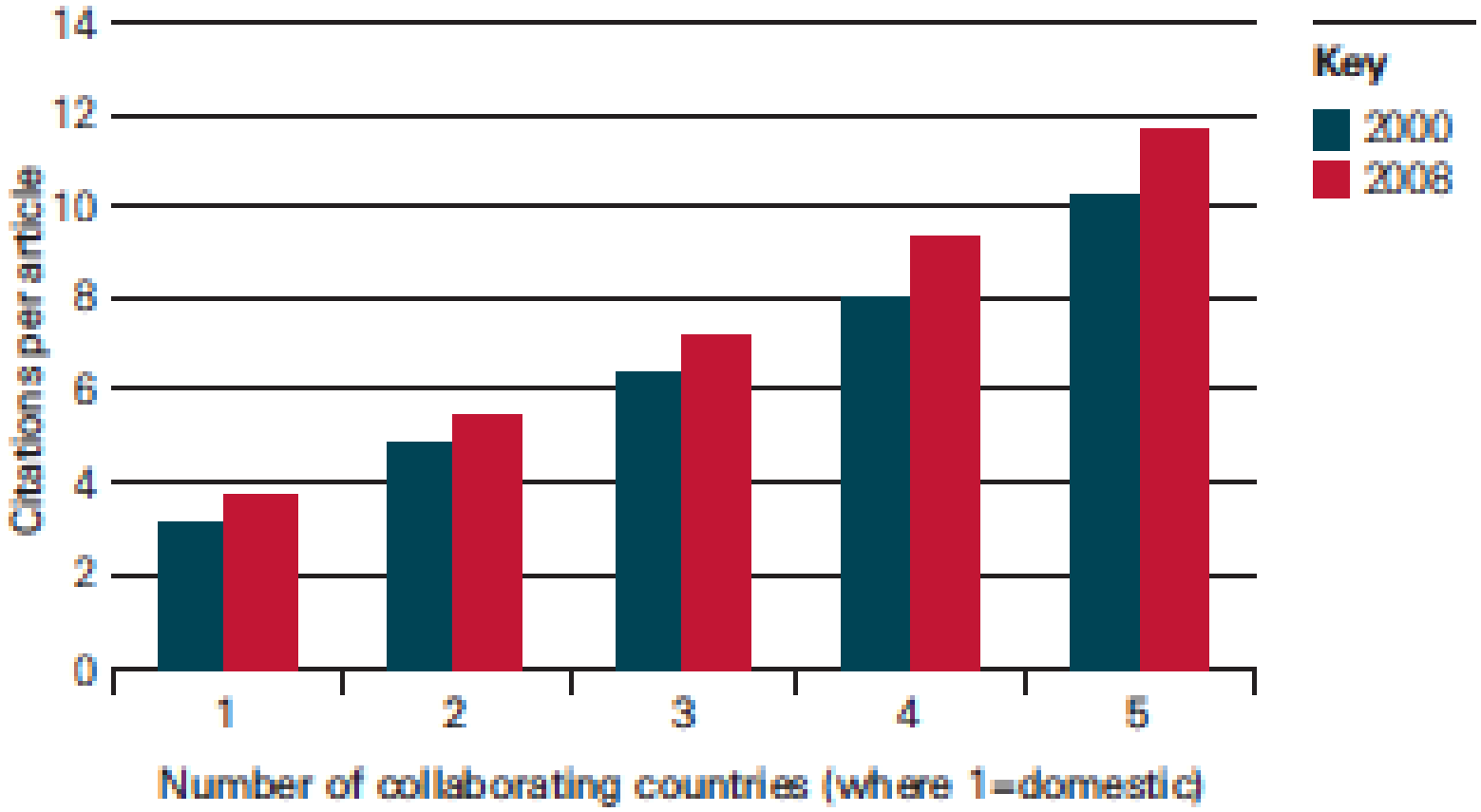
Internationalization

Internationalization



Citations per Article *vs.* Number of Collaborating Countries



Knowl., Networks & Nations, *Royal Soc.*, 2011

Research Excellence at USP

- Context
- Challenges

Academic and Economic Impacts of Public Research

‘what does society value?’

and

‘does publicly funded research contribute to these dimensions of what society values?’

Academic and Economic Impacts of Public Research

- **material** – encompassing the goods and services available to society;

- **human** – encompassing physical health, mental health, quality of inner life, and the extent to which people can have pleasurable experiences;

- **environmental** – encompassing biodiversity and the quality of air, and, inland waters and seas;

- **social** – encompassing social attachments, freedom from crime, the level and security of political rights and the extent to which the population engages in political processes.

Measurements of Quality

- subjective evaluation (peer-review);
- numbers of publications;
- citations;
- the number and value of research grants and contracts gained.

Indicators

Excellence

Share publication in top 10 journals in each field of reference of respective facilities
Field normalized citation rate Indicator of impact of publications

Knowledge Transfer

No. of PhD theses and post doctoral programmes/citations (absolute and relative to total in each field)
Normalized to total number of PhD theses in the given field
No. of patents and licenses based on the work of the RI, normalized to no. of patents and licenses in the field
No. of industrial users and projects with industrial cooperation

Networking

No. of joint proposals/total users
Co-publication analysis: interdisciplinary
Fraction of non-Nation users, indicator of internationalization

USP Roadmap to Excellence in Research

Advantages:

- Structured Funding Agency System
- Excellent critical mass (no problem to produce & publish in large number)
- Structured Graduate Program (reach a new balance with Post-doctoral fellows, but maintain its role in the expansion of the system)

Challenges:

- Increase relevance of scholarly research
- Increase the engagement of USP in the Innovation Ecosystem

Increase Relevance of Scholarly Research at USP

- Facilitate interdisciplinary and cooperative research
- Intensify internationalization
- Favor long-term projects with high-impact and -risk to impact on “advancement of knowledge, economy, society, public policy, culture and the quality of life"
- Concentrate exceptional researchers in exceptionally well-equipped working environments
- Focus the faculty on the ends rather than the means
- Increase number of post-docs (“reduce” or rebalance the efforts on undergraduate and graduate towards post-doc training)

Science is all about Visions, it begins with a vision.

Scientific thought is fed by the capacity to “see” things differently than they have previously been seen.

Challenges:

- to improve the relevance of the scholarly research
- to engage USP in the Innovation Ecosystem

Por que?

Increase USP visibility and accountability

- Pull together University-wide data into a comprehensive report fully integrated with the university's website and researcher repository
- Be prepared and take advantage of the Innovation opportunities

weR_USP

USP

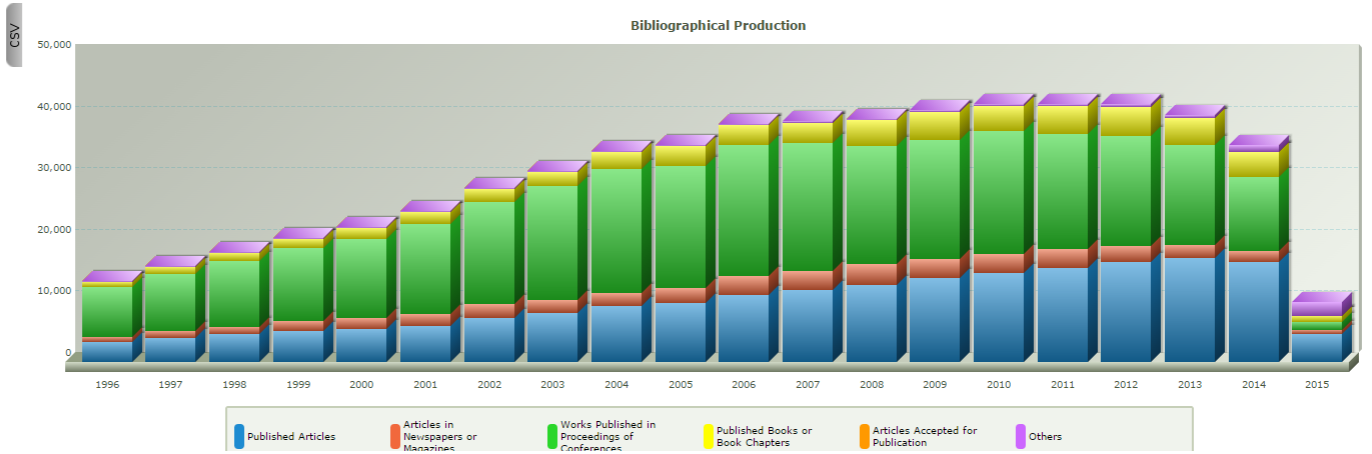
Indicator	Total
Number of Teaching Staff	6173
Number of Teaching Staff with Curriculum Lattes	6121 (99.16%)
Number of Units	52

Units and Indicators

Show Units

Graphics

CSV



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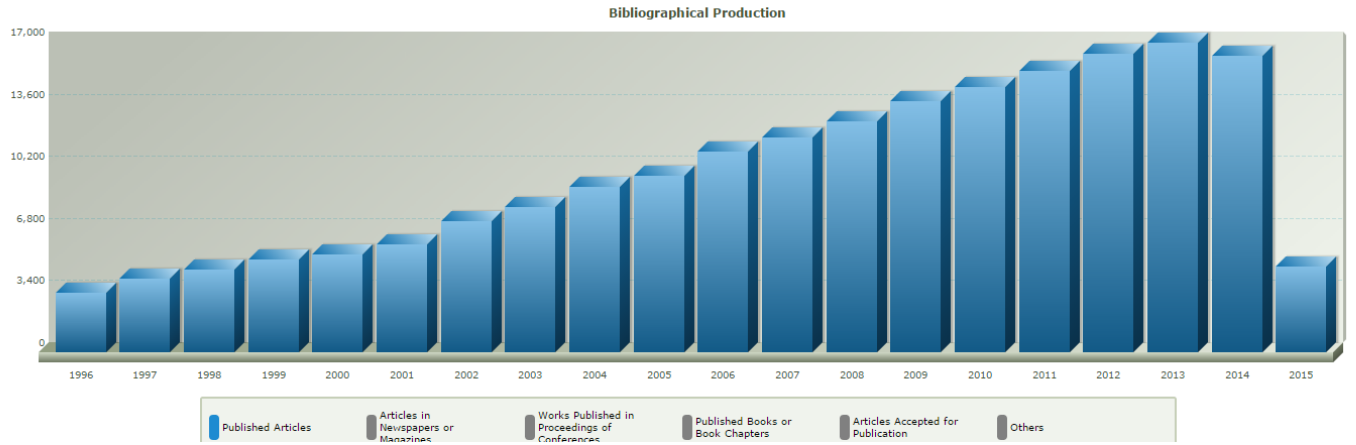

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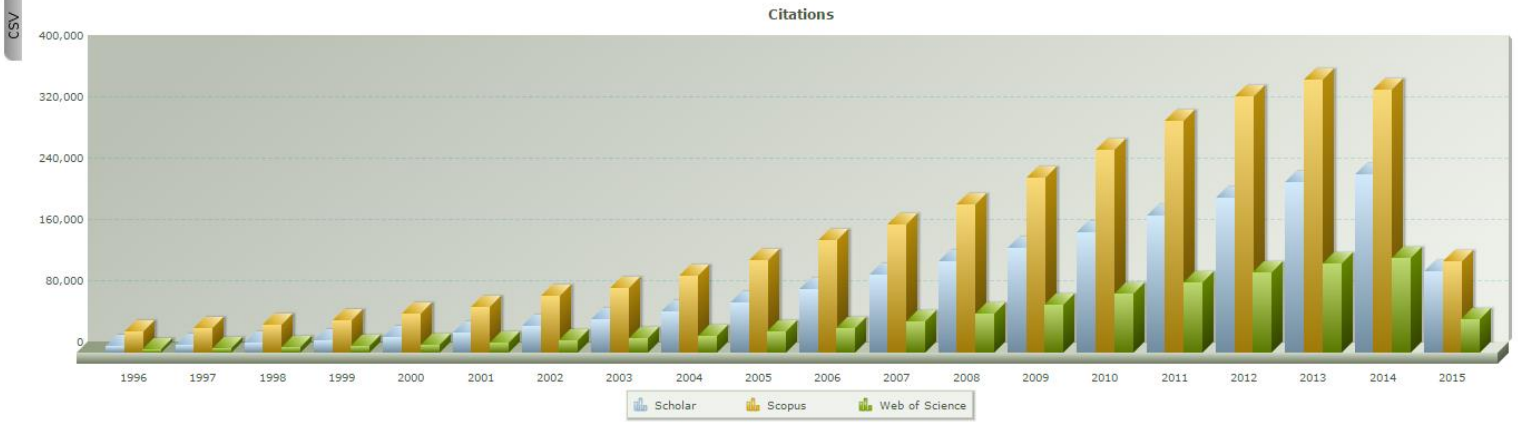

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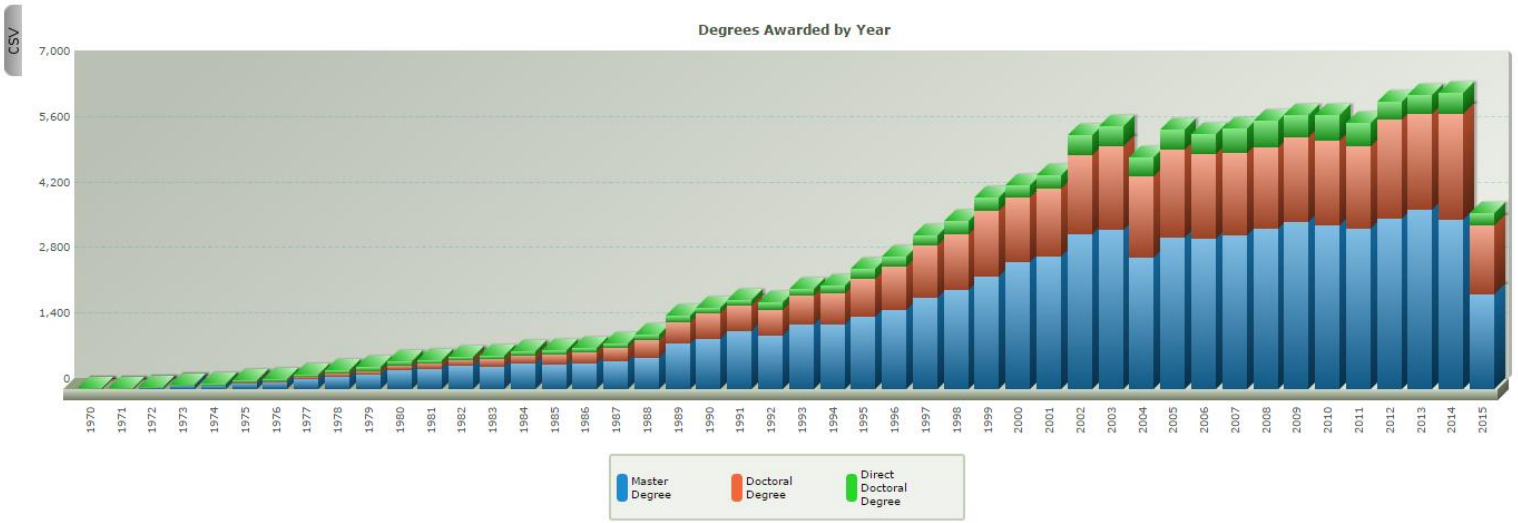

