

LEGAL-INSTITUTIONAL DESIGN EFFECTS ON MISSION-ORIENTED DYNAMIC CAPABILITIES: CASE STUDY OF TWO BRAZILIAN INNOVATION AGENCIES

Eduardo Spanó 

University of Campinas (UNICAMP),
Department of Science and Technology Policy (DPCT), Campinas/SP, Brazil
eduardo.spano@jatai.org.br

Rafael Monnerat 

University of Campinas (UNICAMP),
Department of Science and Technology Policy (DPCT), Campinas/SP, Brazil
rmonnerat31@gmail.com

Rafael Leite 

German Research Institute for Public Administration, Speyer, Germany
leiterafaelo@gmail.com

Carlos Américo Pacheco 

University of Campinas (UNICAMP),
Department of Science and Technology Policy (DPCT), Campinas/SP, Brazil
cap346@gmail.com

Maria Beatriz M. Bonacelli 

University of Campinas (UNICAMP),
Department of Science and Technology Policy (DPCT), Campinas/SP, Brazil
biabona@unicamp.br

While policymakers and academics have advocated for mission-oriented innovation policies to address global challenges, implementing those policies requires strong adaptive capabilities in innovation agencies, which are influenced by their legal-institutional design. This paper explores how the legal-institutional design of two Brazilian innovation agencies shapes organizational routines that affect the development of dynamic capabilities needed for missions. The findings enhance the understanding of these designs, offering insights for policymakers to (re)design more effective innovation agencies.

Keywords: dynamic capabilities; mission-oriented innovation policies; innovation agencies; legal institutions.

EFEITOS DO DESENHO JURÍDICO-INSTITUCIONAL SOBRE AS CAPACIDADES DINÂMICAS ORIENTADAS A MISSÕES: ESTUDO DE CASO DE DUAS AGÊNCIAS BRASILEIRAS DE INOVAÇÃO

Formuladores de políticas públicas e acadêmicos defendem políticas de inovação orientadas por missões para enfrentar desafios globais. No entanto, a implementação dessas políticas exige fortes capacidades adaptativas nas agências de inovação, que são, por sua vez, influenciadas pelo seu respectivo desenho jurídico-institucional. Este artigo explora como o desenho jurídico-institucional de duas agências de inovação brasileiras molda rotinas organizacionais que afetam o desenvolvimento das capacidades dinâmicas necessárias para as missões. Os resultados ampliam a compreensão sobre esses desenhos, oferecendo subsídios para que formuladores de políticas possam (re)desenhar agências de inovação mais eficazes.

Keywords: capacidades dinâmicas; políticas de inovação orientadas por missões; agências de inovação; instituições jurídicas.

EFFECTOS DEL DISEÑO JURÍDICO-INSTITUCIONAL SOBRE LAS CAPACIDADES DINÁMICAS ORIENTADAS A MISIONES: ESTUDIO DE CASO DE DOS AGENCIAS BRASILEÑAS DE INNOVACIÓN

Formuladores de políticas públicas y los académicos han defendido políticas de innovación orientadas a misiones para abordar los desafíos globales. Sin embargo, la implementación de dichas políticas requiere sólidas capacidades adaptativas en las agencias de innovación, las cuales están influenciadas por su diseño jurídico-institucional. Este artículo explora cómo el diseño jurídico-institucional de dos agencias de innovación brasileñas moldea las rutinas organizacionales que afectan el desarrollo de las capacidades dinámicas necesarias para las misiones. Los hallazgos amplían la comprensión de estos diseños y ofrecen aportes para que los responsables de políticas (re)diseñen agencias de innovación más eficaces.

Keywords: capacidades dinámicas; políticas de innovación orientadas a misiones; agencias de innovación; instituciones jurídicas.

1 INTRODUCTION

In the face of pressing global challenges such as climate change and inequality, policymakers and academics have advocated a new generation of innovation policies oriented toward missions. Recent scholarship has stressed the importance of dynamic capabilities in innovation agencies to implement mission-oriented innovation policies to promote system-wide changes (Larrue, 2021; Mazzucato, 2021; Kattel & Mazzucato, 2018; Kattel et al., 2022).

However, most studies have not delved into the organizational features that enable or constrain the development and continuance of the dynamic capabilities in the public sector necessary to implement mission-oriented innovation policies, especially regarding their legal-institutional design. Several studies have investigated the importance of state capacities for policy implementation, as well as the rationales for adopting a dynamic capabilities framework in the public sector, with both approaches pointing to the advantage of dynamic arrangements (Berwick & Christia, 2018; Cingolani, 2018; Kattel & Mazzucato, 2018; Kattel et al., 2022). On the other hand, studies about more concrete and practical questions, such as the legal-institutional designs conducive to forming dynamic capabilities, remain overlooked (Haddad et al., 2022; Piening, 2013).

This paper seeks to deepen the understanding of innovation agencies' implementation of mission-oriented innovation policies in an emerging economy context. We focus on understanding how the legal-institutional design of innovation agencies can result in more effective and adaptive performance to face the challenges of implementing these mission-oriented policies. We build upon Spano et al.'s (2024) framework to evaluate how legal-institutional design impacts the capabilities of innovation agencies in an emerging country implementing mission-oriented innovation policies. The research question guiding this paper is: How the legal-institutional design of each innovation agency affected the development and sustainability of their dynamic capabilities for implementing mission-oriented innovation policies?

To answer this question, we examine two Brazilian innovation agencies. The two innovation agencies are *Financiadora de Estudos e Projetos* (FINEP; translated as the Funding Authority for Studies and Projects) and *Empresa Brasileira de Pesquisa e Inovação Industrial* (Embrapii, translated as the Brazilian Agency for Industrial Research and Innovation). The analytical framework used for the case studies comprises nine low-order dynamic capabilities for implementing mission-oriented innovation policies, five organizational routines, and the legal-institutional design of agencies connected to them. We then assess the rules and institutional provisions affecting FINEP and Embrapii governance, organizational design, budget and finance, public procurement and partnerships, and human resources (HR) by collecting and analysing public and internal documents and conducting in-depth interviews with stakeholders and with former and current staff members of both agencies

Section 2 briefly summarizes the theoretical background of the research, describing the analytical framework used for the case studies. Section 3 explains the methods employed and describes the research design, case selection for Finep and Embrapii, and data collection and analysis. Section 4 presents the findings on the different legal-institutional designs of agencies, while Section 5 highlights the effects of different legal-institutional designs on agencies' dynamic capabilities. Section 6 discusses the implications of the findings for the state capacities research agenda and mission-oriented innovation policy implementation.

2 THEORETICAL BACKGROUND: LEGAL-INSTITUTIONAL DESIGN AND DYNAMIC CAPABILITIES OF MISSION-ORIENTED INNOVATION AGENCIES

This article focuses on the influence that legal-institutional design has on the public sector's capabilities to implement mission-oriented innovation policies (Piening, 2013; Eriksson, 2014; Spanó et al., 2024). We draw on Kattel's (2022) synthesis of state capacity, public sector innovation, and dynamic capabilities, and adopt the analytical framework proposed by Spanó et al. (2024) to analyse mission-oriented innovation agencies.

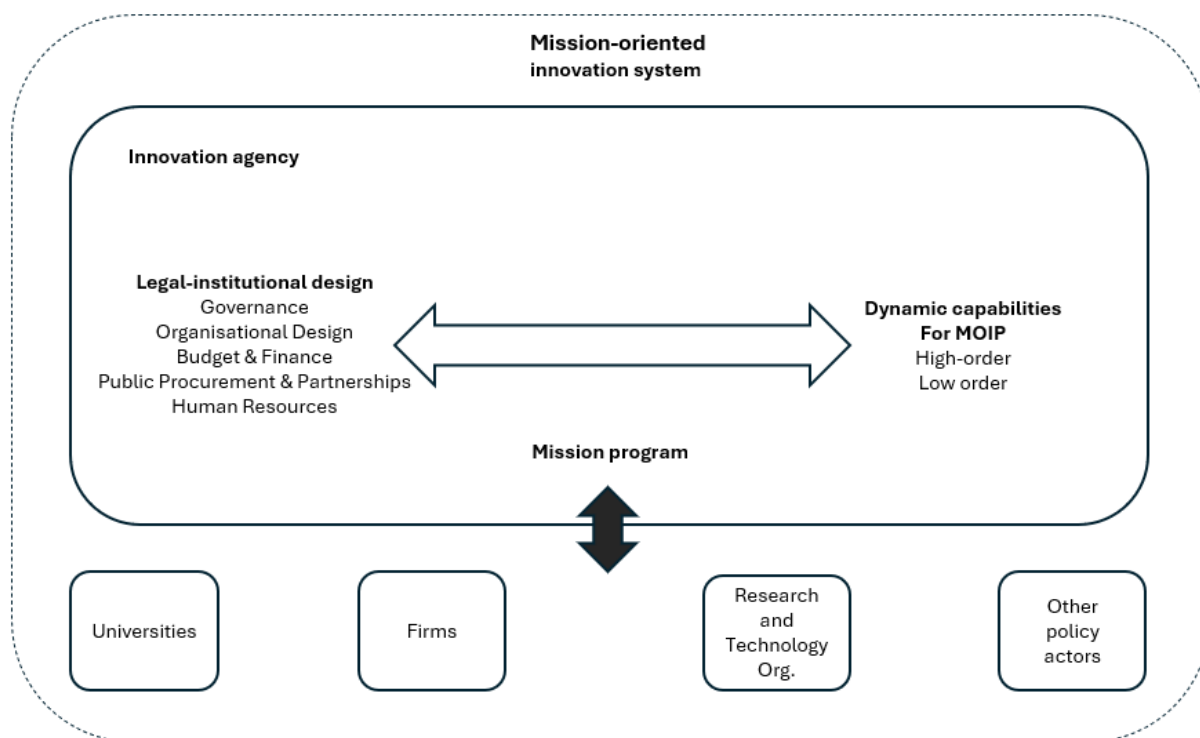
The state capacity literature aligns with the Weberian tradition of state and bureaucracy, centred around the idea of autonomy, highlighting that state capacity means a state has legitimacy and can put forward its goals, navigating the pressures of different societal forces (Evans et al., 1985; Amsden, 1989; Evans, 1995). Public sector innovation research examines how public organizations develop adaptive and innovative capabilities (Gieske et al., 2016; Meijer, 2019; Mayne et al., 2020), and, partly in response to New Public Management reforms, has advanced the Neo-Weberian state paradigm (Pollitt & Bouckaert, 2011). Dynamic capabilities scholarship, in turn, emerged from studies of organizational routines (Nelson & Winter 1982) and from strategic management of innovation in the private sector (Teece et al., 1997), with more recent applications to public organizations. Frameworks on public sector dynamic capabilities for mission-oriented innovation policy are situated at the intersection of these three strands of literature.

