BIN @ Sheffield

Brazilian Innovation Ecosystem Challenges & Collaboration Opportunities Through BIN@

SHIRLEY COUTINHO
Sheffield, UK
30 October - 1 November 2017

BRAZIL Innovation Opportunities

- Brazil: huge, diverse & innovative - that few outsiders understand
- Few countries have similar resilience after experiencing deep crises & equal creativity in overcoming them
- E g: The economic recovery in the mid-1990s & the arrival in 2012 as one of the most entrepreneurial countries
- The current political crisis & its dramatic economic reversal shake the country again, but do not destroy its potential to innovate
- In the current scenario, collaboration for win-win games can emerge if business & innovation strategies are properly understood & implemented
- This session objective is:

✓ To present the unique characteristics of the Brazilian innovation ecosystem;

✓ The profile of its colossal domestic market;

✓ The challenges for TECHNOLOGICAL DEVELOPMENT, INTELLECTUAL PROPERTY RIGHTS, & INNOVATION that bring several opportunities for INTERNATIONAL PARTNERS.

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BRAZIL UNIQUE CHARACTERISTICS

- Brazil: the **fifth-largest country in the world by total area** & **occupies almost half of the entire South American continent**
- **Diversity and Creativity**
- **Global Value Chains**:
  - ✓ **Current:**
    - **Information Technology (including Communication);**
    - **Biopharmaceuticals;**
    - **Oil & Gas;**
    - **Aircraft (Embraer);**
    - **Agriculture;**
  - ✓ **Future:**
    - **Creative Industries;**
    - **Education;**
- **Brazilian Characteristics**: **10 global lead firms produce in Brazil**, e.g. Samsung, Apple, GE, HP, Siemens, Hitachi, Sony, Panasonic (2014)

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BRAZIL UNIQUE CHARACTERISTICS

- **Brazilian market (Source: Apex Brazil)**
  http://www.apexbrasil.com.br/discover-brazil
  - ✓ **2nd largest market for beauty and healthcare products;**
  - ✓ **3rd largest market in the world for computers** (**behind US & China**);
  - ✓ **5th largest market in the world for mobile handsets (2014);**
  - ✓ **5th largest for medical equipment.**
- **Strong financial sector**
  - ✓ The most solid and prudently regulated financial sectors in the G20 (Source: Apex Brazil)
- **Domestic lead firms** (e.g. Positivo) **remain focused almost entirely on the domestic market**
- **Barriers**:
  - » **High interest rates;**
  - » **Antiquated labor laws and tax codes;**
  - » **Crumbling or non-existent infrastructure;**
  - » "**Brazil cost**" very high & often passed on to final consumers.

Historical Evolution of IP in Brazil

1808 Arrival of the Portuguese Court

1809 Industrial Incentives - Inspiration: UK

1822 Independency

1824 1st Constitution-Inventors Rights Protected

1830 1st Law for Industrial Privileges

1882 New Patents Law: 3 years rights

1883 Paris Convention

(Brazil in the first group to subscribe it)

1970 Law 5.648/11.12.1970

INPI INSTITUTO NACIONAL DA PROPRIEDADE INDUSTRIAL

Brazilian Strategic Actions for Science & R&D Capacity Building

CNPq
Conselho Nacional de Desenvolvimento Científico e Tecnológico

The Brazilian National Council for Scientific and Technological Development, linked to MCTI (Ministry of Science, Technology and Innovation)

1950´s decade

CAPES

Government agency linked to the Brazilian Ministry of Education in charge of promoting high standards for post-graduate courses in Brazil

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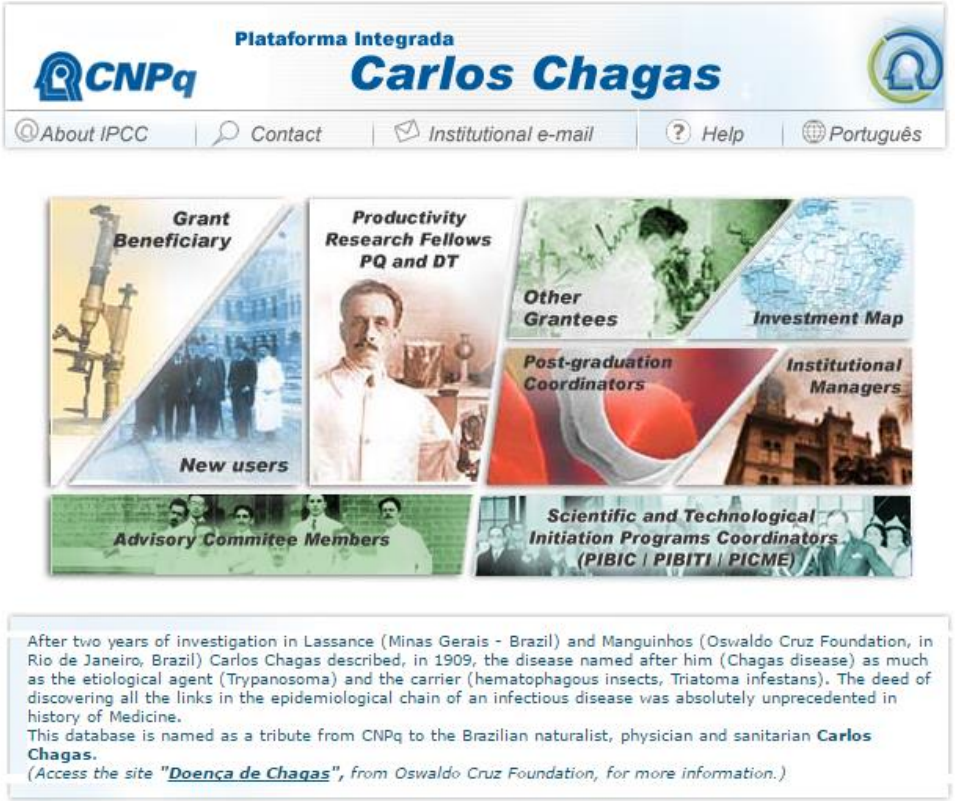
Brazilian Strategic Actions for Science & R&D Capacity Building

Named after the Brazilians physicist, **Cesar Lattes**, & physician **Carlos Chagas**

http://lattes.cnpq.br/



http://carloschagas.cnpq.br/

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University Mission

Science&R&D Incentives & Support

- Until the 60's: Teaching was the University Mission
- 1975: Expansion of the University Mission

  Creation of the National Graduation System

- 1970/1980

  Considerable Investment in Science &Technology without Articulation with Technological Development & Innovation

- 1990

Specific programs and Institutions created: PADCT (TIB), FINEP to Increase Technological Capability in Industry

- 1996-1998 – New IP Legal Framework
  (Industrial Property, Authors Right, Software, etc.)
- 1998/1999
- Government Programs to SURPASS the TECHNOLOGICAL GAP

Special R&D Funds Created & Implemented
Collaboration between Universities/R&D Centres & Enterprises
Recognition of the University third Mission

Source: M. Elizabeth Ritter dos Santos
President of FORTEC - 2006/2010

University 3rd Mission
Collaboration with Enterprises
The case PUC-Rio

PARTNERSHIPS

The large number of partnerships and agreements in which PUC-Rio participates evinces not only the extent of the university integration into the Brazilian society but also the degree of trust that it shares with other institutions as a serious model of education and research.

