

Extended Abstract of THE INTERSECTION OF SPILLOVERS EFFECTS: WHO LEARNS FROM WHOM?

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Knowledge spillovers are among the potential positive effects of foreign direct investment in developed and developing countries (Blomstrom & Kokko, 1998; Aitken & Harrison, 1999; Marin & Bell, 2006). Meanwhile, co-location of agents is crucial for understanding the geography of innovation by multinationals (MNEs), and the interaction between heterogeneous companies in a given location makes possible an analysis of which dimensions of learning processes are the most relevant. The fact is that foreign companies in host economies can generate spillovers that are beneficial for domestic firms while also absorbing knowledge from them (Driffield *et al*, 2014; Hassine *et al*, 2016; Jacobs *et al*, 2017). Moreover, the cumulative experience of foreign companies in a specific location may be an important driver that contributes to defining learning possibilities for other foreign units. More than ever, the increasing internationalization of companies, along with the impact of productive fragmentation within the global value chain, makes necessary the exploration of spillover effects from a multilevel approach (Perri & Peruffo, 2015). This paper contributes in that direction by *integrating the internationalization experiences of domestic firms with relevant technological specialization into the study of knowledge spillover effects that benefit foreign co-located companies*.

An empirical analysis is carried out for manufacturing firms in Spain from 1991 to 2014, based on statistical information from the ESEE Survey. A two-step procedure is followed to assess the presence of knowledge spillovers, both from domestic to foreign firms and within foreign firms. Firstly, we estimate total factor productivity (TFP) for samples of foreign and domestic firms by manufacturing sector, following a semi-parametric approach (Levinsohn & Petrin, 2003). The reasoning is that TFP integrates a knowledge component, making this a suitable indicator for measuring technology flows (Driffield, 2001). Secondly, we analyze the relationship between the productivity of foreign firms

and the TFP of the relevant sector, making the distinction between domestic firms (MNEs and non-MNEs) and foreign firms, and following a dynamic approach.

Analysis of knowledge spillovers from domestic to foreign firms for a technologically intermediate country like Spain contributes to the understanding of learning processes in at least two directions. On the one hand, our results highlight the importance of the internationalization of national companies, differentiating between purely national companies and companies that are multinationals. The internationalization path of national companies is a key element in the study of the intersection of co-location as a driver mechanism for generation of spillovers. The potential network externalities obtained abroad reinforce the likelihood of knowledge spillovers at home and increase the learning opportunities for foreign units. On the other hand, this aspect should be considered in close relation to the level and type of technological specialization of companies, because technological complexity also represents a significant aspect in the definition of spillovers from national firms. In sum, knowledge spillovers benefiting foreign companies are the result of the intersection between internationalization, embeddedness, and learning.

KEYWORDS: spillovers; multinationals; technology

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