Acesso Público
Apresentação

Acesso Restrito
Mapa do Site
Pós-Graduação
CPA
WeR_USP
Trocar perfil

WeR_USP > Indicadores

WeR_USP

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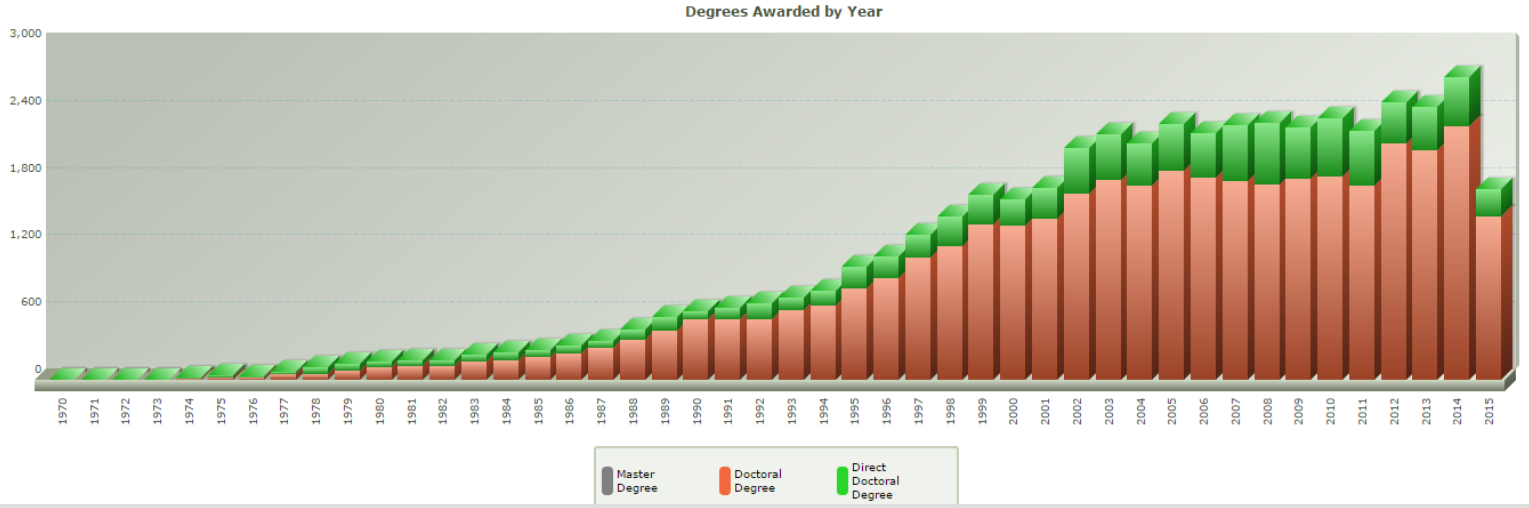

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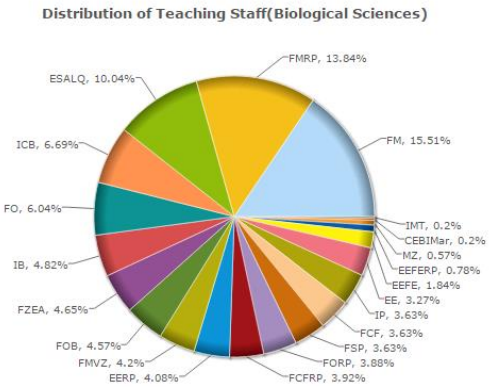

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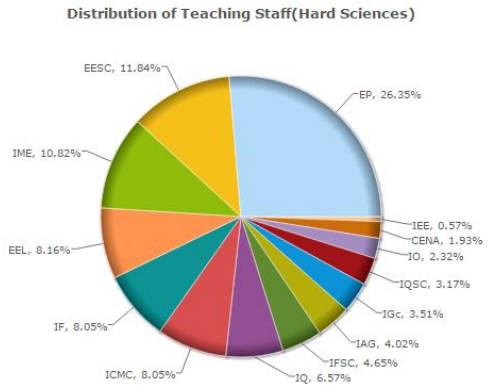

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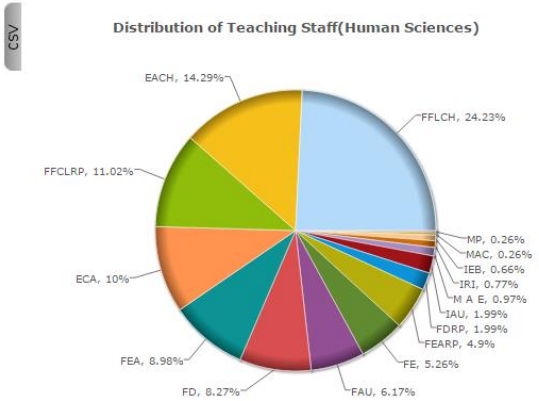

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Units and Indicators Hide Units

CSV

Unit	No. of Teaching Staff	% of Teaching Staff	No. of Teaching Staff with Curriculum Lattes	% of Teaching Staff with Curriculum Lattes
"Luiz de Queiroz" College of Agriculture	246	3.98 %	246	100 %
Archeology and Ethnology Museum	19	0.31 %	19	100 %
Bauru College of Dentistry	112	1.81 %	112	100 %
Center for Marine Biology	5	0.08 %	5	100 %
Center of Nuclear Energy in Agriculture	34	0.55 %	34	100 %
College of Animal Husbandry and Food Engineering	114	1.85 %	114	100 %
College of Architecture and Urbanism	121	1.96 %	121	100 %
College of Arts, Sciences and Humanities	280	4.53 %	280	100 %
College of Communication and Arts	196	3.17 %	194	98.98 %
College of Economics, Administration and Accounting	176	2.85 %	174	98.86 %
College of Education	103	1.67 %	103	100 %
College of Medicine	380	6.15 %	377	99.21 %
College of Nursing	80	1.30 %	80	100 %
College of Pharmaceutical Sciences	89	1.44 %	89	100 %
College of Philosofy, Literature and Human Sciences	475	7.69 %	475	100 %
College of Physical Education and Sports	45	0.73 %	45	100 %
College of Public Health	89	1.44 %	89	100 %
College of Veterinary Medicine and Animal Husbandry	103	1.67 %	103	100 %
College of Dentistry	148	2.40 %	148	100 %
Institute for Energy and Environment	10	0.16 %	10	100 %
Institute of Architecture and Urbanism	39	0.63 %	39	100 %
Institute of Astronomy, Geophysics and Atmospheric Sciences	71	1.15 %	71	100 %
Institute of Biomedical Sciences	164	2.66 %	164	100 %
Institute of Biosciences	118	1.91 %	117	99.15 %
Institute of Brazilian Studies	13	0.21 %	13	100 %
Institute of Chemistry	116	1.88 %	115	99.14 %
Institute of Geosciences	62	1.00 %	62	100 %
Institute of International Relations	15	0.24 %	15	100 %
Institute of Mathematics and Computer Science	142	2.30 %	142	100 %
Institute of Mathematics and Statistics	191	3.09 %	179	93.72 %
Institute of Oceanography	41	0.66 %	41	100 %
Institute of Physics	142	2.30 %	139	97.89 %
Institute of Psychology	89	1.44 %	88	98.88 %
Institute of Tropical Medicine	5	0.08 %	5	100 %
Law College	162	2.62 %	160	98.77 %
Lorena College of Engineering	144	2.33 %	139	96.53 %
Museum of Contemporary Art	5	0.08 %	5	100 %
Paulista Museum	5	0.08 %	5	100 %
Polytechnic College	465	7.53 %	456	98.06 %
Ribeirão Preto College of Dentistry	95	1.54 %	94	98.95 %
Ribeirão Preto College of Economics, Administration and Accounting	96	1.55 %	96	100 %
Ribeirão Preto College of Medicine	339	5.49 %	338	99.71 %
Ribeirão Preto College of Nursing	100	1.62 %	100	100 %
Ribeirão Preto College of Pharmaceutical Sciences	96	1.55 %	96	100 %
Ribeirão Preto College of Philosofy, Literature and Human Sciences	216	3.50 %	216	100 %
Ribeirão Preto College of Physical Education and Sports	19	0.31 %	19	100 %
Ribeirão Preto Law College	39	0.63 %	39	100 %
São Carlos College of Engineering	209	3.38 %	200	95.69 %
São Carlos Institute of Chemistry	56	0.91 %	56	100 %
São Carlos Institute of Physics	82	1.33 %	82	100 %
Zoology Museum	14	0.23 %	14	100 %

weR_USP

USP > São Carlos Institute of Chemistry

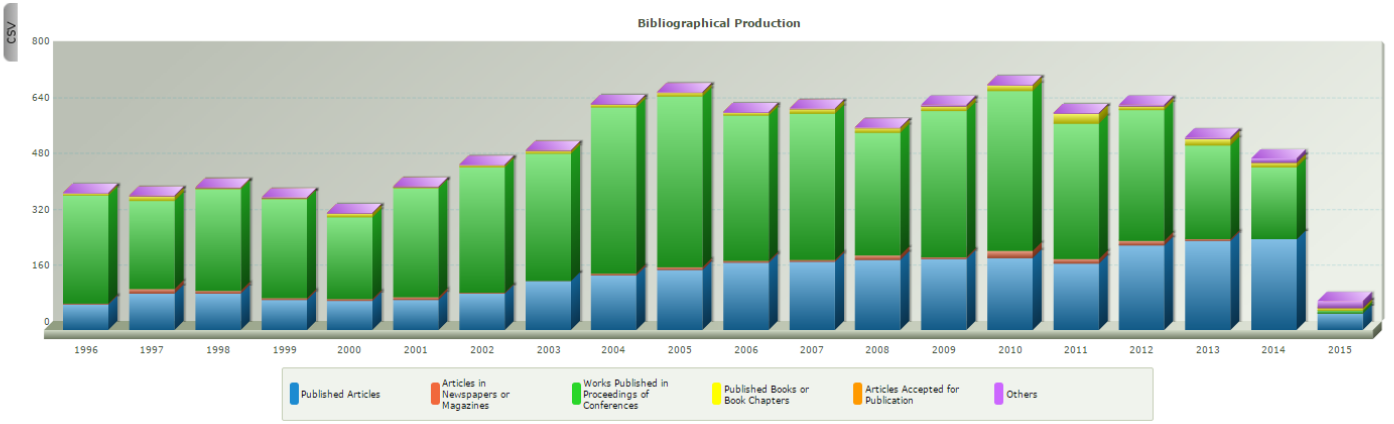
Unit's Indicators: São Carlos Institute of Chemistry

Indicator	Total
Number of Teaching Staff - IQSC	56
Number of Teaching Staff with Curriculum Lattes	56 (100%)
Number of Departments	2

Departments and Indicators

Show Departments

Graphics



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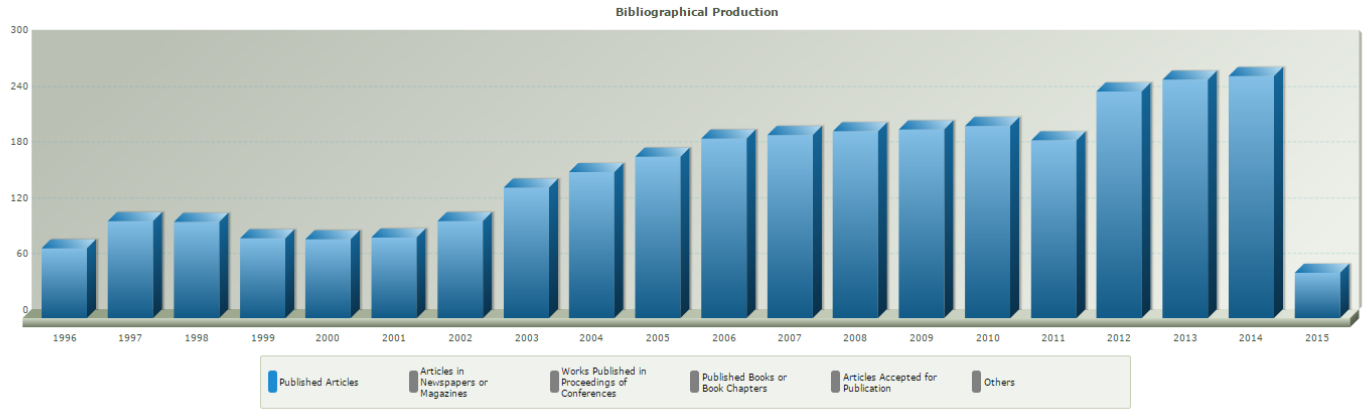

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Acesso Público
Apresentação
Acesso Restrito
Mapa do Site
Pós-Graduação
CPA
WeR_USP
Trocar perfil

weR_USP

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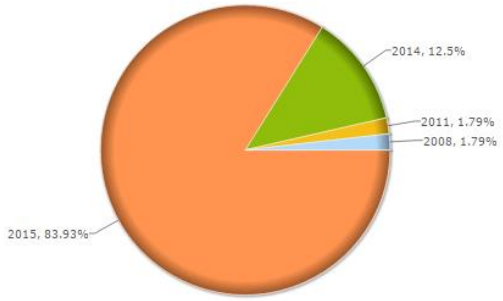
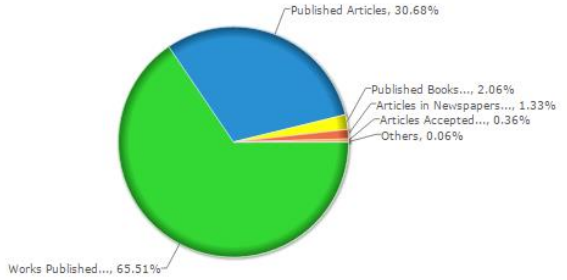
CSV

% of Teaching Staff who Last Updated the Curriculum Lattes by Year



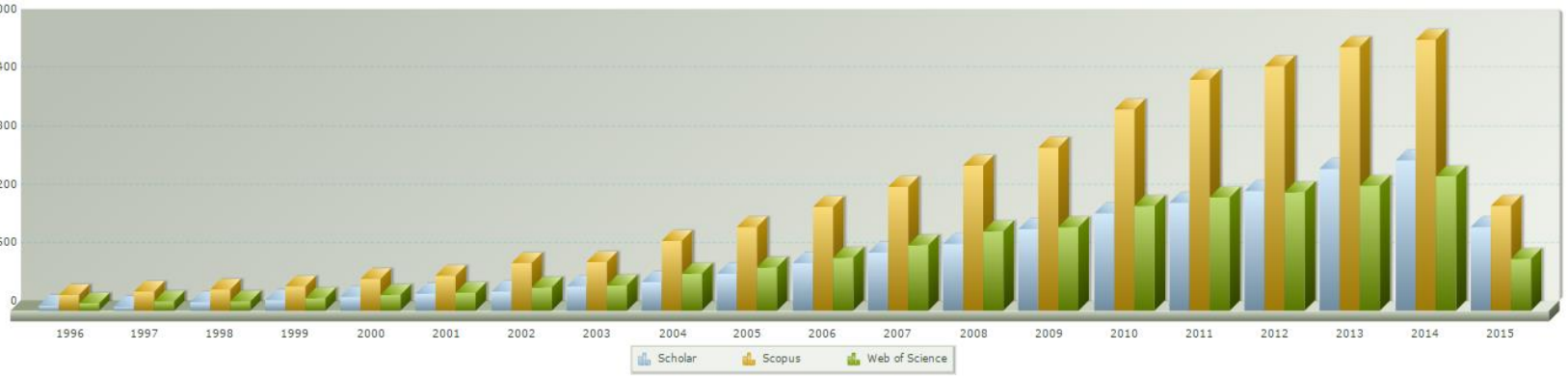
CSV

Total of Bibliographical Production



CSV

Citations



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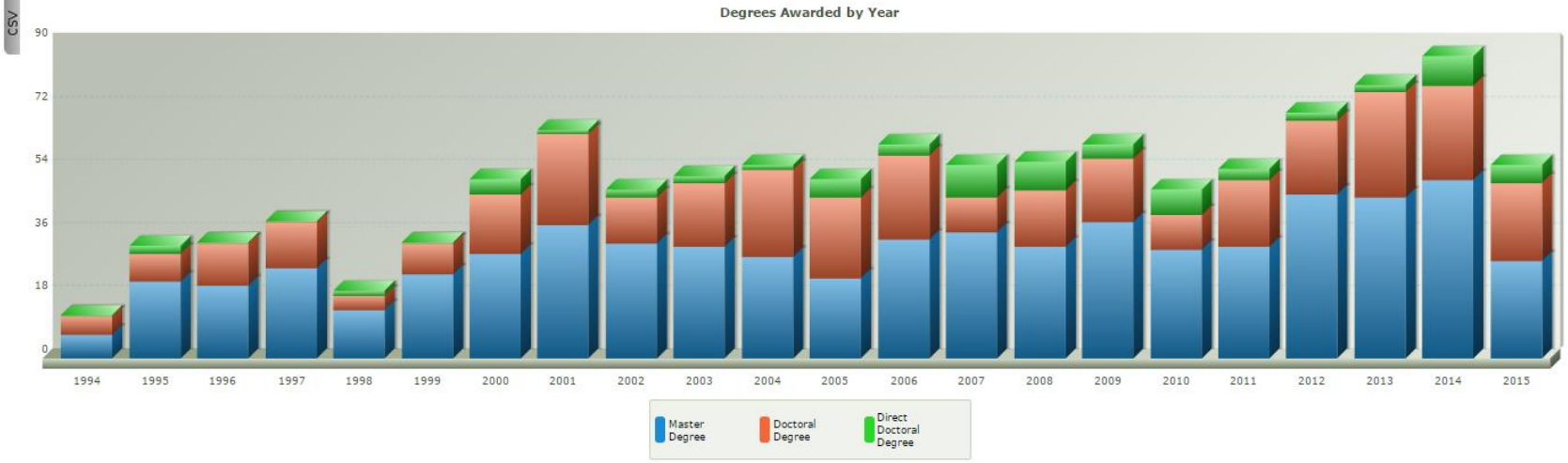