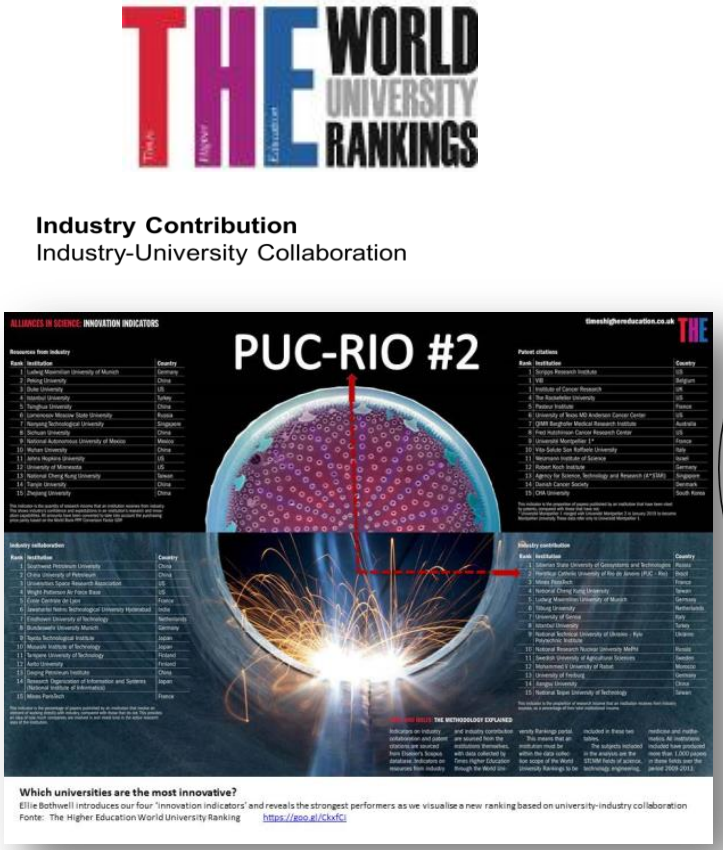
These partnerships create countless advantages for students and faculty.

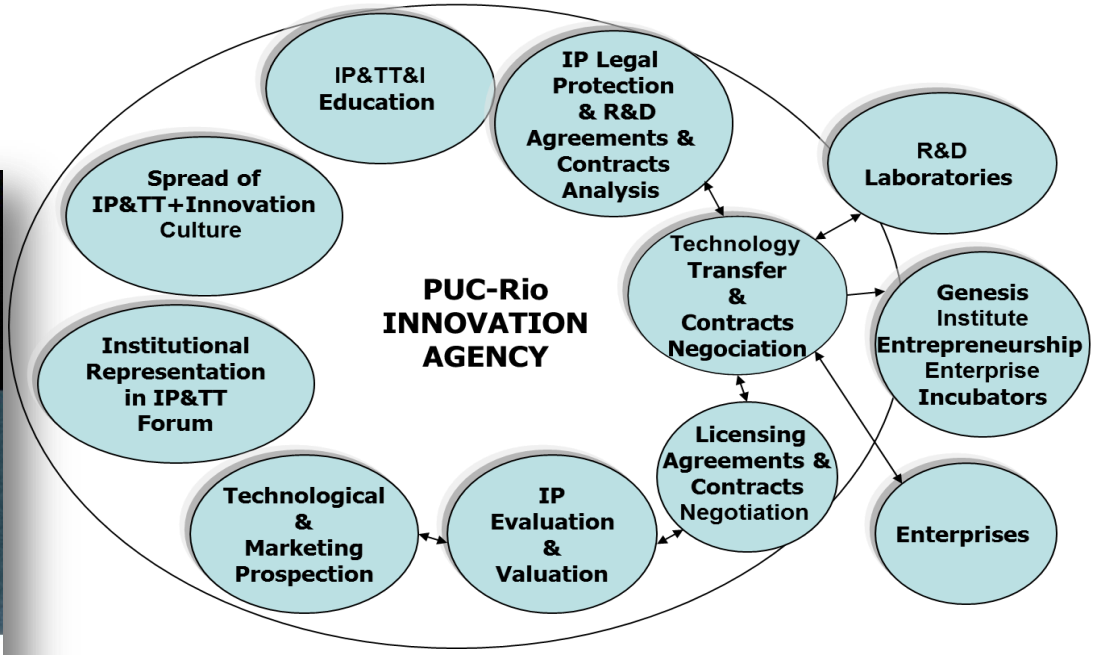
Some of PUC-Rio's main partnerships:

- **Oil & Gas companies**
  Research and work comprising the whole production chain of gas and petroleum, presenting students with the most modern innovations in these fields.
- **Eletrobras**
  Carries on analyses related to the consumption of electrical power in Brazil.
- **ICT companies, Globo Network, Vale do Rio Doce, Thyssenkrupp, Gerdau Group, Peugeot-Citroen do Brasil, among many others.**

  … over 300 current R&D contracts.

University 3rd Mission
KTT → Innovation
The case PUC-Rio





https://www.linkedin.com/in/yoguir/

http://www.agi.puc-rio.br

Collaboration

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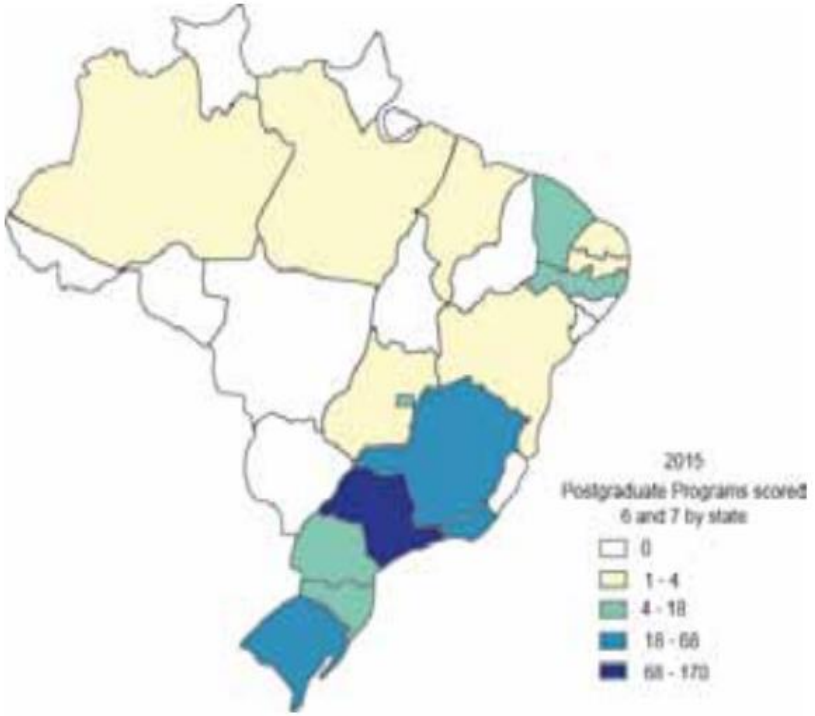
CAPES EVALUATION SYSTEM

- **All postgraduate programs in Brazil are evaluated every four years.**
- **The system is unique all over the world.**
- **But, improvements are required:**
  - ✓ **Motivation for products and patents;**
  - ✓ **Incentives for new areas (e.g. games, interface,..);**
  - ✓ **Reviews of the definition of Interdisciplinarity;**
  - ✓ **Strategic planning (what do we want in the next 15, 25 years?)**
- **The excellence programs graded 6 and 7 are present in all regions of the country.**



Source: geocapes.capes.gov.br

FIGURE 01: Geographical distribution of Excellence (Grades 6 and 7 as classified by CAPES evaluation system) Grade Brazilian Post-graduate programs in 2015

Brazilian Strategic Actions for Science & R&D Capacity Building

Brazilian GAP - Scientific Knowledge but Innovation?

