

**Inward FDI and host country labour markets.
Evidence from the Italian manufacturing system.**

Mariachiara Barzotto, Birmingham Business School, University of Birmingham
Giancarlo Corò, Università Ca' Foscari Venezia
Ilaria Mariotti, Politecnico di Milano
Marco Mutinelli, Università di Brescia

Abstract

Countries are increasingly competing to attract inward FDIs because of the potential benefits they bring about. In advanced economies, a specialised, skilled workforce is a pivotal economic development asset to enhance local and regional innovation capabilities. Within this framework, the paper aims at investigating how the use of a local, skilled workforce differs according to firms' ownership; being either affiliates of foreign MNEs, or uni-national firms (firms that have neither been acquired in the period of analysis, nor have invested abroad; henceforth NATs). We empirically investigate this issue by adopting a novel database merging economic data on inward FDIs and NATs operating in the manufacturing sector in the Veneto region (northeast of Italy) between 2007 and 2013. Descriptive statistics and econometric analysis (counterfactual estimation) have been developed, devoting particular attention to the firms' skill composition (in terms of skill level, age, gender and nationality). The results show that the two groups of firms differ in terms of workforce skill composition, and the affiliates of foreign MNEs positively impact on the regeneration of the host country's human capital by attracting and employing a wider share of a more highly skilled labour force than NATs.

Keywords: Multinational Enterprises, Advanced Economies, Host Country's Labour Market, Skill Composition

1. INTRODUCTION

The fast pace of globalisation has reshaped not only the global scaling of trade, but also the organisation of economic activity and, accordingly, the division of labour (Gereffi *et al.*, 2001; Nielsen & Sturgeon, 2014). In the last decades, the international engagement of manufacturing firms in advanced economies has been both active and passive. On the one hand, they have heavily offshored low value-added operations to low labour cost economies and focused on high value-added upstream and downstream activities at home. On the other hand, they have received inward foreign direct investments (FDIs), from both other developed countries and from emerging ones. The extensive pursuit of these strategies has significantly affected the resource endowment of high-income countries.

The presence of inward FDIs in host countries may bring potential benefits (Crescenzi *et al.*, 2015); this is the reason why countries are increasingly competing to attract inward FDIs. Nevertheless, it cannot be denied that there is another side to the coin: the progressive moving away from the domestic productive ecosystem (e.g. Berger, 2013), and the control over key assets that foreign companies can gain by acquiring firms located in high-income countries (Giuliani *et al.*, 2014: 681) has led multinational manufacturing firms in advanced economies to dissipate their own 'industrial commons': "the set of external economies of localisation – such as skilled workforce, supply networks, manufacturing culture, social capital – necessary to support manufacturing" (Pisano & Shih, 2009; 2012). The threat to, or in some cases the entire erosion of, the industrial commons is severely jeopardising the long-period competitiveness of advanced economies; for instance, by hollowing out the local suppliers' networks and the loss of critical skills, competences and tacit knowledge.

The literature on host countries has widely documented the superior performance of international firms, whereby multinationals (MNEs) are more productive than exporters, who in turn outperform purely domestic firms (Lipsey, 2002; Castellani & Zanfei, 2006; Greenaway & Kneller, 2007; Mayer & Ottaviano, 2008) thanks to their ability to reap ownership advantages and easily transfer them within firm boundaries (Dunning, 1993). The sources of these productivity premia have, however, largely remained unclear. Standard theoretical models consider differences in productivity as the results of chance (Castellani & Giovannetti, 2010). Only recently have models acknowledged that firms in

more competitive environments, such as international markets (as opposed to smaller domestic markets), are more likely to adopt new technologies and achieve higher productivity than firms which simply have a monopoly power (Schmitz, 2005). Besides, MNEs might generate spillovers through several interaction mechanisms, both intra-industry (i.e. in their own sector), and inter-industry (i.e. in the other sectors in which they interact) (Mariotti *et al.*, 2008; Iammarino & McCann, 2013).