CSV

weR_USP

USP > São Carlos Institute of Chemistry

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Indicator	Total
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Number of Teaching Staff with Curriculum Lattes	56 (100%)
Number of Departments	2

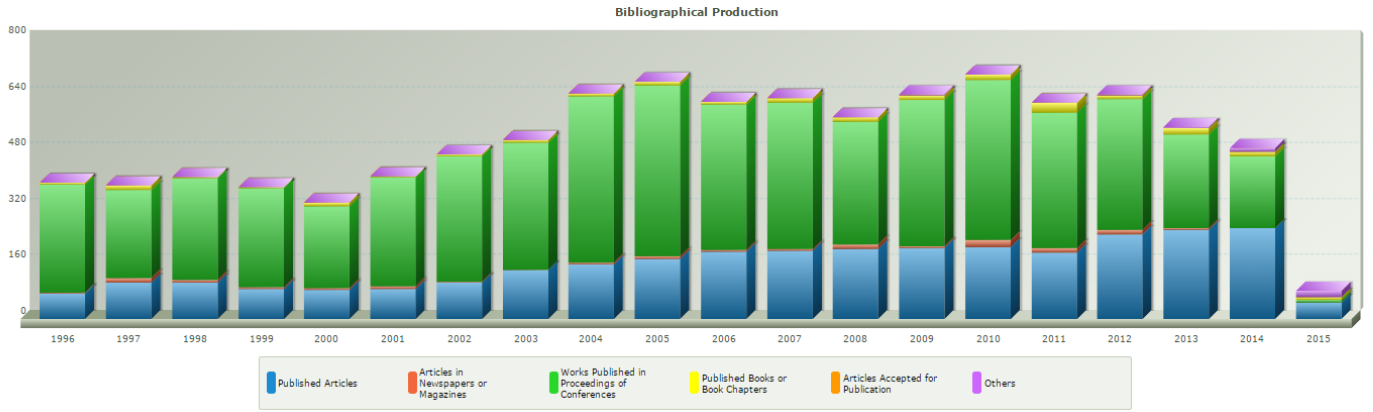
Departments and Indicators

Hide Departments

CSV

Department	No. of Teaching Staff	% of Teaching Staff	No. of Teaching Staff with Curriculum Lattes	% of Teaching Staff with Curriculum Lattes
SQF - Physics-Chemistry	27	48.21 %	27	100 %
SQM - Chemistry and Molecular Physics	29	51.79 %	29	100 %

Graphics



weR_USP

USP > São Carlos Institute of Chemistry > SQM - Chemistry and Molecular Physics

Department's Indicators: SQM - Chemistry and Molecular Physics

Indicator	Total
Number of Teaching Staff - SQM	29
Number of Teaching Staff with Curriculum Lattes	29 (100%)

Teaching Staff

Hide Teaching Staff

CSV

USP Number	Professor Name	Lattes ID	Scopus ID	Google Scholar ID	Researcher ID
82893	Albérico Borges Ferreira da Silva	2885913546753507	7402942493	-	C-3274-2011
4859030	Álvaro José dos Santos Neto	1690612352319705	11739631500	-	B-4199-2009
2085451	Ana Maria de Guzzi Plepis	0797302759648052	35619609800	-	-
7406530	Andrei Leitão	1054486706893333	7005219764	-	-
90120	Benedito dos Santos Lima Neto	6390399144540353	6603571488	-	-
314657	Carlos Alberto Montanari	9200533791228786	7005522880	g-INorAAAAAJ	C-2799-2012
2252162	Daniel Rodrigues Cardoso	6036407972884077	7005777422	lMB1XZUAAAAJ	-
67951	Douglas Wagner Franco	8113779505149284	7201358279	-	-
90137	Eder Tadeu Gomes Cavalheiro	4745280891704797	13410160700	-	-
5982496	Eduardo Bessa Azevedo	6847311664433673	7006132523	ukqvCTMAAAAJ	-
61019	Emanuel Carrilho	9157872297410868	7004839394	Yft1SAsAAAAJ	-
55012	Eny Maria Vieira	5808503261461263	7102986924	-	-
5851343	Fernanda Canduri	5918350258599906	6603882092	-	-
71038	Fernando Mauro Lanças	3462216438517585	7005296588	-	-
82681	Hidetake Imasato	0692633415007446	6602839371	-	-
5001320	Igor Renato Bertoni Olivares	1688354630476483	16507428900	-	-
94232	Janete Harumi Yariwake	6852119433976879	6602548545	-	D-1387-2012
58269	Janice Rodrigues Perussi	4613147780858271	6602174100	Nfv-dmUAAAAJ	-
5851385	Júlio César Borges	6033516785481779	24340470000	Oo30UHkAAAAJ	C-6160-2008
71104	Marcel Tabak	5190473278746135	7006837710	-	-
3563182	Marcos Roberto de Vasconcelos Lanza	8543846691991670	36157970400	87LLlakAAAAJ	C-3527-2012
2085357	Maria Olimpia de Oliveira Rezende	6164624893473124	35509556100	-	-
53393	Maria Teresa do Prado Gambardella	5708935097780101	35582864300	-	-
45932	Regina Helena de Almeida Santos	1193062849655090	7201375122	-	-
5014724	Roberto Luiz Andrade Haiduke	6043815817375763	6602993719	r26_mZMAAAAJ	-
72338	Sergio Akinobu Yoshioka	4286979118769528	8122813600	-	-
3034470	Ubirajara Pereira Rodrigues Filho	4073581583592013	6602764858	-	-
5517197	Victor Marcelo Deflon	8068967021078220	6603600892	-	-
2523101	Vitor Hugo Polisél Pacces	5144499144963049	-	-	-
68462	Wagner Luiz Polito	8259533501059722	6602546948	dY3ABjMAAAAJ	-

USP Roadmap to Excellence in Research

Advantages:

- Structured Funding Agency System
- Excellent critical mass (no problem to produce & publish in large number)
- Structured Graduate Program (reach a new balance with Post-doctoral fellows, but maintain its role in the expansion of the system)

Challenges:

- Increase relevance of scholarly research
- Increase visibility and accountability

- Facilitate & Stimulate Interdisciplinary approaches
- Intensify Internationalization
- Focus the Faculty on the ends rather than the means
- Improve USP research infrastructure & assure its rational use
- Explore new sources of funding (Private and Charity)
- Be prepared and take advantage of the Innovation opportunities

Goals:

- Make USP “CNPJ” readily available for the Research Enterprise
- Enable researchers to focus on **ends** rather than **means**
- Internalization
- Engage USP in the Innovation Ecosystem & Social relevant activities

Racionalizar o Apoio Institucional a Pesquisa

Submetas

1.1 Estabelecer Rede de Escritórios de Apoio a Pesquisa – EAP

1.2 Consolidar o Funcionamento de 12 EAP

1.3 Consolidar e Ampliar o Programa de Redes de Pesquisa USP

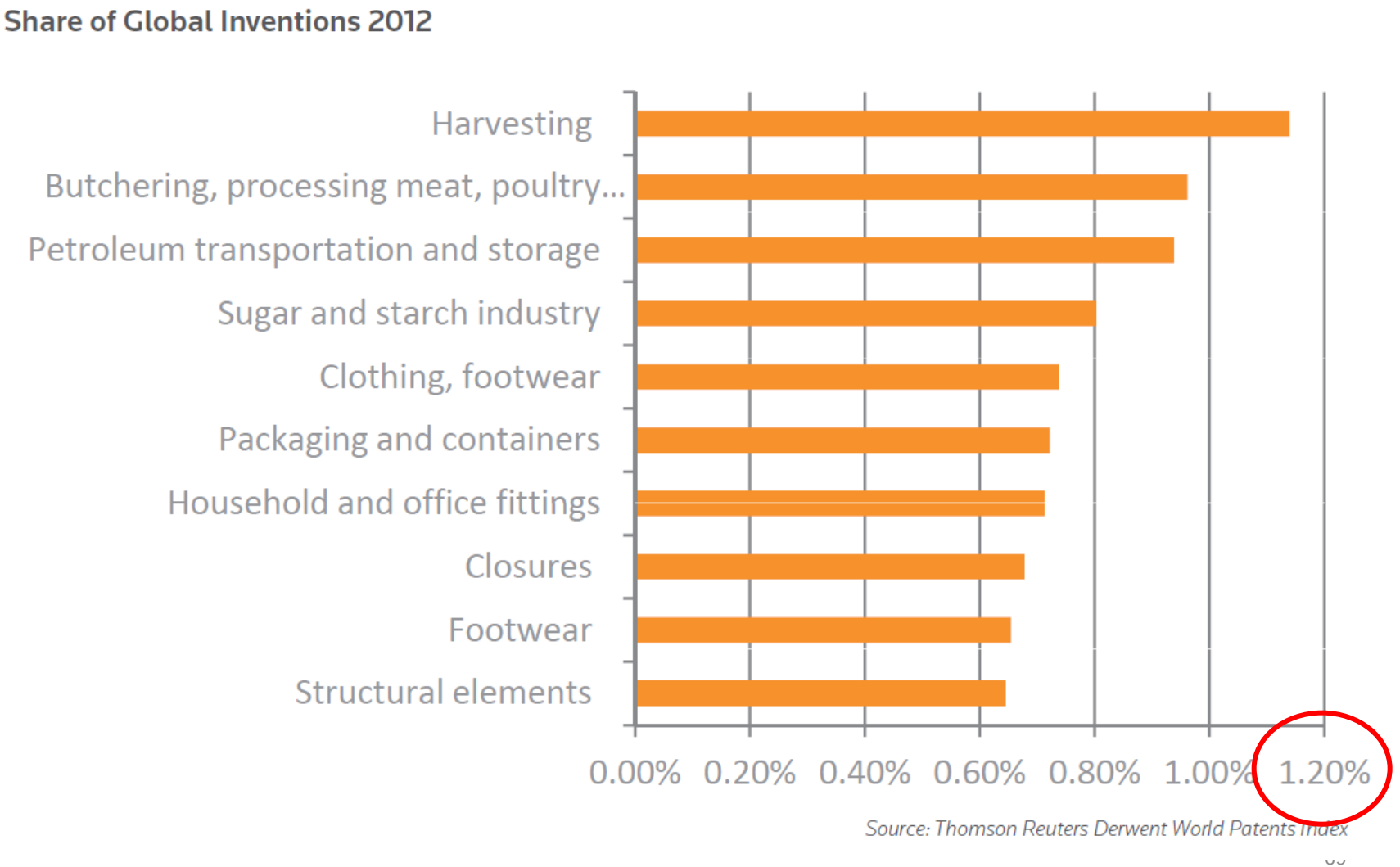
1.4 Criação de Rede de Engenheiros e Técnicos da USP

1.5 Criar o Núcleo de Apoio aos Laboratórios Multiusuários da USP – LabMultiUSP

1.6 Consolidar e Ampliar os Programas de Alocação de Pessoal PAGPesq e Procontes

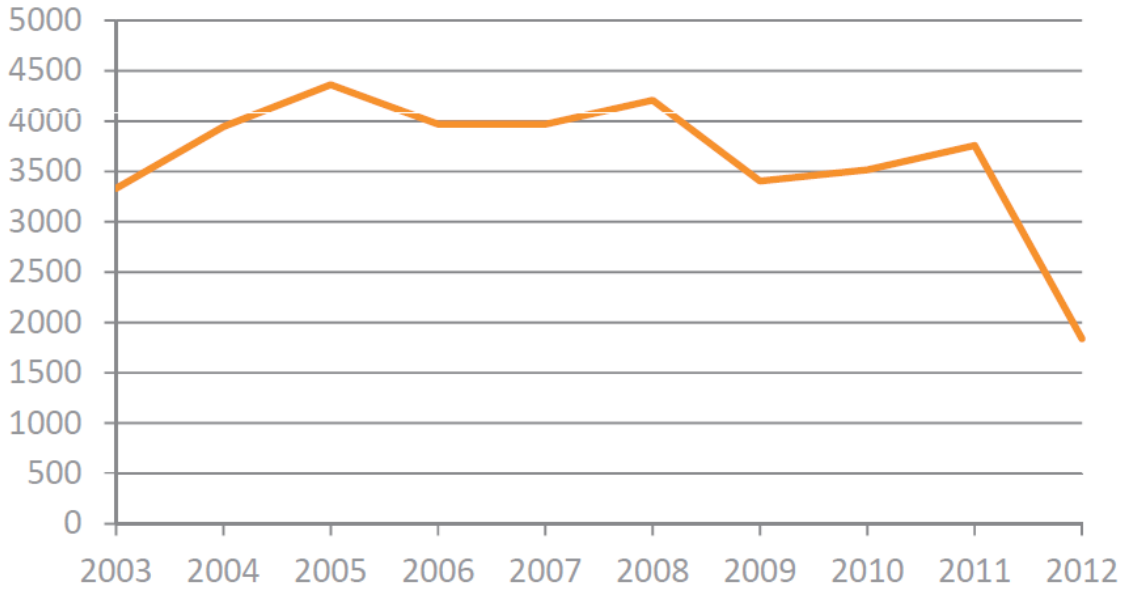
Intellectual Property Research

Brazil: Intellectual Property Research



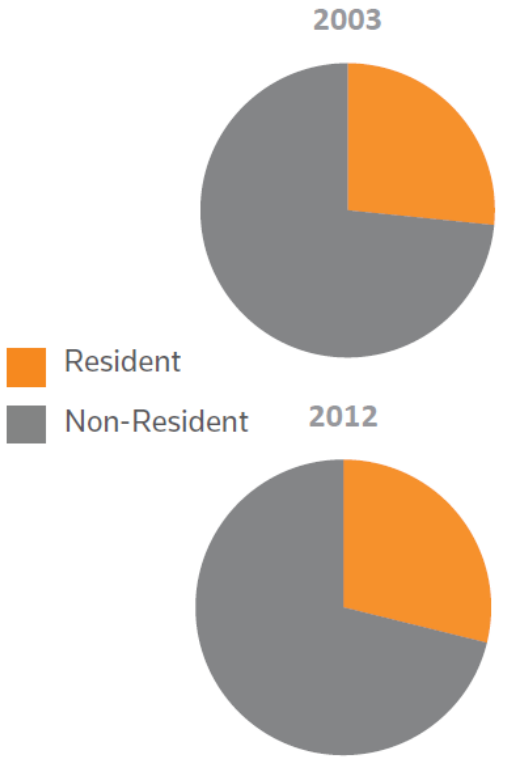
Brazil: Intellectual Property Research

BR Patent Applications with BR Priority 2003-2012



Source: Thomson Reuters Derwent World Patents Index

Resident vs. Non-Resident



Source: Thomson Reuters Derwent World Patents Index

Brazil: Intellectual Property Research

COMPANY - FOREIGN & RESIDENT	ALL BR INVENTIONS 2012
PETROBRAS PETROLEO BRASIL SA	30
UNIV SAO PAULO USP	23
WHIRLPOOL SA	18
UNICAMP UNIV ESTADUAL CAMPINAS	15
UNIV FEDERAL DO RIO GRANDE DO SUL	14
UNIV FEDERAL MINAS GERAIS	13
GRENDENE SA	8
JOBE IND E COMERCIO PLASTICOS LTDA	7
UNIV FEDERAL LAVRAS	7
COMISSAO NACIONAL ENERGIA NUCLEAR	6