While the dynamic capabilities framework originated in private sector strategic management (Teece et al., 1997), it has been increasingly adapted to public sector contexts to understand how organizations respond to complex societal challenges (Piening, 2013; Kattel & Mazzucato, 2018; Kattel, 2022; Spanó et al., 2024). In this adaptation, capabilities can be analysed at the macro policy level or at the organizational level. Kattel's (2022) synthesis, for instance, proposes a broader set of dynamic capabilities (sense-making, connecting, and shaping) that encompasses the public policy level, offering a valuable but wider analytical scope. Since our focus is strictly organizational, we chose the framework advanced by Spanó et al. (2024) for its specificity in analysing the internal routines of mission-oriented innovation agencies at the organizational level, providing a more applied structure suited to comparative case study research.

2.1 Analytical framework for the effects of legal institutional design on mission-oriented innovation agencies

The framework comprises: (1) a mission-oriented innovation system; (2) nine low-order dynamic capabilities aligned with Teece’s (2007) higher-order categories of sensing, seizing, and transforming; and (3) five groups of organizational routines shaped by legal–institutional design. Our analysis focuses on the latter two elements (see Figure 1).

Figure 1 – Framework for the legal-institutional design and dynamic capabilities of mission-oriented innovation agencies



Source: Spanó et al. (2024).

The first part of the analytical framework comprises a set of concrete low-order dynamic capabilities for mission-oriented innovation agencies. These build on Teece’s (2007) higher-order dynamic capabilities—sensing, seizing and transforming. Sensing refers to scanning and interpreting the environment to identify opportunities and threats; seizing concerns mobilizing resources to act on those opportunities; and transforming involves reconfiguring internal structures and resources to sustain effective performance. These high-order capabilities are linked to lower-order dynamic capabilities (Eisenhardt & Martin, 2000), understood as specific, identifiable routines or ‘best practices’. The framework adapts these lower-order capabilities to the applied context of mission-oriented innovation agencies.

In this context, dynamic capabilities transform ordinary capabilities related to policy implementation to generate greater public value. This should not be confused with the transformation driven by mission-oriented policy interventions themselves, which seek to build symbiotic ecosystems that create public value (Mazzucato, 2016). Rather, dynamic capabilities within innovation agencies enable them to sense developments in the innovation system, seize promising opportunities for policy action, and reconfigure internal resources to implement mission-oriented policies effectively.

Sensing involves identifying missions, technological opportunities, and political feasibility (Mazzucato, 2021; Geels & Schot, 2007; Perez & Soete, 1988). Seizing refers to allocating resources, structuring decision-making, and coordinating stakeholders and policy mixes (Mazzucato, 2018; Larrue, 2021). Transforming concerns managing financial stability, sourcing arrangements, and HR capabilities through reskilling and organizational learning (Edler & Georghiou, 2007; Bugge & Siddiq, 2021). Table 1 summarizes these high- and low-order capabilities.

Table 1 – High-order and low-order dynamic capabilities for innovation agencies implementing mission-oriented policy implementation

High-order dynamic capability	Low-order dynamic capability
<p>Sense <i>Ability to scan the environment</i></p>	<ul style="list-style-type: none"> • Strategic thinking to discern potential missions • Analytical thinking to forecast technological opportunities • Analytical thinking to discern political leverage and political bargain
<p>Seize <i>Ability to take advantage of opportunities</i></p>	<ul style="list-style-type: none"> • Strategic investment and allocation of non-monetary resources • Structure decision-making procedures that avoid errors, bias and welcome innovation • Manage stakeholder networks and policy complementarities
<p>Transform <i>Ability to change internal resources to adapt to the environment</i></p>	<ul style="list-style-type: none"> • Manage, prioritize and secure stable financial funds • Insource and outsource goods, HR, projects and processes • Manage and reshape/reskill HR

Source: Adapted from Spanó et al. (2024).

The second part of the analytical framework is the legal-institutional dimension of innovation agencies that shapes five essential organizational routines. Legal-institutional design is a relevant antecedent of dynamic capabilities, conditioning their development in public organizations. The framework presents five important groups of routines impacted by legal-institutional design: governance, organizational design, budget and finance, public procurement and partnerships, and HR. Governance rules affect leadership autonomy, accountability, and stakeholder engagement. Organizational design defines the structure and authority of units and innovation-related teams. Budget and finance rules determine stability and flexibility of

funding. Procurement and partnership rules govern collaboration with external actors and the design of innovation-oriented contracts. HR rules influence recruitment, promotion, incentives, learning mechanisms, and workforce diversity. These elements, summarized in Table 2, can either enable or constrain the emergence and sustainability of dynamic capabilities in mission-oriented innovation agencies. We explore the relation of each group to dynamic capabilities in the case studies' findings.

Table 2 – Analytical framework for assessing legal-institutional design effects on dynamic capabilities for mission-oriented policy implementation

	Sense	Seize	Transform
Governance	<ul style="list-style-type: none"> • Rules on leadership election, turnover, replacement, succession • Rules on leadership powers, accountability, and mandate • Rules on stakeholder inclusion, negotiation, and management • Institutional mechanisms to steer directionality and build common/shared views on challenges • Rules and institutional mechanisms to avoid collusion, agency capture, and abuse of powers 		
Organizational design	<ul style="list-style-type: none"> • Rules on autonomy and control of organizational units by top management (i.e., centralized/decentralized decision-making procedures) • Rules on the creation, discontinuation, merging, splitting, and ending of organizational units and professional positions • Existence and degree of formalization of organizational units dedicated to innovation (innovation labs, i-units, etc.) 		
Budget and finance	<ul style="list-style-type: none"> • Rules on the budget cycle • Rules on availability, autonomy, and execution of financing, especially regarding stability, diversification of revenues, and funding instruments • Rules on expense accountability, review, and impact 		
Public procurement and partnerships	<ul style="list-style-type: none"> • Rules on procurement standards, tenders design, specification and evaluation criteria • Rules on procurement and partnership procedures • Rules on the scope of partnership agreements and procurement contracts • Rules on dispute resolution 		
Human resources	<ul style="list-style-type: none"> • Rules on leadership and managerial positions hiring and discharging • Rules on hiring and discharging • Rules on career structures, paths, and promotion • Incentives tied to professional development and sanctions on misconduct • Existence of organizational learning and reskilling mechanisms • Existence of sound workplace policies on diversity and professionalism 		

Source: Adapted from Spanó et al. (2024).

3 CASE STUDY METHODOLOGY: FINEP AND EMBRAPII

3.1 Research design

We adopted a case-study method to provide contextual insights into the causal factors behind the differential development of dynamic capabilities at these innovation agencies. This approach helps identify links, not easily observable in existing data reports, between legal-institutional design and dynamic capabilities and offers empirical insights into why policymakers should consider institutional architecture when (re)designing innovation agencies. By focusing on Finep and Embrapii, we aim to provide actionable insights to inform the (re)design of innovation agencies globally, emphasizing the importance of legal-institutional frameworks in shaping dynamic capabilities. However, this approach also has limitations. As a qualitative case study of two agencies within a single country, the findings are context-dependent and not directly generalizable. Moreover, access to interviewees was shaped by the researchers' professional networks, which may introduce selection bias. Despite these constraints, the comparative design allows for analytical generalization, contributing to theory development rather than statistical inference (Yin, 2018).

A case-study approach also allows for an in-depth understanding of complex phenomena within their real-life context, which is particularly useful for exploring or explaining poorly understood phenomena from a 'big picture' perspective (Yin, 2018). Examining specific instances allows us to generate insights that contribute to a broader theoretical understanding (Gerring, 2004). This methodology illuminates the unique interaction of factors in the agencies studied, which broader surveys or quantitative analyses may obscure. Case studies make it possible to explore nuances and generate hypotheses for future research, contributing to cumulative knowledge (Flyvbjerg, 2006).

3.2 Case selection

Finep and Embrapii were selected for three reasons. First, both are central federal innovation agencies in Brazil, a leading R&D investor in Latin America between 2010 and 2017 (UNESCO, 2021), making them relevant references for other emerging economy contexts.