However, there is still scant evidence of the effects of inward foreign investments on high-income countries' industrial base (Giuliani *et al.*, 2014; Barzotto *et al.*, 2016), in particular on the labour market composition/human capital endowment, which is crucial for enhancing the competitiveness of a territory. Indeed, as Moretti (2012) clearly states, the economic value of a place depends as never before on talent. More specifically, in advanced economies a specialised, skilled workforce represents one of the most critical factors of their local industrial commons. Indeed, it represents a pivotal economic development asset to enhance local and regional innovation capabilities (see also Blakely & Green Leigh, 2009; Jacobs & Hawley, 2009). Indeed, the labour force endowment of a territory is strongly linked to the success of the companies located in the area. As Pisano and Shih (2012: 23) claim, there is a close connection between the competitiveness of companies and the competitiveness of workers located where firms are based. If a worker is not endowed with appropriate skills (education and training), then the enterprise's competitive power will be threatened. Conversely, dense concentrations of highly skilled workers in geographically localised clusters trigger virtuous processes of economic growth (Moretti, 2012). Hence, it is crucial to investigate how companies located in developed countries (both domestic ones and MNEs) employ their local labour workforce, and how this use fosters the skilled workers' upgrading.

By building on a novel database that merges economic data on inward manufacturing FDI and NATs with information about their labour composition, this work aims to investigate: (i) the impact of inward FDI on the host country's labour market; and (ii) how the need for a local, specialised, skilled workforce differs according to the companies' ownership structure (domestic or foreign control). Moreover, it sheds lights on the extent to which foreign investments sustain the regeneration of the host country's skilled human capital.

The paper compares NATs with the affiliates of foreign MNEs (henceforth FMNEs) located in the Veneto region (northeast of Italy), through descriptive analyses and a propensity score matching technique. It contributes to the existing literature, which has mainly analysed the effects of inward FDI in terms of productivity, technology, knowledge spillovers (Mariotti *et al.*, 2008), patent outputs and innovation (Crescenzi *et al.*, 2015), by focusing on the composition of the host country labour market.

The rationale behind the selection of the Veneto NUTS2 region in this study is twofold. First, in 2013 Veneto showed a good internationalisation performance compared to the national average (about 3% both for inward and outward FDI), attracting 11% of inward FDI in Italy, and was responsible for 14% of the total outward FDI originating from Italy¹. Besides, it experienced the highest inward FDI growth (42%) in 2000-2013, whose amount is confirmed when only manufacturing FDI are taken into account: 13% (during the economic downturn of 2007-2013). Second, Veneto traditionally represents the context of the Italian district model, on which the Italian industrial system and its competitiveness are grounded. In 2013, this region hosted about 20% of the Italian industrial districts in the Made in Italy sectors.

The paper comprises six sections. The introduction is followed by the literature review on the effects of inward FDI on the host country, devoting particular attention to the composition of the local labour market. Section three focuses on the data. Descriptive statistics and counterfactual analysis are given in sections four and five, respectively. The results and conclusions follow.

2. LITERATURE REVIEW

The theoretical and empirical literature on the effects of MNEs on the host country, which aims to investigate "who" the impact displaces, can be mainly divided into three categories: (i) micro level – studies of firms (market shares, sales or profits) that have been acquired by or merged with an FMNE; (ii) meso level – studies on the industry the foreign affiliates belong to; and (iii) macro-level – studies of the effects at system level, specifically when the focus is on large firms that exploit effects on the economies in which they are based (Ietto-Gillies, 2005).

Moreover, scholars have highlighted both the direct and indirect effects of MNEs on (a) performance; (b) employment and skills; (c) trade; and (d) balance of payments (for a review see Ietto-

¹ Veneto was responsible for 14% of outward FDI in the country, being only surpassed by the Lombardy region, which is the Italian financial-economic hub.