Thomson-Reuters, 2014

Brazil & S. Korea: Intellectual Property Research

COMPANY - FOREIGN & RESIDENT	ALL BR INVENTIONS 2012
PETROBRAS PETROLEO BRASIL SA	30
UNIV SAO PAULO USP	23
WHIRLPOOL SA	18
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COMPANY - FOREIGN & RESIDENT	ALL KR INVENTIONS 2012
LG ELECTRONICS INC	6009
SAMSUNG IND CO LTD	3669
HYUNDAI MOTOR CO LTD	1729
POSCO	1498
HYUNDAI STEEL CO	1031
HYUNDAI HEAVY IND CO LTD	974
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KOREA ADV INST SCI&TECHNOLOGY	845
SK HYNIX INC	787
HYUNDAI MOBIS CO LTD	732

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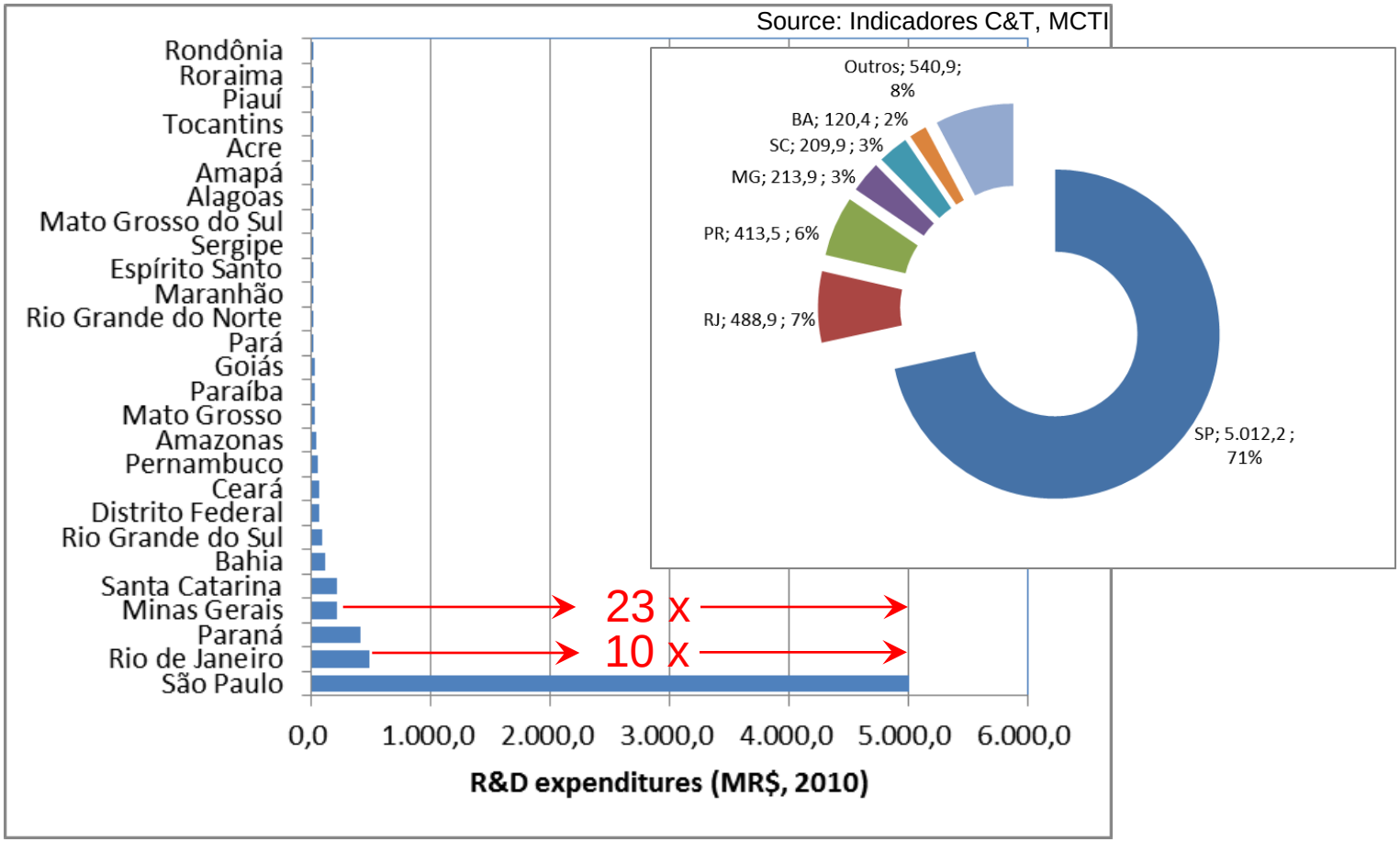
R&D Funding

State level support for R&D in Brazil, 2010



Fapesp: São Paulo Research Foundation

- Mission: support research in all fields
- Funded by the State of São Paulo with 1% of all state revenues
  - Started in 1962
- All proposals are peer reviewed (20,600 proposals in 2011)
- Annual budget: $PPP 600 M in 2011
  - **Fellowships** (2,600 SI, 2,400 MSc, 3,900 DrSc, 1,700 Post-docs, 800 other)
  - **Academic R&D** (Thematic, Regular, Young Investigators)
  - **University-Industry Joint R&D**: Microsoft, Agilent, Braskem, Oxiteno, GSK, SABESP, VALE, Petrobrás, Embraer, Padtec, Biolab, Cristalia, Whirlpool, Boeing , GSK, **BP...**
  - **Small bussiness R&D:** 1,200 SBE's (PIPE+PAPPE)

FAPESP's Large & Green Economy Research Programs

- Giant Magellan Telescope
  - $40 million
- BIOEN-FAPESP: Bioenergy research
  - Feedstock, processing, green chemistry, engines, sustainability
  - 300+ scientists (50 from abroad); 600+ graduate students
  - R$ 73 million (FAPESP); R$ 55 million (State Government); R$ 5 million (industry)
- BIOTA-FAPESP: Biodiversity and conservation research
  - 150 scientists; 500 graduate students
  - R$ 93 million
- GCG-FAPESP: Global Climate Research
  - 70 scientists; 100 graduate students
  - R$ 65 million

FAPESP: international agreements for joint research funding

- Agreements with foreign funding agencies, universities and companies

RCUK (UK) **KCL; Surrey;Southampton;Nottingham;** **Birmingham (UK)** **DFG (Ge)** **ANR;CNRS;INSERM;INRIA;INRA (Fr)** **ISTP;U. Toronto;U. W. Ontario (Ca)** **Hebrew Univ. Jerusalem (Israel)**	**UE-CNPq (Bioenergy)** **CONICET (Ar)** **CONICYT (Ch)** **NSF (CNIC, ICC, Biodiversity)** **Microsoft Research, Boeing; MIT (U.S.)** **FCT (Portugal)**

- 242 joint proposals supported, 2005-2010
  - France 85; U.S 52; Germany 39; U.K. 20; Argentina 10; Canada 12; Portugal 8

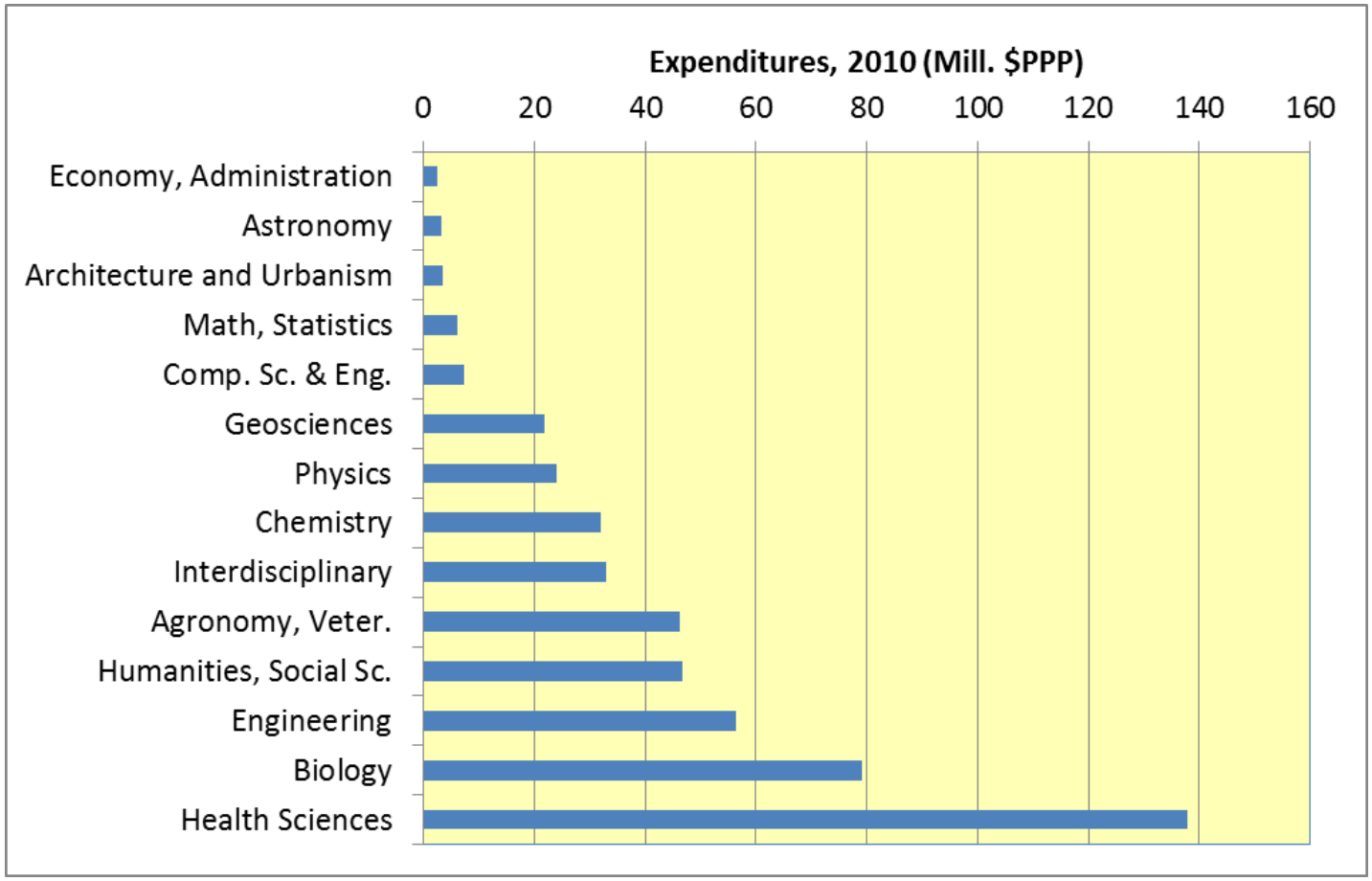
FAPESP international collaboration: bringing foreign scientists to SP

- Post doctoral fellowships
  - Stipend, travel, some research money
- Young Investigator Awards (1.5 awards per week)
  - Stipend, travel, research money
- Visiting scientists
  - 205 in 2010 (travel, stipend;2 weeks to 12 months)
- São Paulo Schools of Advanced Science (SPSAS)
  - Each one with 50-100 young Dr students from abroad
- São Paulo Excellence Chairs (SPEC)
  - For top notch scientists from abroad: full research grant for staying 3 mo. per year in SP for 3-5 years

FAPESP international collaboration: sending scientists from SP abroad

- Research fellowships (2-12 mo; 158 in 2010)
- Special grants for participation in international conferences (903 awarded in 2010)
- Fellowship for short stays
  - 4 mo – 12 mo doing research work abroad
  - Eligible: all 11,000 FAPESP fellowship holders

FAPESP expenditures, 2010
By field of science



Science and Technology in São Paulo, Brazil

- Sustained growth in the number of scientific articles for the last 30 years
- Strength in the education of graduate students
  - DrSc graduated yearly: USP 2,200/Unicamp 800/Unesp 800
- Challenges
  - Increase the impact of the scientific production
    - Intelectual (citations) and socio-economic (wealth and well being)
  - Increase international cooperation
  - Increase the number of scientists in academia and industry

R&D expenditures in São Paulo, by source

Ano 2010 (values in R$)	Value (MR$)	%	%GDP
R&D Expenditures	**19.758,4**	**100%**	**1,64%**
Federal	**2.800,5**	**14%**	**0,23%**
State	**4.611,7**	**23%**	**0,38%**
State Higher Education	3.272,2	17%	0,27%
State Research Institutes	559,4	3%	0,05%
FAPESP	780,0	4%	0,06%
Private	**12.346,2**	**62%**	**1,03%**
Business	11.986,9	61%	1,00%
Private Higher Education	359,3	2%	0,03%

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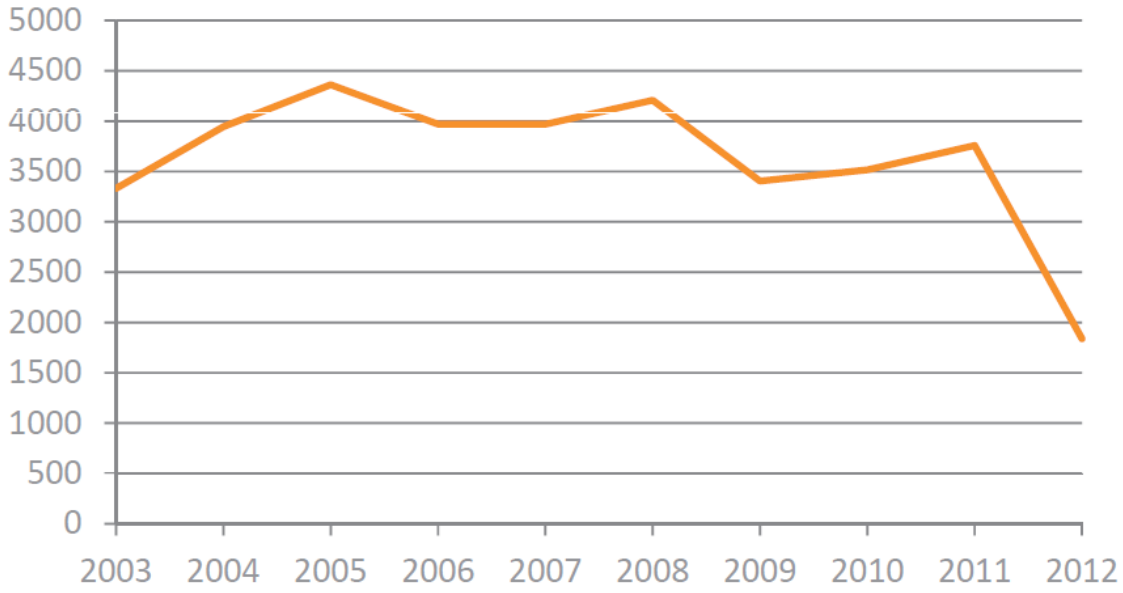

