Stimulating technological innovation through incentives: Perceptions of Australian and Brazilian firms

Tan Yigitcanlar\textsuperscript{a,⁎}, Jamile Sabatini-Marques\textsuperscript{b}, Eduardo Moreira da-Costa\textsuperscript{b}, Md Kamruzzaman\textsuperscript{a}, Giuseppe Ioppolo\textsuperscript{c}

\textsuperscript{a} School of Civil Engineering and Built Environment, Queensland University of Technology (QUT), 2 George Street, Brisbane, QLD 4001, Australia
\textsuperscript{b} Engineering and Knowledge Management, Federal University of Santa Catarina, Campus Universitário, Trindade, CEP 88040-900 Florianópolis, SC, Brazil
\textsuperscript{c} Department of Economics, University of Messina, Piazza Pugliatti, 1, 98122 Messina, Italy

ARTICLE INFO

Keywords:
Innovation
Incentives
National innovation system
Knowledge-based economic development
Knowledge economy
Technology firms
Australia
Brazil

ABSTRACT

Innovation has been the main driver of economic growth as it plays an increasingly central role in firm performance. Incentivising innovation by governments is essential to stimulate investment by companies, covering part of their R & D costs, and minimising their financial risks. There is, however, limited understanding of how innovation incentives are perceived by the companies. This paper examines the perceptions of technology firms, and the views of key actors about public incentive schemes for innovation in Australia and Brazil. The study finds that: (a) Direct incentives are perceived as critical for increasing innovation capabilities of firms; (b) Where tax incentive and infrastructure development schemes are the most preferred incentive programs among the firms; (c) However, despite the former two findings, effectiveness of existing incentive programs has been marginal in fostering innovation significantly in the studied countries. These findings imply that Australian and Brazilian governments should further focus on the design, promotion, and delivery methods of the innovation support mechanisms.

1. Introduction

Today’s most advanced economies are fundamentally knowledge-based (Baum et al., 2009; Carrillo et al., 2014; Dunning, 2000). As Burton (1999) indicates, under the knowledge capitalism the gap between rich and poor countries is rapidly expanding; where knowledge-intensity is also leading to a growing gap within our societies. Promoting innovation through research and development (R & D) is seen as a useful method to narrow this gap (Byun et al., 2017; Yun et al., 2016). Many scholars see innovation as the main driver to establish a competitive edge and generate economic growth (Cooke and Leydesdorff, 2006; Pancholi et al., 2014, 2015). The growing dependency of wealth creation on intangibles is making the global economy more fluid and volatile, and the capacity to access and combine new and existing knowledge effectively for innovation has become highly important for the competitiveness of firms, cities/regions, and nations (Huggins, 2011; Lonnqvist et al., 2014; Wolfe and Bramwell, 2008).

Innovation provides a company with a relative advantage over the competition (Betz, 2003). Beyond an advantage, particularly in the global knowledge economy, for many firms innovation is the key to survival (Doran and Ryan, 2012). Since innovation leads to more innovation, firms that invest in R & D and build technological and organisational capabilities are likely to induce further innovation (Baumol, 2002). However, stated by Guan & Yam (2015, p.273), “investors are usually anxious to obtain quick and safe returns on their investments, and the high R & D costs and risks involved in research keep many investors away”. Therefore, government innovation support mechanisms—such as government regulations, grants, subsidies or other financial incentives—are critical for many firms to invest in innovation generating activities (Leiblein and Madsen, 2009; Scotchmer, 2004). The governments of OECD member countries fund about 30% of R & D expenditure by companies in their countries (Thomson and Jensen, 2013). While the rationale for government intervention is strong, the ability of governments to effectively support innovation through incentives remains a daunting challenge (Norberg-Bohm, 2000). Furthermore, many firms do not take advantage of the available incentive programs due to various reasons such as unawareness of the support programs available, complex application procedures, or low success rates (Sabatini-Marques et al., 2015a, 2015b).

Although there have been considerable literature on technological
innovation and the role of incentives, our understanding on the firms' perceptions on incentive programs remains limited. It is against this backdrop that the study analyses Australian and Brazilian technology firms and the key policy actors—i.e., government departments, professional bodies, and eminent innovative entrepreneurs—views on the public incentive schemes for innovation. Since a case study research (Eisenhardt, 1989; Yin, 2003) allows in depth understanding of the logical or causal drivers of phenomena—rather than statistical generalisation—, it is reasonable in this study to examine the case of Australia and Brazil by surveying technology firms and interviewing the key actors. The study findings generate insights on the innovation ecosystems of Australia and Brazil, and describe how incentive mechanisms are perceived, and what the contributions of these incentives to firms' innovation performances are in these countries.

2. Literature review

Improving innovation performance is fundamental. Innovation is placed at the heart of countries and firms' drive to raise productivity and economic growth. It is a broad concept that relates not only to the generation and commercialisation of new ideas, but also to the process of diffusion and adoption of existing knowledge and technologies by all firms (OECD, 2016). Schumpeter (1934) was one of the first to acknowledge the importance of innovation by underlining innovation as the market introduction of a technical or organisational novelty, not just its invention. He perceived innovation as a power to lead change. Nonaka and Takeuchi (1995) indicate that the firm is a repository of knowledge with potential to innovate. Schumpeter (1934) considers the innovative entrepreneur in a firm as an economic agent that by developing new products generates new markets. But beyond this, innovation creates competitiveness, breaks barriers, opens new markets, generates exports by bringing foreign capital into the country, and produces qualified jobs with higher pay. This results in a greater purchasing power, and forms the basis for knowledge-based economic development (OECD, 2016).