Gillies, 2005) in the host country. Direct effects are typical of the micro-level studies and investigate output and employment, while indirect effects concern the company's supply chain and the broader business environment in which it operates (Mariotti & Piscitello, 2007). However, the literature on the labour composition of MNEs vs. NATs is scant, an issue that is investigated in this paper².

Empirical studies mainly investigate the impact of foreign presence on the host country's labour or total factor productivity, focusing on firm heterogeneity according to ownership. Doms and Jensen (1998), using US data, show that there are substantial differences between NATs and FMNEs. More specifically, they find that FMNEs have higher labour productivity, pay higher wages and are more capital intensive than US NATs, while the US domestic multinationals are the productivity leaders. Griffith and Simpson (2001) find that UK FMNEs exhibit higher labour productivity than NATs, while the De Backer and Sleuwaegen (2002) analysis of Belgian firms shows that foreign firms are more productive than NATs. Nevertheless, the Belgian MNEs are very similar to FMNEs in terms of efficiency and returns to scale. In the case of Portugal, Barbosa and Louri (2005) find that ownership tends to make a difference with respect to a firm's performance, and firms with foreign ownership outperform domestically owned firms with similar characteristics. This superior performance is explained by the fact that MNEs are large and have higher capital intensity. Indeed, the empirical literature (Castellani & Zanfei, 2006; Greenaway & Kneller, 2007; Mayer & Ottaviano, 2008) on firm heterogeneity, and in particular a strand of literature focusing on heterogeneity linked to ownership (national vs. multinational), have stressed that, on average, MNEs are larger, and have higher capital intensity and superior technology than NATs. Therefore, we can assume that inward FDI of the greenfield type increase both the production capacity and the employment level of the host country, if they are additional to the existing local firms. This employment increase can be generated by direct production, exports, imports, and joint ventures. In the case of inward greenfield FDI which substitute for local firms, a market stealing effect may take place.

On the other hand, M&A FDI, which are in the majority worldwide³, only tend to generate additional production capacity in the investing MNE, not in the host country. This may happen, for instance, when foreign investors privatise local firms (Sader, 1995). Specifically, in the short run no new jobs are created; in the medium run employment cuts will probably take place as a result of a firm's restructuring; and in the long run the MNE can invest through greenfield FDI, which will create new jobs.

Beyond the direct effects described so far, indirect effects can occur in the host country as well. The MNEs' expansion generates inputs of fresh capital, which is desirable. However, inward investments not only impact on the ownership structure of companies located in high-income countries but – more importantly – also on the productive ecosystem in which the firms are embedded. Indeed, acquisitions by MNEs raise concerns about the control over strategic assets that foreign companies can gain by acquiring firms located in high-income countries (Giuliani *et al.*, 2014: 681). The loss of control over local strategic assets represents a threat, as it might lead to the dissipation of a local industrial commons. A recent study (Giuliani *et al.*, 2014) started to shed light on the level of exploitation of the local context by companies investing in advanced economies and their contribution to the host-country territory. Specifically, Giuliani *et al.* (2014) investigate how subsidiaries of MNEs - both in emerging and advanced economies - investing in the industry machinery and equipment sector in Italy and Germany learn from the local context and contribute to it as much as they benefit from it. The results of the quantitative and qualitative analyses show that MNEs from emerging economies undertake different strategies compared to those from high income ones. Specifically, subsidiaries of MNEs from advanced economies predominate in the passive typology, while those from emerging markets fall either into the dual or predatory typologies⁴. This result therefore supports the idea that FMNEs can contribute to the creation of firm-level advantages through reverse knowledge transfer, and to the generation of mutually enriching opportunities for the corporation and the local context.

Indirect effects on employment may be related to the correlation between FDI and trade. For example, inward FDI increases exports, which in turn can generate additional jobs. Vice versa, if FDI leads to higher imports, this may have a negative impact on employment. Besides, if the *filiale* in

² The studies analysing the impact of foreign activities on labour intensity and labour composition focus on the home country (e.g., Brainard & Riker, 1997; Mariotti *et al.*, 2003; Castellani *et al.*, 2008; Elia *et al.*, 2009; for a review, see Gattai, 2015). They provide evidence on the concerns related to the drop in home employment and low skilled workers' real wages in high-income economies. These are due to the offshoring and outward FDI activities extensively implemented by companies located in advanced countries.