R&D & Innovation	Brazil X World
PIB	2%

More then 200.000 researchers

Scientific Publications	2,1%

But

Patents/Innovation	0,2%

BRAZILIAN STRATEGIC ACTIONS for IPR & TT & Innovation

- **2002**: **26 IP&TT Offices** in Brazilian **Universities** & R&D **Centres** **(Survey of INPI & FINEP)**
- **2004: "Innovation Law"** Law 10.973/2004 **- Incentive for Innovation in the Productive Sector**;
- **2006: FORTEC established on May 1st, with 43 affiliates**;
- **FORTEC**: **Representative body** of **TTO/KTO** from **Public** & **Private Universities, Research Centres, Enterprises and Individuals** working with **Innovation Policies &** Activities related to IP &TT Management;
- **FORTEC Goals**: **Commitment with the dissemination, promotion, and enforcement of the culture and polices, as well as in Education for management and technical capacity building concerning to IP & TT & Innovation** for the TTO in Universities, Research Centres & Enterprises.

www.portalfortec.com

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BRAZIL
Innovation Trends & Pitfalls

- **Innovation Law & Fiscal Incentives Law** enacted but:
- ✓ Lack of Law Enforcement;
- ✓ Difficult Management of IP co-ownership;
- ✓ Lack of Professional Capacity at the Legal and Governmental Entities, Enterprises and NIT/TTO;
- ✓ Very high expectation on royalties income;
- ✓ Lack of IP Cultural Knowledge in ICT & most Enterprises;
- ✓ Lack of Lab-infrastructure outside ICT & High Potential of Conflict of Interests;
- ✓ Lack of Proof of Concept Funds pre-Tech Transfer of the early stage technologies.

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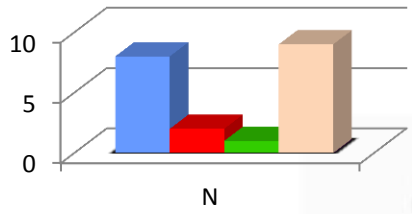
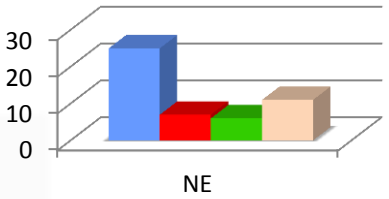
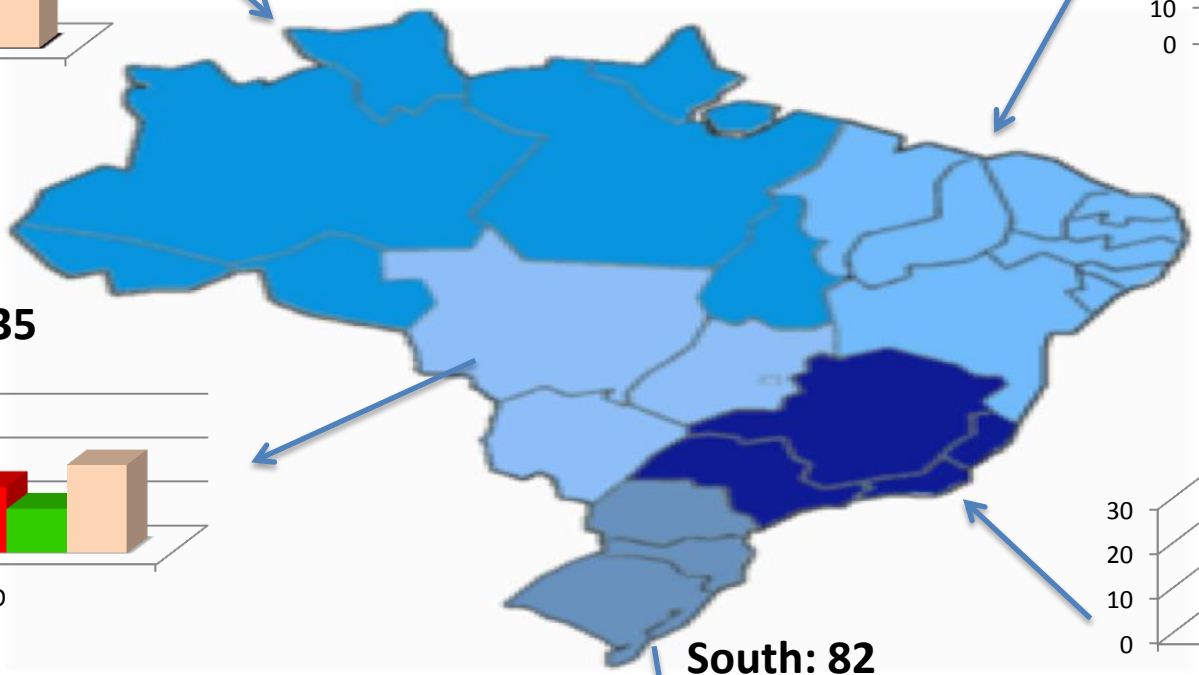
FORTEC - created in 2006 with 43 affiliates & 406 in 2017