Second, they differ markedly in their legal-institutional design. Although both utilize public financial resources, they operate under different legal regimes. Finep, established in 1967, is a state-owned enterprise (SOE) responsible for financing and promoting science and technology. Embrapii, created in 2013, functions as a quasi-autonomous non-governmental organization (QUANGO), formally classified in Brazil as a Social Organization (SO)—a non-

profit entity that manages a public service operating under private law (Azevedo et al., 2018).¹ Although the government retains strategic oversight and funds its activities, Embrapii enjoys greater managerial autonomy. These contrasts provide a valuable basis for examining how legal–institutional arrangements shape dynamic capabilities.

The legal–institutional design of public organizations tends to evolve from flexibility toward increasing rigidity. In Brazil, new institutional models such as SOEs and SOs were created to escape the constraints of direct public administration and allow more adaptable policy implementation (Goldemberg in Caldas, 2001). Over time, however, SOEs have faced growing regulatory controls that bring them closer to public law (Pinto, 2010). This pendulum between autonomy and oversight, observed across Latin America (Strauss Klein, 2012; Delgado, 2014; Salomón, 2015; Antón, 2008), shows how attempts to enhance flexibility are often followed by measures aimed at curbing spending, addressing corruption and closing accountability gaps.

Finally, both agencies have implemented, or are preparing to implement, mission-like innovation interventions (Mazzucato & Penna, 2016; Limoeiro & Schneider, 2017). Finep launched programmes to address the Zika virus, COVID-19 and technological challenges such as second-generation ethanol (Laplane, 2024). Embrapii mobilized initiatives to respond to COVID-19 and support the energy transition, among others. Even when not explicitly framed as “missions,” these initiatives share mission characteristics such as ambitious challenges, strong R&D intensity and bottom-up experimentation (Mazzucato, 2018a), and therefore offer relevant insights into how institutional design affects the agencies’ dynamic capabilities.

3.3 Data

We employed qualitative research techniques to address the research question and to test and validate the chosen framework in a problem-solving context. We relied on three primary sources: interviews, documents (both internal and public), and legal statutes. We conducted 12 exploratory and semi-structured interviews (mostly via videoconference) with current and former personnel from both innovation agencies (Table 3). The sampling approach was purposive, leveraging the researchers’ institutional access to present and past directors, managers, and legal coordinators, aiming to capture diverse organizational perspectives across hierarchical levels and functional areas within each agency. Complementarily, we have also employed snowball sampling, asking interviewees to suggest additional relevant contacts for subsequent interviews.

¹For the legal provisions, see the Social Organization’s Law (SO Law), Law n° 9.637/1998, https://www.planalto.gov.br/ccivil_03/LEIS/L9637.htm

Table 3 –List of interviewees (Total = 12)

Innovation agency	Responsibility
Embrapii	1 Director
Embrapii	2 managers
Embrapii	2 coordinators
Embrapii	1 Legal manager
Finep	3 directors from different mandates
Finep	2 managers
Finep	1 Legal manager

Source: Authors' construction.

Document analysis helped examine specific initiatives mentioned in the interviews and reconstruct the official narratives of innovation programmes. We analysed primary legislation to understand how formal rules shape organizational routines and complemented these sources with academic articles and thesis on the agencies. All data were gathered with a focus on our research question, aiming to test the accuracy and utility of the chosen framework of dynamic capabilities in supporting public policymakers and managers to implement mission-oriented innovation policies.

4 LEGAL-INSTITUTIONAL DESIGN OF FINEP AND EMBRAPII

Finep was established in 1967 as an SOE to promote scientific and technological development. In Brazil, SOEs can either be dependent (those compensated for operating and capital expenses through disbursements from the National Treasury) or not dependent (those that do not require continuous support from the Brazilian Treasury). The latter category, which has more regulatory flexibility (Silva et al., 2017), includes Finep, whose funding is derived from providing services to the government rather than from direct Treasury outlays. Finep has managed the National Fund for Scientific and Technological Development (FNDCT), receiving a maximum 2% administration fee.² Finep operates a broad set of instruments to foster innovation, such as credit for innovation, equity investments, grants, and non-refundable funding of science and technology infrastructure. Between 2014 and 2022, it managed an average annual budget of 3.9 billion BRL, increasing to 8.8 billion BRL in 2023–24 (Finep, 2024).

Embrapii, created in 2013, is a peripheral innovation agency designed as an SO to promote bottom-up innovation through firms' needs in collaboration with existing RTOs, not to be a top-down mission-oriented agency.³ It operates as a private nonprofit organization

²For the management of the FNDCT, see Art. 8, Law n. 11.540/2007, https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/lei/111540.htm

³Inspired by the success of the Brazilian Agricultural Research Corporation (Embrapa), a crucial player in Brazil's innovative agricultural sector, Embrapii was created to support innovation in the manufacturing sector (Azevedo et al., 2018). Unlike Embrapa, an SOE with in-house technology labs and significant physical assets, Embrapii operates with a lean and flexible structure, focusing primarily on mobilizing existing public and private RTOs to collaborate with industry.

officially recognized by the Ministry of Science, Technology and Innovation (MCTI), with a board composed of both public sector appointees and industry representatives. The concept of SOs in Brazil, influenced by the quasi-autonomous non-governmental organizations (QUANGOs) from the United Kingdom during the New Public Management era of the 1990s,⁴ represents an effort to blend public oversight with private initiative (Bresser-Pereira, 1998). These non-profit associations are initiated by the private sector but can be officially recognized by the government to receive public funding and provide services under a charter agreement. This recognition process requires the organization to meet specific criteria, such as including government appointees on its board. This framework allows the government to have significant influence over their management while also allowing operational flexibility.

Embrapii raises public funds, including from the FNDCT, through multi-annual charter agreements. These funds finance industry-led projects in partnership with RTOs from Embrapii's network. Typically, projects are funded one-third by the firm, one-third by the RTO, and one-third by Embrapii, following a model inspired by Germany's Fraunhofer Institute that aimed to boost private sector R&D investment (Azevedo et al., 2018; de Oliveira & Guimarães, 2019). The agency provides grants for R&D projects involving collaboration between RTOs and firms (not providing funds directly under firms' management), operating within a flexible framework that blends public oversight with private initiatives. Its contracted project volume grew from 10.8 million BRL in 2014 to 779.3 million BRL in 2023 (Associação Brasileira de Pesquisa e Inovação Industrial, 2024).⁵

Finep's **governance** follows SOE Law: its board of directors (BoD) is appointed mainly by the federal government, must include one staff representative and at least 25% independent members⁶. SOEs' board member selection is a discretionary decision of the executive branch, subject to the requirements set in SOE Law (such as years of relevant experience and political party management positions) and in each SOE's statutes.⁷ Finep's BoD may appoint and dismiss members of the executive board, including the CEO, at any time and without fixed terms, which often aligns executive leadership changes with electoral cycles. Other elements introduced by SOE Law, such as publishing policies and creating internal committees, are considered more formal and bureaucratic.

⁴ Regarding science and technology organizations, the SO model was also influenced by the Federally Funded Research and Development Centers (FFRDC) in the US, particularly the national laboratories.

⁵Embrapii's budget is entirely dedicated to grants to partially fund R&D projects with private companies and RTOs. Unlike Embrapii, Finep offers a wider range of financial instruments, including loans and equity investments, in addition to grants. For a more direct comparison, Finep's allocation for grants, similar to Embrapii's focus, was approximately 520.7 million BRL in 2023 (combined financial support provided to private sector projects through direct grants, decentralized grants to companies, and non-reimbursable funds to companies). To provide context, in the same year, Finep allocated 4.25 billion BRL to direct credit, highlighting the size and diversity of its financial instruments (Finep, 2023).

⁶Law n. 13.303/16.

⁷Unlike countries where appointments are overseen by civil service commissions or similar bodies, Brazil does not have a specific agency mandated to supervise the appointment of board members and CEOs of SOEs (Wong, 2004; Wong, 2018).

Finep's governance is further complicated by its role in executing resources from the National Fund for Scientific and Technological Development (FNDCT)⁸. FNDCT is a public fund financed through various taxes and levies to support innovation and scientific and technological development in Brazil. However, the strategic direction of the fund is defined by the FNDCT's board of directors, which includes representatives from several ministries (including the MCTI, the Ministry of Education (MEC), the Ministry of Development, Industry, Trade and Services (MDIC)) and representatives of industry and the scientific community. This governance structure requires Finep to coordinate mainly with MCTI, which in practice controls the FNDCT (Corder et al., 2023), thereby heavily shaping Finep's operations.

As an SOE, Finep can define its **organizational design** with some autonomy, provided it is approved by its BoD. Aside from compliance-related units mandated by the SOE law, Finep and Embrapii operate similarly in this regard.

In **budget and finance**, Finep has long faced challenges in securing stable resources for innovation across policy cycles and economic fluctuations (Azevedo et al., 2018; Pacheco, 2019; Corder et al., 2023). The agency manages the resources of the FNDCT, which until 2021 were subject to annual federal budget rules, could not accumulate over time, and were often restricted by the Ministry of Finance for fiscal purposes. A 2021 reform transformed the fund into a financial fund, allowing resource accumulation and preventing the Ministry of Finance from withholding approved budget allocation.⁹

Finep's **public procurement** practices remain close to those of direct administration. Although the Constitution envisions a specific procurement statute for state-owned enterprises, a general procurement law enacted in 1993 and reinforced by subsequent judicial decisions made these enterprises follow rigid procedures¹⁰. In 2016 the SOE Law permitted state-owned enterprises to issue their own procurement regulations, but empirical evidence shows that these rules still closely replicate traditional procedures (Silva, 2018), which appears to be the case for Finep.