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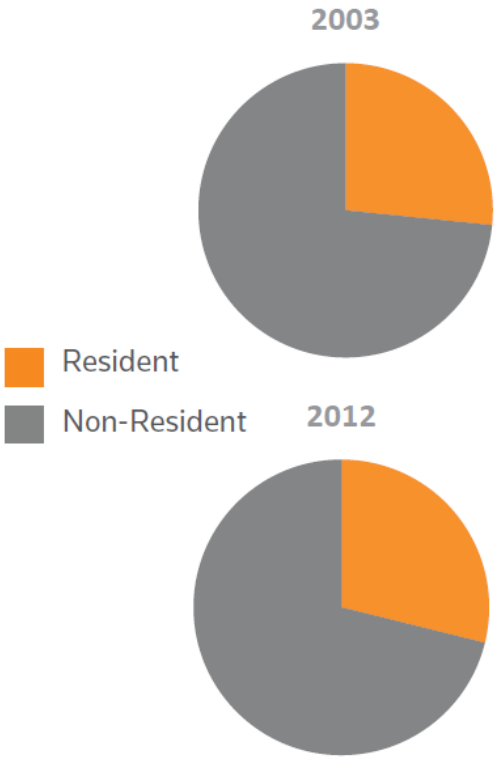

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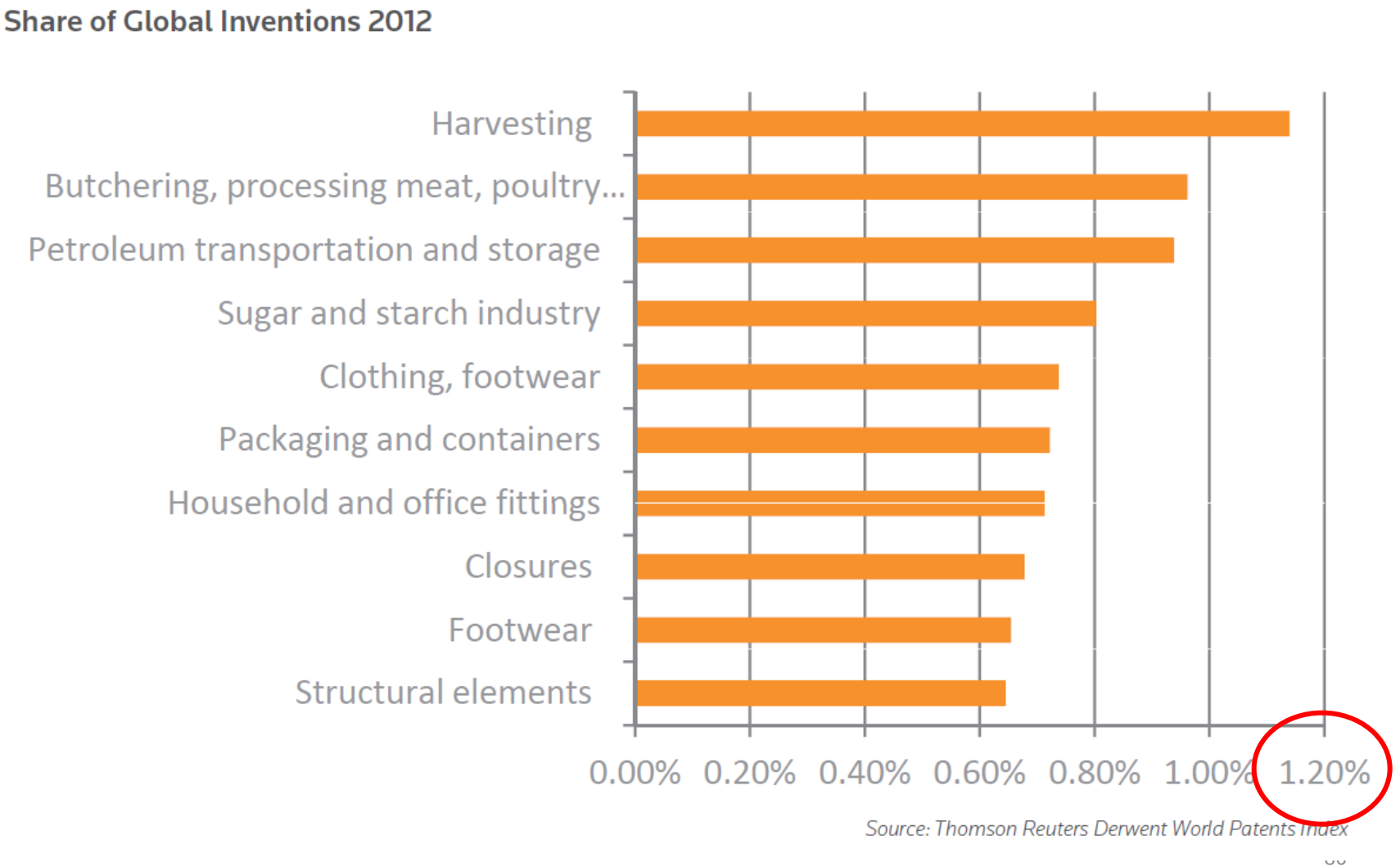

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Thomson-Reuters, 2014

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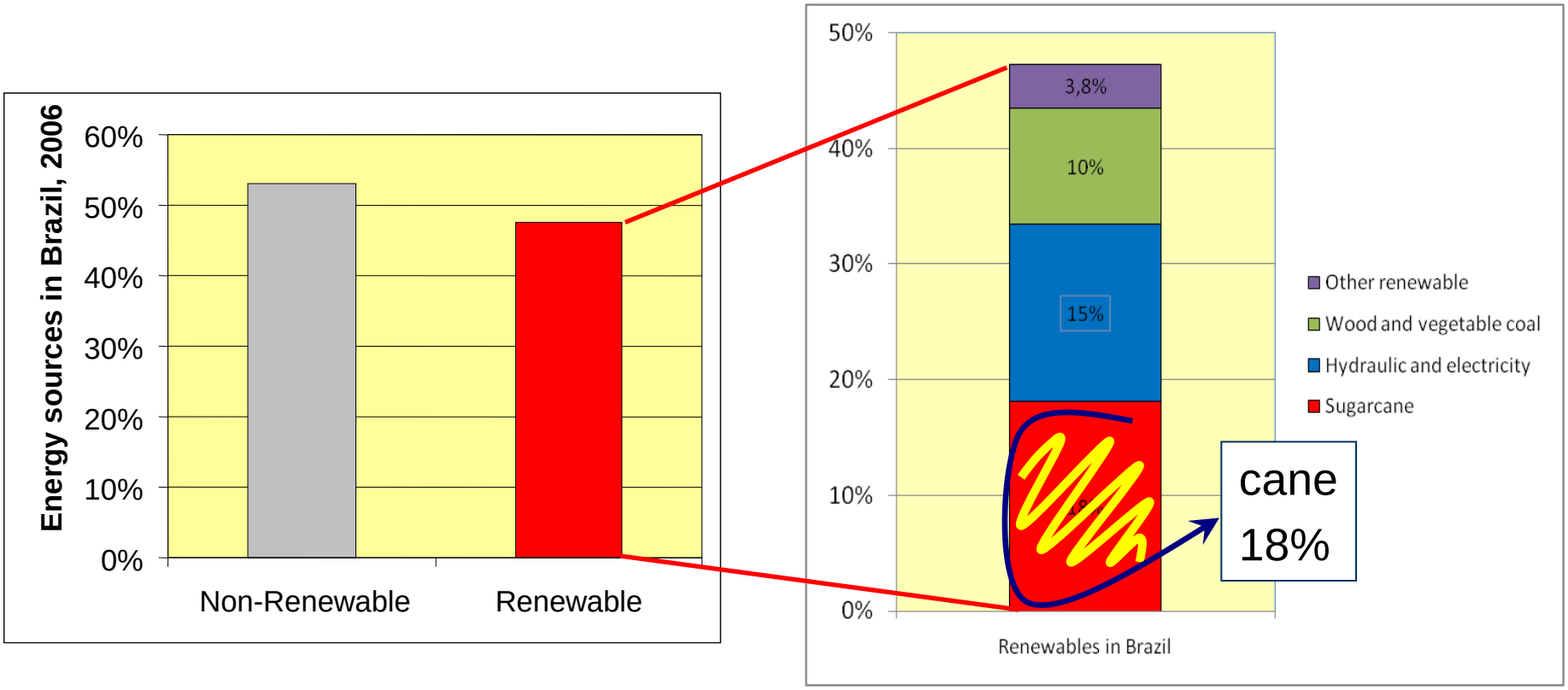
Success Cases

Brazil: 47% of energy from renewable sources (2009) (18% from sugarcane)

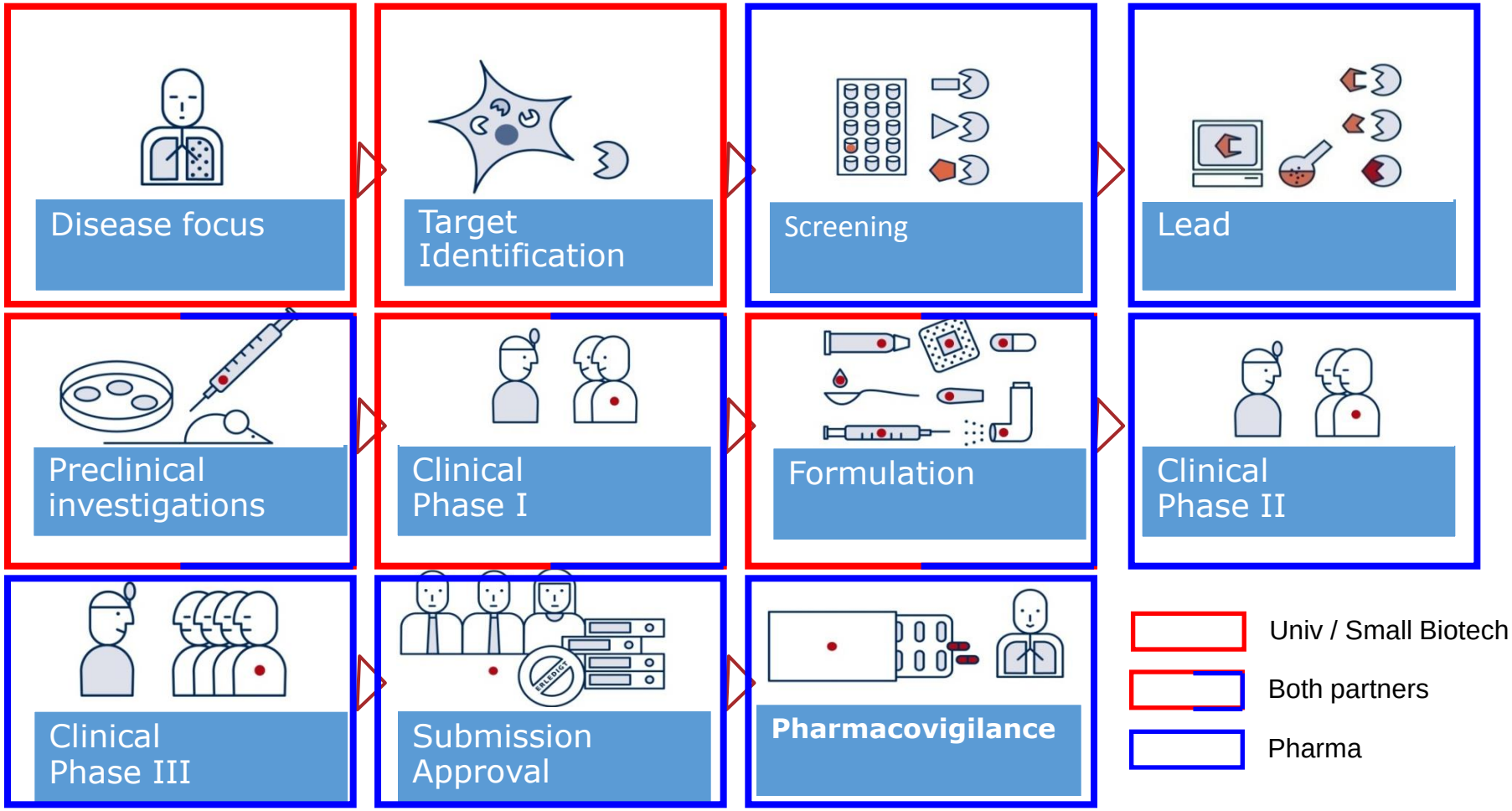


Renewables in Brazil: 47%; World: 13%; OECD: 7,2%

Academia & Industry – Pharmaceutical Sector

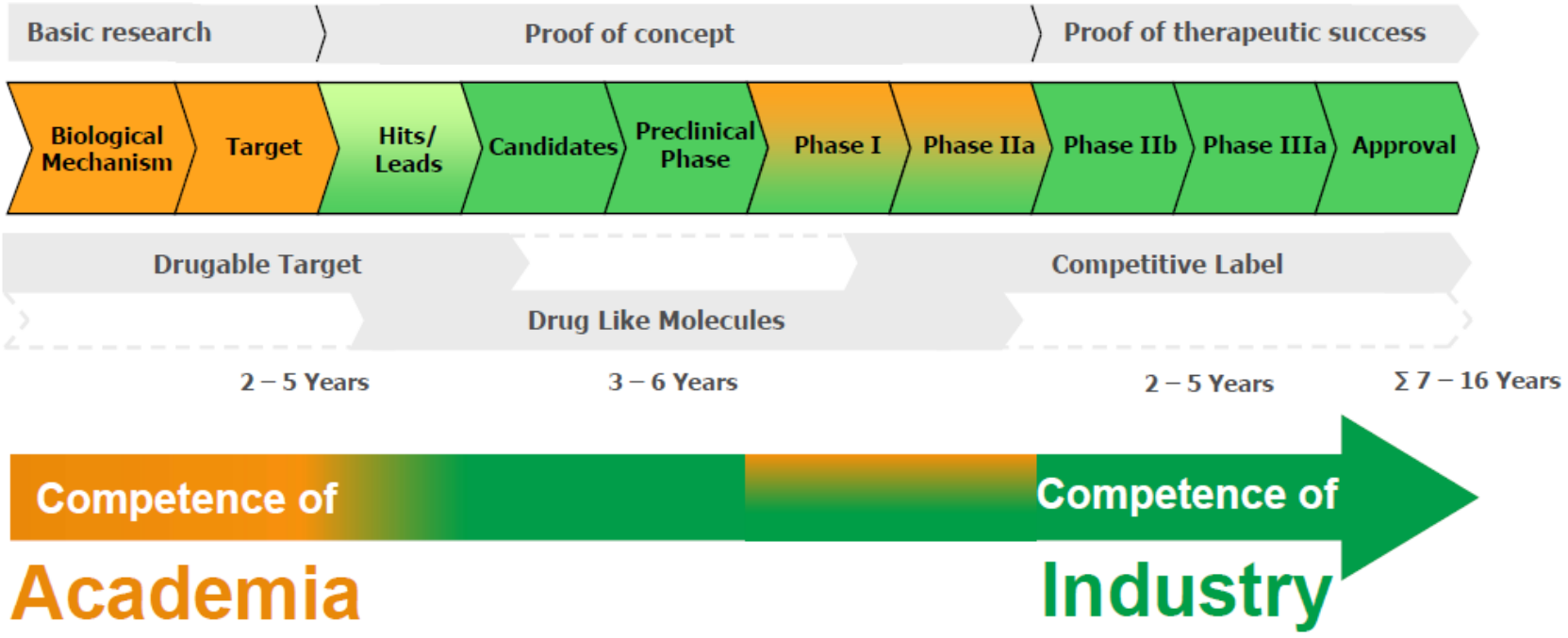
Open innovation and external co-operations

(Individual strenghths along the value chain)



Who does what best?