North: 54

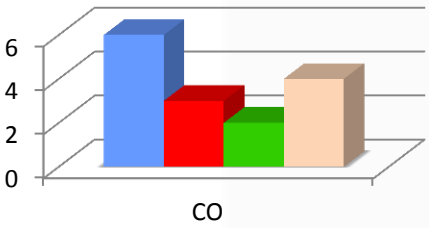


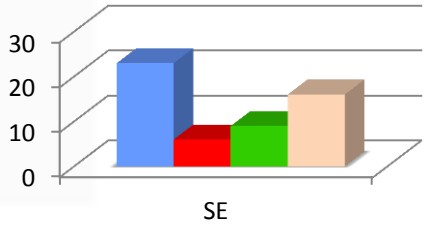
North East: 114





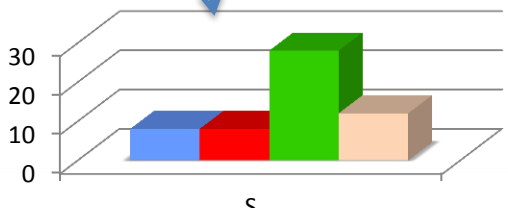
Middle West: 35





South East: 121

South: 82



Federal

Estate

Private/Communitarian

Individuals

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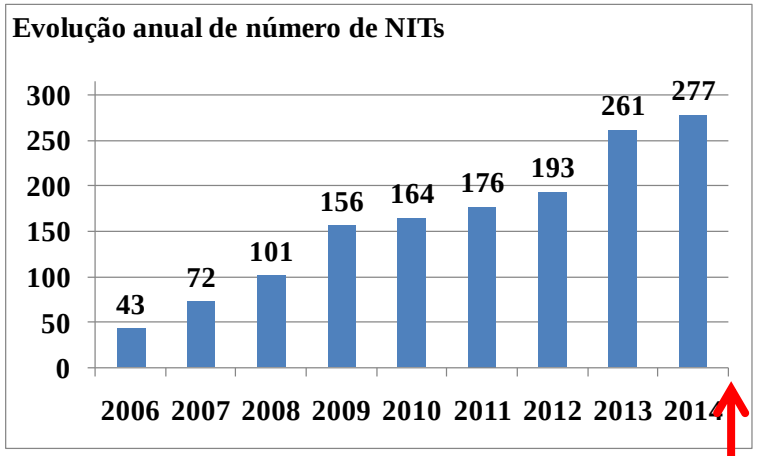
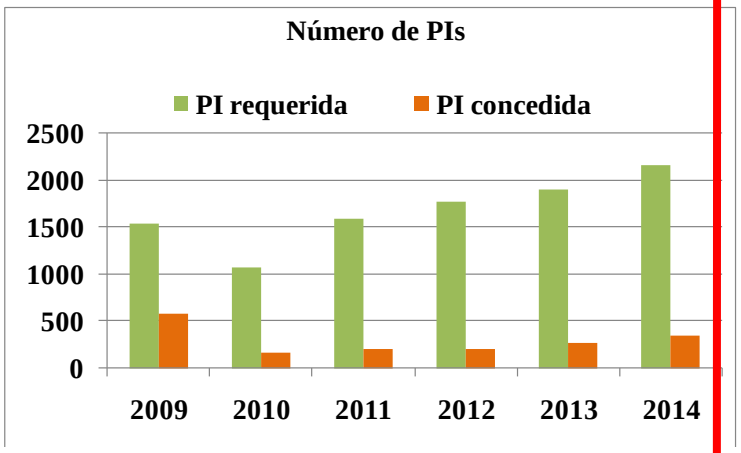
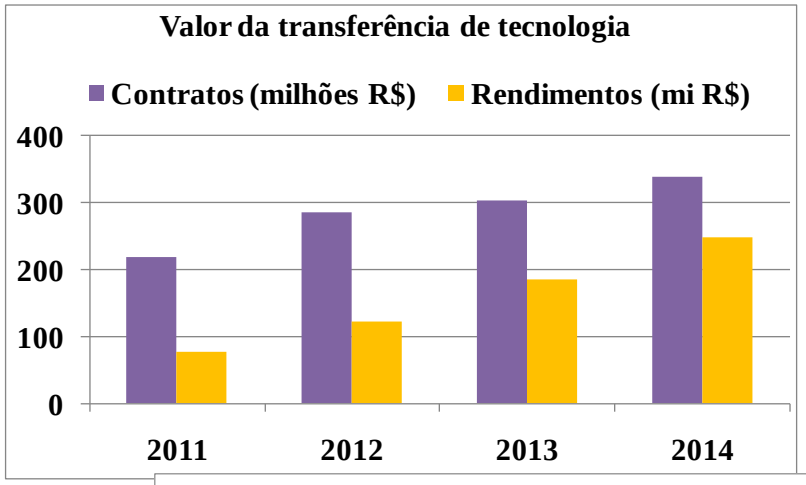
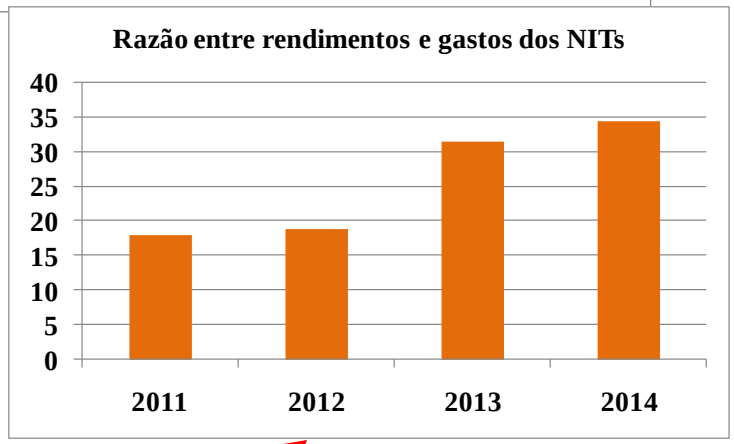
Intellectual Property Rights
Technology Transfer & Innovation in Brazil







Increasing 30% per year



Increasing Sistem not yet stabil ...

Cost-benefit Positive & annualy increased

Fonte: Quintella, C.M., Andrade, R., 10 anos da estratégia de estado para consolidação do sistema nacional de inovação brasileiro: contribuição dos núcleos de inovação tecnológica (NITs), ALTEC 2015