Finep's **human resource** management has also become increasingly similar to that of direct administration. While the SOE model allows flexibility in defining remuneration and its employees are formally governed by private labour law, the Constitution requires entry through public examinations, and judicial rulings have introduced dismissal procedures similar to those applied to civil servants, giving employees a status akin to civil servants. This grants them more job security than typical private sector roles but greater flexibility than civil service positions. Finep recruits primarily through large competitive exams held at irregular intervals, with limited opportunities for lateral entry. Finep maintains a career-based system with uniform rules for advancement, mobility, and compensation can encourage peer pressure for professional

⁸Established by Decree n. 68.748/1971 and reaffirmed by Law n. 11.540/2007.

⁹Law n° 177/2021.

¹⁰Law n° 8.666/93.

development, but can also lead to corporatism. As of December 2023, Finep had 541 employees, excluding interns and outsourced staff (Financiadora de Estudos e Projetos, 2024). The processes for attracting, selecting, retaining and dismissing personnel remain mainly rigid.

Embrapii's **governance** structure, as defined by SO's Law, is multisectoral. The board of directors (BoD) comprises 16 members, representing the public sector, civil society organizations and independent experts elected by the board. Members serve four-year terms, ensuring stability and strategic continuity. The Executive Board, appointed by the BoD, aligns with Embrapii's mission and is insulated from electoral cycles. Embrapii also undergoes regular external evaluations by an independent commission, ensuring transparency and accountability in its mission to strengthen industrial innovation in Brazil (Ministério da Gestão e da Inovação em Serviços Públicos, 2023).

Embrapii has a lean **organizational design**. It operates with an asset-light and decentralized structure, working through a network of existing public and private RTOs, known as Embrapii Units, managed using an operational excellence framework (de Oliveira & Guimarães, 2019). Embrapii publishes public calls for the accreditation of these RTOs and designates them as Embrapii Units. These contracts are simple and flexible, give autonomy to the units and evaluate their excellence in innovation management according to the framework developed by Embrapii (de Oliveira & Guimarães, 2019; Salles-Filho et al., 2021). This evaluation is used to strengthen the partnership or to disqualify the RTO as a unit. This model keeps Embrapii considerably leaner than Finep.

Regarding **budget and finance**, Embrapii suffers from the uncertainty of receiving resources from signed charter agreements with MCTI, MEC, MDIC and the Ministry of Health, and must constantly fundraise resources with ministries. The first charter agreement signed with the MCTI was established from 2013 to 2019 with an estimated transfer of R\$1.5 billion, only part of which was effectively transferred to Embrapii's account. Although disbursements can be uncertain, once resources are transferred to Embrapii's account they are not subject to federal annual budget rules, giving the agency more flexibility than Finep. The volume of financial resources managed by Embrapii remains substantially smaller.

Embrapii's **public procurement** follows an internal regulation approved by its BoD. While aligned with general principles of Brazilian public administration, ensuring compliance, transparency and equal treatment, it does not replicate the direct administration rules. Instead, it adopts more flexible procedures and allows vendor selection based on value for money rather than strictly the lowest price, which is the rule in Brazilian public administration. This flexibility enables faster engagement with external providers.

Finally, Embrapii's **human resources** management also follows internal regulations. Embrapii hires continuously through a position-based system in small batches, allowing for incremental team growth. As of December 2023, Embrapii had 116 employees, including 20 interns and 16 outsourced professionals (Associação Brasileira de Pesquisa e Inovação Industrial, 2024). Each position is publicly announced, and candidates are selected through CV analysis,

essays, and interviews. Embrapii operates on a relatively decentralized position-based system. Recruitment and promotions are handled at the departmental level, focusing on specific job functions and technical qualifications. This approach allows for lateral entry, where individuals can be hired directly into specific roles based on their expertise.

Finep and Embrapii differ significantly in their legal-institutional design, which shapes their governance, organizational structure, budgetary flexibility, procurement procedures and human resource management. These differences condition each agency’s capacity to develop dynamic capabilities. We summarize this comparison in Table 4.

Table 4 – Legal-institutional design of Finep and Embrapii

	Finep	Embrapii
Governance	Mandated by SOE Law and SOE statute.	Mandated by SO’s Law and SO statute.
Organizational design	Autonomy to define organizational structure because it is a non-dependent SOE and follows its own statutory rules.	Autonomy to define organizational structure because it is a non-profit association, qualified as OS. It follows its own statute.
Budget and finance	Mainly operates external resources from FNDCT, following federal budgetary rules.	Raises money with contracts with government bodies, including resources from FNDCT, and executes these resources following its own budgetary rules.
Public procurement and partnerships	Mandated by SOE Law and its own procurement regulation.	Follows procurement regulation approved by the board, aligned with principles of the public administration.
Human resources	Hires mainly through public exams (constitutional requirement), but has also room for a more flexible selection process, according to its own regulation.	Follows HR regulation approved by the board, hiring for each position with specific job descriptions.

Source: Authors’ construction.

5 EFFECTS OF LEGAL-INSTITUTIONAL DESIGN ON FINEP AND EMBRAPII’S DYNAMIC CAPABILITIES

This section discusses the effects of this legal-institutional design of innovation agencies on their dynamic capabilities for missions: sense, seize and transform.

5.1 Sense

The capabilities that underpin sensing are crucial for innovation agencies to effectively scan and interpret the environment. According to Teece (2007), “Sensing (and shaping) new opportunities is very much a scanning, creation, learning, and interpretive activity.” In mission-oriented contexts, this involves strategic thinking to identify potential missions, analytical thinking to forecast technological and industrial opportunities, and analytical thinking to understand political leverage and bargaining (see Table 5 for a summary).

Sensing at Finep. Finep's legal-institutional design shapes its sensing capabilities in several ways. The capability of strategic thinking to discern potential missions seems constrained by its governance structure, split between the FNDCT Council and its BoD, shaped over its 55 years of existence. There are two main formal governance spaces for Finep: the FNDCT Council, where Finep approves financial resources for policy interventions, and its BoD, where internal decisions of the SOE are decided. Strategic direction is largely set by the FNDCT Council, formed by government officials and a few representatives of staff, academia and industry. This governance model results in a high turnover rate at the leadership level, with short-term mandates aligned with government cycles, and separates planning from execution, hindering an agile strategic steering of the agency (Wong, 2004; Sabel & Victor, 2022:50). This reduces Finep's ability to strategically assess the challenges and agencies capacities to shape new markets, which affects its capability to discern potential missions effectively (Weber & Rohrachner, 2012; Mazzucato, 2021).

Finep's capability for analytical thinking to forecast technological and industrial opportunities seems to be influenced mainly by HR and public procurement and partnerships. Finep could have a degree of flexibility as an SOE to hire consultants or procure complementary specialists, but it does not seem to do so in practice.¹¹ The agency's in-house career-based system ensures a stable cadre of specialists with technology and market knowledge across various sectors, which is crucial for identifying technological and industrial opportunities that align with mission-oriented innovation policies. However, relying solely on internal expertise narrow Finep's exposure to diverse perspectives, potentially hindering its ability to keep pace with rapid technological change (Breznitz et al., 2018; Azevedo et al., 2018). Rigid procurement rules further restrict access to external expertise.

The capability for analytical thinking to discern political leverage and political bargaining in Finep seems to be predominantly shaped by the legal-institutional design of its governance and HR routines. Public-private collaboration remains weak (Azevedo et al., 2018), and the government majority in the FNDCT Council limits consensus-building for mission-oriented strategies. Additionally, the rigid career-based HR system struggles to internalize the specific complementary competencies needed to provide a quality service delivery that legitimizes public interventions.

Sensing at Embrapii. The legal-institutional design of Embrapii also influences its capability for strategic thinking to discern potential missions. Embrapii's governance and HR legal-institutional design appear to enhance strategic thinking capability. Embrapii benefits from a stable governance structure with minimal turnover at the leadership level, disconnected from political election cycles. For instance, the president of the BoD remained in charge from 2013 to 2021. There is less turnover at the executive board level, and the CEO and other officers

¹¹In the 1990s, this limited capacity to conceive and develop strategies led to the establishment of a SO called Center for Management and Strategic Studies (CGEE). The CGEE was responsible for the technical secretariats of the sectoral funds of FNDCT. This model operated until 2002.

have a four-year mandate. Even the search for a new CEO, which is usually done through a search committee, looks different from traditional government agencies due to the established governance. Apart from the turnover, Embrapii has a multistakeholder BoD, including government officials, experts, and industry leaders, which enhances the agency's strategic orientation and ability to assess challenges from different perspectives. Finally, because the BoD also controls resource allocation, strategic steering is more agile than in Finep. This model allows for more agile and strategic decision-making to collaboratively shape and co-create markets, enabling Embrapii to discern and pursue missions more effectively.¹²

The capability for analytical thinking to forecast technological and industrial opportunities is strongly influenced by Embrapii's HR and procurement and partnership regime derived from its legal-institutional design. Although Embrapii was designed as a bottom-up, demand-driven agency rather than a mission-oriented one, its position-based HR system and flexible procurement practices allow rapid hiring of experts and acquisition of specialized knowledge for forecasting technological opportunities. Even if it does not have in-depth technological and industrial knowledge, the position-based HR system allows Embrapii to quickly hire external experts and simplified procurement practices to purchase consultancy services for specific, targeted projects, enabling flexible integration of cutting-edge technological insights. Embrapii's network of RTOs is another important asset since it is regularly tested against real industrial demands, ensuring that the agency remains attuned to current technological needs of the industry.

