

Innovation Support Ecosystems in Europe and the Americas | Insights on Incubation and Internationalisation Programmes in Europe, Brazil, USA and Costa Rica

Science and technology parks ecosystem in Brazil

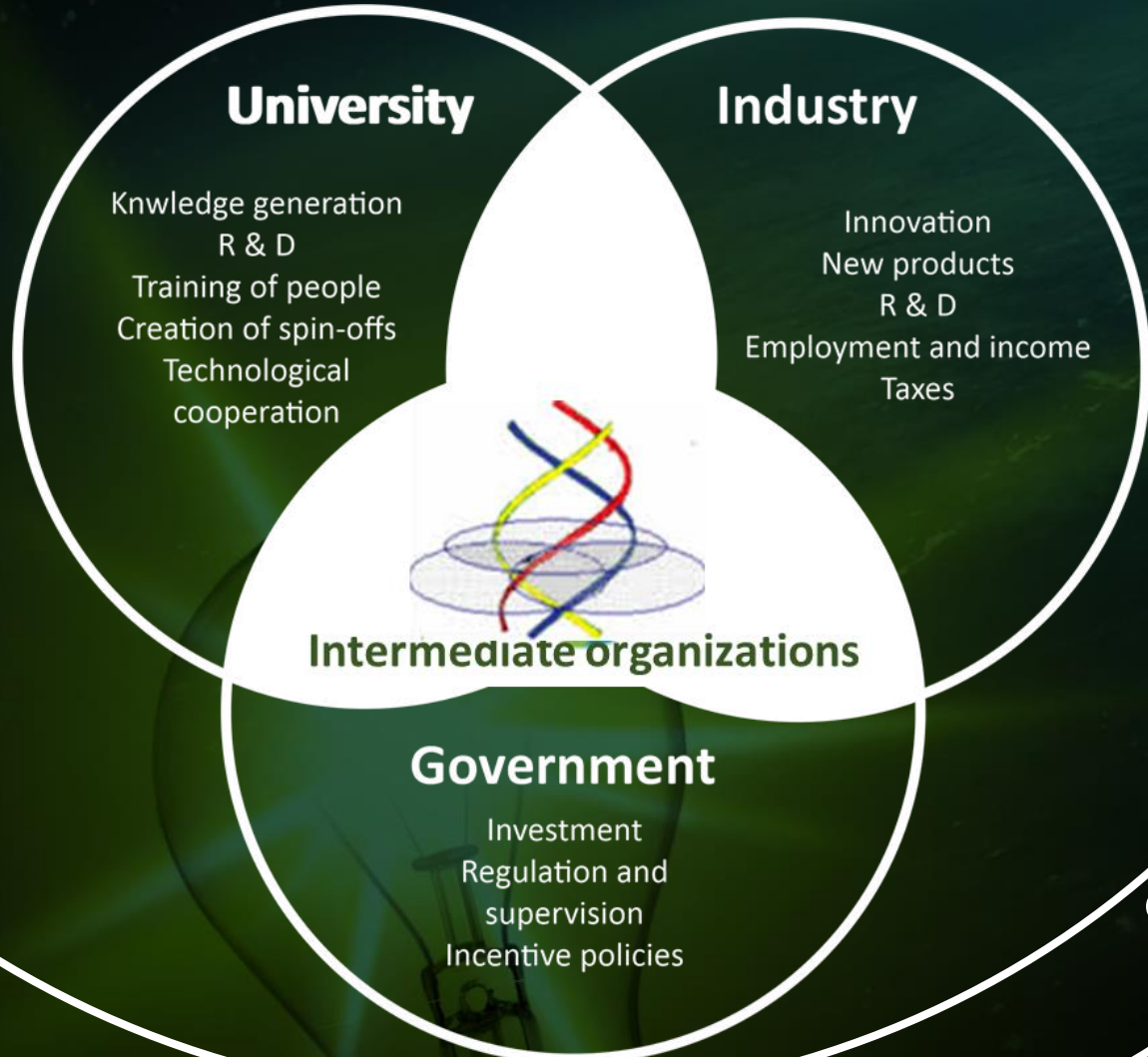
Prof. Dr. Adriana Ferreira de Faria (tecnoPARQ/UFV)
adrianaf@ufv.br

Science Parks ecosystem in Brazil

About the presentation

- Background
- Objective
- Methodology
- Results
- Conclusion
- Acknowledgements

Background – Triple Helix Model



Science and technology parks (STPs) **ARE THE INTERMEDIATE ORGANIZATIONS** that provide the social environment, technological and organizational resources, and managerial expertise for the transformation of a technology-based business idea into an efficient economic organization.

(Phan, Siegel, & Wright, 2005)

Despite the worldwide proliferation of science parks and scholarly interest, **THEIR CONTRIBUTION IS YET TO BE FULLY UNDERSTOOD.**

(Lecluyse, Knockaert, & Spithoven, 2019)

(Hobbs, Link, & Scott, 2017).

The effectiveness of STPs as **INSTRUMENTS OF INNOVATION POLICY** has generated thriving debate among academics, practitioners and policy makers.

(Albahari, Barge-Gil, Pérez-Canto, & Modrego, 2018).

Background – ST Parks

The most cited definition in the SP literature (Lecluyse, Knockaert, & Spithoven, 2019) is provide by UKSPA:

• “business support and technology transfer initiative that:

1. encourages and supports the start-up and incubation of innovation-led, high growth, knowledge-based businesses;
2. provides an environment where larger and international businesses can develop specific and close interactions with a particular center of knowledge creation for their mutual benefit;
3. has formal and operational links with centers of knowledge creation such as universities, higher education institutes and research organizations”.

“Link dictum” - Professor Albert Link of the University of North Carolina at Greensboro:

“IF YOU’VE SEEN ONE PARK, YOU’VE SEEN ONE PARK”

(National Academy of Sciences, 2009).

There is no consensus on *WHAT IS A SUCCESSFUL TECHNOLOGY PARK*, and it is particularly difficult to compare these ventures accurately (DABROWSKA, 2011).

It should be noted that *SUCCESS OR FAILURE IS OFTEN SIMPLY ASSOCIATED WITH THE IMBALANCE OF GOALS AND RESOURCES* in park development (ETZKOWITZ e ZHOU, 2018).

Background - Performance

- **Monitoring of generic statistical information :**

- number of companies
- occupied area
- total jobs created

- **Financial indicators**

- kind of investments
- business budget
- return on investments
- economic and social impacts

- **Innovation indicators:**

- number of startups created
- registered patents

A gap in the existing literature on STPs is that research mostly does not consider STPs' heterogeneity.

(Albahari, Barge-Gil, Pérez-Canto, & Modrego, 2018).

Premature conclusions are sometimes made about the success and failure of the technology park, based on case studies that do not consider the potential for strategy change, paving the way for ultimate success, and often end up blackening the parks' image *(ETZKOWITZ e ZHOU, 2018)*, without considering the dependent variables involved such as maturity and objectives of the analyzed park, nature of stakeholders involved, geographical location and level of regional development *(WASIM, 2014)*.

Objective

- In this perspective, this study aimed to **ANALYZE THE EVOLUTION OF TECHNOLOGY PARKS IN BRAZIL:**
 - to verify the main indicators reached
 - to support the thesis of the effectiveness of parks as an instrument of public policy.
- This work intends to begin the construction of a framework suitable to **understand the dynamic nature of technology parks** in Brazil and its resident companies with the **construction of historical series.**
- **In a second moment:** develop a **multivariate statistical analysis** to infer cause and effect relationships.