³ The value of cross-border M&A increased by 28% over 2013, reaching almost \$400 billion (Unctad, 2014).

⁴ According to the authors, the predatory subsidiary combines bottom-up knowledge transfer (the subsidiary transfers more knowledge to the remaining corporation than receives from it, therefore being a sort of knowledge source for the headquarters and the other subsidiaries) and low local embeddedness (the subsidiary maintains very limited local innovative ties), while the passive subsidiary combines top-down knowledge transfer and low local embeddedness.

which the inward FDI operates is located inside the host country, positive effects on employment may arise, while they might be negative if the *filière* is outside the host country's borders. Previous studies have also focused attention on the indirect macroeconomic effects of FMNE expansion: those of the turnover multiplier and of employment by Keynes/Kahn, which exist in the case of greenfield FDIs.

The effects on host employment also concern its quality (salary, productivity, professional qualifications and labour contractual power). MNE productivity levels tend to be higher than those of NATs because MNEs are larger and use higher capital intensity productive techniques than NATs. Therefore, higher productivity levels allow firms to offer above average salaries (Girma & Gorg, 2007). Another interesting issue is that higher productivity levels can also be obtained through staff training courses that raise the level of skills and professional profiles. Empirical evidence is provided on the training and development courses offered by MNEs (UNCTAD, 1994); it is found that inward FDIs in skilled-labour-intensive industries are mainly directed to advanced countries. Besides, MNEs tend to be more innovative, developing new products, production processes, and production organisation, which may have positive effects on productivity. MNEs tend to pay, on average, higher wages, thus impacting on the salaries offered by NATs.

The literature on firms' heterogeneity by ownership in Italy is mixed. Some studies find that belonging to multinational groups is related to higher productivity, while innovation activity is more evident in Italian MNEs than in FMNEs (Castellani & Zanfei, 2006). Meanwhile, the study by Grasseni (2007) indicates a higher level of labour productivity and a higher average wage for FMNEs in respect to domestic Italian MNEs, which dominate in terms of return on sales and leverage. Even though evidence from Italy suggests that FMNEs mostly seek market expansion, they still may benefit from a different managerial structure in the host country. The study by Crinò and Onida (2007) confirms the previous results, showing that FMNEs are more knowledge-intensive, more productive, pay higher wages and show a more solid financial structure than domestic firms. However, Benfratello and Sembenelli (2006) focus on Italy in the period 1992-1999 and find that, after accounting for endogeneity in an instrumental variable set-up, the productivity advantage of foreign firms disappears, implying that foreign firms tend to cherry pick the best Italian firms, without contributing to raising their economic performance.

With respect to the indirect effects, spillovers can arise when the employees move from the MNE's affiliate to local firms, thus showing an impact upstream and downstream in the supply chain, in terms of number of jobs and skills. Nevertheless, even negative spillovers can take place, such as the market stealing effect, environmental pollution, and an excess of demand for local services and infrastructures, with negative effects on employment structure and on quality of life.

The extent to which inward FDIs use the host-country local labour workforce and its skills composition will be empirically explored in the following sections.

3. DATA

This paper focuses on the impact of inward FDIs on the host country's labour market and skill composition by studying manufacturing companies (with more than 10 employees) located in the same region (Veneto) but differing in terms of ownership: affiliates of FMNEs and NATs, that is, Italian firms that have neither been acquired by or merged with foreign companies, nor have invested abroad. The analysis of firms located in the same region allows one to control for the legal, cultural, and socio-economic framework. As previously mentioned, the rationale behind the choice of Veneto is twofold. First, it shows a higher performance, in term of inward and outward FDIs, compared to the country average: it attracted about 12% of inward FDIs; registered the highest inward FDI growth (42%) in 2000-2013; and was responsible for 14% of the outward FDIs in the country. Besides, during the economic downturn period (2007-2013) 13% of manufacturing inward FDIs were invested in Veneto compared to about 3% in Italy, on average. Second, Veneto traditionally represents a world-renowned economic area for manufacturing production based on the industrial districts in the Made in Italy sectors⁵.

