

# Spillover Effects of Foreign Direct Investment: New Evidence from Italy

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## **Abstract**

*This chapter investigates the relationship between foreign direct investment (FDI) and the productivity of Italian provinces over the period 2003-2009. Our findings suggest that recipient local economies are on average more productive when they receive FDI. Nevertheless, our estimates reveal that spillover effects are solidly concentrated in provinces with the highest absorptive capacities, thus reinforcing the notion that local competences play a crucial role to capture the benefits associated with inward FDI. This evidence suggests that policy measures for the attraction of FDI should necessarily be accompanied by interventions aimed at generating adequate skills and competences at the local level.*

## **1. Introduction**

International business activity has become an increasingly relevant feature of the world economy, spurred by tighter economic integration and the fall of trade and communication costs in the last decades. Consistently, the global stock of foreign direct investment (FDI) has increased fourfold from 1980 to 2013 (UNCTADStat, 2014), reaching unprecedented levels. This trend responds to the belief, especially common among policy makers, that the attraction of FDI can boost the competitiveness of the recipient economies as a result of the larger productivity and superior knowledge carried by foreign multinational companies (e.g. Dunning, 1980; Cantwell, 1989). Yet, in the academic debate a general lack of consensus on the actual benefits associated to the activities of foreign firms persists. This chapter revises the existing debate on the impact of FDI and introduces a focus on the heterogeneity of domestic local economies as a key dimension to

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account for when analysing the effects of FDI. This approach takes stance from the intuition that firms, industries and regions do not simply take advantage from the mere presence of corporate activities and that a determinant role is played by the ability of domestic actors to capture the benefits deriving from the presence of a MNE (Görg, Strobl, 2001). More specifically, the present study focuses on differences in local absorptive capacities as a key driver of spatial heterogeneity in the relationship between inward FDI and domestic productivity. To this scope, we combine information on the inward flow of FDI in Italian provinces (defined at the NUTS-3 level) for the period 2003-2009 together with data on domestic labour productivity. We show that provinces that experienced larger inward FDI are characterised by higher average productivity, and that this positive spillover effect is crucially determined by their level of absorptive capacity, being more pronounced for provinces with larger capabilities to exploit foreign knowledge. Overall our findings suggest that the relationship between multinationals and domestic economies functions as a bilateral interaction. The assumed superiority of multinational enterprises alone does not suffice to justify the emergence of positive spillovers, which instead arise also in response to the competency level of domestic economies as a crucial counterpart of both intended and unintended knowledge exchanges.

The rest of the chapter is organized as follows: the next section summarises the existing debate on the impact of inward FDI on the productivity of recipient economies. Sections 3 and 4 discuss the data and present the main result of the empirical analysis while section 5 offers our concluding remarks and considerations for policy.

## 2. Literature Review

Existing research on the impact of FDI hinges on the recognition that multinationals are systematically different from uni-national firms, either exporters or not, due to a number of characteristics, including the possession of specific knowledge and higher productivity (Dunning, 2000; Helpman *et al.*, 2004). These facts mirror the notion of the superiority of multinational companies pioneered by Hymer (1976), which has become central to the theory of the multinational enterprise associated with the Ownership-Localization-Internalization (OLI) paradigm by Dunning (1977; 2000). As a consequence, the decision of multinational enterprises to locate abroad contribute to the global diffusion of knowledge by granting to specific geographical contexts the access to the infrastructure that channels global knowledge (Iammarino, McCann, 2013).

Several existing contributions have considered this rationale to test whether MNEs investments abroad are systematically associated with productivity gains for the recipient economies (see for instance Blomström, Kokko, 1998; Ascani,

Gagliardi, 2015; Crescenzi *et al.*, 2015). However, existing research is far from being univocal on the intensity and the sign of this effect, as different studies point at very heterogeneous and often conflicting results. For instance, the entry of a foreign company may trigger a more intense product market competition, which can alternatively crowd out domestic firms in the short term (Aitken, Harrison, 1999) and hinder their innovative capacity (García *et al.*, 2013). Conversely, multinational investments may affect positively domestic firms by leading them to make a more efficient use of available resources or to be more innovative as a strategy to tackle the greater competitive pressure (Wang, Blomström, 1992; Görg, Greenaway, 2004). FDI-induced effects can also act through the mobility of workers such that domestic companies can benefit when successfully attract human capital from foreign firms (Glass, Saggi, 2002; Görg, Strobl, 2005), via an upgrading of the technical and managerial competences of their local supplier, aimed at maintaining a high level of quality in production (Ernst, Kim, 2002) or through pure spillover dynamics operating via demonstration effects and reverse engineering can operate as a relevant mechanism (Javorcik, 2004; Sinani, Meyer, 2004; Brambilla *et al.*, 2009). The heterogeneity of domestic actors has been traditionally considered a key element to interpret and understand the conflicting results that characterize existing studies (Kokko *et al.*, 1996; Girma, 2005; Blalock, Simon, 2009). In this context, differences in absorptive capacities have received special attention as a pivotal characteristic to account for. On the one hand, it has been suggested that positive spillovers are concentrated in the subset of more productive domestic enterprises that operate close to the technological frontier and have adequate capabilities to understand and process external knowledge (Haskel *et al.*, 2007). In contrast with this hypothesis, other studies have provided evidence in line with a catching-up process of FDI-induced externalities, according to which larger technological gaps between domestic and foreign firms are more conducive of positive spillovers (Castellani, Zanfei, 2003). Therefore, while the literature has produced insightful analyses in various regards, the evidence remains characterised by very mixed results.