Boundary conditions and Success Factor:

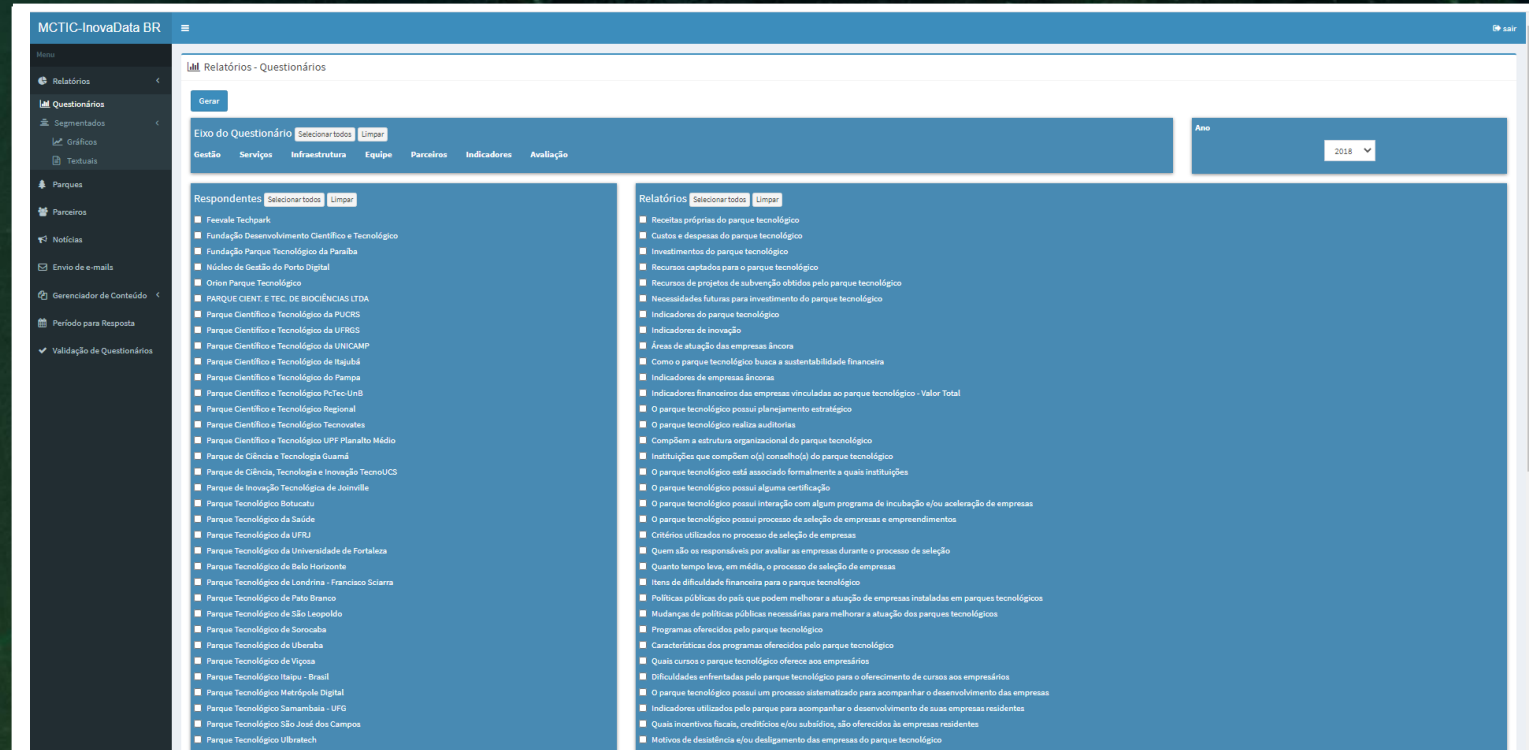
- Strong scientific and technological base
- Governance process (stakeholders alignment and focus and decision making process)
- Park location and geographical location
- Infrastructure – physical attributes and Quality of buildings
- Innovation and entrepreneurial culture in the region
- Qualified management team
- Value-added service establishment
- Entrepreneurial leadership
- Anchor companies
- Network
- Government support
- Availability of finance for tenants
- Image and reputation
- Age and Size of park

Methodology

- Case studies with 20 technology parks in Brazil - *framework*
- Research constructs:
 - boundary conditions and success factors
- Survey instruments:
 - Concept of the park
 - Real State
 - Legal model
 - Governance model
 - Business model
 - Organizational model
 - Services
 - Infrastructure, facility, facilities
 - Qualified team
 - Operational result
- It was developed the platform MCTI-InovaData-BR.
- The survey was applied only to the parks in operation, of which 40 responded, both for 2017 and 2018.
- Statistical analyzes