Finally, its capability for analytical thinking to discern political leverage and political bargain seems affected by Embrapii's legal-institutional design of governance, HR and budget and finance routines. Embrapii's political sensing is supported by its balanced governance structure, which includes government, industry and scientific representatives. The position-based hiring system enables Embrapii to bring in politically savvy professionals and complementary competencies to provide quality services that give legitimacy to innovation policy.¹³ Interviewees highlighted the agency's low red tape and strong legitimacy with industry. While effective for broad industrial engagement, this model may face challenges when missions benefit only parts of the industrial system or involve managing transitions with asymmetric impacts.

¹²Even though Embrapii appears to have a more effective governance structure for missions than Finep, it may still fall short of designing and implementing cross-sectoral, whole-of-government missions. Pacheco (2019) emphasized the need for an innovation policy governance structure that is more closely aligned with the centre of government.

¹³For instance, Sabel and Victor (2022:10) argued that the false dichotomy between technocracy and democracy has hindered progress on climate change, claiming that a collaborative governance that integrates knowledge of experts with experience and values of citizens can provide greater democratic accountability to institutions.

Table 5 – Effects of legal-institutional design at Sense: the ability to scan the environment

Low-order dynamic capabilities	Effect of legal-institutional design (Finep)	Effect of legal-institutional design (Embrapii)	Comparison
Strategic thinking to discern potential missions.	Dual <i>governance</i> (FNDCT Council and BoD) with high leadership turnover and separation of planning and execution.	<i>Governance</i> with more stable leadership with a balanced multi stakeholder board.	Embrapii’s governance allows more strategic, collaborative decision-making, while Finep’s approach is less consistent over time and less agile.
Analytical thinking to forecast technological and industrial opportunities.	Career-based <i>HR</i> system provides stability but limits exposure to diverse perspectives; rigid <i>procurement</i> practices limits agility.	Position-based <i>HR</i> system enables rapid hiring of external experts; simplified <i>procurement</i> allows for agility.	Embrapii’s systems offer greater adaptability and integration of new insights, while Finep’s more rigid systems limit agility in technological and market forecasting.
Analytical thinking to discern political leverage and bargaining.	<i>Governance</i> that does not favour public-private collaboration; less agile career-based <i>HR</i> system.	Balanced multi stakeholder <i>governance</i> ; position-based <i>HR</i> system enhances quality service delivery.	Embrapii’s governance, HR systems support broader, more effective political engagement compared to Finep’s more centralized and rigid approach.

Source: Authors’ construction.

5.2 Seize

Seizing capabilities enable innovation agencies to act on opportunities identified through sensing. As Teece (2007) emphasized, “once a new [technological or market] opportunity is sensed, it must be addressed through new products, processes, or services.” In mission-oriented contexts, these capabilities involve strategic investment and allocation of resources, structuring decision-making procedures to avoid errors and bias while enabling innovation, and managing stakeholder networks and policy complementarities (Teece, 2007; see Table 6 for a summary).

Seizing at Finep. The legal-institutional design of Finep seems to affect the development and sustainability of “seize” capability in many ways. Finep’s capability for strategic investment and allocation of non-monetary resources was positively influenced by the recent transformation of FNDCT into a financial fund, which provides greater budgetary stability shielded from budget cuts. However, pressure to fully spend these funds within the fiscal year can cause rushed decisions, undermining strategic and impactful resource allocation.¹⁴ This capability also seems to be influenced by legal-institutional design of HR routines. HR routines centered on career-based internal expertise support the development of internal technical knowledge but limit access to complementary external insights needed for mission-oriented policies.

¹⁴In other investment models, such as private equity or venture capital, funds are typically deployed over several years. The lifespan of venture capital and private equity funds, from formation to exit, typically ranges from 10–12 years, depending on local regulations. For a more detailed analysis of VC investment decisions and the importance of timing, see Gompers et al. (2020).

Finep's capability to structure decision making procedures that avoid errors, bias and welcome innovation is negatively influenced by its governance legal-institution design, following compliance norms from the SOE legal regime. The Federal Court of Audit oversight on Finep is characterized by stringent procedural compliance requirements. Procedural rigor and conservative legal interpretations, such as strict adherence to competitive calls, make experimentation difficult. The career-based HR model also limits diversity of perspectives needed to reduce bias and encourage innovation. For instance, conservative legal interpretation of the principle of impartiality in public administration led Finep to design only open competitive calls for grants until 2023, instead of rolling-basis ones, making funding projects with Finep more bureaucratic than with Embrapii.

Finally, Finep's capability to manage stakeholder networks and policy complementarities appears to be affected by its governance legal-institutional design. Finep's management of stakeholder networks and policy complementarities is diminished as an agency that is far from the centre of government and is being supervised by MCTI. Nevertheless, Finep integrates a broad range of formal government commissions, which can help promote policy complementarities, even if Finep does not play an active leadership role in that. For instance, in 2024, it became a member of the commission with a remit to coordinate the state's purchasing power.¹⁵ Finep sits on a range of commissions, but the effective coordination of supply and demand policy initiatives and other policy complementarities remains challenging.

Seizing in Embrapii. Embrapii's capability to strategically invest and allocate non-monetary resources seems to be influenced by its flexible legal-institutional design on budget and partnership routines that support strategic investment and allocation of resources. Embrapii benefits from a multiannual budget model, which reduces pressure for annual expenditure and enables longer-term planning. However, Embrapii faces challenges related to its limited in-house capacity for specialized knowledge in technology and industry, which are important to design mission-oriented policies. Limited internal technical expertise is partly compensated by its network of accredited RTOs, although this bottom-up structure may constrain its ability to direct mission-oriented interventions.

Embrapii's governance, HR and partnerships legal-institutional design also seems to affect its capability to structure decision making procedures that avoid errors and bias and welcome innovation. Embrapii's decision-making environment is designed to be more dynamic and adaptable than Finep's, and its governance structure, which emphasizes results-based management, supports quicker and more agile responses to emerging needs. Embrapii's accountability is based on result metrics evaluated by an evaluation committee and submitted to the BoD for approval. Moreover, Embrapii's position-based HR system allows for the recruitment of external experts, continuously integrating new ideas and perspectives into the organization. From the outset, Embrapii also established a committee of specialists to evaluate the agency's results every semester, which strengthens its capability to avoid errors and ensures that its

¹⁵Decree n. 11.890/2024.

programs are continuously refined. Embrapii’s focus on a results-oriented approach allows it to incrementally design and improve its services, making them more effective for Brazilian firms seeking innovation. The partnerships with RTO within an accreditation system further enhance decision-making by prioritizing proven capabilities, reducing procedural delays, and fostering an environment that is conducive to innovation.

Finally, Embrapii’s governance and partnership legal-institutional design also affects its capability to manage stakeholder networks and policy complementarities. Embrapii’s quasi-public status gives it flexibility in managing stakeholder relationships and integrating complementary policies, while its governance structure facilitates the participation of ministries that contribute financially to the agency and are therefore more engaged with its projects, such as the Ministry of Health. However, due to its initial idea of a bottom-up agency, Embrapii’s governance legal-institutional design puts the agency even farther from the centre of government than Finep, making it harder to manage policy complementarities. Regarding its partnership routines, utilizing a standardized accreditation system further enhances the effectiveness of interactions with RTO and firms by reducing bureaucratic obstacles and enabling a more responsive and efficient approach to stakeholder management.

Table 6 – Effects of legal-institutional design on Seize: the ability to take advantage of opportunities

Low-order dynamic capabilities	Effect of legal-institutional design (Finep)	Effect of legal-institutional design (Embrapii)	Comparison
Strategic investment and allocation of non-monetary resources.	<u>Budget</u> based at annual spending deadlines leads to rushed decisions; <u>HR</u> routines favour development of in-house knowledge.	Multi-annual <u>budget</u> model supports deliberate planning and targeted resource allocation; it depends on <u>partnerships</u> with specialized technical expertise via accredited units.	Embrapii’s multi-annual budget supports strategic investment, while Finep’s in-house expertise is important for strategic investment.
Structuring decision-making procedures to avoid errors and bias while welcoming innovation.	<u>Governance</u> with rigid decision-making focused on procedural compliance; rigid <u>HR</u> limits exposure to diverse perspectives.	<u>Governance</u> with agile decision-making with a focus on results; flexible <u>HR</u> to bring in new perspectives and <u>partnerships</u> with RTOs within an accreditation system reduces delays and fosters innovation.	Embrapii’s result-oriented, flexible and decentralized decision-making enables quicker and innovative responses compared to Finep’s procedural compliance and rigid HR system.
Managing stakeholder networks and policy complementarities.	<u>Governance</u> does not favour broader stakeholder engagement; broader remit presents more policy instruments for engagement.	<u>Governance</u> with strategic engagement with few funding ministries; <u>partnership</u> through standardized accreditation system support management of implementation stakeholders.	Embrapii has more focused management around funding ministries; Finep participates more broadly on government commissions but is still far from the centre of government.

Source: Authors’ construction.

5.3 Transform

Transforming capabilities refer to an agency's ability to adapt and reconfigure internal resources as technologies, markets and policy demands evolve (Teece, 2007). In mission-oriented contexts, this involves three low-order dynamic capabilities: managing and securing stable financial resources; insourcing and outsourcing goods, HR, projects and processes; and managing and reskilling human resources (see Table 7 for a summary).

Transforming at Finep. Finep's legal-institutional design affects its capability to manage, prioritize and secure stable financial funds. One interviewee highlighted the lack of financial autonomy, referencing a case where a funding call to support firms experienced significant delays in fund transfers to grantees due to unforeseen financial restrictions. Although recent reforms stabilised FNDCT funding, Finep still operates under an annual budget cycle, which encourages short-term allocation and limits long-term planning for mission-oriented projects (Anadon, 2012).

