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Analysis of determinants for Open Innovation implementation in Regional Innovation Systems

Lindomar Subtil de Oliveira [a,b,*], Márcia Elisa Soares Echeveste [b], Marcelo Nogueira Cortimiglia [b], César Giovani Colini Gonçalves [b]

[a] *Universidade Tecnológica Federal do Paraná – UTFPR, Paraná, PR, Brazil*
[b] *Universidade Federal do Rio Grande do Sul – UFRGS, Porto Alegre, RS, Brazil*

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Abstract

This study deals with the challenge of implementing an Open Innovation strategy in Regional Innovation Systems. In this context, our research question is: can a Regional Innovation Systems be a favorable environment for Open Innovation implementation? To address this question, the main objective of this paper was to identify and analyze the determinant factors for a successful implementation of Open Innovation in Regional Innovation Systems. The factors were empirically tested through qualitative research involving seven of the key actors in a Regional Innovation Systems in the Paraná state, in southern Brazil. The results suggest that some of the determinants factors and conditions for Open Innovation implementation are: proximity and close relationship with Higher Education Institutions; existence of a governance system to intermediate relationships with knowledge actors outside the regional system; mechanisms of relationship network and knowledge absorptive capacity by the firms constituting the Regional Innovation Systems; and provision of public support (e.g., incentives, funding, infrastructure). Since these determinants are present in the Regional Innovation Systems in question, we conclude that the Regional Innovation Systems offers a favorable environment to Open Innovation implementation. Additionally, we highlight a number of contributions and implications for academics, practitioners and those interested in Regional Innovation Systems governance.

Keywords: Innovation; *Open Innovation*; Regional Innovation System; Cooperation and partnerships

Introduction

Governments have been increasingly dedicating efforts to strengthen the existing relationships between innovation and geographical boundaries by establishing dedicated policies, particularly regarding scientific and technological development (Buesa, Heijs, Pellitero, & Baumert, 2006). Regional development, on the other hand, requires dedication and commitment by a number of actors, such as public research institutes, firms, Higher Education Institutions (HEI), and regional government agencies, whose complex interrelationship constitute an innovation habitat. In particular, the Regional Innovation Systems (RIS) have emerged as focal points of innovation, technology and technical training, orchestrating the identification of industrial demand in these areas and facilitating relationship and interaction between private firms, researchers and other institutional actors (Asheim & Coenen, 2005; Casali, Silva, & Carvalho, 2010; Tödtling & Trippl, 2005). Besides, RIS enable a continuous flow of knowledge exchanges between constituting actors, provide qualified human resources and financial incentives, and promote legal and intellectual propriety management support

* Corresponding author.
E-mails: lindomar@utfpr.edu.br (L.S. Oliveira), echeveste@producao.ufrgs.br (M.E. Echeveste), cortimiglia@producao.ufrgs.br (M.N. Cortimiglia), CGoncalves@pr.sebraepr.br (C.G. Gonçalves).
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(Wang, Vanhaverbeke, & Roijakkers, 2012). Given these characteristics, it can be argued that RIS are potentially favorable environments for practices and strategies of Open Innovation (OI) implementation.

Although literature on OI is already mature, theory and practice about OI implementation is still rather limited and fragmented (Wikhamn & Wikhamn, 2013), and does not yet fully cover a number of specific topics. In particular, there is a lack of academic research on OI implementation in RIS. In this context, the research question addressed in this paper is: can a RIS be a favorable environment for OI implementation? In order to answer this question, the aim of this paper is to identify and analyze the determinant factors for a successful implementation of OI in RIS. The identified factors were empirically tested through qualitative research involving seven of the key actors in a RIS in the Paraná state, in southern Brazil.

The main contribution of this paper is the expansion of the current academic discussion about new applications and opportunities for OI implementation. This research is focused on RIS, which can be an interesting setting for OI strategies. Besides, this work can foster additional academic research in this topic in order to generate new knowledge about the link between RIS characteristics (e.g., structure, governance, practices) and innovation performance results, including results relating to OI adoption. For managers, this work brings also an important contribution, as the results of this research private may be used by firms participating in a RIS to guide the implementation of specific OI practices aligned with existing opportunities in collaborative partnerships, public infrastructure and incentives, availability of technological resources, legal support and innovation policies.