IPR & Innovation Capacity Building

Proposal: V FORTEC 2011
Work Plan: 2014-16
Candidats: 1.200

Ministério da Ciência e Tecnologia

BRASIL UM PAÍS DE TODOS

PROFNIT

Professional Master in IP&TT&I for NIT Managers, through a NATIONAL Network

CAPES

APCN 367/2014 Approved by CAPES

Proposed by: FORTEC

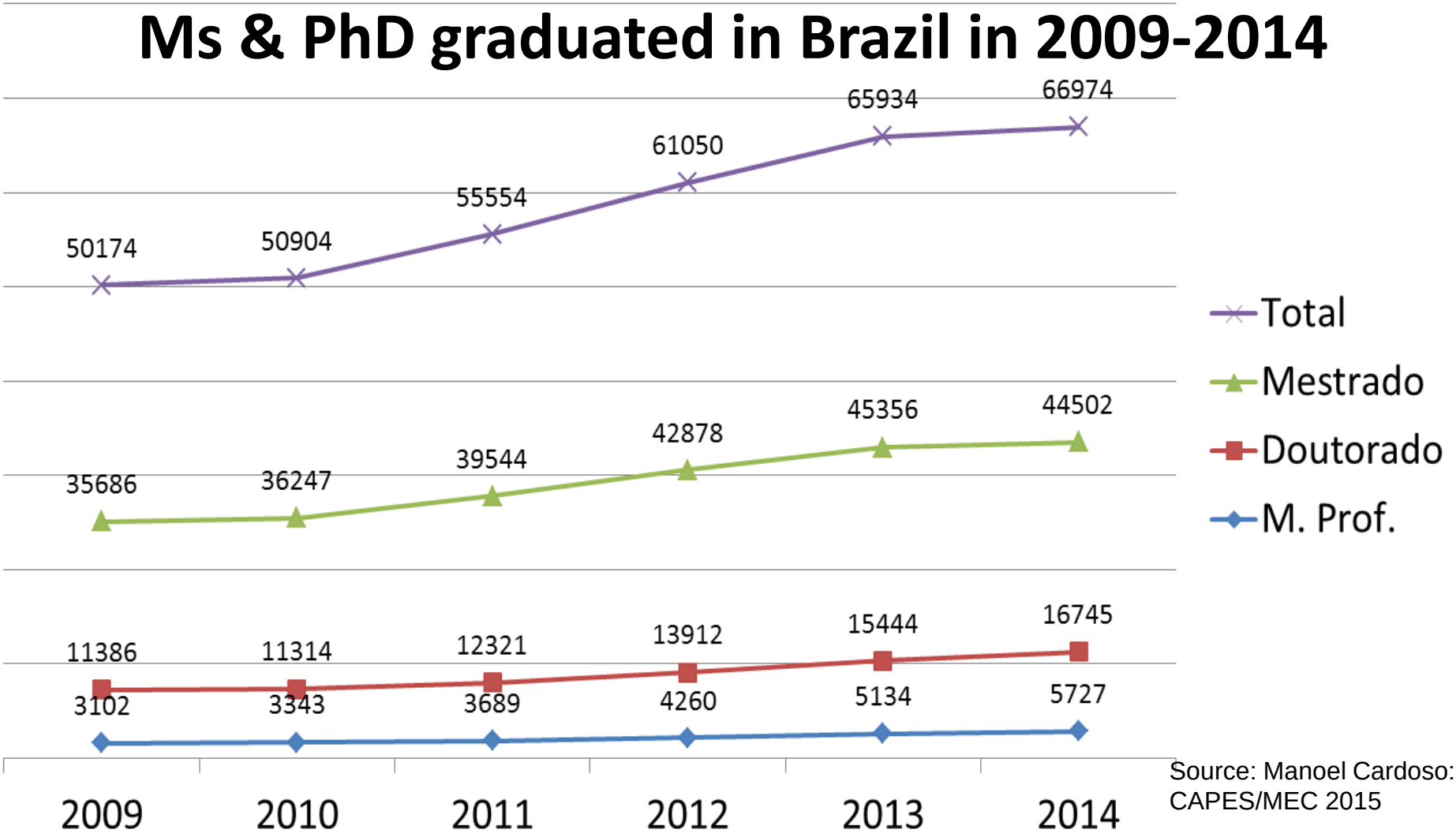
fortec

Due Diligence: Initial headquarters UFBA

Has now 13 Focal Points all over the Country

Brazilian Strategic Actions for Science & R&D Capacity Building

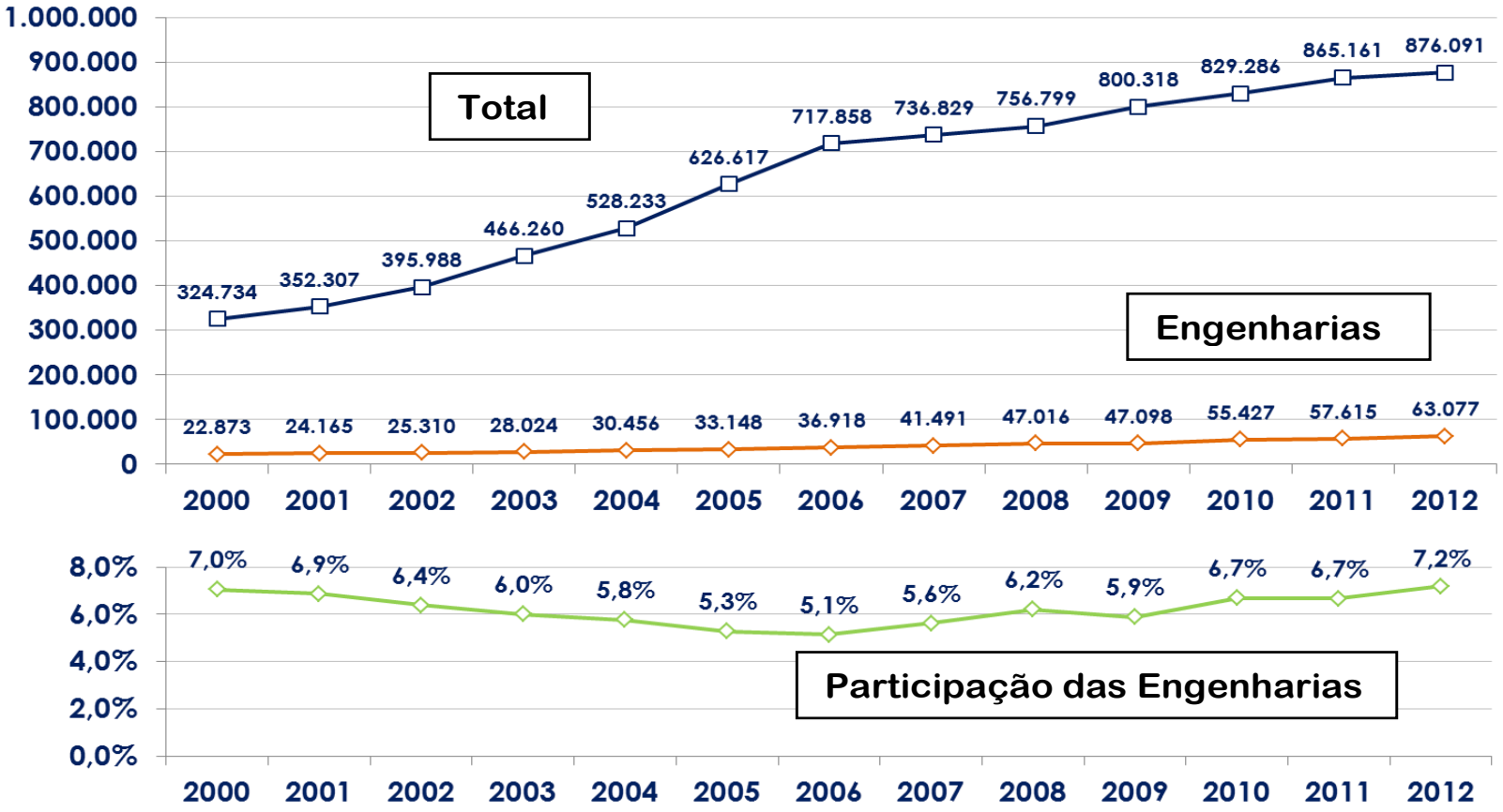
Ms & PhD graduated in Brazil in 2009-2014



Source: Manoel Cardoso:- CAPES/MEC 2015

Brazilian Strategic Actions for Science & R&D Capacity Building

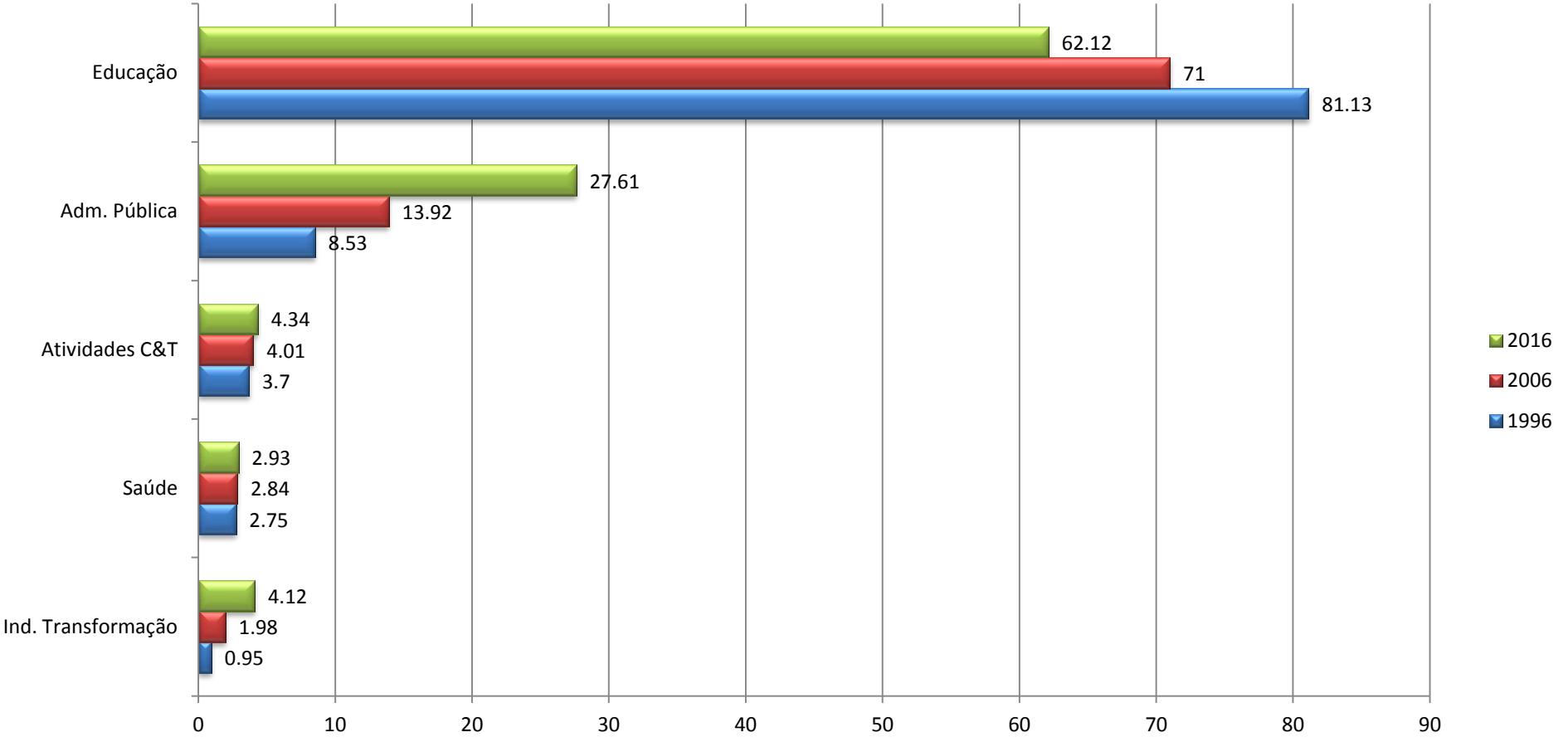
Total of Students graduated & in Engineering