Finep's legal-institutional design of HR, procurement and partnerships constrain its capability to insource and outsource goods, HR, projects and processes. The organization's reliance on more complex and procedural recruitment processes for in-house HR and adherence to more strict public procurement rules increases the costs of hiring and purchasing. It also slows the acquisition of external expertise and resources, hindering Finep's ability to adapt quickly to changing project demands and learning by doing from implementation.

Finally, Finep's capability to manage and reshape/reskill HR is also negatively affected. Finep's HR are managed predominantly through a career-based system, which provides stability and supports long-term institutional knowledge. This system encourages the development of deep expertise among its staff, including opportunities for advanced education such as PhD programs. However, the career-based approach also reduces flexibility, making it difficult to adapt quickly to new technological and industrial demands. Although Finep can hire external consultants through limited at-will positions, this process is seldom used.

Transforming at Embrapii. Embrapii's transforming capability is strongly influenced by its more flexible budgetary and HR arrangements. The capability to manage, prioritize and secure stable financial funds is affected by Embrapii's budget and finance legal-institutional design. Embrapii's multiannual funding model, though significantly smaller, allows resources to be carried across years, reducing exposure to fiscal volatility and supporting more strategic investment. Interviewees noted that Embrapii's private legal status enables it to attract resources from ministries seeking to execute their budgets quickly. In Brazil's public budget process, unspent funds often lapse, creating incentives for ministries to transfer resources rapidly; Embrapii can then use these funds over subsequent years. This mechanism enhances financial stability and allows for more deliberate allocation. However, Embrapii's funding is still less stable than Finep's and depends on continuous fundraising through specific charter agreements

More flexible HR, procurement and partnership rules strengthen Embrapii’s capability to insource and outsource goods, HR, projects and processes. Position-based hiring, simplified procurement and a strong evaluation culture allow the organization to bring in external expertise rapidly and to adjust projects and processes to evolving demands. This system enables Embrapii to quickly adapt to new project demands and market conditions by bringing in specialized external firms and consultants with proven track records.

Finally, the capability to manage and reshape/reskill HR seems to be influenced by the legal-institutional design for HR. Embrapii’s position-based HR system facilitates reskilling and adaptation compared to Finep’s career-based approach. The agency can hire staff with diverse backgrounds, including industry specialists and public servants on secondment, enabling continuous skill renewal and responsiveness to project needs and supporting a more experimental and adaptive organizational culture than Finep’s.

Table 7 – Effects of legal-institutional design on transform: the ability to change internal resources to adapt to the environment

Low-order dynamic capabilities	Effect of legal-institutional design (Finep)	Effect of legal-institutional design (Embrapii)	Comparison
Manage, prioritize, and secure stable financial funds.	<i>Finance</i> provided volatile funding historically. Recent reforms provide stability but annual budgeting create challenges due to sudden influxes.	Multi-annual <i>budget</i> with flexibility to carry over funds, ensuring stable and strategic financial management, but with uncertainty about future funding.	Embrapii’s multi-annual model allows for better long-term planning, while Finep recently achieved more funding stability.
Insourcing and outsourcing goods, HR, projects, and processes.	Rigid <i>HR</i> system, <i>procurement and partnerships</i> regime limits flexibility in adapting to new demands.	Flexible <i>procurement and partnership</i> regime and <i>HR</i> allow for better outsourcing and insourcing decisions and improves responsiveness.	Embrapii’s flexible and dynamic model contrasts with Finep’s rigid approach, enabling quicker adaptation.
Managing and reshaping/reskilling HR.	Career-based <i>HR</i> system ensures stability and institutional knowledge but limits flexibility.	Position-based <i>HR</i> system with greater flexibility.	Embrapii’s HR practices allow more dynamic/responsive workforce management than Finep’s rigid system.

Source: Authors’ construction

6 DISCUSSION

Mission-oriented innovation policies require innovation agencies to develop dynamic capabilities to deal with uncertainty and adapt accordingly in search of solutions for significant global challenges (Kattel & Mazzucato, 2018). This study examined the legal-institutional design of two Brazilian innovation agencies, Embrapii and Finep, and offered a contingent explanation of how these designs shape the dynamic capabilities necessary for mission-oriented innovation policies.

Comparing Embrapii (an SO) with Finep (an SOE) suggests that Embrapii's current legal-institutional design is more conducive to developing dynamic capabilities. Its routines encourage a more results-oriented agency, with stable and multistakeholder leadership, fewer political transitions, and greater room for experimentation and acquisition of complementary capabilities. These features support continuous improvement in service delivery and responsiveness.

However, Embrapii's bottom-up approach limits its ability to steer mission-oriented strategies. Its strategic influence largely concerns accrediting new Embrapii Units; project selection is mainly determined by firms and RTOs. While this decentralization fosters collaboration and adaptation, it complicates alignment around large, cross-sectoral missions requiring directionality and coordinated resource allocation. Embrapii's flexibility thus positions it well for mission-oriented policies but does not guarantee capacity to guide transformative missions.

Embrapii also faces the challenge of scale. Finep operates with significantly greater resources and system-wide visibility. Should Embrapii continue to grow, increased oversight and political attention may reduce its current flexibility, changing the political economy in terms of its ability to avoid intricate procedures to manage public funds. Larger organizations tend to become more rigid, especially when they have to deal with great budgets of public resources.

Overall, the cases reinforce the relevance of legal-institutional design for the development and sustainability of mission-oriented dynamic capabilities. They also suggest that higher degrees of publicness remain associated with more rigid organizational functioning and lower dynamic capabilities (Piening, 2013). Yet policymakers should note that legal-institutional design is not the only determinant: environmental turbulence, leadership, existing capabilities and path dependencies also influence dynamic capability development. Furthermore, higher publicness does not inevitably produce rigidity; institutional arrangements can be intentionally designed to support flexibility and dynamic capabilities. The case of DARPA illustrates that high publicness can coexist with strong dynamic capabilities when tailored procurement, hiring regimes and agile accountability are in place (Bonvillian, 2014).

6.1 The legal-institutional design matters

This paper contributes empirically to the literature by *demonstrating that legal-institutional design plays a decisive role in enabling mission-oriented dynamic capabilities, confirming theoretical expectations advanced by Spano et al. (2024)*. Embrapii's evolution suggests that its design may provide better "evolutionary fit" than Finep's, enabling more robust sensing, seizing and transforming capabilities despite its initially smaller scale.

The findings reinforce earlier work showing that *legal-institutional environments shape dynamic capabilities* (Eriksson, 2014; Piening, 2013) and connect to legal institutionalism by illustrating the role of law in structuring institutions (Deakin et al., 2017) and enabling experimentalist governance (Sabel & Victor, 2022). Yet legal reforms alone cannot generate dynamic capabilities. In Brazil, SOE Law empowered organizations to create flexible procurement regulations, but many remained risk-averse and reproduced traditional rules due to compliance cultures and fear of oversight scrutiny (Silva, 2018). Capability development is mediated by internal culture, environmental turbulence, leadership and existing routines.

The cases also support the argument that *higher degrees of publicness—collective ownership, state funding and political control over managers—tend to correlate with lower dynamic capabilities* (Piening, 2013). Finep's higher publicness constrains its adaptive capacity compared to Embrapii. However, examples such as DARPA demonstrate that institutional design can be purposefully crafted to balance public accountability with agility. The Defense Advanced Research Projects Agency (DARPA) in the US maintains high publicness while fostering dynamic capabilities through unique institutional characteristics, such as specialized procurement and hiring regimes and dynamic accountability mechanisms, including direct reporting to Congress (Bonvillian, 2014).

These findings align with broader insights on hybrid organizations (Billis, 2010; Brandsen & Karré, 2011), showing that organizational identity lies on a continuum between publicness and privateness. Hybrids can combine diverse funding streams and governance mechanisms to balance public accountability with autonomy, enabling more innovative and adaptive organizational forms.

Recognizing the role of legal-institutional design opens possibilities for policymakers to craft models that promote learning, adaptability and better public sector performance. This ability to design institutions that learn and adapt over time is crucial for enhancing service delivery and improving public sector performance. Different organizational models can reflect the specific nature of services offered and the evolving understanding of what needs improvement, showcasing the government's ability to innovate within the public framework.

6.2 Pathway to improve the legal-institutional design and dynamic capabilities framework

Empirical testing of the framework used in this study suggests ways to strengthen it. The current framework effectively captures how administrative routines are shaped by legal-institutional design and how these routines influence dynamic capabilities. However, it overlooks the “finalistic” routines central to innovation agencies’ missions, such as the processes of selecting, structuring and administering financial instruments for innovation policy.

Mission-oriented innovation agencies operate through various intervention routines that are crucial for selecting, funding, and evaluating a successful portfolio of projects. These routines involve complex decision-making processes that tailor financial instruments to meet diverse stakeholder needs. The framework’s emphasis on administrative routines omits the nuances of finalistic organizational routines of innovation agencies, such as the processes of providing equity, credit and grants for mission-oriented innovation policies. For instance, it neglects key nuances in finalistic routines, such as the distinction between Finep R&D grants, which firms manage, and those in Embrapii, which are managed by RTOs.