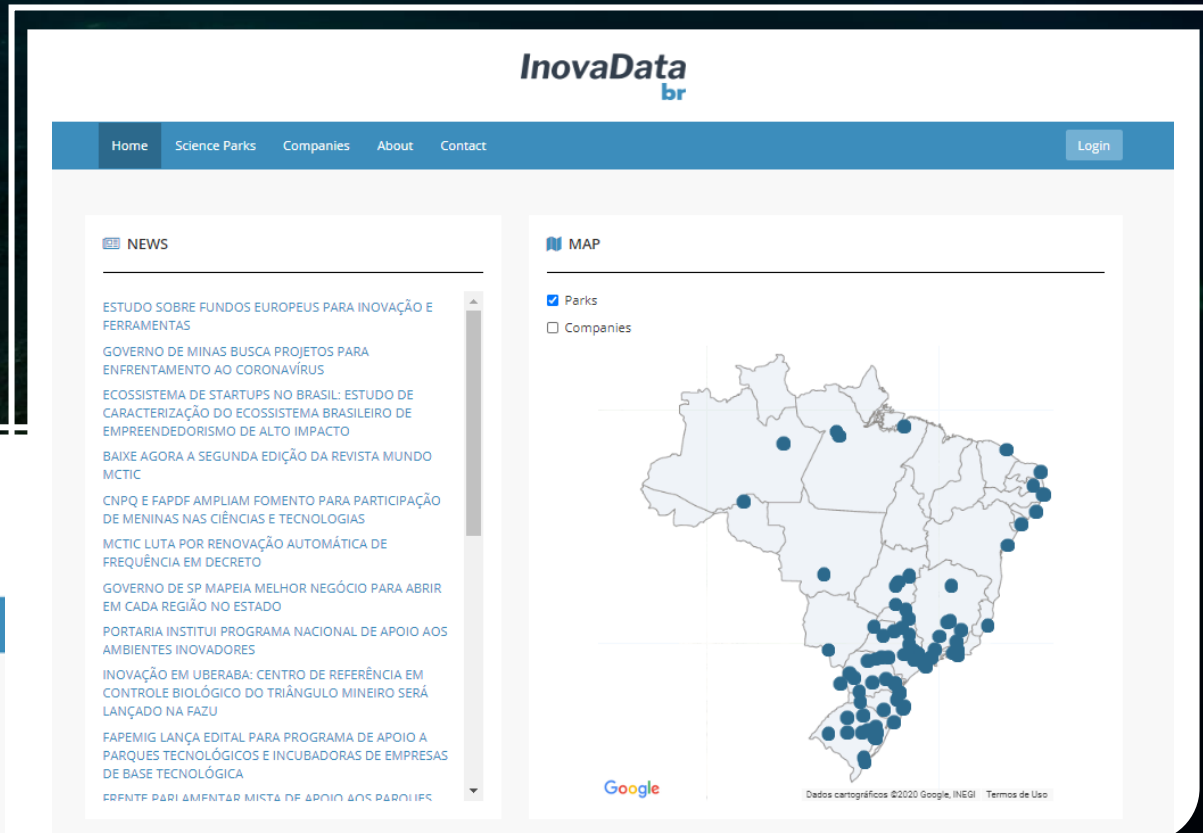
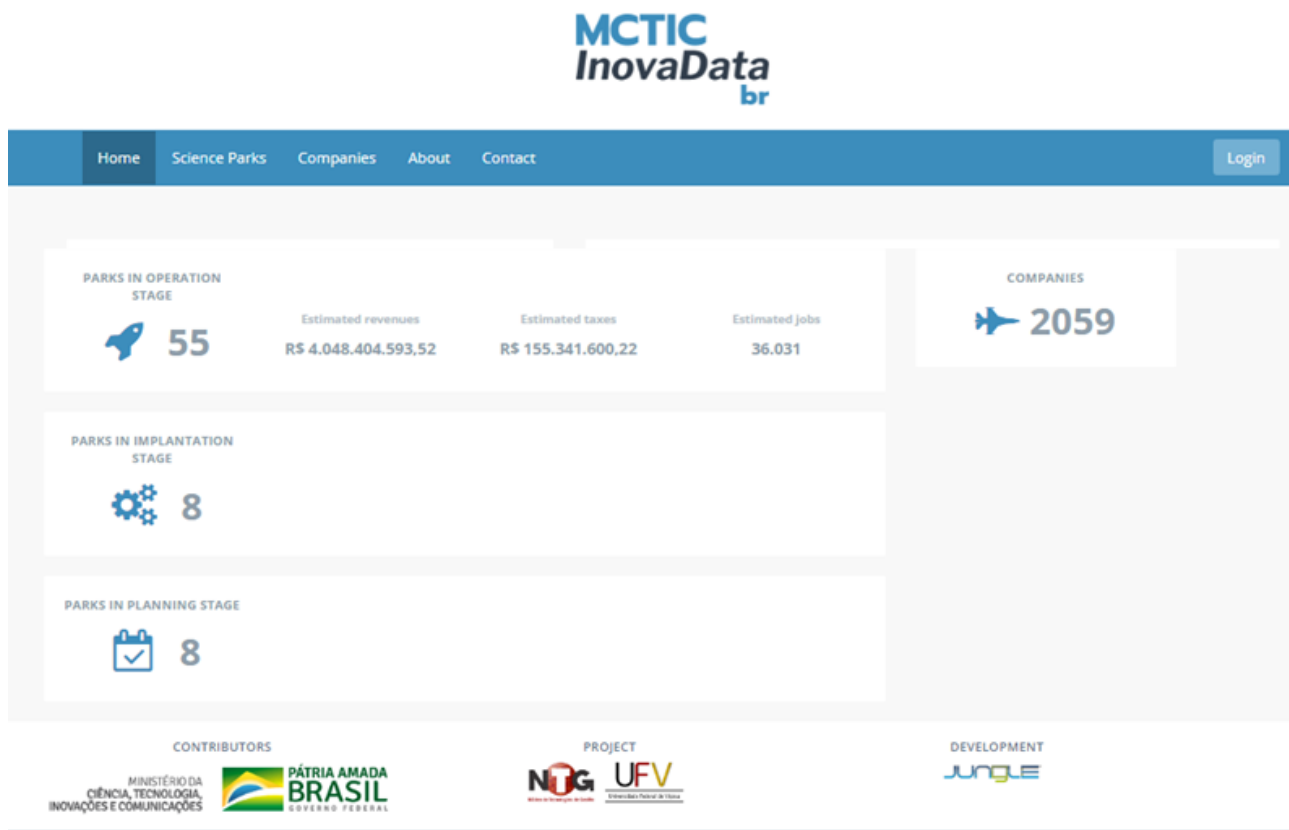
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Cia de Desenv. do Polo de Alta
Tecnologia Campinas



Feevale Techpark



Fundação Desenvolvimento
Científico e Tecnológico



Fundação Parque Tecnológico
da Paraíba



Fundação Parque Tecnológico
de Santos



Hotmilk Ecosistema de
Inovação - PUCPR



Iparque - Parque Científico e
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Digital



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P.T de Eletroeletrônicos e
Tecnologias Associadas



Parque Canoas de Inovação



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Companies

A Science Park can hold different types of enterprises as: tenant companies, researches centres, business incubators, business accelerators, supporting entities of innovator entrepreneurship, universities and educational institutes, among others.

It is opportune, therefore, take in consideration the main conceptual element involved in this innovation environmental, the tenant residents. Tenant companies is formal linked companies to the Science park and that receive its services to develop new business and technology based innovators products, as well as increase their competitiveness.

Below, it is possible to search for tenant companies by Science Park, by city or State.

Companies

Show 10 entries

Search:

	Nome	Email	Cidade	Estado	Parque Tecnológico
	Lumetron Industrial Energia	gildazio@lumetron.com.br	Recife	PE	Parqtel
	B&R Automação Industrial Ltda	office.br@br-automation.com	CAMPINAS	SP	Techno Park Campinas
	Brasau	contato@brasau.com	São Leopoldo	RS	Tecnosinos
	CERTI - CPC - Centro de Produção Cooperada	mhm@certi.org.br	Florianópolis	SC	Sapiens
	Embrapii	contato@embrapii.coppe.ufrj.br	Rio de Janeiro	RJ	PTEC - UFRJ
	Lis Consultoria & Treinam. (Cooperação Técnica)	lis@lis.srv.br	Lages	SC	Orion
	LoopKey	daniel@loopkey.com.br	Brasília	DF	PCTec-UnB
	Prototipos Ind. e Com. de Prod. Prototipos Ltda	borges@prototipos3d.com.br	Viamão	RS	Tecnopuc
	USINAVERDE	diretoria@usinaverde.com.br	Rio de Janeiro	RJ	Bio Rio

Results

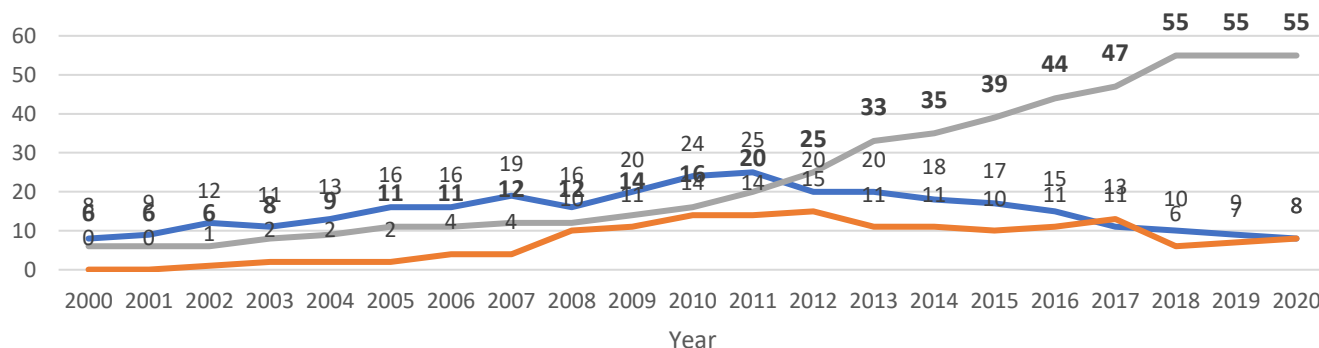
It is estimated more than 1,000 technology parks in the world.

https://www.aurp.net/assets/publications/2018_AURP_Benchmarking-FINAL2_rev.pdf. Acesso em: 02/02/2020

150 STP USA*

S- shape curve - Adoption of the innovation - the establishment of a science park

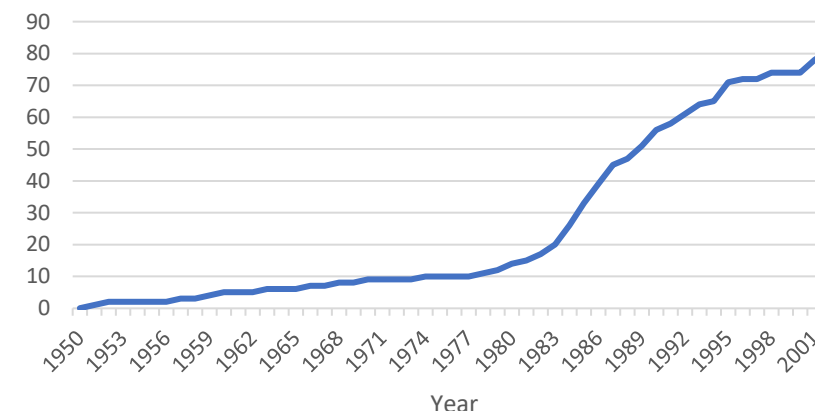
STP's evolution in Brazil



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— STP Planning — STP Implantation — STP Operation

STP' Evolution in USA



Evolution of technology parks in Brazil, at different stages of development

The technology parks in Brazil **ARE MOSTLY YOUNG PARKS**, only 25% of the parks are over 19 years old and 50% of the parks are under 09 years of operation.

