

# Local productivity spillovers from foreign direct investment in the U.K. electronics industry

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## Abstract

The paper examines whether productivity spillovers from foreign direct investment are geographically limited. Using plant-level data from the U.K. electronics sector, it finds robust evidence of both intra-industry and inter-industry spillovers from regional FDI. By contrast, it fails to establish any discernible relationship between domestic plant's productivity and FDI *outside* the region.

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## 1. Introduction

The purpose of this paper is to examine empirically whether productivity spillovers from foreign direct investment are geographically limited, using plant-level data from the U.K. electronics sector. A significant proportion of Regional Selective Assistance (RSA) – the main form of regional subsidy in the U.K. – goes to foreign-owned firms (over 40% in the early 1990s according to [Taylor and Wren, 1997](#)). One prominent motivation for offering such incentives to foreign firms is the presumption that they stimulate aggregate productivity growth either directly through their own higher productivity growth or through an indirect spillover effect. It is therefore important to subject this optimistic prognosis by policy makers to systematic empirical investigation.

We concentrate on the electronics sector because total factor productivity (TFP) externalities from FDI are expected to be high in view of the fact that multinational enterprises (MNEs)

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undertake a significant proportion of innovative activity in this sector (see Section 3 for more details). Furthermore, it has been established that the electronics sector is one of the major sectors in the U.K. in which the average R&D intensity of investing countries is greater than domestic R&D intensity (Driffield and Love, 2002). Thus FDI in the U.K. electronics sector is unlikely to be motivated by technology sourcing considerations, suggesting the potential of technology transfer from multinational to indigenous enterprises. We distinguish FDI by the nationality of the multinational firm — in particular separating out Japanese firms which have a high participation in the electronics sector and US firms which have a long history of investment in the U.K. (Dunning, 1998).

For the purpose of this paper, the U.K. is divided into 10 *Standard Regions* with common Regional Development Agencies<sup>1</sup>. These regions correspond approximately to the NUTS<sup>2</sup> 1-regions of Europe, and are therefore larger than NUTS 3-regions that are sometimes used in the regional economics literature (e.g. Ciccone, 2002). We separate regions into those with Assisted Area status (i.e. those for which government incentives are available) and those without. This would allow us to assess whether the benefits from FDI are particularly high or low in these relatively underdeveloped regions.

Apart from the fact that this paper focuses on a relatively homogenous sector, it also has a number of features which distinguish it from the extant literature that sought to assess the extent of local productivity spillovers from FDI in the U.K. (e.g. Girma and Wakelin, 2002). First, we use plant level information which is arguably the most appropriate unit of analysis for the problem at hand. Typically, firm level data sets fail to address the distinct possibility of firms locating plants in more than one region or operating in more than one industry. Second, we estimate TFP using the semiparametric technique developed by Olley and Pakes (1996) to account for the time-varying endogeneity of factors of production and the selection problem generated by plant exit. Third, we instrument FDI to control for the potential endogeneity problem arising from the fact regional development may influence the investment strategy of MNEs. Finally, we exploit the availability of employment data by skill level to investigate whether domestic plants with a higher proportion of skilled workers (therefore higher absorptive capacity) benefit more from the presence of MNEs.

Our findings suggest that productivity externalities from FDI have a strong regional dimension. The intra-industry spillovers from regional FDI (particularly from Japanese) are found to be quite significant. We also document robust evidence of inter-industry spillovers from regional FDI. By contrast, we fail to find any discernible relationship between domestic productivity and FDI in the same four-digit sector from *outside* the region.

The structure of the paper is as follows. Section 2 presents a literature review. Section 3 gives some information on the U.K. electronics industry. Section 4 covers the modelling framework of the paper. Section 5 gives some details of the data. Section 6 presents results from the analysis and Section 7 concludes.

## 2. Literature review

Governments the world over try to attract foreign direct investment (FDI) by offering incentives such as trade policy concessions, financial assistance and tax breaks. One prominent

<sup>1</sup> Northern Ireland is not included in the database.

<sup>2</sup> Nomenclature of Territorial Units for Statistics.

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