In the knowledge economy, for a country to become and stay competitive, it is necessary to build its own innovation ecosystem and invest in people and firms (Dedebayir et al., 2016; Silva et al., 2017). Such an ecosystem is defined by the Australian Government (2014, p.14) as “an open network of organisations that interact with each other and operate within framework conditions that regulate their activities and interactions”. In many countries national innovation systems—consisting of a network of institutions whose activities initiate, import, modify and diffuse new technologies, and provide the framework within which governments form and implement policies to influence the innovation process—form the backbone of their innovation ecosystem (Carayannis et al., 2017; Jiao et al., 2016; Taddeo et al., 2017).

Under the framework of national innovation systems, governments develop various strategic approaches to promote innovation and foster new innovative firms (Hewitt-Dundas and Roper, 2010; Kang and Park, 2012). For example, these strategies include: (a) Empowering people to innovate; (b) Unleashing innovation in firms; (c) Creating and applying knowledge; (d) Applying innovation to address global and social challenges; and; (e) Improving the governance and measurement of policies for innovation (Ioppolo et al., 2012, 2016; OECD, 2010). These generic strategies have a positive effect on innovation activities. For example, Carboni (2017) finds in a comparative study of seven European countries that public grants have a positive effect both on firms' investment and R & D, implying that recipient firms spend more than they would have without public aid. However, the analysis also reveals heterogeneity across the studied seven countries—meaning context matters. While countries have tried innovation-fostering strategies to boost their national innovation capacities, not all have been successful. In a study of 17 European countries, Proksch et al. (2017) have identified different paths or innovation strategies that lead to differential innovation capacity. This implies that, rather than a universally generic strategy, countries should choose appropriate strategies on the basis of their capabilities and conditions—meaning precondition matters. In a study on Turkish small and medium enterprises (SMEs), Olcay and Bulu (2015) reveal the positive effect of government support funds on SMEs' innovation. They also find that relatively larger firms located in industrial zones and technology development centres produce outputs with higher level of innovation—meaning company size matters. The findings suggest that different strategies need to be tailored for increasing innovation performance of smaller companies. While these strategies are all well and good (Huggins and Izushi, 2013; Yigitcanlar et al., 2016), for firms to become innovative and competitive, governments also need to share a reasonable portion of the innovation financial risks through providing decent amount of incentives (Kauffman and Tödtling, 2002; Nonaka et al., 2008).

Firms seek support to stimulate their learning and innovation, and share risks with partners in investing in costly R & D activities (Rasiah et al., 2016). Public sector incentives, thus, play an important role in increasing innovation capabilities of firms (Cohen et al., 2002; Veloso and Soto, 2001). Governments provide incentives to firms in several ways. The first method is the provision of financial subsidies, where the funds provided by the government do not return back to the financing agency. The second one is the provision of low-interest and long-term loans, where companies are given some lead-time to bring innovation to the market before repaying back the debt. The third method is tax reduction, which provides tax offsets for promoting innovation and ideas boom (Guellec and Poterrie, 2003; Lerner and Wulf, 2007).

Incentives are also provided for different purposes. Some of the programs support individual firms' innovation endeavours (Heyddebrek et al., 2000), some provide aid for firms to cluster with others in innovation hubs (Aquiliani et al., 2017; Bröcker et al., 2012), and some supply funds for the university-industry collaboration (Ponds et al., 2010), and establishment of triple helix model partnerships (Leydesdorff and Ezzkowitz, 1998). Recent studies investigated the effects of these government incentives on firms' innovation performance in different country contexts (Guan and Yam, 2015; Radas et al., 2015). These studies particularly revealed that incentives cause increased R & D expenditure in firms.

The literature argues that innovation and technological development are crucial for knowledge-based economic development and for the competitiveness of firms and countries. Moreover, supporting innovation activities through public sector incentive mechanisms are essential to increase the innovation performance. There has been, however, so far no research looking into how firms perceive available innovation support programs, particularly by using a cross-country comparison method. Existing literature mainly utilises innovation surveys conducted nationally (Salazar and Holbrook, 2004), and mostly looks into the issues of innovation's nature, impact, productivity, employment generation capacity and so on (Crespi and Zuniga, 2012; Evangelista et al., 1997; Hashi and Stojojć, 2013; Zuniga and Crespi, 2013) or investigates firm perception only on a specific area of innovation—i.e., eco-innovation (Doran and Ryan, 2012). The study at hand, with an aim to bridge this gap in the literature, undertakes an empirical investigation for depicting the perceptions of technology firms on innovation incentives in Australia and Brazil.

3. Empirical investigation

This research applied a case study method for the empirical investigation. The method was considered appropriate for this research because it allows to define the topic more broadly (i.e., to identify the perception of technology firms) by taking into account contextual issues in each case and relying on multiple sources of evidence (Yin, 2011). The two most common approaches of case study research include inductive approach based on the Grounded Theory (Glaser and Strauss, 1967) and deductive/testing approach (Yin, 2003). The basic difference between the approaches is that while the Grounded Theory relies on
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