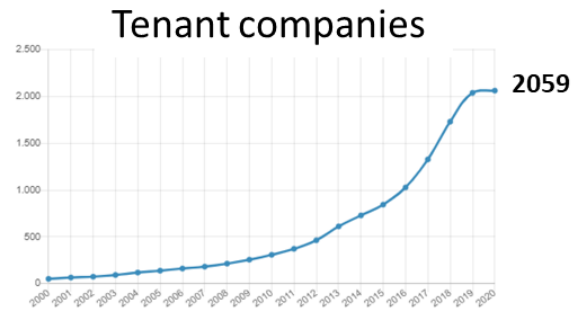
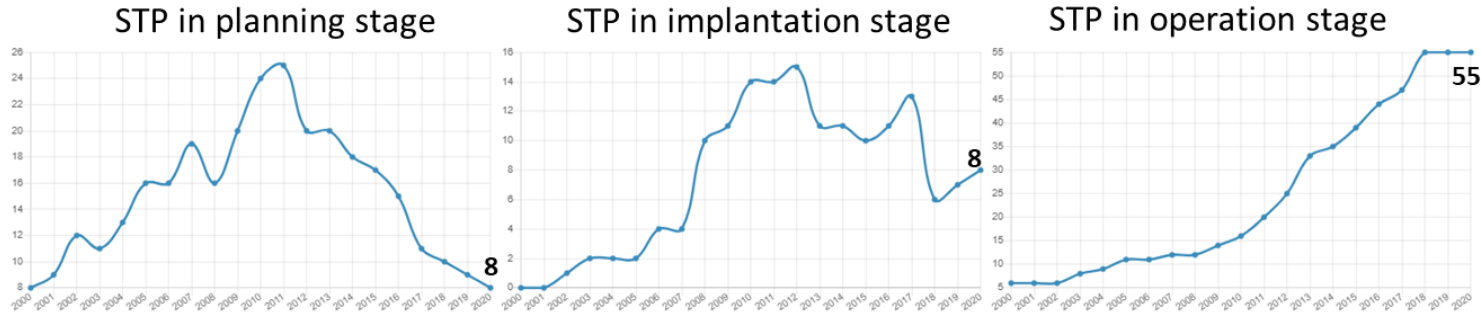
Evolution of technology parks in USA (Link & Scott, 2003)

UNESCO. Disponível em:

<http://www.unesco.org/new/en/natural-sciences/science-technology/university-industry-partnerships/science-parks-around-the-world/>.

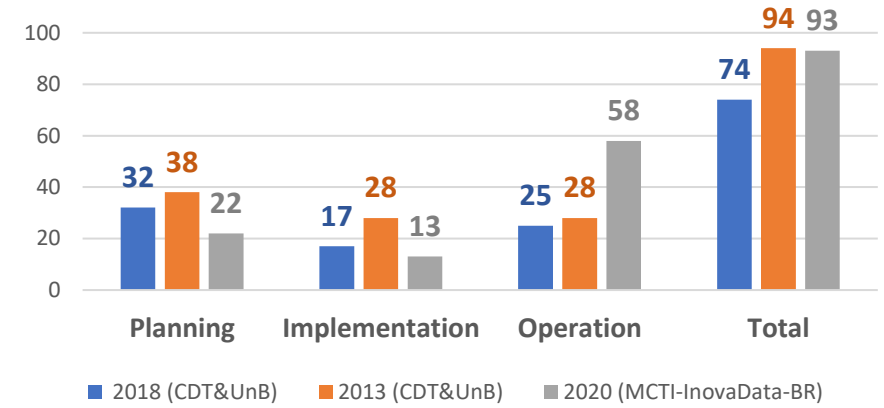
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Parks in Brazil

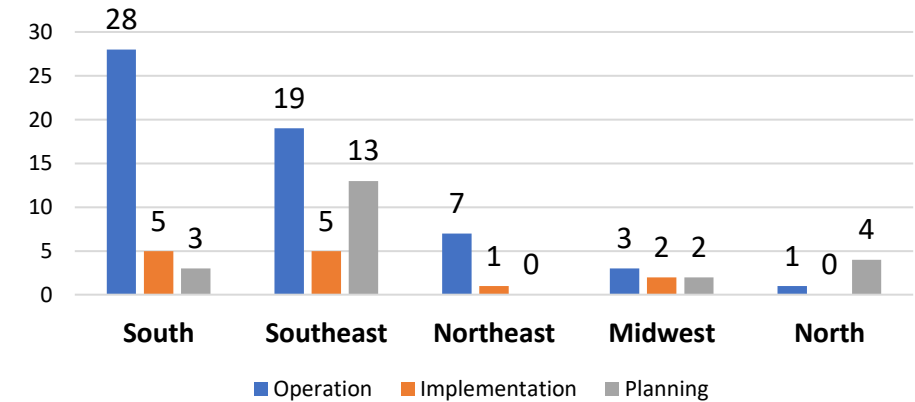


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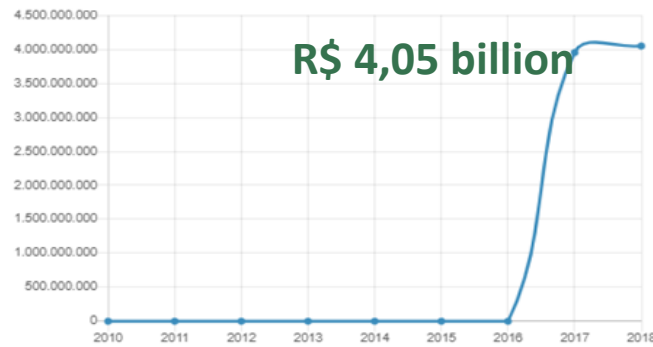


