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Policies to Attract R & D-related FDI in Small Emerging Countries: Aligning Incentives With Local Linkages and Absorptive Capacities in Chile

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ABSTRACT

Over the last decade we have witnessed an unprecedented growth in the number of cross-border R & D investments towards large emerging countries such as China and India. However, small middle-income countries have played a marginal role as recipients of R & D-related FDI despite increasing policy efforts. In particular, several Latin American countries have recently launched new policy programs with the aim of attracting this kind of investments, but it remains uncertain whether public incentives can be useful to compensate for other locational disadvantages. The case of Chile provides an interesting empirical setting to explore these issues because during the last decade its government has been actively promoting R & D-related FDI through a new policy mix. This article suggests that for national innovation systems to benefit from the attraction of internationally-mobile R & D it is critical for public policies to ensure that appropriate linkages are established with local actors that hold absorptive capacities. Equally important for a small emerging economy like Chile is to prioritize R & D-related FDI in strategic technology niches where the country can realistically attain critical mass.

1. Introduction

Since the early 2000s an increasing number of multinational enterprises (MNEs) have located their research and development (R & D) centers in emerging countries (Gammeltoft, 2006). China and India have now become the top destinations of R & D-related foreign direct investments (FDI) worldwide (Castelli and Castellani, 2013). This has raised the attention of researchers and policy-makers on the impact of R & D-related FDI in emerging economies and the possibilities of emulating the Chinese and Indian "miracles" in other middle income countries. Behind this aim lies the belief that R & D-related FDI might have very positive effects on host countries in terms of technology transfer and the development of technological capabilities in local firms that interact with innovative MNEs (Santangelo, 2005). Under certain conditions, these investments can enable upgrading and catching up in particular industries or technology fields, as the examples of China in telecommunications (Fu et al., 2011) or India in software (Parthasarathy and Aoyama, 2006) illustrate.

During the last decade, researchers in international business, innovation studies and economic geography have provided rich

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evidence on the motivations, modes of entry and impacts of R & D-related investments by developed country MNEs in emerging economies, typically with an emphasis on the MNE rather than the host country. However, this literature has been limited on two accounts. First, on investigating systematically the role of public policies in the host countries for both attracting and embedding international R & D investments. And, second, on discussing the particular case of small emerging economies that cannot compete in terms of market size or broad technological base with much larger emerging economies such as China, India or Brazil.

Against this background, the general objective of this paper is to explore the policy options available for small emerging countries to attract R & D-related FDI, building on a case study of Chile. The liberal policies that Latin America pursued in the 1980s and 1990s under the Washington Consensus were not successful at using FDI as a lever for learning and capabilities accumulation (Cimoli et al., 2009). With time, it became clear that the aim of public intervention should not be limited to maximizing FDI inflows, but also to attracting the kind of FDI that better contributes to diversifying the economy, gaining access to foreign knowledge, and providing highly-skilled jobs. Consequently, since the mid-1990s, a shift from quantity to quality emerged in the FDI policies of several Latin American countries, including Chile, and attracting R & D-related FDI became a more explicit policy priority (Lederman et al., 2014; Monge-González and Tacsir, 2014; Nelson, 2005).

Beyond improving the conditions of the national innovation system, public policies can adopt a more proactive approach to attracting R & D-related FDI by offering incentives and support services to MNEs. But what kind of policy instruments might be more appropriate for small emerging countries? Under which conditions are public incentives aimed specifically at attracting R & D-related FDI efficient? This paper contributes to addressing these questions by analyzing the particular case of Chile.

Chile represents an interesting empirical setting for the purposes of our research since during the last decade its government has launched a new package of incentives to attract R & D-related FDI, in addition to broader measures to enhance the national innovation system. In particular, the Chilean government has launched some pioneering policy instruments in international context, such as a program to attract foreign universities and public research institutes or a program to attract foreign start-ups. Thus, the country's recent experience is highly relevant to foster policy learning in other emerging countries from Latin America and beyond.

Our research relied on interviews with key informants and on a variety of secondary sources. Section 2 first contextualizes the paper within the existing literature and then provides an overview of the Chilean innovation system and the role of FDI. Section 3 describes the methodology and Section 4 presents the results of a case study that explores the policy mix used by the government of Chile to attract R & D-related FDI. Section 5 rounds up the paper with some concluding remarks.

2. Analytical framework

2.1. Global innovation networks, linkages and absorptive capacities

Through R & D internationalization, MNEs aim at tapping into knowledge resources from multiple local contexts in order to leverage them into competitive advantages (Andersson et al., 2016; Cantwell, 2017; Dachs, 2014; Meyer et al., 2011) and eventually into financial returns (Mudambi, 1998). The internationalization of corporate R & D is driven by the increasing potential for disintegrating the R & D function into different separable activities (Martínez-Noya et al., 2012) or, in other words, to the *fine-slicing* (Mudambi, 2008) or *organizational decomposition* (Schmitz and Strambach, 2009) of innovation. Among the factors influencing the location choice of MNEs' R & D centers there are traditional drivers such as market size, income level and costs, as well as knowledge-related considerations such as the availability of qualified scientists or the possibility to tap into globally dispersed knowledge reservoirs (Kafouros et al., 2012; Lewin et al., 2009; OECD, 2011; Thursby and Thursby, 2006).

The internationalization of R & D has opened up new opportunities for emerging countries to participate in *global innovation networks* and build knowledge-intensive clusters through the attraction of FDI (Chaminade and Vang, 2008; Ernst, 2002; Manning et al., 2010; Necoechea-Mondragón et al., 2017). A recent analysis of *international knowledge connectivity* (Cano-Kollmann et al., 2016a) relies on a “flowers and bees” metaphor to illustrate how border-crossing firms (bees) and spatial locations (flowers) co-evolve in an organic symbiosis. Bees need flowers to survive (to remain competitive) while flowers need bees to be pollinated (to become more innovative). From the perspective of host countries, R & D-related FDI can facilitate the absorption of foreign knowledge and strengthen national technological capabilities; increase demand sources for both domestic R & D suppliers and local talent; and ultimately improve the position of a country in global innovation networks (Carlsson, 2006; Santangelo, 2005). Moreover, FDI in R & D can contribute to addressing existing inefficiencies of a host country's national innovation system, for example by fostering science-industry links or by building critical mass in designated priority areas.

Integrating into global innovation networks is especially important for emerging countries as a means of closing technology gaps and accelerating catching-up (Ernst, 2002; Fu et al., 2011; Narula and Dunning, 2010; Plechero and Chaminade, 2016). But attracting R & D-related FDI requires a simultaneous effort to improve local supplier networks, universities, scientific infrastructures, institutions and human capital, in a process of coupling international and local innovation networks. Indeed, previous studies have stressed that the benefits of R & D-related FDI on host countries increase when MNEs collaborate in innovation with local firms and public research organizations, leading to knowledge-intensive *linkages* (Guimón and Salazar-Elena, 2015; Markusen and Venables, 1999; Meyer et al., 2011; Nell and Andersson, 2012).

The economic literature has postulated that the local development effects arising from any kind of new flows of investment depend of the possible linkages with local agents through input-provision (backward linkage effects) or output-utilization (forward linkage effects) (Hirschman, 1977). The specific path of creation of such linkages depends on firms' decisions concerning the sourcing of components and materials for their operations. In the case of backward linkages, this path might be seen as a sequence of decisions involving, first, whether to procure components in-house or outside the firm (i.e. internalize or contract) (Belderbos et al., 2001). If