We embrace the approach centred on the role of local absorptive capacity as a key moderating factor of FDI-induced effects in the case of Italy. Hence, after producing baseline evidence on the robustness of the link between FDI and domestic productivity in our data, we test whether the local presence (or lack) of adequate absorptive capacities correlates with the emergence of spillovers from foreign multinationals.

### **3. Data Description, Methodology and Main Results**

To provide an empirical test of our main argument we assembled a novel dataset that includes information from two complementary sources. We combine

data from Orbis, a business-level database reporting companies' balance sheet, with information on FDI taken from the Balance of Payment of the Bank of Italy and merge them by province (NUTS-3).

Orbis data are used to measure the average domestic firms' labour productivity across Italian companies by province. Data from the Bank of Italy are, instead, collected to recover information of FDI inflows at the provincial level. This is a remarkable advantage over previous research that almost exclusively employ proxy variables for the foreign presence in a region by means of the number of foreign affiliates or the share of foreign employment.

Our final dataset is a panel at the province level providing information on the average domestic firms' productivity level, the amount of investment flows and a set of standard controls for the period 2003-2009. We exploit the panel nature of our data to explore whether provinces with more substantial FDI flows experience productivity gains on a yearly basis. To this aim, we estimate the following basic equation:

$$\ln Y_{pt} = \beta_1 fdi_{pt-1} + \beta_2 X_{pt} + \delta_t + \vartheta_p + \varepsilon_{pt} \quad [1]$$

where subscripts  $p$  and  $t$  denote province and time, respectively;  $Y$  stands for (average) firm labour productivity;  $fdi$  denotes inward FDI as a share of domestic GDP and it is our variable of interest;  $X$  includes a set of standard controls at the province level;  $\delta$  and  $\vartheta$  denote year and province fixed effects while  $\varepsilon$  encompasses unobserved random factors influencing firm labour productivity.

To exploit the heterogeneity of domestic firms in terms of absorptive capacities we follow Haskel *et al* (2007) and estimate equation (1) for the subset of provinces with different levels of labour productivity, including the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentile. Table 1 reports standard descriptive statistics on key variables, while Table 2 shows the correlation coefficients between our independent variables.

In Table 3, we explore the relationship between provincial labour productivity and inward FDI. Column 1 shows that FDI inflows correlates positively and significantly with the average productivity of domestic firms, also controlling for standard provincial level controls and for province and year fixed effects. In columns 2 to 5 we estimate the same specification by gradually adding the set of covariates in order to control for other potential determinants of provincial productivity.

These variables include the average capital assets endowment of firms within each province (column 2), the economic size of provinces measured with GDP (column 3), the local unemployment rate as an indicator of the functioning of local labour markets and the incidence of dismissed activities by foreign multinationals measured as foreign disinvestment. Results show that the significance level and magnitude of our variable of interest remain stable and consistent across specifications. Finally, we construct area trends at the provincial level to

*Table 1 – Descriptive Statistics*

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>
log(productivity)	721	-0,245	0,155
Share of FDI <sub>t-1</sub>	721	0,011	0,048
log(capital assets)	721	7,743	0,475
log(gdp)	721	9,165	0,791
unemployment rate	721	7,324	4,230
log(foreign disinvestment)	721	-4,642	4,349

*Source:* Author's elaboration

*Table 2 – Correlation Matrix*

	<i>Share of FDI<sub>t-1</sub></i>	<i>log (cap. assets)</i>	<i>log (gdp)</i>	<i>unemp. rate</i>	<i>log (for. disinv.)</i>
Share of FDI <sub>t-1</sub>	1				
log(capital assets)	-0,06	1			
log(gdp)	0,35	-0,16	1		
unemployment rate	-0,15	-0,06	-0,24	1	
log(for. disinvestment)	0,11	0,11	-0,20	0,19	1

*Source:* Author's elaboration

capture any unobserved factor that can affect productivity in a specific province over the sample period. This may include specific policy measures at the local level or other shocks influencing the provincial economy. Therefore, combining area trends with province fixed effects in column 6 produces a quite stringent specification. Nevertheless, the coefficient on FDI remains significantly and positively correlated with average provincial productivity, thus suggesting that the estimated relationship is adequately stable.

