

Multinationals, Capabilities and Regional Structural Change: The Role of Inward FDI in Technological Specialisation

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Extended Abstract

1. Introduction and Objectives

Developing countries and lagging-behind regions usually suffer from persistent shortages of technological capabilities and skills. Due to the limited availability of indigenous scientific and technological competences, local actors in emerging economies are often encouraged to search for external sources of knowledge in order to foster innovation and structural change. In general, emerging economies remain highly dependent on technologies and knowledge generated in more advanced countries. Among the main channels through which such external knowledge can reach host regions, inward Foreign Direct Investment (FDI) by Multinational Companies (MNCs) stands out as one of the most prominent mechanisms.

Knowledge spillovers from inward FDI occur when the presence of MNCs, typically endowed with superior technologies, managerial practices, and organizational routines, enhances the knowledge base and learning opportunities of domestic firms. The establishment of foreign subsidiaries in a given region can therefore increase the rate of technological change and learning in the host economy by facilitating access to advanced knowledge, skills, and production practices. These potential benefits have motivated many governments, particularly in developing countries, to design and implement FDI attraction policies as part of broader strategies aimed at fostering regional development, industrial upgrading, and innovation.

The importance of inward FDI as a vehicle for introducing new knowledge and technologies into host regions is well established in the economic geography and international business literature (Capello & Lenzi, 2019; Javorcik, 2004; Ning et al., 2023). A large body of empirical research has investigated the effects of inward FDI on regional and firm-level outcomes, including productivity growth, structural change, and innovation performance. More recently, attention has increasingly shifted towards understanding the role of FDI in shaping regional innovation systems and technological trajectories.

Despite these advances, important gaps remain in our understanding of how and under which conditions inward FDI contributes to regional innovation and technological diversification. In particular, there is growing recognition that the effects of FDI are highly heterogeneous across regions

and depend crucially on local conditions. Regions are not passive recipients of external knowledge, but rather active agents whose existing capabilities, skills, and institutions shape their ability to absorb and recombine knowledge brought by MNCs.

Against this background, the aim of this paper is to examine the role of inward FDI in fostering regional technological diversification and the emergence of new regional specialisations in an emerging economy context. More specifically, we aim to investigate how local absorptive capacity—expressed through both firms’ capabilities and the knowledge base of local universities and research institutions—moderates the relationship between inward FDI spillovers and regional innovation. By adopting a regional perspective and focusing on Brazil, a country characterised by strong territorial inequalities in innovation capacity, the paper seeks to contribute to debates on regional innovation systems, capability building, and place-based development strategies.

2. Literature Review and Conceptual Framework

The role of inward FDI as a source of knowledge spillovers has been extensively discussed in the literature. Early contributions highlighted that MNCs can transfer advanced technologies and organizational practices to host economies, potentially generating productivity and innovation gains for domestic firms (Javorcik, 2004). Subsequent studies have provided evidence on the positive effects of inward FDI on firm performance and regional development, both in developed and developing countries (Morales & Moreno, 2020).

More recently, a growing strand of research has focused explicitly on the relationship between inward FDI and regional innovation. Studies have shown that knowledge spillovers from MNCs can stimulate patenting, R&D activities, and technological diversification in host regions (Ascani et al., 2020; Garcia et al., 2023; Valacchi et al., 2021; Wang et al., 2016). This literature suggests that inward FDI can act as a catalyst for regional learning processes by introducing new knowledge that can be recombined with existing local capabilities.

At the same time, there is increasing awareness that the benefits of inward FDI are far from automatic. The impact of FDI spillovers depends critically on the characteristics of host regions and firms. Similarly, other studies emphasize the importance of heterogeneity at both the firm and regional levels in shaping the innovation effects of FDI (Ascani & Gagliardi, 2020; Jin et al., 2019). This has led to a shift in the literature from asking whether FDI is beneficial to examining under which conditions it is beneficial.

One key concept in this debate is absorptive capacity, understood as the ability of firms and regions to identify, assimilate, and exploit external knowledge. Empirical studies suggest that firms and regions with higher levels of absorptive capacity are better positioned to benefit from knowledge spillovers associated with inward FDI (Ascani & Gagliardi, 2020; Ubeda & Pérez-Hernández, 2017). Knowledge-intensive technological environments, in particular, seem to favour the effective use of external knowledge brought by MNCs.

However, absorptive capacity is a multidimensional concept, and the literature has not yet reached a clear consensus on which dimensions matter most at the regional level. Some contributions focus on firms’ internal capabilities and technological relatedness, while others stress the role of universities and research institutions in shaping the regional knowledge base. In this paper, we build on these insights and propose to distinguish between two complementary dimensions of local absorptive capacity: (i) firms’ capabilities embedded in the regional productive structure, and (ii) academic and institutional capabilities associated with universities and research organisations.