Fonte: INEP/MEC

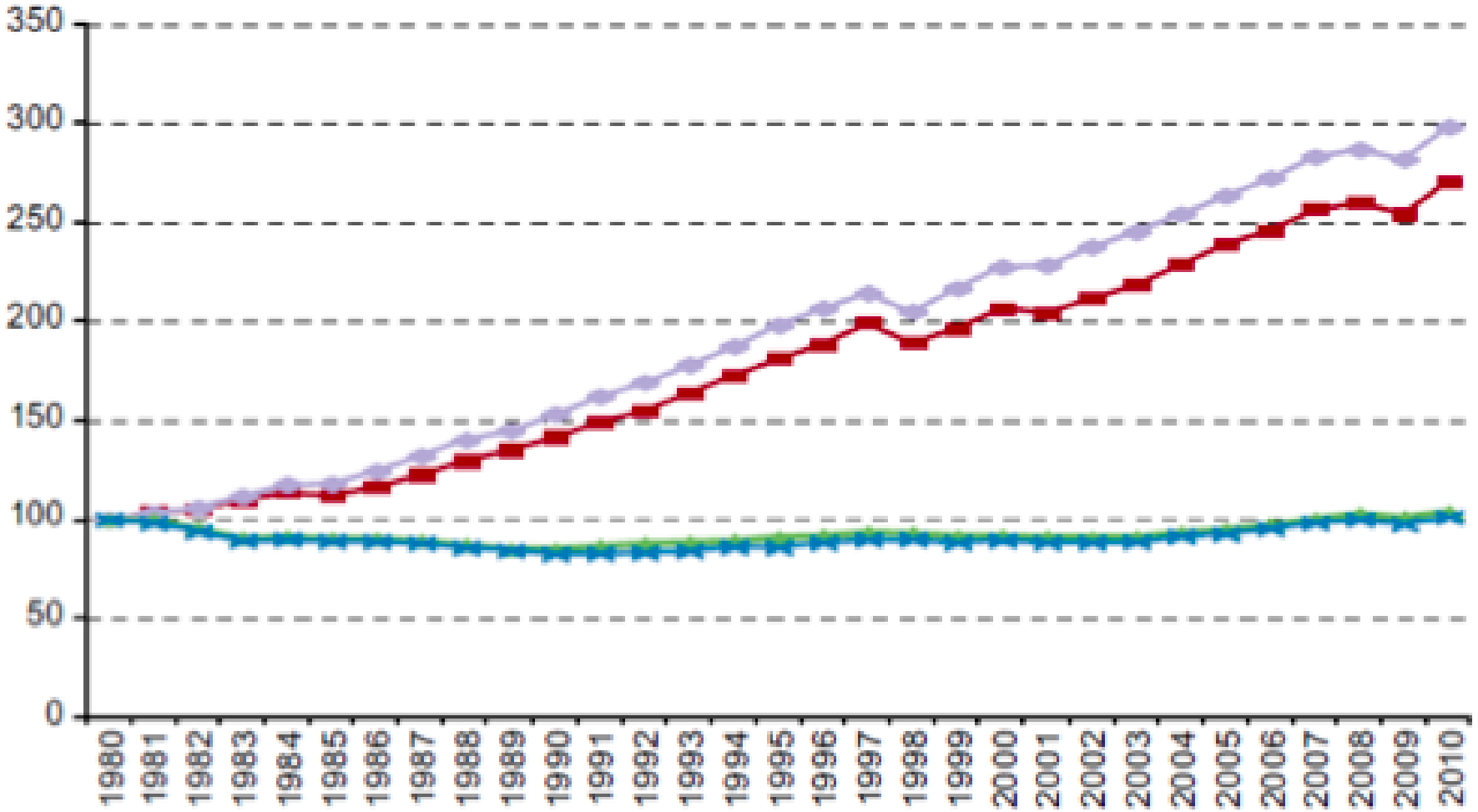
Brazilian Strategic Actions for Science & R&D Capacity Building

Where are going the Doctors (PhD)?



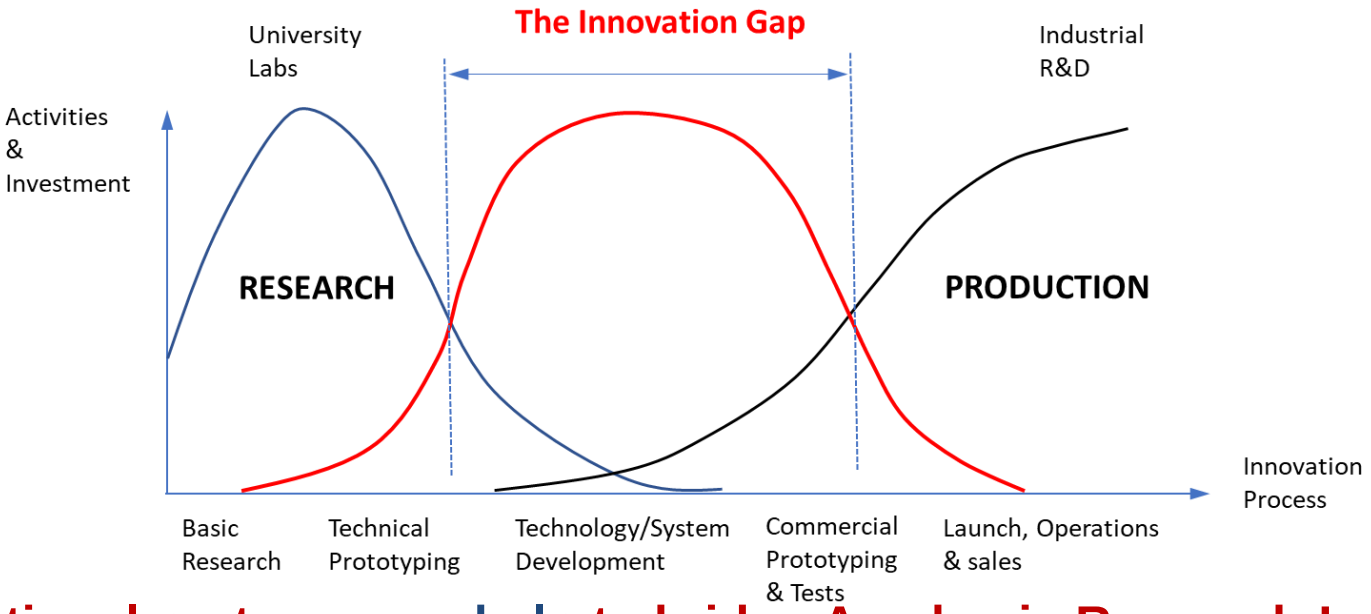
Source: Manoel Cardoso based on CAPES data - RAIS (MTE) 2008 e CGEE 2010.