Table 4 unpacks the sample by level of average labour productivity and presents the estimates by defining high, medium-high, medium-low and low levels of absorptive capacity, based on the 75<sup>th</sup>, 50<sup>th</sup>, and 25<sup>th</sup> percentile of the productivity distribution. Results show that the positive effect from FDI tends to be concentrated in provinces where domestic firms show the highest level of absorptive capacities, specifically above the 75<sup>th</sup> percentile. In provinces with a lower level of absorptive capacity, the effect of inward FDI becomes non-significant and it turns to be negative in areas with the least developed absorptive capacity. The latter effect is not statistically different from zero, but it may suggest that FDI

Table 3 – Provincial Panel Fixed-effects Estimates

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
<i>log(productivity)</i>						
Share of FDI <sub>t-1</sub>	0.841 *** (0.170)	0.850 *** (0.155)	0.697 *** (0.139)	0.694 *** (0.150)	0.691 *** (0.152)	0.666 *** (0.156)
log(capital assets)		-0.113 (0.100)	-0.090 (0.104)	-0.095 (0.102)	-0.094 (0.102)	-0.102 (0.105)
log(gdp)			1.223 *** (0.254)	1.149 *** (0.254)	1.148 *** (0.255)	1.170 *** (0.264)
unemployment rate				-0.014 ** (0.006)	-0.013 ** (0.006)	-0.015 ** (0.007)
log(for. disinvestment)					0.001 (0.002)	0.001 (0.002)
R-squared	0.16	0.16	0.18	0.19	0.19	0.19
Observations	721	721	721	721	721	721
Number of provinces	103	103	103	103	103	103
Province FEs	Y	Y	Y	Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y
Area trends						Y

Notes: Standard errors are clustered on provinces. Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The number of observations include 103 provinces observed over a period of 7 years (103×7=721).

Source: Author's elaboration

can also produce detrimental effects within areas with weak competences, due for instance to market stealing dynamics associated to competitive pressures.

#### 4. Conclusions

This chapter provides an empirical account of the relationship between inward FDI and the domestic productivity level of recipient local economies in Italy over the period 2003-2009. At the aggregate level our data suggests that there is an average positive effects on labour productivity in provinces that receive inward foreign investment, thus corroborating the most general findings of the literature. In this sense, our fixed effects estimates prove to be robust to the inclusion of other confounding factors, thus confirming the positive link between inward FDI and the performance of Italian provincial economies. Nevertheless, when considering the heterogeneous local ability to intercept the benefits from incoming foreign investments, our results suggest that the positive effects related to FDI

*Table 4 – Provincial Performance and FDI*

<i>Dependent Variable: log(productivity)</i>	(1)	(2)	(3)	(4)
	<i>High</i>	<i>Med.-high</i>	<i>Med.-low</i>	<i>Low</i>
Share of FDI <sub>t-1</sub>	0.765 *** (0.115)	0.106 (0.417)	0.936 (0.755)	-2.374 (1.576)
log(capital assets)	0.046 (0.212)	-0.188 (0.145)	0.068 (0.074)	-0.053 (0.087)
log(gdp)	0.792 ** (0.365)	0.823 *** (0.248)	0.595 ** (0.267)	1.022 ** (0.441)
unemployment rate	-0.007 (0.010)	-0.012 (0.008)	-0.002 (0.005)	-0.023 ** (0.010)
log(for. disinvestment)	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.001 (0.005)
R-squared	0.70	0.53	0.30	0.19
Observations	180	181	180	180
Number of provinces	33	42	47	42
Province FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Area trends	Y	Y	Y	Y

*Notes:* Standard errors are clustered on provinces. Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The four columns consider different levels of provincial performance defined on the following values of labour productivity: higher than the upper quartile (column 1), between upper quartile and median (column 2), between median and lower quartile (column 3), lower than the lower quartile (column 4).

*Source:* Author's elaboration

tends to be entirely concentrated within areas with the highest levels of absorptive capacity, while most of the other provincial economies do not experience any significant local spillover. This heterogeneity may produce clear spatial imbalances in the distribution of the benefits deriving from the foreign presence within the country. Hence, in policy terms, this result suggests that national and regional initiatives for the attraction of foreign multinational companies should be accompanied by measures aimed at strengthening the knowledge base and competences of domestic actors. In absence of such ancillary measures, the scope for absorbing the technical and managerial know-how possessed by foreign firms may remain largely unexploited, and this could be especially the case of areas where the marginal benefits of the potential FDI-induced spillovers are the greatest.

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## Sommario

### L'impatto territoriale degli investimenti diretti esteri: Nuove evidenze empiriche sul caso italiano

Questo capitolo investiga la relazione tra gli investimenti diretti esteri (IDE) e la produttività delle province italiane negli anni 2003-2009. I risultati dell'analisi suggeriscono che le province che ricevono più IDE sono mediamente più produttive. Tuttavia, le stime rivelano anche che gli effetti benefici sono fortemente concentrati nelle province caratterizzate da capacità di assorbimento estremamente elevate. Ciò rafforzerebbe l'idea che le competenze territoriali svolgono un ruolo prominente nello sfruttamento degli effetti associati agli IDE in entrata. Alla luce di tale evidenze empiriche, le politiche di attrazione degli IDE dovrebbero necessariamente essere accompagnate da misure volte a rafforzare adeguatamente il tessuto di competenze locali.