Individual strenghts along the value chain



SHIFT IN INFLUENCE OF G20 NATIONS

Analysts from the IP & Science business of Thomson Reuters conducted an in-depth study of the G20 nations to compare the research and innovation landscape of each. Their work revealed that the power is shifting, as emerging nations enhance their science, education and technology policies. This map shows changes that occurred over the last decade, giving rise to new opportunities and potential in the future. Read more in the report "The Research and Innovation Performance of the G20."

UNITED STATES

- **5.2%** Decline in world share of papers indexed in Web of Science (2002 – 2012)
- **7%** Decline in innovation originating domestically in the U.S. (2003 – 2012)

RUSSIA

- **1%** Decline in world share of papers indexed in Web of Science (2003 – 2012)
- **19%** Increase in domestic patent applications (2003 – 2012)

EUROPEAN UNION

- **3%** Decline in world share of papers indexed in Web of Science (2002 – 2011)

JAPAN

- **3.6%** Decline in world share of papers indexed in Web of Science (2003 – 2012)
- **20%** Increase in citation impact of papers (2003 – 2012)

FRANCE

- **33%** Increase in citation impact of papers (2003 – 2012)

GREAT BRITAIN

- **.5%** Increase in world share of highly cited papers (2002 – 2011)
- **8%** Decline in domestic patent applications (2003 – 2012)

BRAZIL

- **145%** Increase in research papers in Web of Science (2003 – 2012)

CHINA

- **8.4%** Increase in world share of papers indexed in Web of Science (2002 – 2012)
- **900%** Increase in domestic patent applications (2003 – 2012)

INDIA

- **115%** Increase in output of Web of Science papers (2003 – 2012)

SOUTH KOREA

- **127%** Increase in output of Web of Science papers (2003 – 2012)
- **30%** Increase in domestic patent applications (2003 – 2012)

AUSTRALIA

- **15%** Increase in citation impact of papers (2003 – 2012)

SAUDI ARABIA

- **373%** Increase in output of Web of Science papers (2003 – 2012)
- **~25%** Increase in domestic patent applications (2003 – 2012)

CANADA

- **13%** Increase in citation impact of papers (2003 – 2012)

Source: Thomson Reuters Web of Science, InCites and Derwent World Patents Index

THOMSON REUTERS

Number of Publications

SIR
SCIMAGO

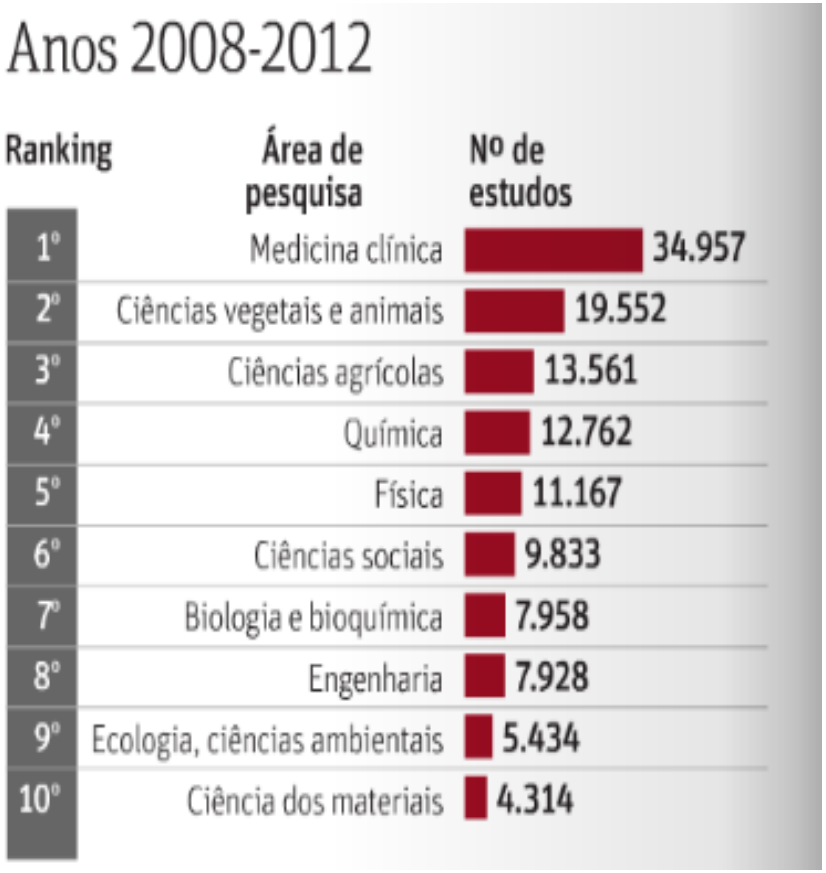
SIR World Report, 2013

Scopus: (>20 thousand journals)

		Publications 2007 - 2011
1º	Harvard University (EUA)	80.467
2º	Tóquio University (Japan)	51.796
3º	University of Toronto (Canada)	48.944
4º	University of Tsinghua (China)	48.396
5º	**USP**	**48.156**
135º	UNICAMP	17.130
137ª	UNESP	16.998

Source: Agencia FAPESP, 22 agosto 2013

Brazil: Scientific & Scholarly Research 1993-2013
(main contributing fields)



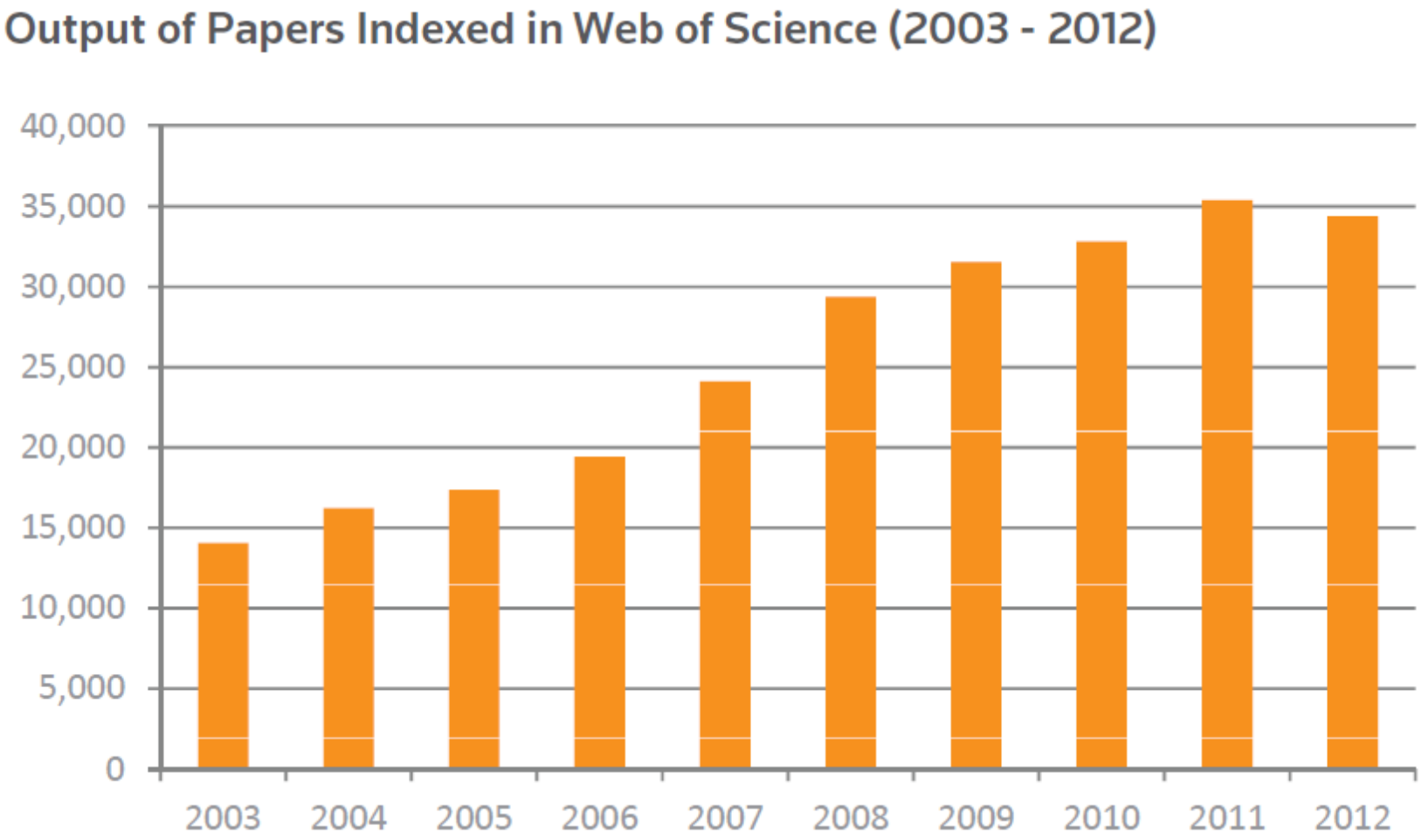
Thomson Reuters/Folha SP

Pró-reitoria
de Pesquisa

Strategies to make the USP “CNPJ” available for the Research Enterprise

Jose Eduardo Krieger
Provost of Research
University of São Paulo

Brazil: Scientific & Scholarly Research



Thomson-Reuters, 2014

Racionalizar o Apoio Institucional a Pesquisa

Submetas

1.1 Estabelecer Rede de Escritórios de Apoio a Pesquisa – EAP

1.2 Consolidar o Funcionamento de 12 EAP

1.3 Consolidar e Ampliar o Programa de Redes de Pesquisa USP

1.4 Criação de Rede de Engenheiros e Técnicos da USP

1.5 Criar o Núcleo de Apoio aos Laboratórios Multiusuários da USP – LabMultiUSP

1.6 Consolidar e Ampliar os Programas de Alocação de Pessoal PAGPesq e Procontes

● Gastos com saúde ao redor do mundo (em US$)

PAÍS	GASTO PÚBLICO (% DO PIB)	GASTO PRIVADO (% DO PIB)	GASTO TOTAL PER CAPITA
Brasil	4,7	5,0	1.083
MERCOSUL			
Argentina	4,9	2,3	1.074
Paraguai	3,5	5,5	395
Uruguai	6,1	2,6	1.431
Venezuela	1,0	2,5	497
SISTEMA UNIVERSAL			
Canadá	7,6	3,3	5.718
França	9,0	2,6	4.864
Suíça	7,6	3,9	9.276
Reino Unido	7,6	1,5	3.598
BRICS			
China	3,1	2,5	367
Índia	1,3	2,7	61
Rússia	3,1	3,4	957
ÁFRICA DO SUL	4,3	4,6	593

Estadao, 2015

USP Contribution for Post-graduate Degrees

Degrees Awarded	
Masters	72.315
PhDs	46.074
Total	**118.389**

In Brazil, 750.000 degrees have been awarded according to CAPES

Source: Sistema Janus, 02 novembro 2014

USP x Brasil

	Brazil	USP	USP/Brazil
Number of Courses (2014)*	5.082	260	5%
Maters (2012)	42.780	3.645	10%
PhDs (2012)	13.879	2.479	20%
Advisors (2014)*	56.890	5.802	10%

* Including Professional Masters

Source: Sistema Janus, 02 novembro 2014

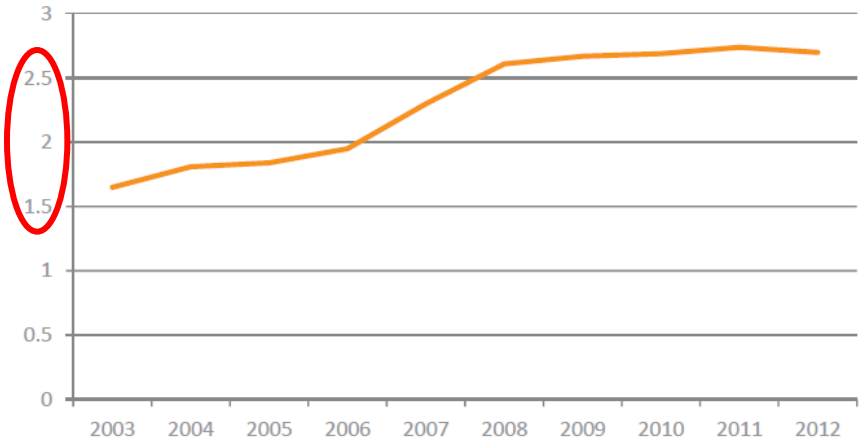
USP: Faculties, Schools & Institutes

2 Medicine
3 Dentistry
2 Pharmaceutical Sciences
2 Nursing
3 Engineering
1 Agronomy
1 Veterinary Medicine
1 Animal Production
2 Physical Education and Sports
2 Economy, Business & Accounting
2 Architecture & Urbanism
1 Biomedical Sciences
2 Mathematics, Stastistics & Computer Sciences
1 Philosophy, Letters & Humanities

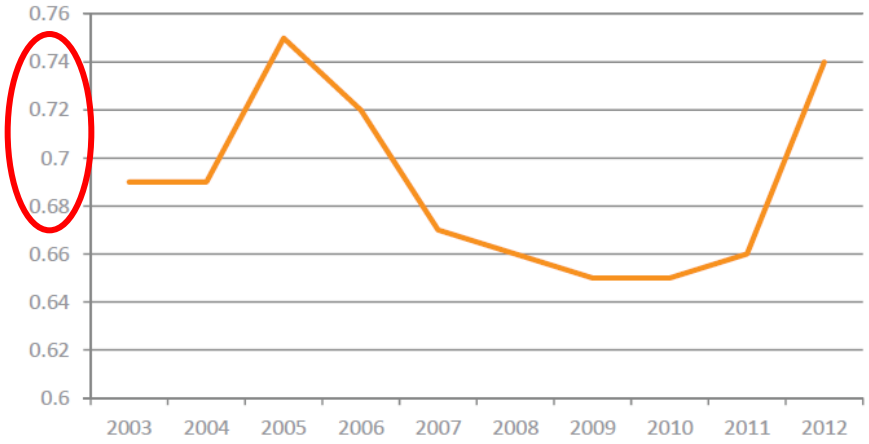
2 Law
1 Education
1 Communication & Arts
2 Physics
2 Chemistry
1 Biology
1 Sciences
1 Psychology
1 Astronomy & Geosciences
1 International Relations

Brazil: Scientific & Scholarly Research

Percent World Share of Papers in Web of Science (2003 - 2012)