Location of STP in Brazil

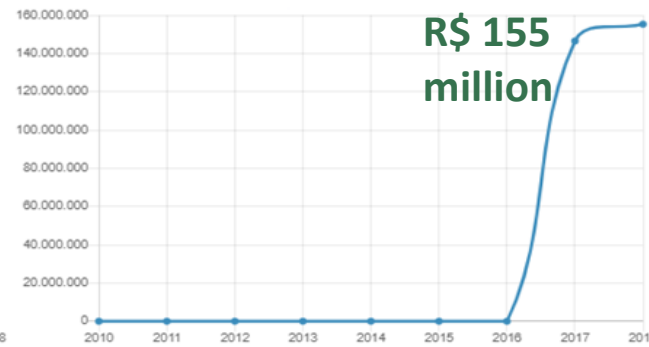


Parks in Brazil

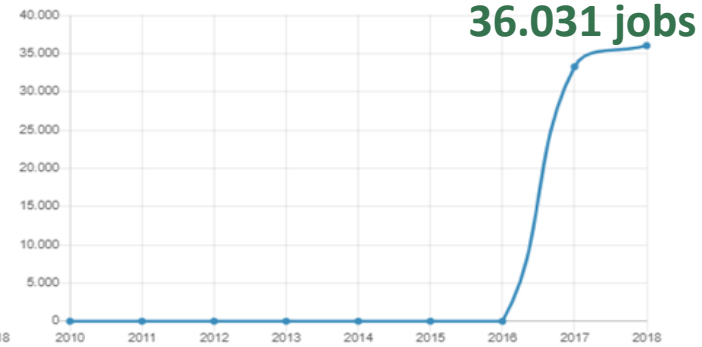
Tenant's revenues



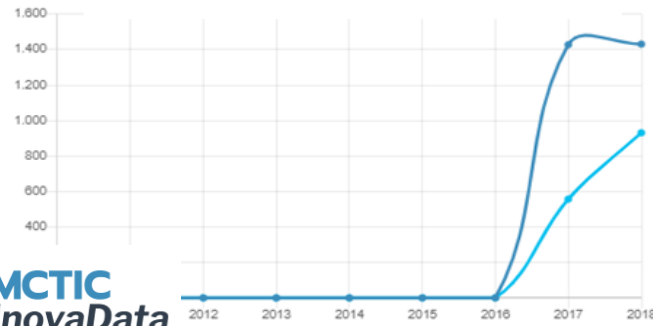
Tenant's taxes



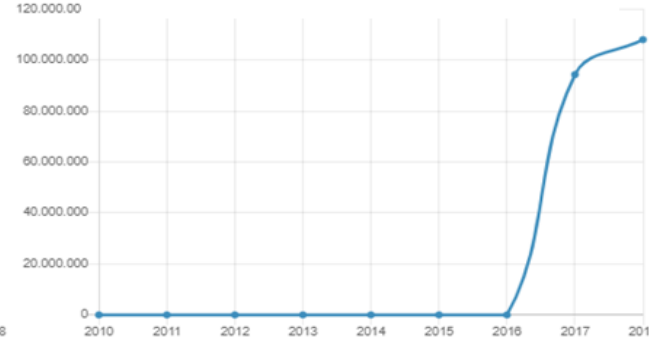
Tenant's Jobs



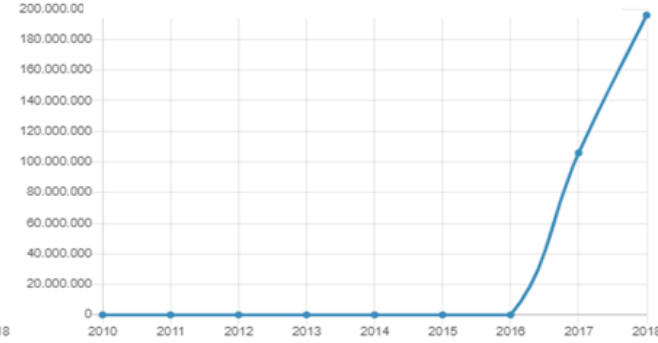
Tenant's innovation



Parks' revenues



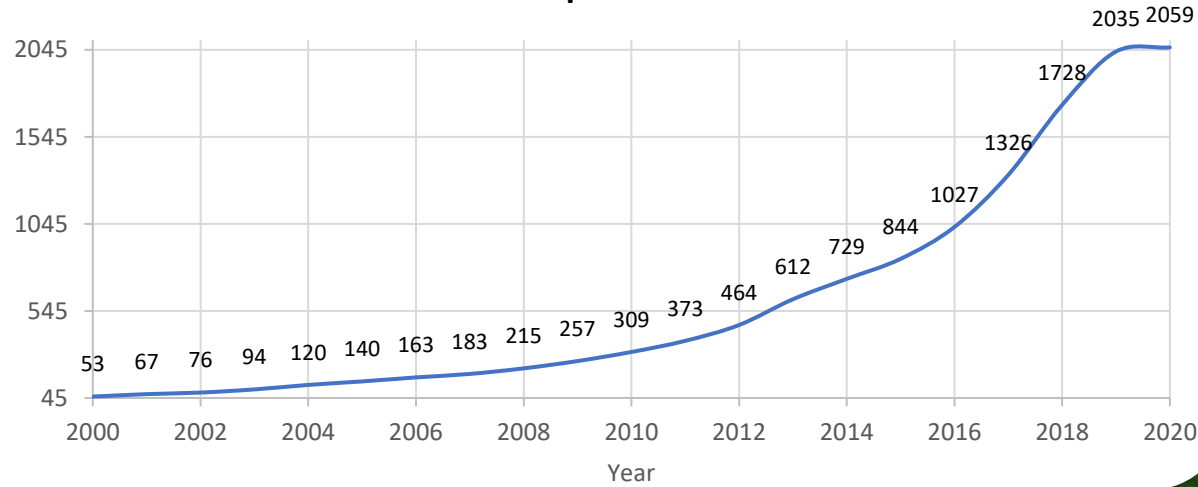
Parks' costs



It is estimated that 1.728 tenant companies generated in 2018.

Parks in Brazil

Tenants companies evolution in Brazil



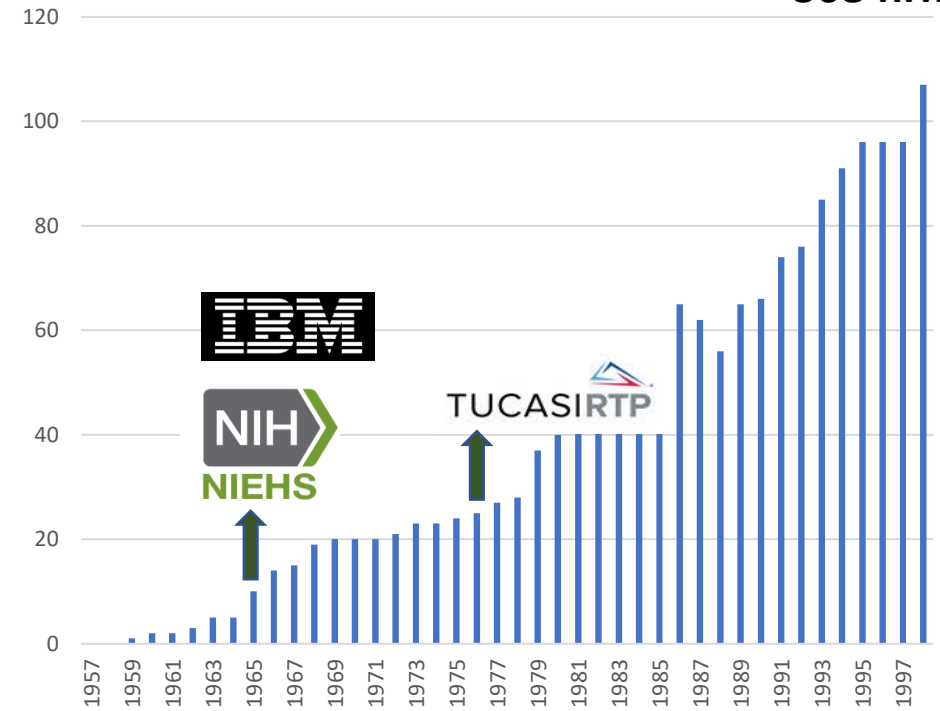
Number of companies and organizations resident in Brazil's STP

Only 31% OF THE PARKS IN OPERATION ARE HOME TO 70% OF THE TENANTS COMPANIES.