The study adopts a unique rich dataset that combines three sources of data (Table 1):

⁵ The industrial districts are "geographically defined productive systems, characterized by a large number of firms that are involved at various stages, and in various ways, in the production of a homogeneous product" (Becattini, 1990: 40). They play a key role in the Italian economy since they represent about one quarter of the country's productive system, as concerns the number of Local Labour Systems (LLS), employees, and productive local units. With regard to employment, more than one third of all employees in the country work in an industrial district. Specifically, Veneto hosts 28 industrial districts in the Made in Italy sectors, representing 62% of the districts in the North-Eastern macro-area, and about 20% of the total in Italy. They are specialized in medium-high technology (mechanics: 43%), and low technology sectors (home furniture: 25%; textile and clothing: 18%; leather and shoes: 7%; food and jewellery: 4% each) (ISTAT, 2015).

- 1) The Reprint database, which has been developed by R&P (Ricerche & Progetti) and the Politecnico di Milano, and is sponsored by the Italian Institute for International Trade (ICE). Since 1986, Reprint has recorded every inward and outward manufacturing FDI which has occurred in Italy⁶ (for details see Mariotti & Mutinelli, 2014). This dataset also collects detailed information (investment year, sector, FDI typology, country of origin) on inward FDIs in the Veneto region, last updated in 2014.
- 2) The AIDA database by Bureau van Dijk, which provides balance sheet data of active Italian firms. This dataset allows us to collect data on the balance sheets of manufacturing firms located in Veneto from 2007 to 2013.
- 3) The SILV⁷ (Informative System Veneto Labour) dataset by Veneto Lavoro, which registers the employment composition (age, gender, citizenship, professional activity, educational qualification, type of contract, new hirings/dismissals) of the firms active in Veneto in the years 2008 and 2014.

The matching of the three datasets, on the basis of the inward FDIs' fiscal code, allows us to compare the employment structure of the FMNEs and NATs.

Data on firms' characteristics and performance refer to the period 2007-2013, while data on the labour composition has a one-year lag (2008 and 2014); this allows us to determine the effects of firms' characteristics and performance on their labour composition (Table 1).

Table 1. Variables and Data Source

Label	Variable	Unit	Year	Source
Firm characteristics	Ownership	Dummy variable	2007-2013	Reprint
	Sector	Dummy variable	2007-2013	AIDA
	Firm size (Turnover)	Thousands of Euros	2007-2013	AIDA
Performance	Labour cost per employee	Thousands of Euros	2007-2013	AIDA
	Value added per employee	Thousands of Euros	2007-2013	AIDA
	ROI	Percentage	2007-2013	AIDA
	Operating profit per employee	Thousands of Euros	2007-2013	AIDA
Labour composition	Share of high skilled workers	No. of workers/share	2008; 2014	SILV
	Share of under 30 workers	No. of workers/share	2008; 2014	SILV
	Share of women workers	No. of workers/share	2008; 2014	SILV
	Share of foreign workers	No. of workers/share	2008; 2014	SILV

The original sample consists of 10,289 manufacturing companies, among which 257 are subsidiaries of FMNEs and 10,036 are NATs, which, according to the information recorded in Reprint, have neither been acquired by foreign companies, nor have invested abroad throughout the period 2007-2014. After removing missing values, the final sample is composed of 9,139 manufacturing companies, among which 219 are subsidiaries of FMNEs and 8,920 are NATs.