Q2 This paper is structured in five sections. After this Introduction, 'Literature review' section presents the theoretical foundation for the empirical research, while the 'Methodological procedures' section describes the methodological procedures employed in the research. Next, sections 'Research method' and 'Results', respectively, report and discuss the results and present the conclusions, limitations, and suggestions for future works in Q3 the topic.

Literature review

Innovation and OI strategies

Innovation is an evolutionary process of collective learning in which different stakeholders (firms, research institutions, customers, governments, financial institutions) can unite and cooperate to conduct collaborative projects (Tödtling & Trippl, 2005; Van Mierlo, Leeuwis, Smits, & Woolthuis, 2010). In this context, the OI approach consists in knowledge inflows and outflows that accelerate innovation development and expand innovation commercialization (Chesbrough, 2003; Rahman & Ramos, 2010). Effective OI requires a flexible and dynamic organizational structure based on collaboration (Chesbrough, 2012). More importantly, OI can positively impact business performance by increasing innovation capabilities (Cheng & Chen, 2013), sharing risks and resources, reducing product development times, improve employee participation and increase access to new knowledge, technologies, and markets (Ades et al., 2013; Enkel, Gassmann, & Chesbrough, 2009; Huang, Lai, Lin, & Chen, 2013; Kumar, Boesso, Favotto, & Menini, 2012; Parida, Oghazi, & Ericson, 2014; Rahman & Ramos, 2010).

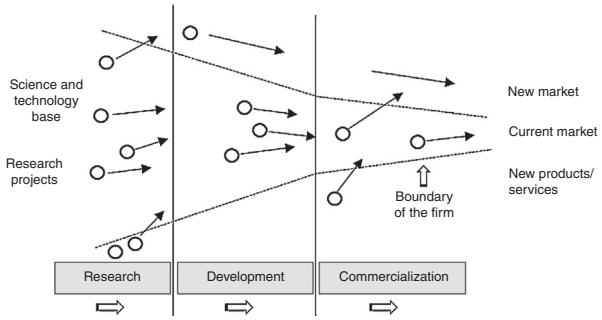

Fig. 1. Innovation funnel (*Open Innovation*).
Source: Adapted from Chesbrough (2003).

The classic concept of innovation funnel advanced by Chesbrough (2003), shown in Fig. 1, divides the OI process in three main stages: (i) research projects/investigation; (ii) development; and (iii) commercialization.

In the research stage, firms search for ideas, concepts, partnerships and projects from technological and scientific sources. This model emphasizes the fact that external opportunities have to be better explored, allowing the development of innovation through the exploration of technologies and resources (Chesbrough, 2007). In the development stage, new opportunities, partnerships and projects can arise. Basically, however, the development stage is a filter for the projects selected in the previous stage, which can be addressed to current or new markets and can result in licensing agreements, joint product and service development projects, technology transfer initiatives, and addition of venture capital. Lastly, in the commercialization stage, external business channels are explored to generate value for the organization.

Among approaches to OI that are complementary to the funnel model, the concept of innovation value chain can be highlighted (Hansen & Birkinshaw, 2007). In this approach, the authors define innovation as an integrated and systemic process constituted by an idea generation and conversion stage followed by the diffusion of the resulting products and practices. Belussi, Sammarra, and Sedita (2010) propose an OI model for a RIS, while Miles, Miles, and Snow (2005) detail a model of collaborative and networked entrepreneurship.

Normally, the literature on OI process mention the terms inbound/inflows and outbound/outflows (Dahlander & Gann, 2010; Parida, Westerberg, & Frishammar, 2012). The former refers to the strategy more often employed by firms (Lichtenthaler, 2008), and basically refers to the internal use of ideas, knowledge and resources created externally to the firm (Sisodiya, Johnson, & Gregoire, 2013), while the latter refers to external exploration and commercialization of innovation developed internally by the focal firm using mechanisms such as licenses (Chesbrough & Crowther, 2006; Huang et al.,

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