From an evolutionary economic geography perspective, the integration of external knowledge into regional innovation systems is expected to foster technological diversification and the emergence of new specialisations when new knowledge is sufficiently related to existing capabilities (Boschma, 2017; Colombelli et al., 2014; Frenken et al., 2010). Inward FDI can therefore be seen as a potential trigger for regional structural change, but its impact will depend on the extent to which local actors are able to absorb, recombine, and exploit the knowledge brought by MNCs.

3. Data and Methodology

Empirically, the paper adopts a regional perspective and estimates a Regional Knowledge Production Function for Brazilian regions. Brazil provides a particularly relevant setting for this analysis. As in many emerging economies, the country exhibits significant gaps in technological and scientific capabilities, as well as strong regional inequalities in innovation performance. At the same time, MNCs play a central role in the Brazilian industrial system, accounting for a substantial share of manufacturing activity and private R&D expenditures (Suzigan et al., 2020). In this context, inward FDI represents a key potential source of external knowledge for domestic firms and regions.

We combine data from multiple sources. Information on greenfield investments by MNCs is obtained from the fDi Markets (Financial Times) database for the period 2003–2014, which covers all announced greenfield investment projects in Brazil. These data allow us to map the spatial and temporal distribution of inward FDI across Brazilian regions and to capture the intensity of foreign investment activity at the regional level. As a proxy for regional innovation, we use patent data from the Brazilian National Institute of Industrial Property (INPI), covering the period 2006–2020. Inventors' addresses are geolocated in order to assign patents to regions and to construct measures of innovative output based on fractional counts. This approach allows us to account for collaborative inventions involving inventors located in different regions and to obtain a more accurate picture of regional innovation dynamics. The unit of analysis is composed of 133 Brazilian intermediate regions, which are broadly comparable to the EU NUTS-2 level. This spatial scale is appropriate for capturing regional innovation systems and the territorial dimension of knowledge spillovers, while still allowing for meaningful variation in economic structure and innovation capacity.

Inward FDI is measured using indicators based on the number and characteristics of greenfield investment projects in each region and year. Local absorptive capacity is operationalized through two main dimensions. The first captures firms' capabilities and the regional productive structure, proxied by indicators related to the existing stock of technological knowledge and the presence of knowledge-intensive activities. The second captures academic and institutional capabilities, measured through indicators of scientific and research activity at the regional level, reflecting the role of universities and research organisations in shaping the local knowledge base.

The empirical strategy is designed to assess both the direct association between inward FDI and regional innovation and the moderating role of local absorptive capacity. In particular, we focus on interaction terms between FDI and the different dimensions of absorptive capacity in order to test whether regions with stronger local capabilities are better able to transform external knowledge into innovation outcomes. This approach allows us to move beyond average effects and to explicitly address the heterogeneity of regional responses to foreign investment.

4. Preliminary Results and Expected Contributions

At this stage, preliminary evidence suggests that inward FDI is likely to play a significant role in shaping regional technological trajectories in Brazil, particularly in terms of technological

diversification and the emergence of new specialisations. Importantly, early results also indicate that this relationship is strongly conditioned by local absorptive capacity.

In line with the theoretical framework, regions endowed with stronger firms' capabilities and more developed academic and institutional infrastructures appear to be better positioned to benefit from the knowledge brought by MNCs. This suggests that inward FDI does not operate as an automatic engine of regional innovation, but rather as a catalyst whose effects depend on the pre-existing regional knowledge base and institutional context.

By explicitly distinguishing between different dimensions of local absorptive capacity, the paper aims to contribute to a more nuanced understanding of the mechanisms through which inward FDI affects regional innovation. Rather than treating absorptive capacity as a single, undifferentiated concept, we highlight the complementary roles of firms and local knowledge institutions in shaping regional learning processes.

From a broader perspective, the paper contributes to several strands of the literature. First, it adds to the debate on FDI and regional development by emphasizing the importance of local capabilities in mediating the innovation effects of foreign investment. Second, it contributes to the literature on regional innovation systems and evolutionary economic geography by linking inward FDI to processes of technological diversification and structural change. Third, it provides new evidence from an emerging economy context characterised by strong territorial inequalities, thereby enriching the comparative perspective of existing studies, which are still largely focused on developed countries.

From a policy point of view, the analysis underscores the importance of aligning FDI attraction strategies with regional innovation and industrial policies. Attracting foreign investment alone is unlikely to be sufficient to foster sustained innovation and development if local absorptive capacities are weak. Policies aimed at strengthening firms' capabilities, upgrading skills, and reinforcing the role of universities and research institutions are therefore crucial to maximize the long-term developmental impact of inward FDI, especially in lagging-behind regions.

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