We find that the legal-institutional design of innovation agencies seems to also affect finalistic routines connected to innovation policy interventions. In Brazil, innovation policy instruments must be created by law due to conservative interpretations of legality (Vitor Monteiro, 2021). This restricts agencies’ autonomy to design new instruments and affects mission-oriented implementation. Differences between Finep’s firm-managed grants and Embrapii’s RTO-managed grants illustrate how these legal-institutional constraints shape operational flexibility. For example, the innovation agency’s choice of whether to provide grants or credit can significantly impact its ability to encourage innovation. Furthermore, the effectiveness of these financial instruments also depends on the legal-institutional constraints surrounding their administration, such as the legal requirement to publicly open competitive calls or provide grants on a rolling basis. While these finalistic routines are not explicit in the analytical framework used in this research, we recognize that their legal-institutional design is critical for the innovation agency’s ability to adapt and refine its mission-oriented strategic interventions over time.

7 CONCLUSIONS

This study shows how mission-oriented innovation policies, dynamic capabilities and legal-institutional design interact within innovation agencies in an emerging economy. The cases of Finep and Embrapii demonstrate that more flexible and result-oriented legal-institutional arrangements create a more conducive environment for dynamic capabilities, while more rigid arrangements constrain them. Embrapii illustrates how flexible governance and resource management can enhance dynamic capabilities, whereas Finep’s higher publicness

and procedural constraints continue to limit adaptability despite recent improvements.

However, these conclusions are not definitive; neither model is inherently superior. Both agencies have important features for mission-oriented policy, albeit through different mechanisms. Finep's integration into the state apparatus, accumulated expertise and financial scale give it strategic leverage for missions, while Embrapii's agility supports experimentation and responsiveness. This diversity in approaches presents fertile ground for further study on how legal-institutional flexibility and public accountability can be balanced to optimize dynamic capabilities development for mission-oriented innovation policies.

Policy implications include the need for governments to consider legal-institutional design as a foundational element when fostering dynamic capabilities in innovation agencies. Moreover, a future research agenda could focus on developing tools to assess dynamic capabilities in mission-oriented innovation agencies, supporting the identification of bottlenecks and best practices that can be translated across different contexts.

Ultimately, this study contributes to the growing recognition that legal-institutional design is foundational for developing and sustaining dynamic capabilities in mission-oriented innovation agencies. However, success in mission-oriented innovation policy requires more than just organizations with dynamic capabilities; it also requires political support around collectively creating value, a market-shaping approach to innovation policy and better distribution of risks and rewards (Mazzucato, 2021). The present study will have achieved its purpose if it helps raise awareness of the relevance of looking at legal-institutional design as an important antecedent for developing dynamic capabilities in innovation agencies for mission-oriented innovation policies.

REFERENCES

- Antón, G. D. (2008). Censura de la huida del derecho administrativo a través de sociedades comerciales. *Revista de Derecho*, 7(13), 125–162. Retrieved from <https://revistas.um.edu.uy/index.php/revistaderecho/article/view/814>
- Associação Brasileira de Pesquisa e Inovação Industrial (Embrapii). (2024, March). *Annual report on activities performed from January to December 2023*. Brasília, DF: Embrapii. Retrieved from https://embrapii.org.br/wp-content/images/2024/04/Relatorio-Gestao-2023_30042024.pdf on July 19, 2024.
- Azevedo, P. F., Saes, M. S. M., Schnaider, P., Morgulis, M. C. A., Franceschini, A. S. N., Santana, S., & Carvalho, T. B. (2018). Brazil: Building capabilities for technology and innovation. In J. Cornick, E. Dal Bó, E. Fernández-Arias, G. Rivas, & E. Stein (Eds.), *Building capabilities for productive development* (Vol. 1, pp. 123–172). Inter-American Development Bank.
- Breznitz, D., Ornston, D., & Samford, S. (2018). Mission critical: the ends, means, and design of innovation agencies. *Industrial and Corporate Change*, 27(5), 883–896. <https://doi.org/10.1093/icc/dty027>
- Berwick, E., & Christia, F. (2018). State capacity redux: Integrating classical and experimental contributions to an enduring debate. *Annual Review of Political Science*, 21. <https://doi.org/10.1146/annurev-polisci-072215-012907>
- Billis, D. (2010). Towards a theory of hybrid organizations. In D. Billis (Ed.), *Hybrid organizations and the third sector: challenges for practice, theory and policy* (pp. 46–69). Houndmills: Palgrave Macmillan.
- Bonvillian, W. B. (2014). The new model innovation agencies: An overview. *Science and Public Policy*, 41(4), 425–437. <https://doi.org/10.1093/scipol/sct059>

- Brandesen, T., & Karré, P. M. (2011). Hybrid organizations: No cause for concern? *International Journal of Public Administration*, 34(13), 827–836. <https://doi.org/10.1080/01900692.2011.605090>
- Bresser-Pereira, L. C. (1998). Uma reforma gerencial da administração pública no Brasil. *Revista do Serviço Público (RSP)*, 49(1), 5–42. Escola Nacional de Administração Pública (ENAP). <https://doi.org/10.21874/rsp.v49i1.360>
- Caldas, M. J. A. (2001). *A USP e seus desafios – Modulo 01* (1st ed.). São Paulo, SP, Brasil: EDUSP.
- Cingolani, L. (2018). The role of state capacity in development studies. *Journal of Development Perspectives*, 5(2), 88–114. <https://doi.org/10.5325/jdevepers.2.1-2.0088>
- Corder, S., Buainain, A. M., Hollanda, S., & Pacheco, C. A. (2023). O potencial e os limites do FNDCT para financiar a inovação no Brasil. *Revista do Serviço Público* 74(1), 143–166. <https://doi.org/10.21874/rsp.v74i1.9961>.
- Deakin, S., Gindis, D., Hodgson, G. M., Huang, K., & Pistor, K. (2017). Legal institutionalism: Capitalism and the constitutive role of law. *Journal of Comparative Economics*, 45(1), 188–200. <https://doi.org/10.1016/j.jce.2016.04.005>.
- Delgado, P. S. (2014). “Huida” ilegal del derecho administrativo: Las fundaciones de la presidencia de la república y la ley de transparencia. *Anuario de Derecho Público*, (1), 441–468. Retrieved from https://www.researchgate.net/publication/265333716_Huida_ilegal_del_Derecho_Administrativo_las_Fundaciones_de_la_Presidencia_de_la_Republica_y_la_Ley_de_Transparencia
- Embrapii. (2024, January 5). *Com R\$ 677 milhões, Embrapii bate recorde de investimento em inovação em 2023* [With R\$ 677 million, Embrapii sets record for innovation investment in 2023]. Retrieved September 3, 2024, from <https://embrapii.org.br/com-r-677-milhoes-embrapii-bate-recorde-de-investimento-em-inovacao-em-2023/>
- Edler, J., & Georghiou, L. (2007). Public Procurement and innovation – Resurrecting the Demand Side, *Research Policy*, 36, 949–963. <https://doi.org/10.1016/j.respol.2007.03.003>
- Eriksson, T. (2014). Processes, antecedents and outcomes of dynamic capabilities. *Scandinavian Journal of Management*, 30(1), 65–82. <https://doi.org/10.1016/j.scaman.2013.05.001>
- European Commission. (2018). Towards a mission-oriented research and innovation policy in the EU.
- Financiadora de Estudos e Projetos (Finep). (2024). *Lei Orçamentária Anual*. Retrieved September 3, 2024, from <http://finep.gov.br/a-finep-externo/fndct/lei-orcamentaria-anual>.
- Financiadora de Estudos e Projetos (Finep). (2024). Finep’s statute approved by 18th extraordinary general assembly on April 30th, 2024.
- Financiadora de Estudos e Projetos (Finep). (2023). *Relatório Anual Integrado da Finep 2023*. Ministério da Ciência, Tecnologia e Inovação. Retrieved July 18, 2024, from http://www.finep.gov.br/images/aceso-a-informacao/Relatorios/2024/29_05_2024_RAI_2023_final.pdf
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219–245. <https://doi.org/10.1177/1077800405284363>
- Gerring, J. (2004). What is a case study and what is it good for? *American Political Science Review*, 98(2), 341–354. <https://doi.org/10.1017/S0003055404001182>
- Gieske, H., van Buuren, A., & Bekker, V. (2016). Conceptualizing Public Innovative Capacity: a Framework for Assessment. *The Innovation Journal: The Public Sector Innovation Journal*, 21(1), 25. hdl.handle.net/1765/86056
- Gompers, P. A., Gornall, W., Kaplan, S. N., & Strebulaev, I. A. (2020). How do venture capitalists make decisions? *Journal of Financial Economics*, 135(1), 169–190. <https://doi.org/10.1016/j.jfineco.2019.06.011>
- Kattel, R. (2022). *Dynamic capabilities of the public sector: towards a new synthesis* (Working Paper). IIPP/UCL.
- Kattel, R., Drechsler, W., & Karo, E. (2022). *How to make an entrepreneurial state: why innovation needs bureaucracy*. New Haven: Yale University Press.
- Kattel, R., & Mazzucato, M. (2018). Mission-oriented innovation policy and dynamic capabilities in the public sector. *Industrial and Corporate Change*, 27(5), 787–801. <https://doi.org/10.1093/icc/dty032>.
- Laplane, A. (2024). Market co-creating and shaping through investments in innovation: a comparative analysis of two public funding programmes in Brazil. *Innovation and Development*, 14(1), 25–46. <https://doi.org/10.1080/2157930X.2021.1989646>