- **PARKS IN BRAZIL ARE STILL SMALL**, with an average of 35 resident companies.
- Only four technology parks claimed to have anchor companies.

Tenants companies in Research Triangle Park (RTP)

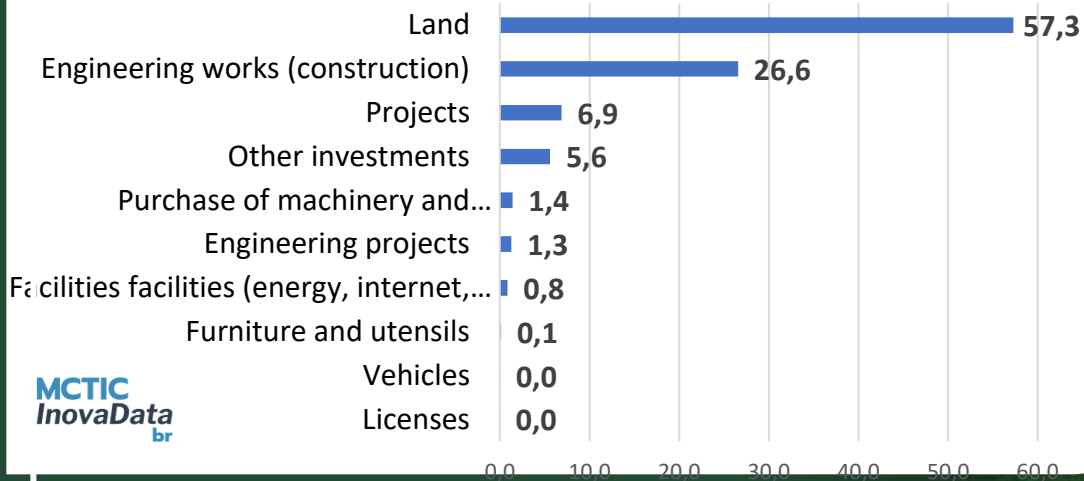
308 firms



Evolution of the companies in RTP (Link & Scott, 2003)

Parks in Brazil - investments

Composition of investments in STP in Brazil, until 2018

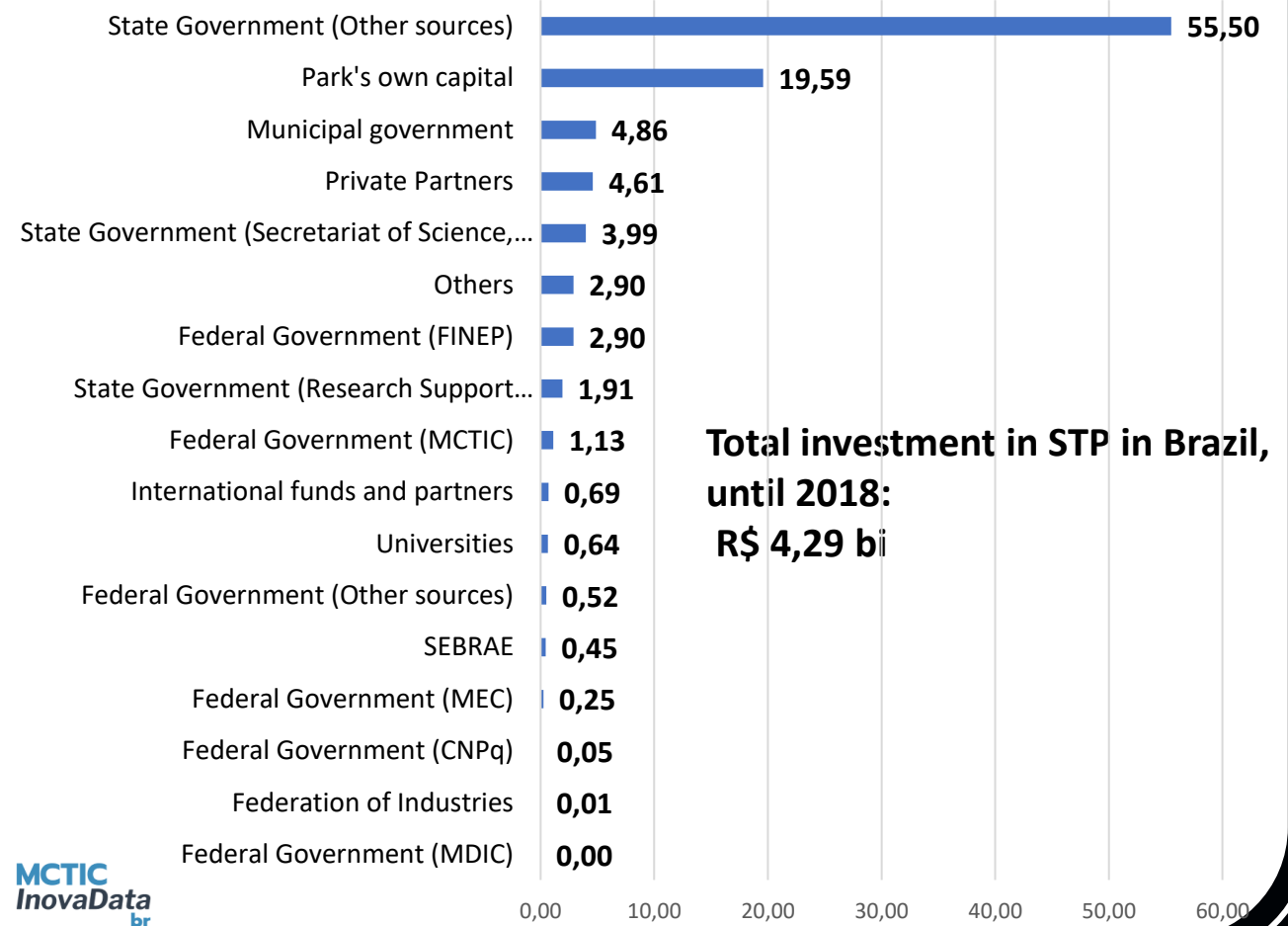


Fallacy of Innovation:

Resources invested in technology parks in Brazil are clearly insufficient!!

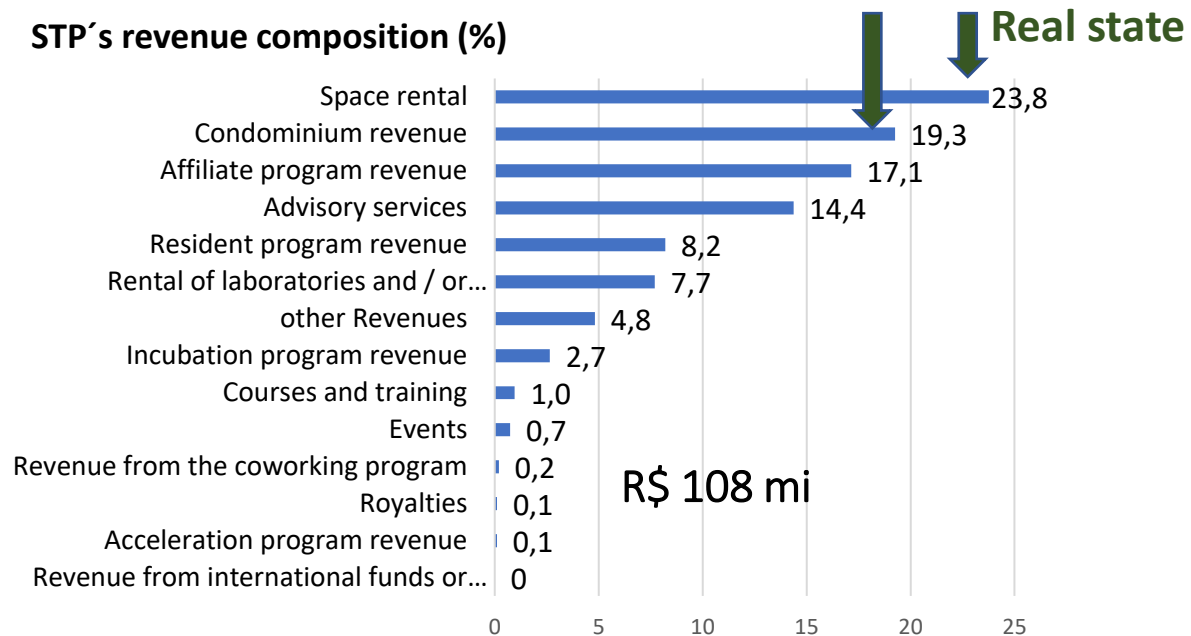
Only the early-stage Singapore Park has received US \$ 8.6 billion in investments to set up research institutes and foreign R&D companies (ETZKOWITZ e ZHOU, 2018).