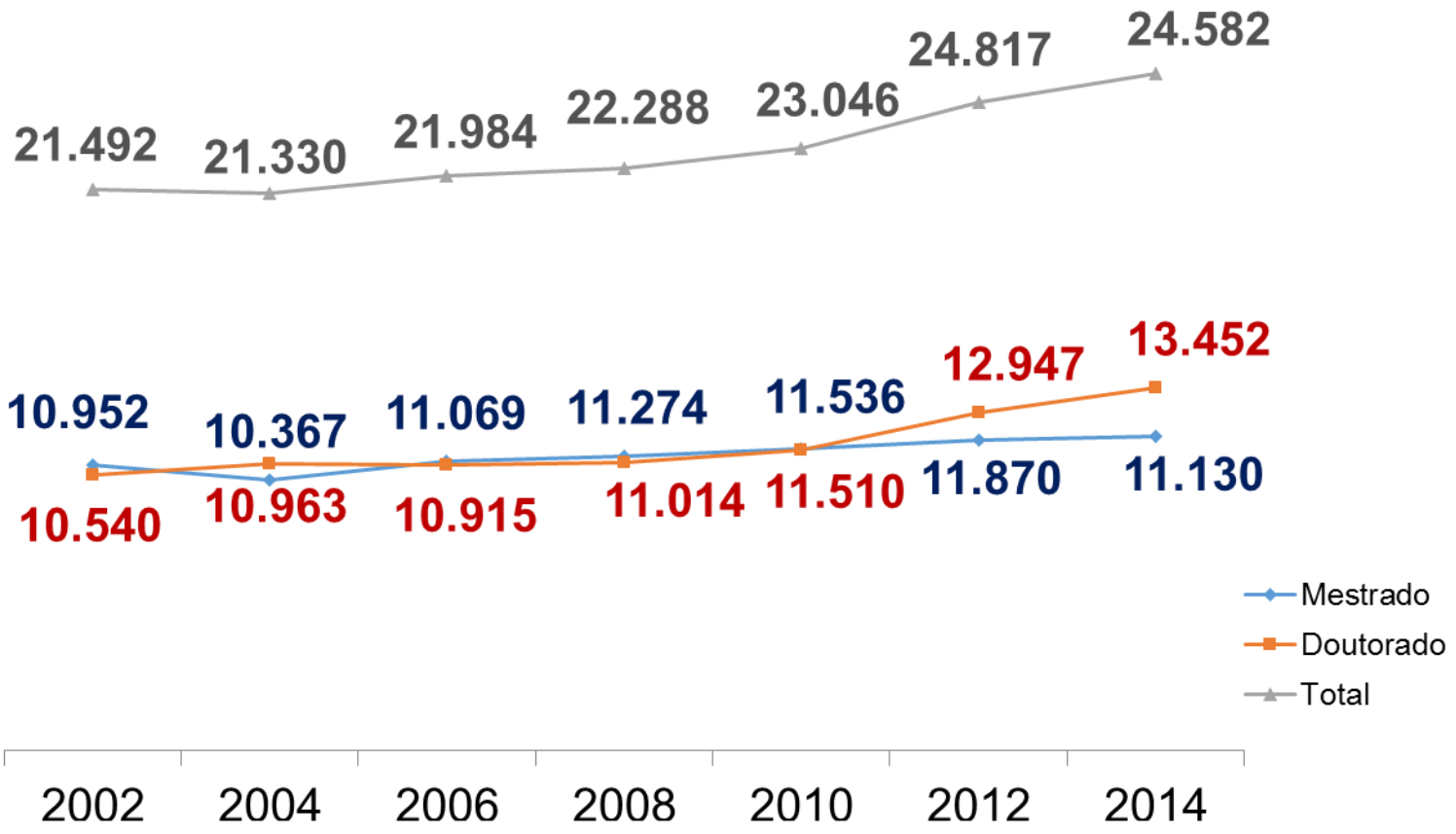
Relative Citation Impact of Papers Indexed in Web of Science (2003 - 2012)



World Average = 1

Thomson-Reuters, 2014

Masters and PhDs Students
Brazil

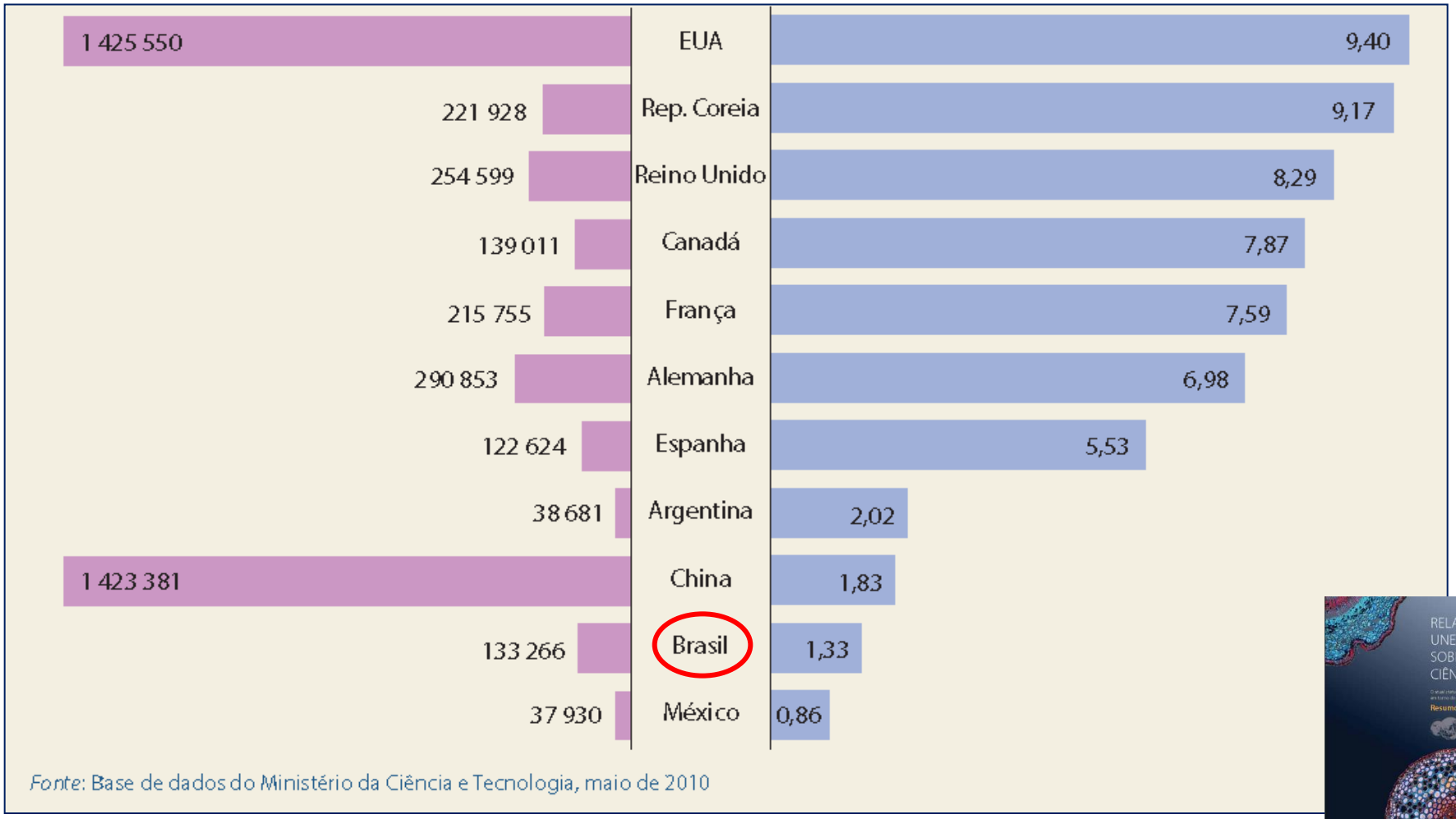


Source: Sistema Janus, 02 novembro 2014

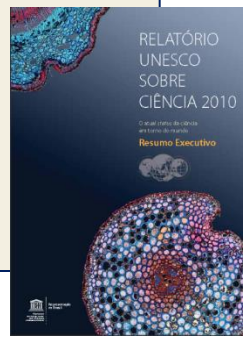
Number of Researches – Total & /1000 workers
(2008)

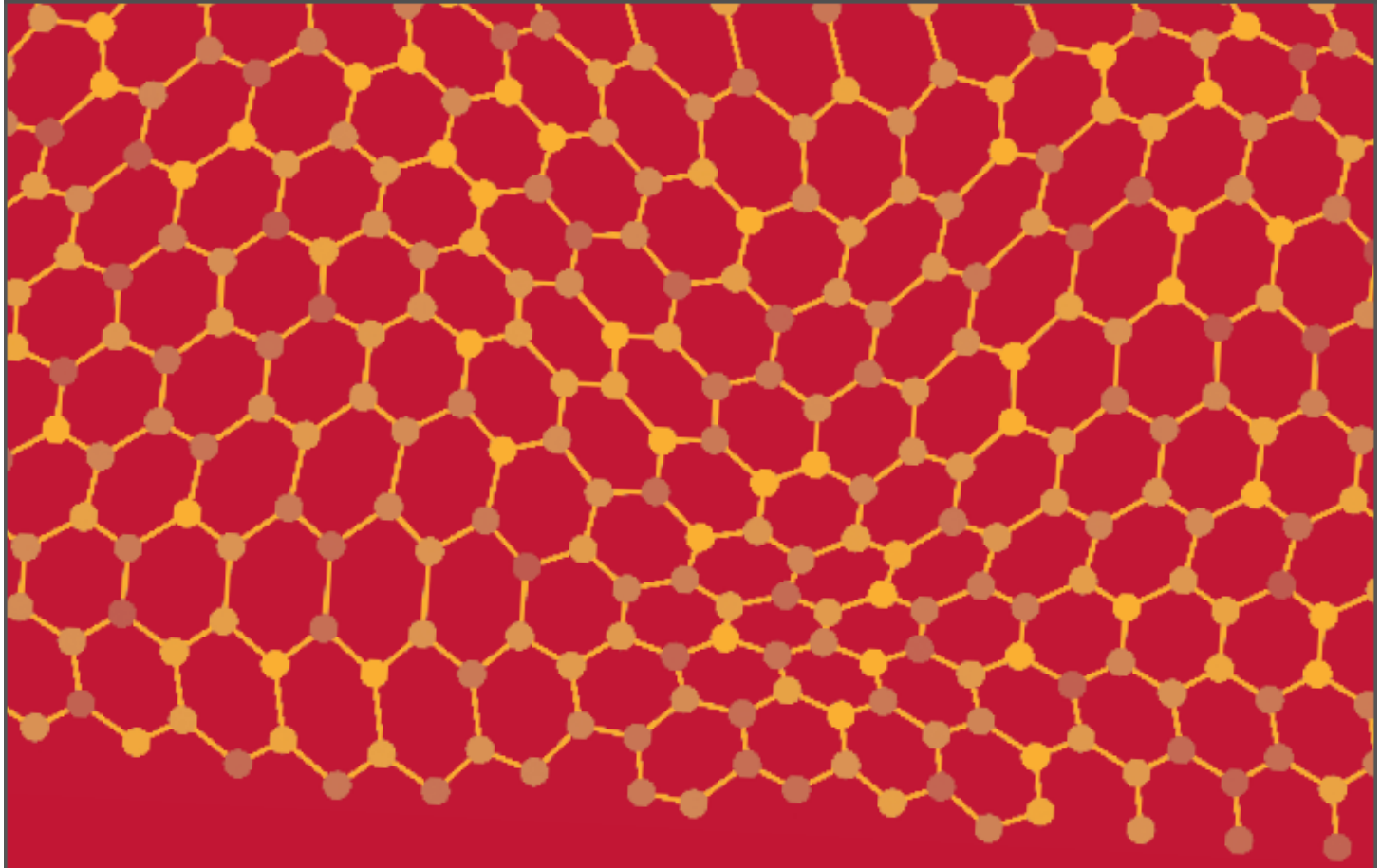
Total Researchers

Researchers/1000 workers



Fonte: Base de dados do Ministério da Ciência e Tecnologia, maio de 2010





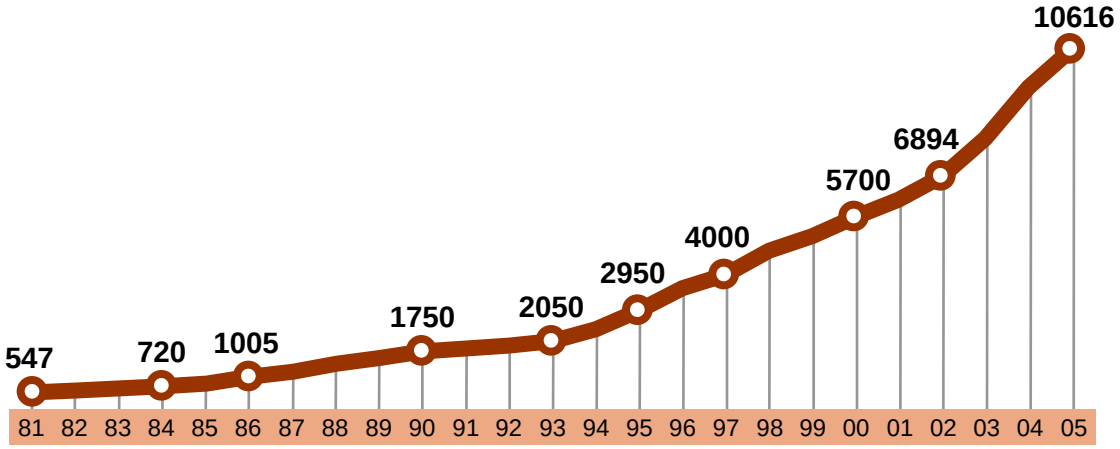
Knowledge, networks and nations

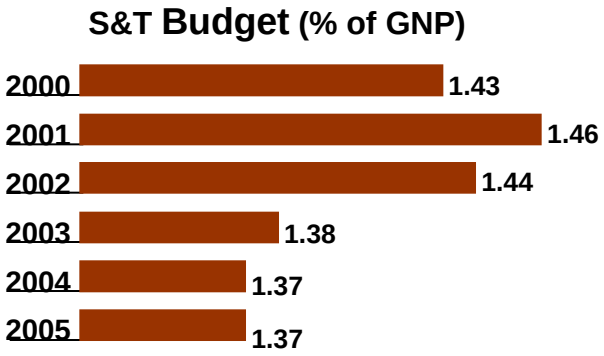
Global scientific collaboration in the 21st century