- Larrue, P. (2021). The design and implementation of mission-oriented innovation policies: A new systemic policy approach to address societal challenges. *OECD Science, Technology and Industry Policy Papers*, n. 100. <https://doi.org/10.1787/3f6c76a4-en>.
- Limoeiro, D., & Schneider, B. R. (2017). State-led innovation: SOEs, institutional fragmentation, and policy making in Brazil. *MIT-IPC Working Paper*, 17-004.
- Mazzucato, M., & Penna, C. (2016). *The Brazilian innovation system: a mission-oriented policy proposal*. Avaliação de Programas em CT&I. Apoio ao Programa Nacional de Ciência (Plataformas de conhecimento). Brasília, DF: Centro de Gestão e Estudos Estratégicos.
- Mazzucato, M. (2018). *The value of everything: making and taking in the global economy*. New York: PublicAffairs.
- Mazzucato, M. (2018a) *Missions: Mission-Oriented Research & Innovation in the European Union*, European Commission, Brussels: European Commission. https://ec.europa.eu/info/sites/info/files/mazzucato_report_2018.pdf, accessed 8 Nov. 2022.
- Mazzucato, M. (2021). *Mission economy: a moonshot guide to changing capitalism* (1st ed.). Allen Lane.
- Meijer, A. (2019). Public innovation capacity: developing and testing a self-assessment survey instrument. *International Journal of Public Administration*, 42 (8), 617–627. <https://doi.org/10.1080/01900692.2018.1498102>.
- Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge, Mass.: The Belknap Press of Harvard University Press.
- Mayne, Q., De Jong, J., & Fernandez-Monge, F. (2020). State Capabilities for Problem-Oriented Governance. *Perspectives on Public Management and Governance*, 3(1): 33–44. <https://doi.org/10.1093/ppmgov/gvz023>.
- Ministério da Gestão e da Inovação em Serviços Públicos. (2023, May 17). *Boletim das Organizações Sociais: EMBRAPII*. Governo Federal. Retrieved from https://www.gov.br/gestao/pt-br/assuntos/estruturas-organizacionais/organizacaoes-sociais/20230517_boletim_embrapii_vfinal.pdf on July 19, 2024.
- Monteiro, V. (2021). *Características do sistema jurídico brasileiro de fomento estatal à inovação: a formação da institucionalidade estatal de ciência, tecnologia e inovação e a sua convergência atual sob o tema da inovação*. USP.
- Oliveira, J. F. G., & Guimarães, J. A. (2019). *Building trust in innovation: The case of EMBRAPII*. In E. B. Reynolds, B. R. Schneider, & E. Zylberberg (Eds.), *Innovation in Brazil: Advancing development in the 21st century* (pp. 231–255). Routledge.
- Pacheco, C. A. (2019). *Institutional dimensions of innovation policy in Brazil*. In E. B. Reynolds, B. R. Schneider, & E. Zylberberg (Eds.), *Innovation in Brazil: Advancing development in the 21st century* (pp. 171–188). Routledge.
- Piening, E. P. (2013). Dynamic capabilities in public organizations: A literature review and research agenda. *Public Management Review*, 15(2), 209–245. <https://doi.org/10.1080/14719037.2012.708358>
- Pinto, H. M. (2010). A autarquização das empresas estatais na jurisprudência do Supremo Tribunal Federal: Um obstáculo para as reformas na administração pública. *Cadernos Gestão Pública e Cidadania*, 15(57). <https://doi.org/10.12660/cgpc.v15n57.3255>
- Pollitt, C., & Bouckaert, G. 2011. *Public Management Reform: a comparative analysis – New Public Management, Governance, and the Neo-Weberian State*. 2nd ed. Oxford: Oxford University Press.
- Reynolds, E. B., Schneider, B. R., & Zylberberg, E. (Eds.). (2019). *Innovation in Brazil: advancing development in the 21st century* (1st ed.). Routledge. <https://doi.org/10.4324/9780429053092>
- Sabel, C. F., & Victor, D. G. (2022). *Fixing the climate: strategies for an uncertain world*. Princeton: Princeton University Press.
- Salles-Filho, S., Bin, A., Bonilla, K., & Colugnati, F. A. B. (2021). Effectiveness by design: overcoming orientation and transaction-related barriers in research-industry linkages. *Revista de Administração Contemporânea*, 25(5), e190346. <https://doi.org/10.1590/1982-7849rac2021190346.en>
- Salomón, D. A. S. (2015). La huida del derecho administrativo en España y en Colombia. Un panorama desde las entidades descentralizadas. *Derecho Público*, (34), 19. Retrieved from <https://dialnet.unirioja.es/servlet/articulo?codigo=7477827>
- Silva, M. S., Schmidt, F. de H., & Kliass, P. (Ed.). (2017). *State-owned enterprises: Public policies, governance, and performance*. Instituto de Pesquisa Econômica Aplicada (Ipea). <https://repositorio.ipea.gov.br/handle/11058/9505>

- Silva, P. I. P. da. (2018). *Regulamentos de licitações editados sob a Lei n. 13.303/2016: instrumentos de inovação ou de repetição?* Rio de Janeiro: FGV EBAPE – Escola Brasileira de Administração Pública e de Empresas.
- Spanó, E., Monnerat, R., Pacheco, C. A., & Bonacelli, M. B. M. (2024). Legal–institutional design and dynamic capabilities for mission-oriented innovation agencies: A new framework. *Science and Public Policy*, 51(2), 192–206. <https://doi.org/10.1093/scipol/scad065>
- Strauss Klein, M. F. (2012). *La nueva gestión pública, la huída del derecho administrativo y el retorno al derecho público*. Retrieved from <https://repositorio.uchile.cl/handle/2250/112914>
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350. <https://doi.org/10.1002/smj.640>.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z)
- UNESCO. (2021). *UNESCO science report: The race against time for smarter development*. Paris: UNESCO Publishing.
- Weber, K. M., & Rohracher, H. (2012). Legitimizing research, technology, and innovation policies for transformative change: Combining insights from innovation systems and multi-level perspective in a comprehensive ‘failures’ framework. *Research Policy*, 41(6), 1037–1047. <https://doi.org/10.1016/j.respol.2011.10.015>
- Wong, S. C. Y. (2004). Improving corporate governance in SOEs: An integrated approach. *Corporate Governance International*, 7(2), 5–15. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=897121
- Wong, S. C. Y. (2018). The state of governance at state-owned enterprises. *Private Sector Opinion*, 40. International Finance Corporation. <https://www.ifc.org/wps/wcm/connect/b1adde06-267d-4d79-bfaf-62f17de51f4a/PSO40.pdf?MOD=AJPERES&CVID=m7T0xLQ>
- Yin, R. K. (2018). *Case study research and applications: design and methods*. Sage Publications.

NOTAS

CONTRIBUIÇÃO DE AUTORIA

Concepção e elaboração do manuscrito: Eduardo Spanó, Rafael Monnerat, Rafael Leite

Coleta de dados: Eduardo Spanó, Rafael Monnerat, Rafael Leite

Discussão dos resultados: Eduardo Spanó, Rafael Monnerat, Rafael Leite, Carlos Américo Pacheco, Maria Beatriz Bonacelli

Revisão e aprovação: Eduardo Spanó, Rafael Monnerat, Rafael Leite, Carlos Américo Pacheco, Maria Beatriz Bonacelli

AUTOR CORRESPONDENTE Eduardo Spanó (eduardo.spano@jatai.org.br)

FINANCIAMENTO

O Instituto Jataí apoiou este trabalho.

CONSENTIMENTO DE USO DE IMAGEM

Não se aplica.

APROVAÇÃO DE COMITÊ DE ÉTICA EM PESQUISA

Aprovado pelo Comitê de Ética da Universidade Estadual de Campinas (CAAE nº 47785221.1.0000.8142).

CONFLITO DE INTERESSES

A autoria declara não haver interesses conflitantes.


DISPONIBILIDADE DE DADOS DE PESQUISA E OUTROS MATERIAIS

Não se aplica.


PUBLISHER

Fundação Escola Nacional de Administração Pública (Enap). As ideias expressadas neste artigo são de responsabilidade de seus autores, não representando, necessariamente, a opinião dos editores ou da Enap.


EDITORES

Editor-Chefe: Alexandre de Ávila Gomide  (Escola Nacional de Administração Pública, Brasília/DF – Brasil)

Editores:

Rafael Rocha Viana  (Escola Nacional de Administração Pública, Brasília/DF, Brasil)

Ana Clara Cândido  (Escola Nacional de Administração Pública, Brasília/DF, Brasil)

Mila Lopes Mesquita  (Escola Nacional de Administração Pública, Brasília/DF, Brasil)

HISTÓRICO

Submetido: 23/dez/2025 | Aceito: 15/abr/2026 | Publicado: 22/maio/2026

AGRADECIMENTOS

We would like to thank the interviewees from Finep and Embrapii and the journal reviewers for their valuable insights. Thanks for comments and feedback on earlier versions of this article to Professor Rainer Kattel, Olga Mikheeva and other attendees of the YSI-IIPP Rethinking Innovation Conference (September 2021); to Prof. Mika Kautonen and colleagues of the Globelics Academy 2022 in Tampere, Finland (15–26 August 2022); to Prof. Carlo Pietrobelli and attendees of the SASE Conference 2023 in Rio de Janeiro, Brazil (20–22 July 2023); and colleagues from the Department of Science and Technology Policy, State University of Campinas (Unicamp). Any remaining errors are our own.

LICENÇA DE USO

Copyright (c) 2026 Eduardo Spanó, Rafael Monnerat, Rafael Leite, Carlos Américo Pacheco, Maria Beatriz Bonacelli. As pessoas autoras mantêm os direitos autorais e concedem à Revista do Serviço Público (RSP) o direito de primeira publicação, com o trabalho licenciado sob a Licença Creative Commons Atribuição-NãoComercial 4.0 Internacional. (CC BY-NC 4.0). Os artigos são de acesso aberto e uso gratuito.