Composition of investments in STP in Brazil

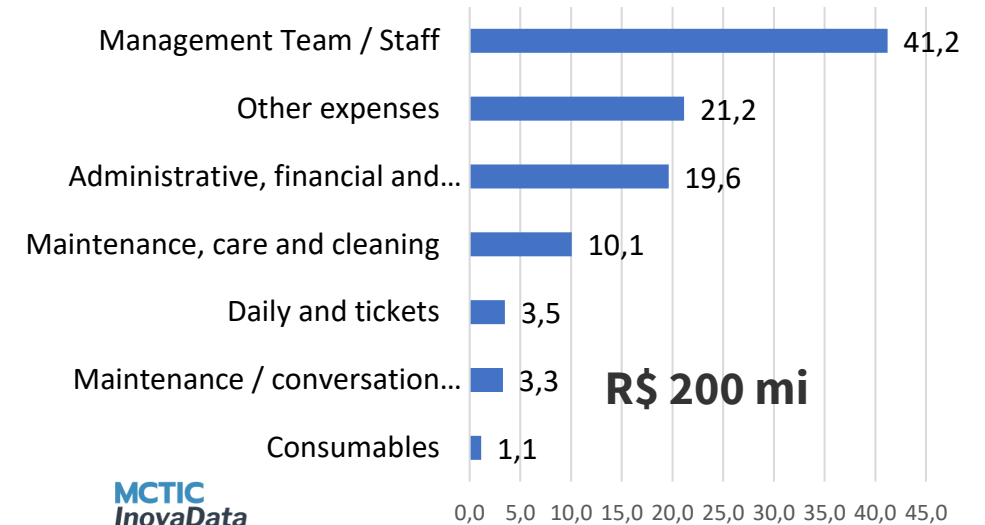


Parks in Brazil - budget

STP's revenue composition (%)



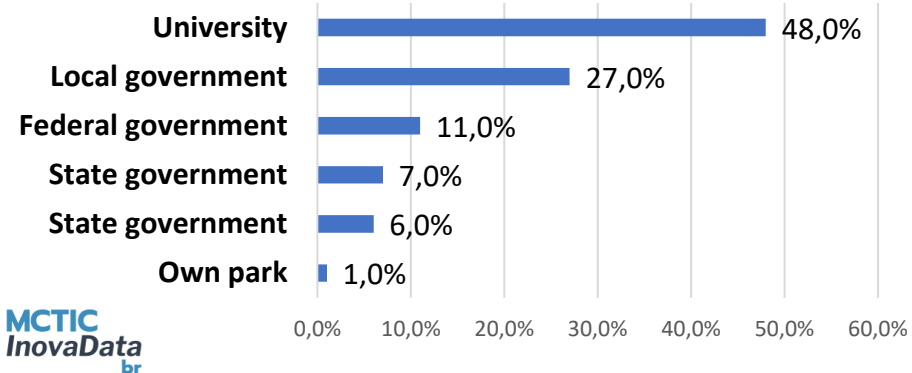
STP's expenditure composition (%)



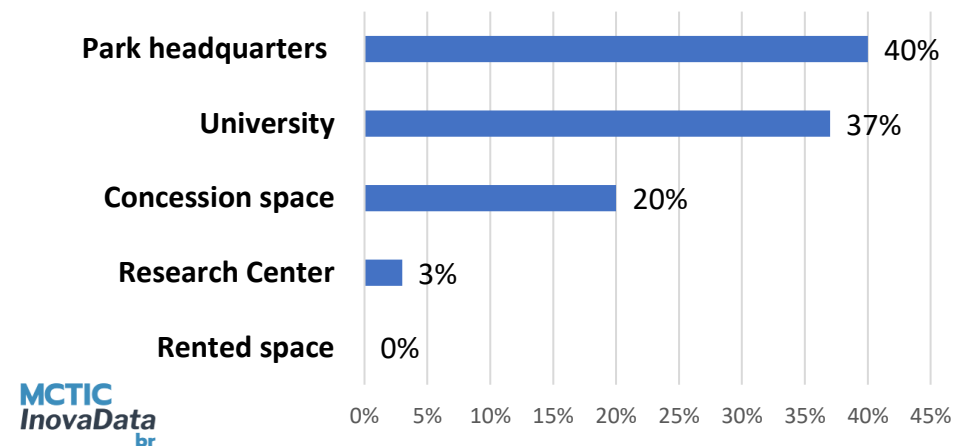
Distribution of technology park revenues and expenditure, 2018

Parks in Brazil – Governance – Triple Helix Model

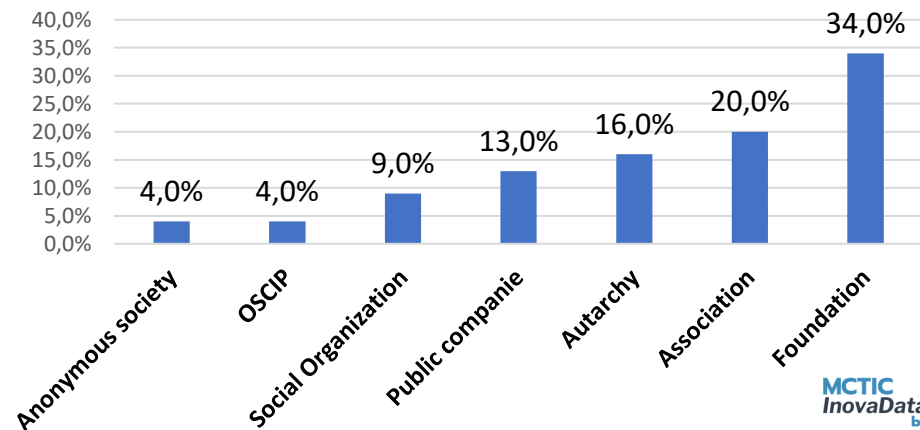
Ownership of the land where the STP is installed