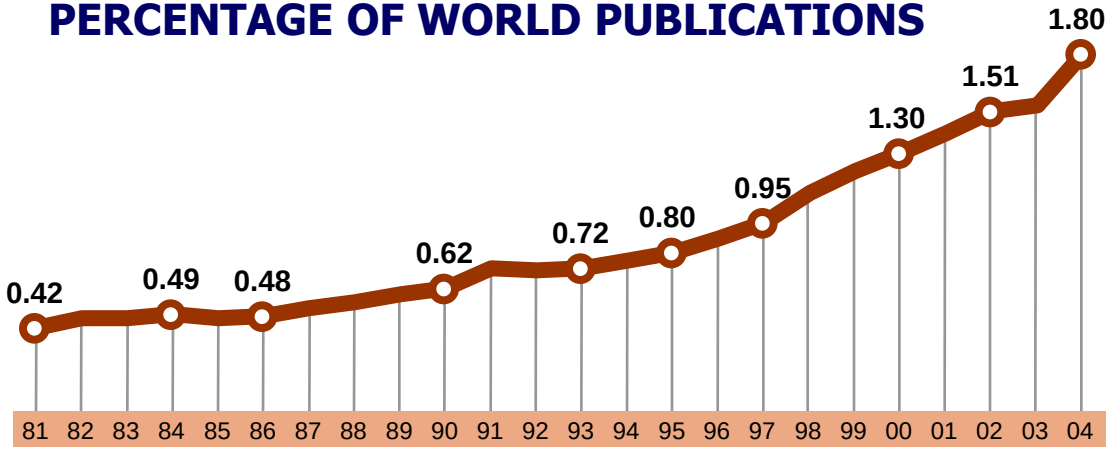
EXCELLENCE IN SCIENCE

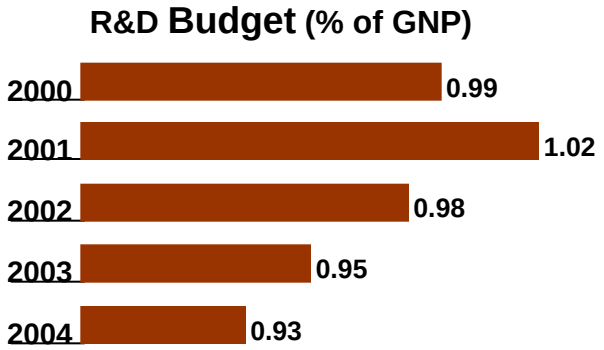
THE ROYAL SOCIETY

Number of PhDs/Year









Scholarly Research in Sao Paulo & USP in the last 30 years

Funding for Research

Relevance of the Scholarly Research

Graduate Students vs. Post-docs

Funding for Research

Relevance of the Scholarly Research

Graduate Students vs. Post-docs

Funding for Research

Relevance of the Scholarly Research

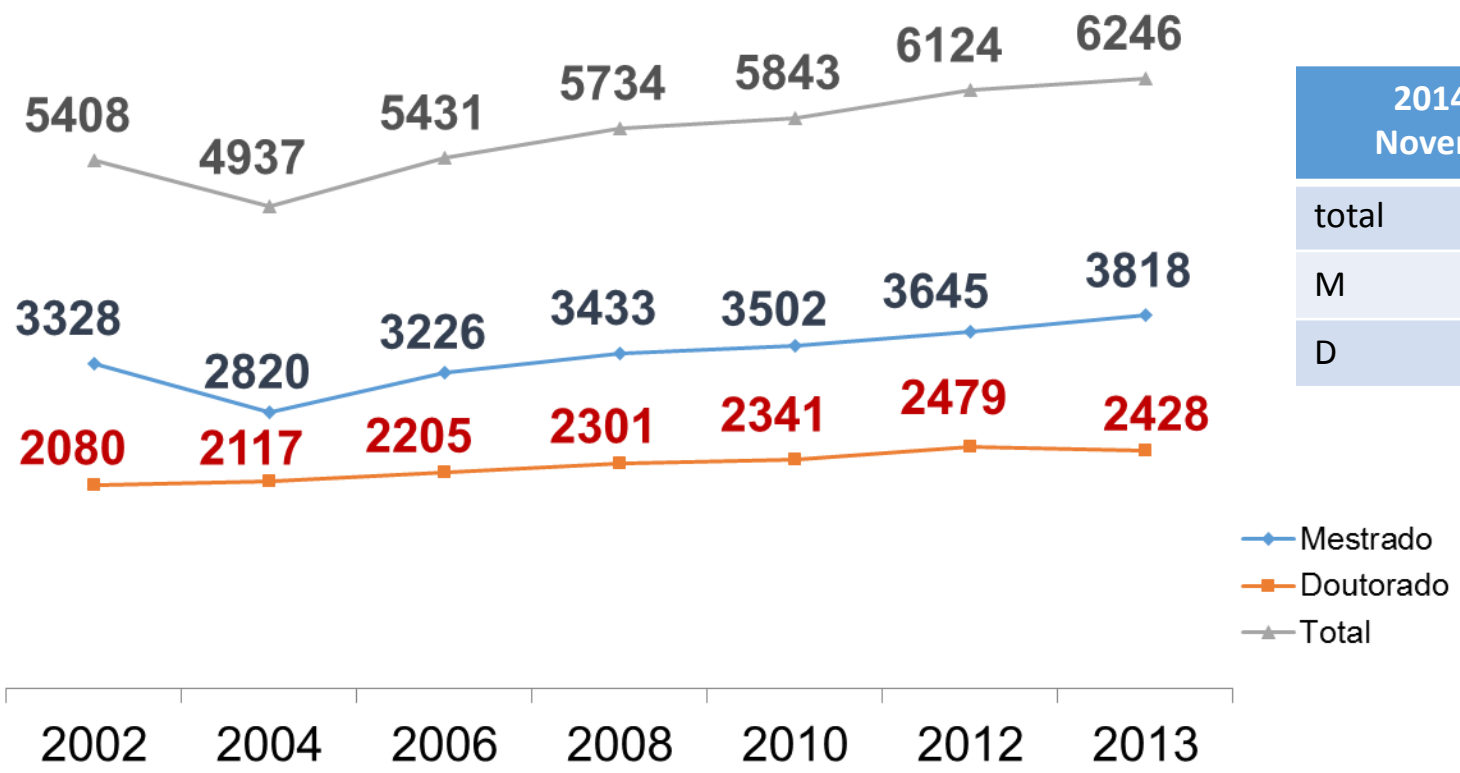
Graduate Students vs. Post-docs

Funding for Research

Relevance of the Scholarly Research

Graduate Students vs. Post-docs

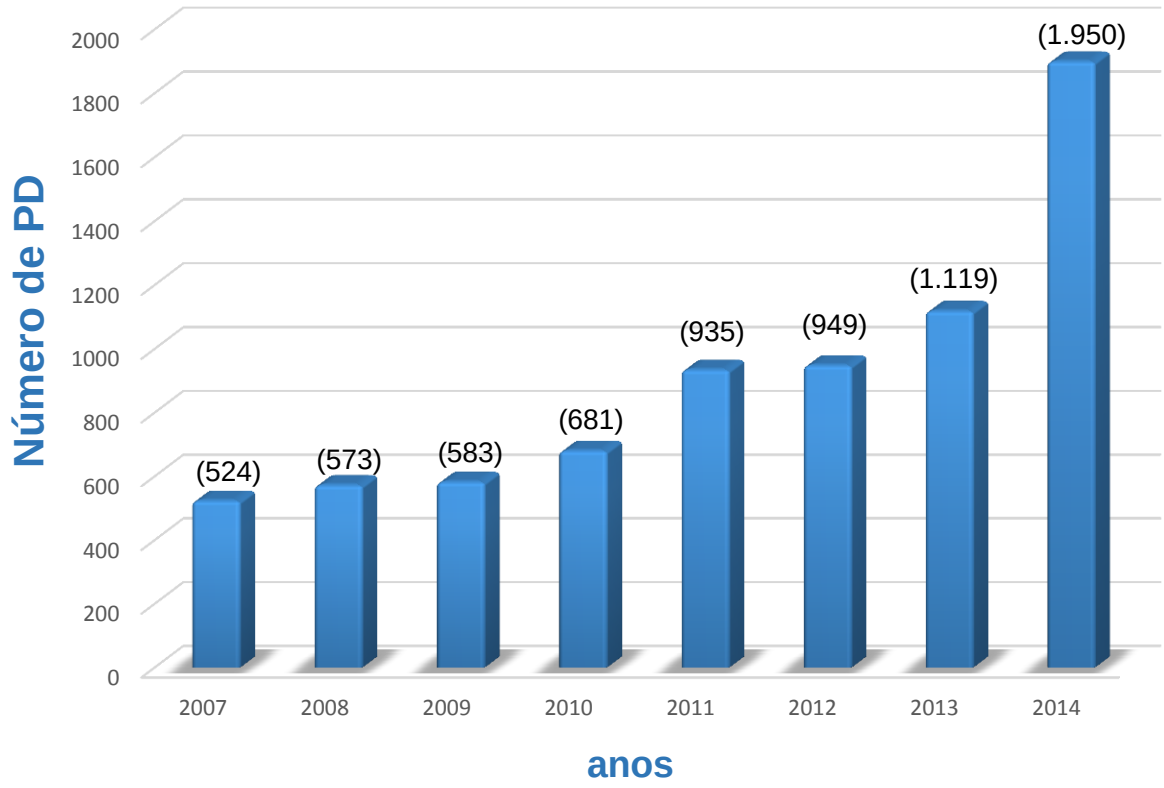
USP Masters and PhDs Awardees

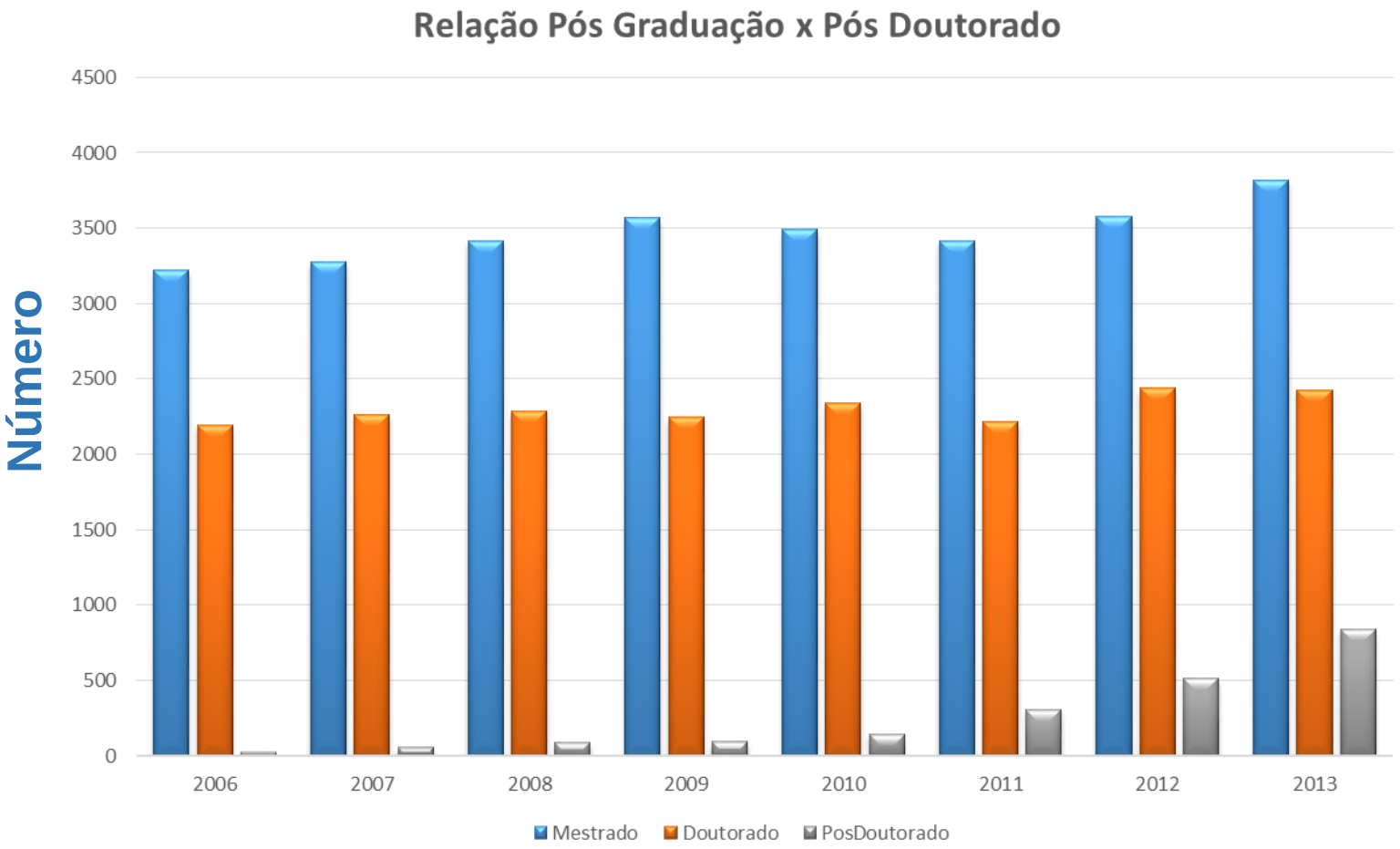


2014 till November	
total	4880
M	2808
D	2075

Source: Sistema Janus, 02 novembro 2014

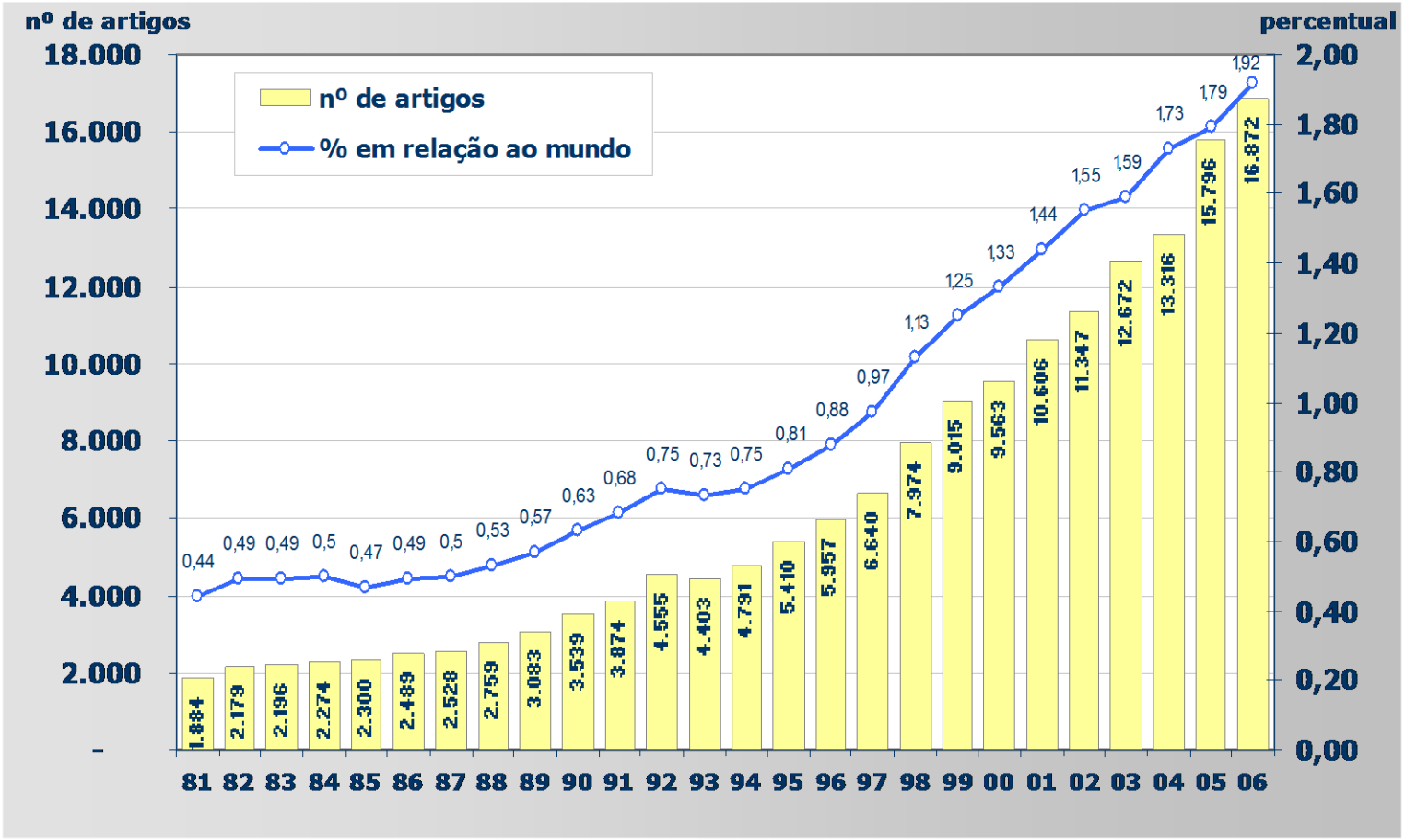
Evolução do Pós-Doutorado na USP




Relação Pós Graduação x Pós Doutorado
Número
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2006
2007
2008
2009
2010
2011
2012
2013
Mestrado
Doutorado
PosDoutorado

Scholarly Research in Brazil in the last 40 years

number of articles in international journals



fonte: ISI/NSI

Research Excellence at USP

- Context
- Challenges

Research Excellence at USP

- Context
- Challenges

UNIVERSIDADE DE SÃO PAULO

University of Sao Paulo – USP

Teaching and research units	42
Research institutes	7
University hospitals	4
Associated university hospitals	2
Museums	4

USP IN NUMBERS – 2015

(Source: Anuário Estatístico da USP 2015 – base de dados 2014)

Faculty	6.090
Non-Faculty Employees	17.190
Student enrollment	94.875
Undergraduate (1º semester)	59.081
Graduate	30.039
Master	14.130
Doctorate	15.909
Post-Docs	5.755
Students Graduated	6.890
Master Degrees Awarded	3.625
PhD Degrees Awarded	2.704
Publications	
Specialized Journals (ISI)	17.282