Productivity & Innovation challenges of the Brazilian Economy



PROPOSAL: BRIDGING THE GAP

The innovation Gap (the "valley of death")



- **International partners can help to bridge Academic Research Labs with Industrial R&D**
- **In US, the innovation gap is partially bridged by the NNMI (Network of Research Institutes).**
- **In Brazil, SENAI created 21 SENAI Innovation Institutes (ISI – Instituto SENAI de Inovação), modeled after Germany's Fraunhofer Institutes & based on models by MIT Industrial Performance Center. However, the ISIs must expand towards universities and be part of a broader Innovation Ecosystem.**
- **EMBRAPII is part of the Brazilian Innovation Ecosystem.**

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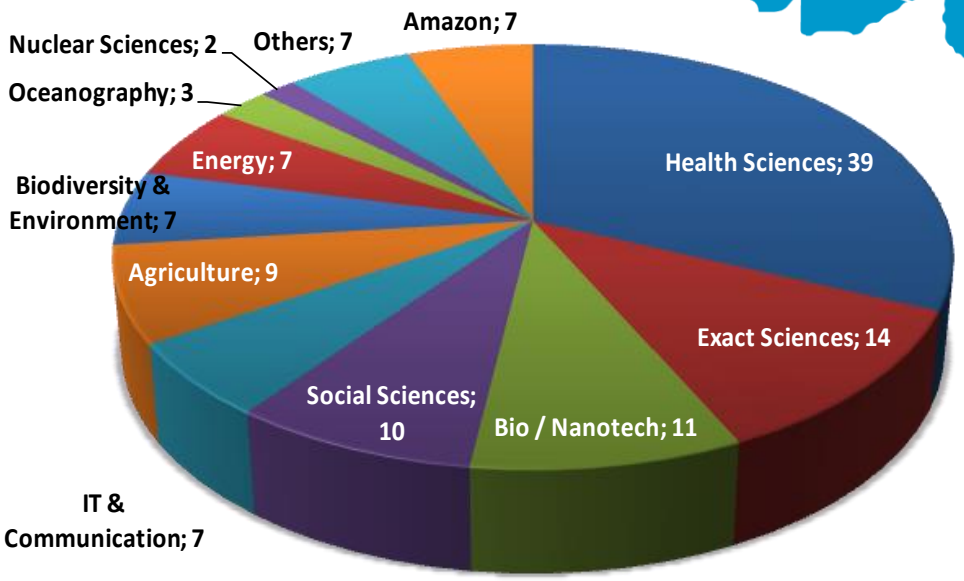
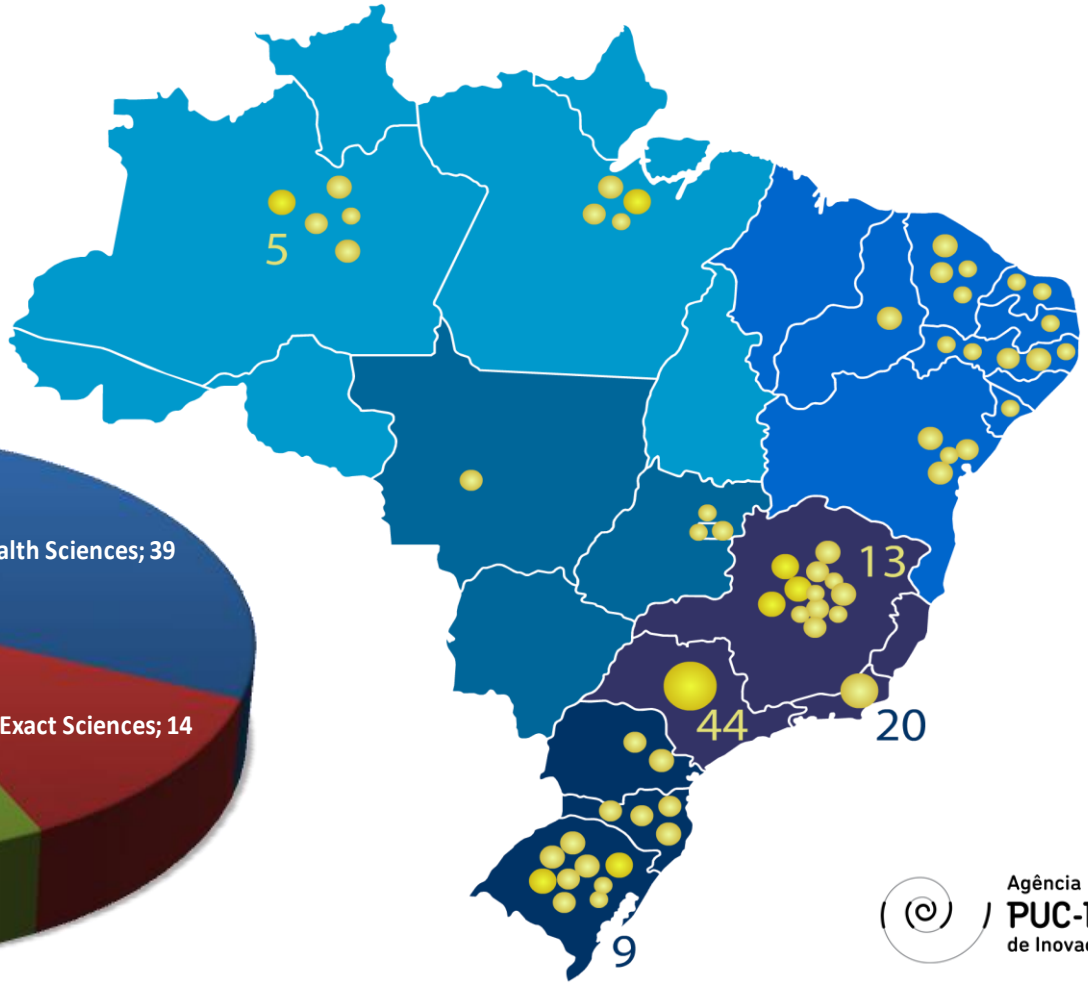
Brazilian Strategic Actions for Science & R&D

123 Science & Technology National Institutes

inct
institutos nacionais
de ciência e tecnologia

CNPq
Conselho Nacional de Desenvolvimento Científico e Tecnológico





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PROPOSAL: CREATING & INCREASING THE FLOW

In Brazil, the main players in the Innovation Ecosystem have weak flow or no flow between them, except between universities & startups, & between OEM & SME.