4. DESCRIPTIVE STATISTICS

The analysis of the dataset on NATs and FMNEs underlines that about 57% of the FMNEs operate in the high-technology and medium-high technology sectors, while about 73% of the NAT firms are in the low-high and low-technology sectors (Table 2) (see the OECD classification in the appendix). This is consistent with the evidence that indicates that foreign investors tend to acquire market shares in technological advanced sectors, and, at the same time, domestic Italian firms are specialised in the most traditional, low-tech sectors (i.e. the Made in Italy sectors).

⁶ Since 2002 it has also recorded other sectors of the economy.

⁷ SILV stands for Sistema Informativo Lavoro Veneto, which means Informative System Veneto Labour.

Table 2. Inward FDI in Veneto and NATs in 2013 by OECD classification (NACE Rev. 1.1)

OECD classification	NAT		FMNE	
	n.	%	n.	%
High-tech	357	4.00	23	10.50
Medium-high tech	2,054	23.03	101	46.12
Medium-low tech	3,517	39.43	55	25.11
Low tech	2,992	33.54	40	18.26
Total	8920	100	219	100

The countries from where inward FDIs originate are in line with the national classification described in UNCAD (2014): the European Union (68.5%; with the EU-15 comprising 55.3%), North America (20.1%, of which the USA accounts for 93.2%), other European countries (11.4%, of which Switzerland comprises 96%), and East Asia (6.4%, of which Japan accounts for 57.1% and China 21.4%). The investments from the European Union come mainly from Germany (28.1%), France (18.2%) and the UK (14%). The origin of the investments recalls that of the country itself, with a strong presence of neighbouring advanced countries, but also of emerging ones such as China, India and the Russian Federation.

As shown in Figures 1-5, the dynamics of the two groups of firms (NATs and FMNEs) differ in terms of:

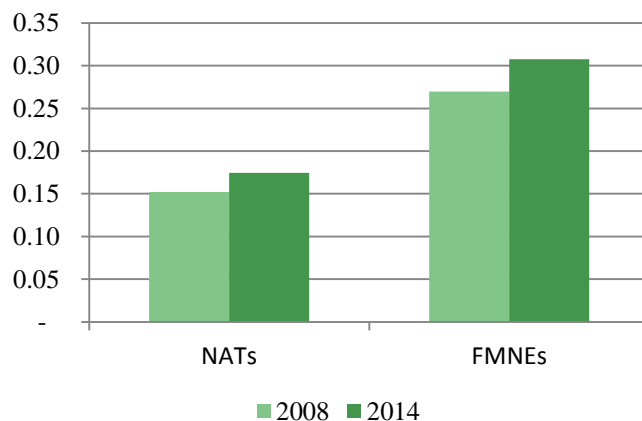
- 1) size (turnover);
- 2) workers' qualifications (highly skilled workers);
- 3) productivity (value added per employee; cost of labour per employee);
- 4) profitability (ROI – return on investment; operating profit per employee);
- 5) characteristics of the production process (vertical integration⁸).

Size

The two groups of firms are heterogeneous in size (in terms of turnover); FMNEs were 7.4 times larger and more skilled than NATs in 2007 and almost 6.9 times larger in 2013.

Workers' qualifications (highly skilled workers)

Figure 1: Share of highly skilled workers (2008-2014) by firm typology.



Although the share of highly skilled employees of NATs and FMNEs increased in 2014 compared to 2008 – the first year of the economic and financial crisis – the affiliates of FMNEs show a larger share of highly skilled employees (Figure 1) than the NATs.

⁸ We compute vertical integration as value added over turnover at a given year. This measure provides a proxy of how much the company produces in-house. Indeed, the vertical integration increases as firms integrate vertically, forwards and backwards, when transactions are carried out within, instead of across, firms (Davies & Morris, 1995).

Productivity

The dynamics of NATs and FMNEs are compared in terms of value added per employee and cost of labour per employee over the period 2007-2013 (Figures 2 and 3). FMNEs present higher values in both dimensions, thus they show a higher labour productivity and pay higher wages.

