



Impact of firm heterogeneity on direct and spillover effects of FDI: Micro-evidence from ten transition countries



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ABSTRACT

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This paper presents a comparative study of the importance of direct technology transfer and spillovers through FDI on a set of 10 transition countries, using a common methodology and appropriate methods to account for selection and simultaneity correction. This paper considers by far the largest firm level dataset (more than 90,000 firms) used by any study on the spillover effects of FDI. The main novelty of the paper is the explicit control for various sources of firm heterogeneity when accounting for different effects of FDI on firm performance. This work shows that the heterogeneity of firms in terms of absorptive capacity, size, productivity and technology levels affect the results. Controlling for these variables leads to some interesting results, which contrast with the previous empirical work in the field. We find that horizontal spillovers have become increasingly important over the last decade, and they may even become more important than vertical spillovers. Positive horizontal spillovers are equally distributed across size classes of firms, while negative horizontal spillovers seem to be more likely to accrue to smaller firms. Moreover, positive horizontal spillovers seem more likely to be present in medium or high productivity firms with higher absorptive capacities, while negative horizontal spillovers are more likely to affect low to medium productivity firms. These findings suggest that both direct effects from foreign ownership as well as the spillovers from foreign firms substantially depend on the absorptive capacity and productivity level of individual firms. In addition, these results show that foreign presence may also affect smaller firms to a larger extent than larger firms, but this impact may be in either direction. *Journal of Comparative Economics* 41 (3) (2013) 895–922. University of Ljubljana, Faculty of Economics, Slovenia; Institute for Economic Research, Ljubljana, Slovenia; LICOS and VIVES, KU Leuven, Belgium; University of Ljubljana, Faculty of Social Sciences, Slovenia; Institute for Macroeconomic Analysis and Development, Ljubljana, Slovenia; NIFU – Nordic Institute for Studies in Innovation, Research and Education, Oslo, Norway.

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1. Introduction

Over the last decade, many studies have been conducted on FDI spillovers in so-called transition countries. Most of these analyses are based on firm level panel data and suggest only a few intra-industry spillovers from FDI, if any. Some of the more recent studies provide more optimistic results about FDI spillovers in some transition countries, at least in some sectors or categories of FDI. These studies provide useful insight into the effects of international R&D spillovers to transition economies at the firm level, but due to the heterogeneous methodology used, they remain merely case studies.

This paper has two primary objectives. The first objective is to provide a comparative study on the importance of direct technology transfer and spillovers through FDI using an exhaustive firm-level dataset on a group of comparable countries by using a common methodology and appropriate methods to account for selection and simultaneity problems. This is a way of achieving comparability of results and of providing credible insight into the importance of FDI as a channel of international technology transfer for firms in transition countries. The second objective of the paper is to account for the inherent heterogeneity of firms. Most of the empirical work so far dealing with the issue of spillover effects from FDI on firm performance has neglected the fact that local firms in competition with foreign affiliates in the same sector or in cooperation with upstream foreign affiliates are not homogeneous in terms of size, absorptive capacity, productivity or technology. Some recent studies, however, demonstrate that firm heterogeneity in terms of absorptive capacity might explain a significant portion of the differential impact of FDI on firm performance. The contribution of this paper is to account explicitly for different aspects of firm heterogeneity, including size, absorptive capacity, productivity and the technology gap relative to foreign affiliates.

We differentiate between direct effects of FDI from the parent firm to foreign affiliates and horizontal and vertical spillovers from these affiliates to domestically owned local firms. To calculate horizontal and vertical spillovers and to differentiate between backward and forward vertical linkages, we use the methodology developed by Blalock (2001) and Damijan et al. (2003a, 2003b). The importance of these different channels of technology transfer is then estimated in the framework of the growth-accounting approach using a unique firm-level database that consists of a panel of some 91,500 firms in 10 transition countries from 1995 to 2005. The countries include eight new EU member states (Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovenia), plus Croatia and Ukraine.¹ We use several correction methods to account for possible biases in the data. We deal with the simultaneity problem that typically arises in the growth-accounting approach in a panel data framework by using the Olley–Pakes method. In addition, we correct for potential selection bias that arises due to possibly endogenous foreign investment decisions using a generalized Heckman two-step procedure.

Over the course of the estimations, the dataset is divided by country, and then into smaller subsamples according to size, productivity, and technology gaps, controlling for firm absorptive capacity. This empirical exercise reveals several interesting findings. First, direct effects of foreign ownership on firm performance are rarely present in this exhaustive dataset of 10 transition countries (only in four countries), but, if present, they are strictly positive. Second, horizontal spillovers are mostly negative if the absorptive capacity of firms is not controlled for. When accounting for firms' absorptive capacity, in most of the countries (6–7 out of 10), firms benefit from the increased competition of foreign affiliates in the same sectors. Third, positive horizontal spillovers are equally distributed across firm size classes, while negative horizontal spillovers seem to be more likely for smaller firms. Fourth, positive horizontal spillovers seem more likely to be present in medium or high productivity firms with higher absorptive capacities, while negative spillovers are more likely to affect low to medium productivity firms. Fifth, vertical spillovers are less frequent than horizontal spillovers from FDI. If they are present, however, then smaller and more productive firms are more likely to benefit from positive vertical spillovers, while larger and less productive firms are more likely to suffer from negative vertical spillovers.

The paper is organized as follows. Section 2 discusses channels of technology transfer through FDI, and Section 3 presents empirical model that allows for accounting for different measures of spillovers at the firm level. Section 4 describes the data and the econometric approach employed. Section 5 presents the results, and the final section discusses the impact of this study and its implications for future research.

2. Channels of technology transfer through FDI

There are many ways that a firm can acquire new technology aside from its own investments in R&D capital. Despite trade, FDI is potentially the most important international vehicle of technology transfer for firms. Foreign investors can transfer technology in two ways: directly to the affiliates under their ownership and control, and indirectly to other firms in the host economy through spillovers. There is ample empirical evidence on positive direct technology transfers from MNCs to their foreign affiliates in terms of higher productivity levels and growth. Empirical studies using firm-level panel data have included developed as well as developing countries (for example, Haddad and Harrison, 1993; Blomström and Wolff, 1994; Blomström and Sjöholm, 1999; Aitken and Harrison, 1999; Girma et al., 2001; Barry et al., 2002; Alvarez et al., 2002; Blalock, 2001; Damijan et al., 2003b; Arnold and Smarzynska-Javorcik, 2005; Girma and Görg, 2006; Ramondo, 2009; Wooster and Diebel, 2010). FDI may also be the cheapest means of technology transfer, as the recipient firm normally

¹ The selection of countries has been determined by data availability and quality.

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