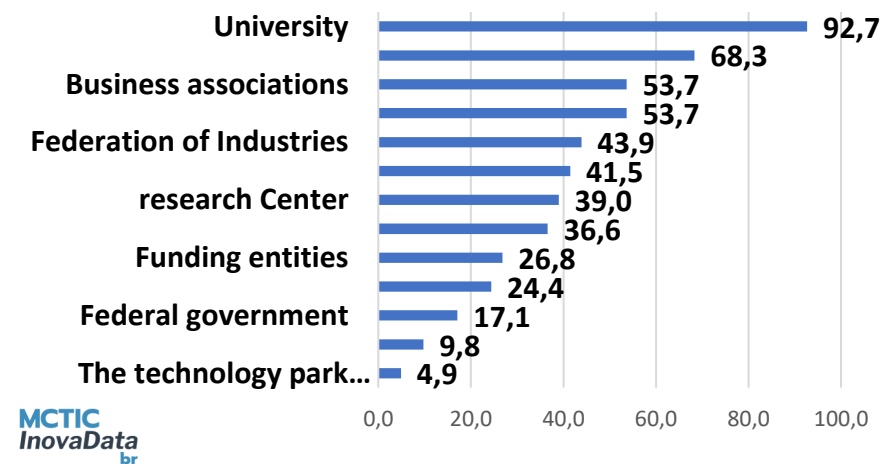
Where STP is installed



Legal nature of technology parks

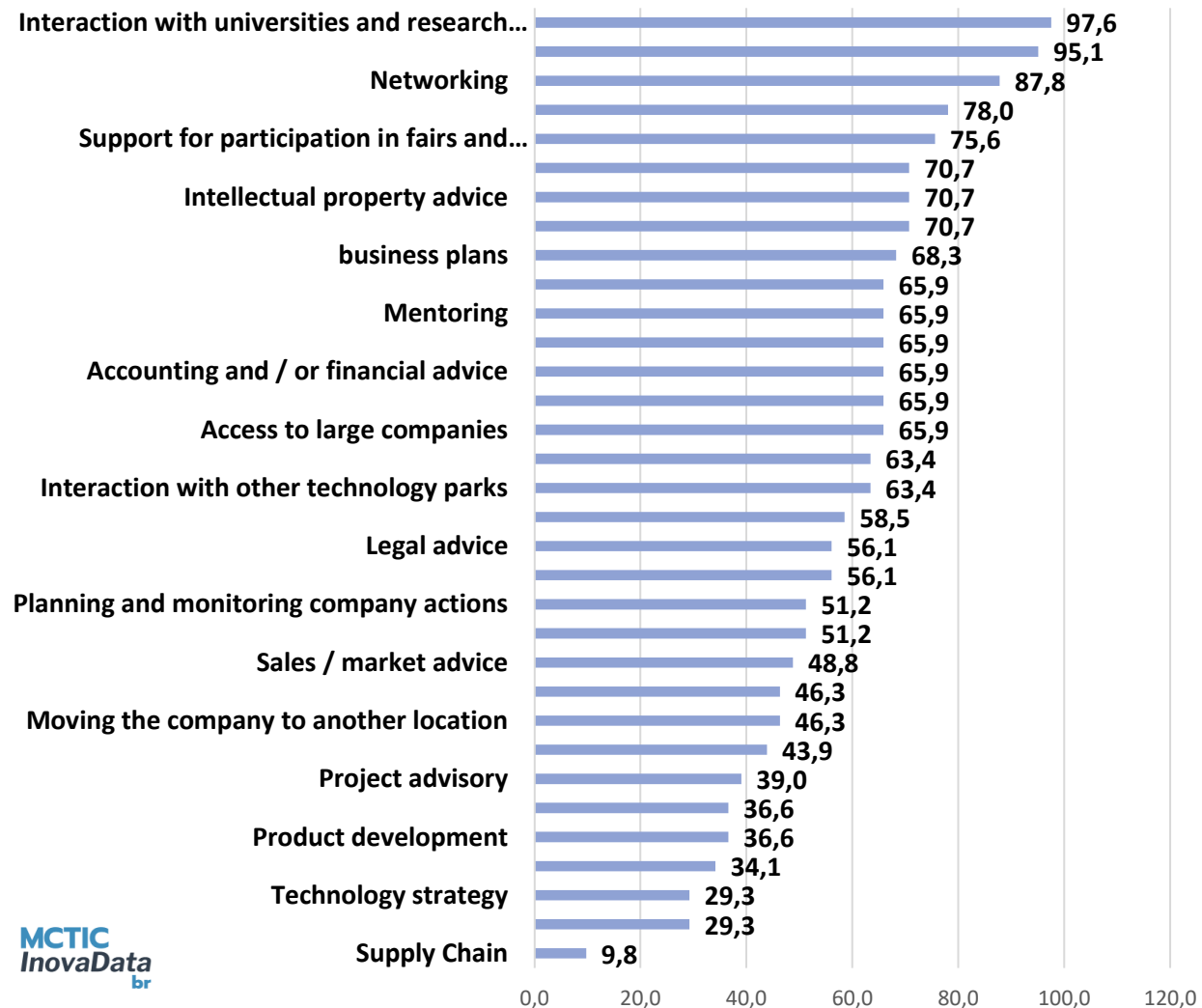


Institutions of STP's council

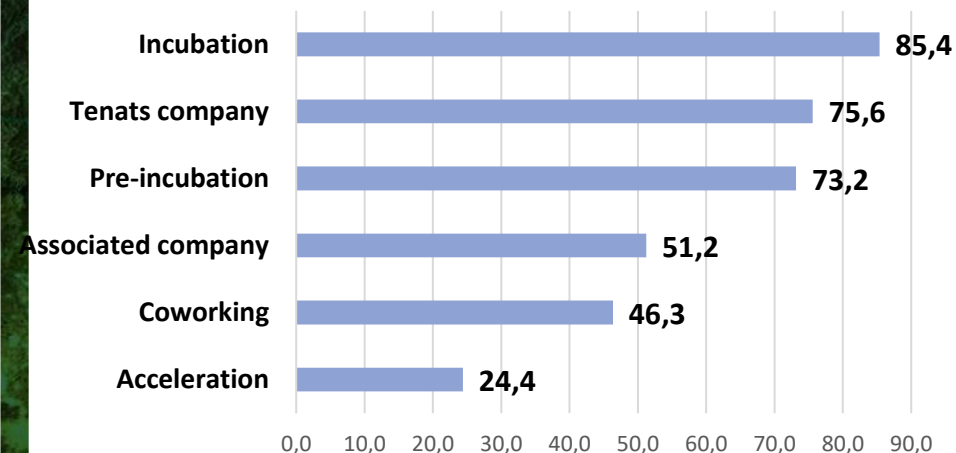


Parks in Brazil – Services and value proposition

Services offered by STP



Programs offered by the STP



Conclusion

- The dissemination of technology parks in Brazil **has encountered RELEVANT CHALLENGES**, in particular the **scarcity of resources** for expansion and improvement of infrastructure and **difficulty in attracting companies**, especially anchor companies.
- The **value proposition** of technology parks in Brazil is based on the **interaction with companies**, through various programs, services and facilities, as well as **with universities and governments**, constituting in its majority a governance model as proposed by ***Triple Helix***, with organizational structures that involve well-defined boards and management functions.
- Nevertheless, all of this reveals the **GREAT POTENTIAL AND THE “JEWEL” THAT ARE TECHNOLOGY PARKS IN BRAZIL**, if the policy makers have sense!
- **IT IS NECESSARY TO BE AWARE THAT TECHNOLOGY PARKS ARE COMPLEX, WITH EFFECTIVE RESULTS IN THE LONG TERM, IN FACT DECADES, AS THE LITERATURE HAS ALREADY DEMONSTRATED.**
- If the policies are maintained or, mainly, these are strengthened, the results of technology parks in Brazil, in the next decade, **will be of GREAT ECONOMIC IMPACT.**

Future

- The realization of this project allowed the development of a systemic framework, **adequate to understand the dynamic nature of technology parks in Brazil** and its resident companies, which obviously is not limited to the realization of an annual survey, but with the possibility of building series continuously, which will allow **reliable statistical analyzes** to be carried out, **WHICH DO NOT COMPROMISE THE PARKS' REPUTATION.**

Acknowledgements



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Further information:

Technology Park of Viçosa (tecnoPARQ)

Av. Oraidia Mendes de Castro, 6.000. Novo silvestre.

36570-000 VIÇOSA - MG – BRAZIL

+55 (31) 3612-1282

centev@ufv.br | www.centev.ufv.br