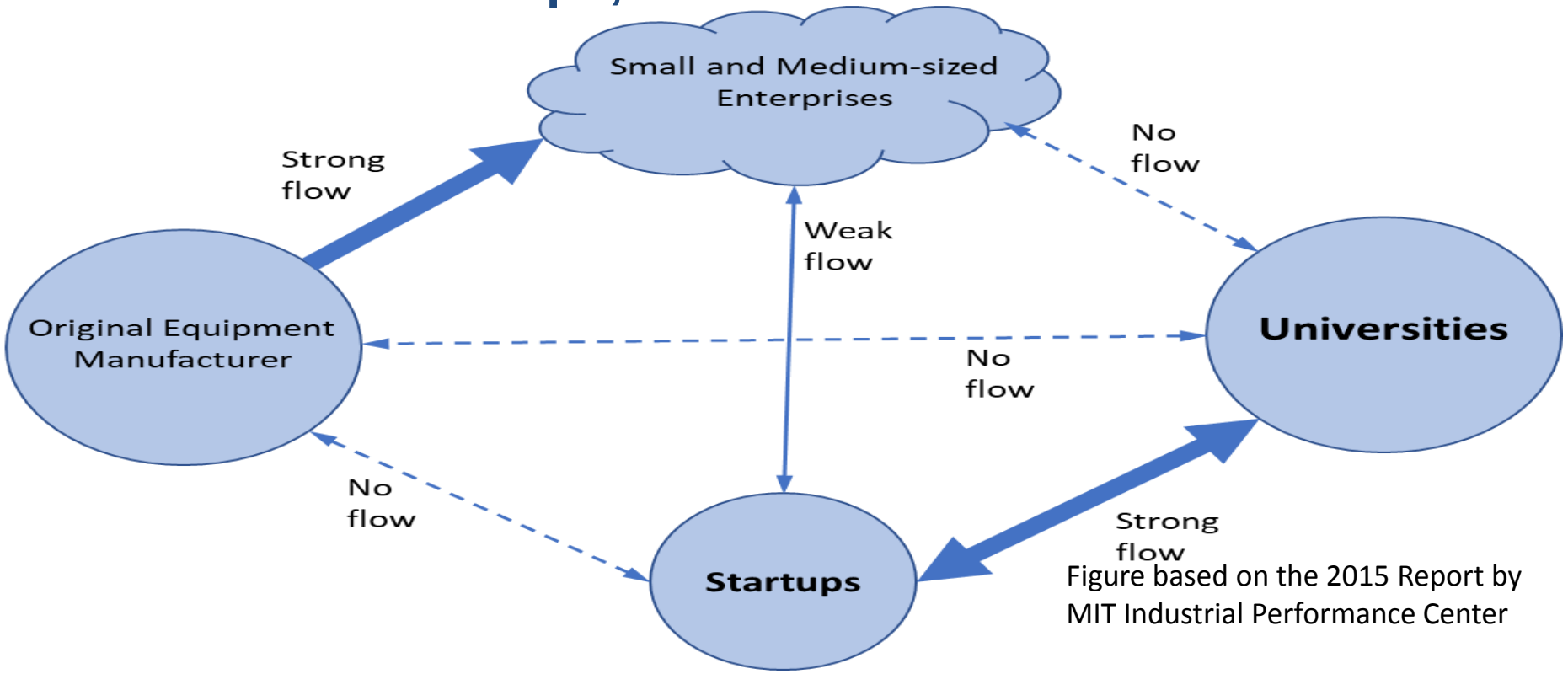
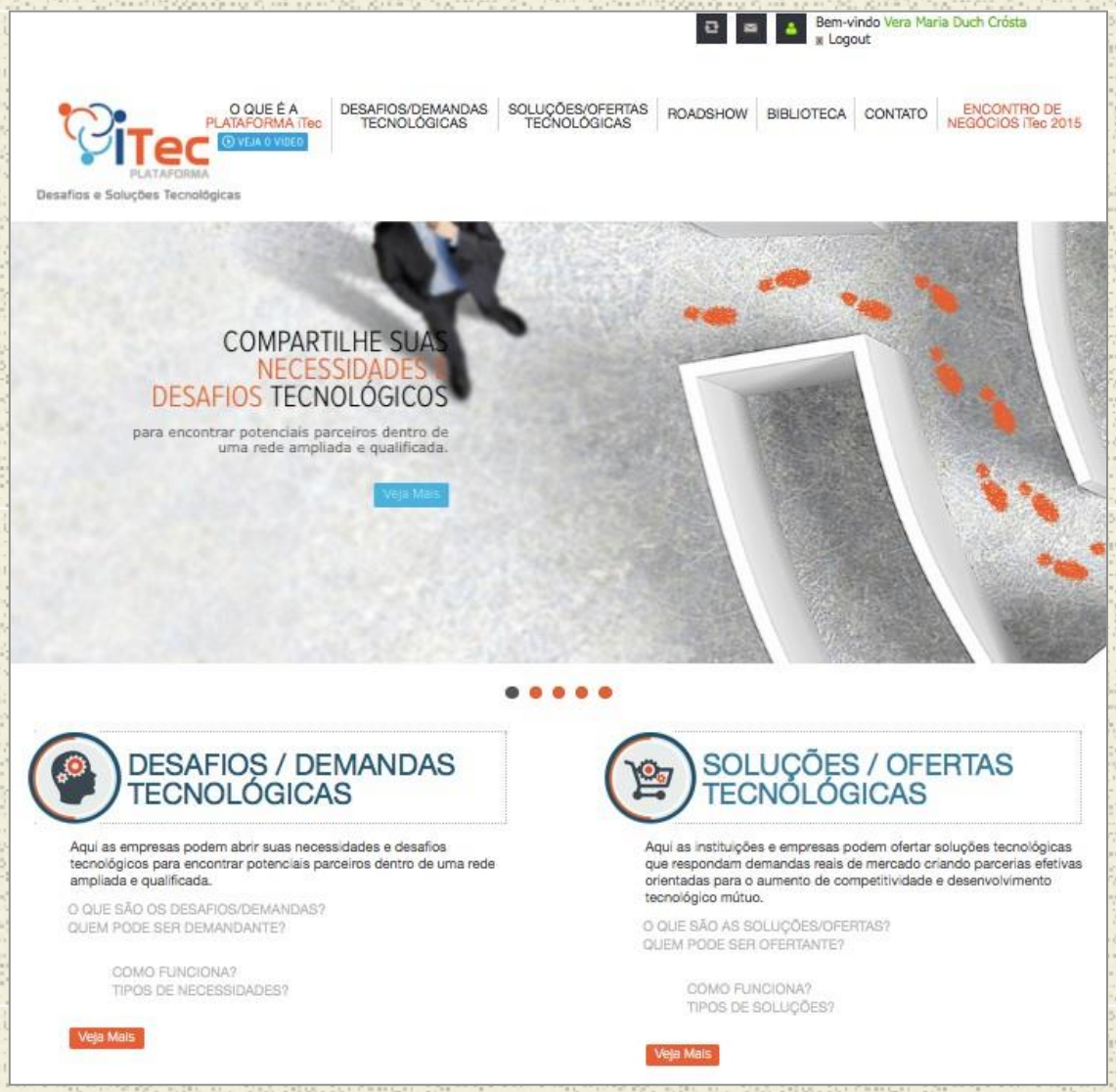


Figure based on the 2015 Report by MIT Industrial Performance Center

International partners can help us to create & increase flow between players.

ITEC Platform-Innovation Matchmaking



April/2015:

48 CHALLENGES
(From 15 Enterprises)

278 SOLUTIONS
(From 80 Solution Providers)

250 *encounters*

ANPEI Coordination

http://www.plataformaitec.com.br

PROPOSAL: IMPROVING EDUCATION

- **Innovation starts in the Secondary School.**
- **Integrating standard curriculum with Technical Training.**
- **Integrating Secondary School with Universities, as part of the Innovation Ecosystem.**
- **Introducing Computational Thinking,**
  Programming, Economics & Citizen Statistics for all.
- **New models of teaching based on Gamification and flipped classroom.**

Thank you!

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