Figure 2. NATs' and FMNEs' value added per employee (2007-2013), pre-counterfactual

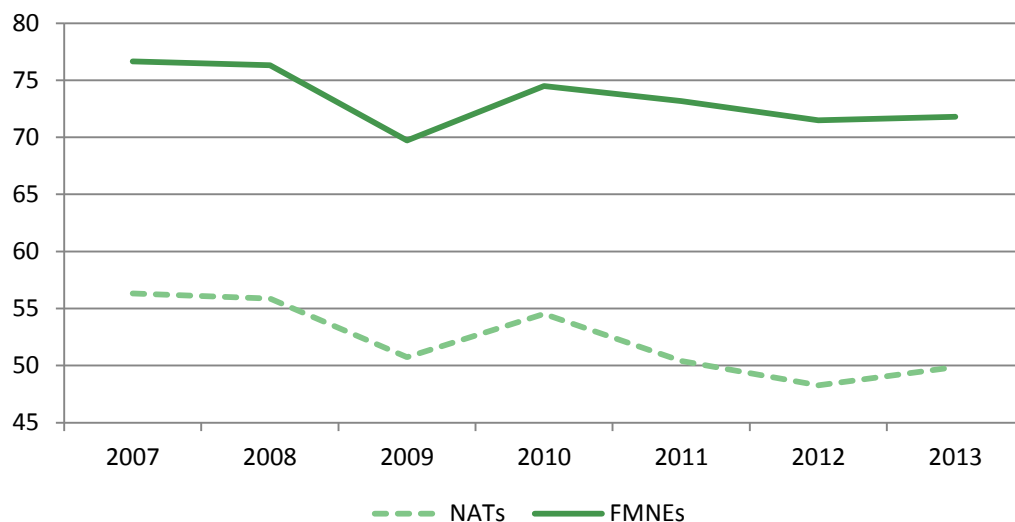
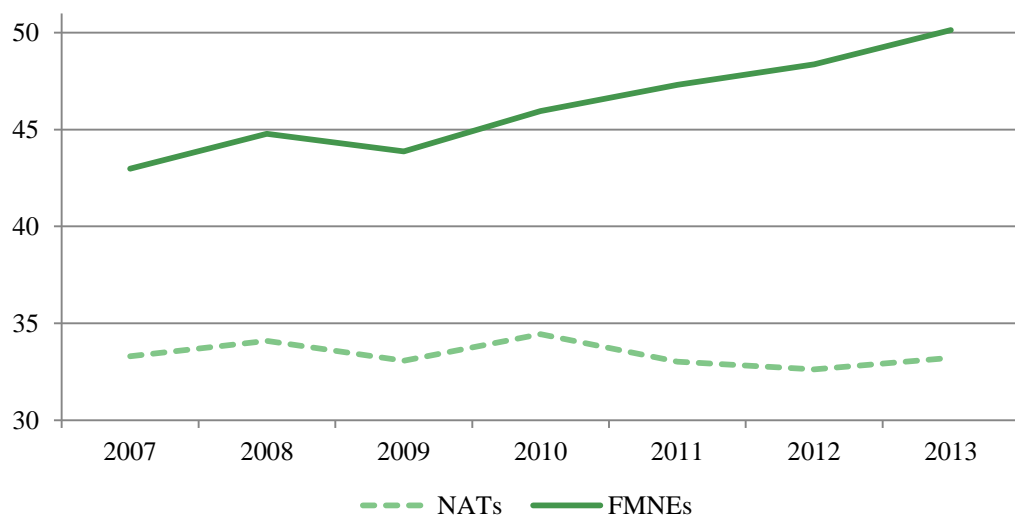


Figure 3. NATs' and FMNEs' cost of labour per employee (2007-2013), pre-counterfactual



Profitability

With reference to profitability, the dynamics of the two groups of companies (NATs and FMNEs) are compared in terms of ROI (Return On Investment) and operating profit per employee over the period 2007-2013 (Figures 4 and 5). It results that FMNEs have shown higher values for ROI since 2010, with a sharp drop just after the economic crisis in 2007. From 2009 and 2013, FMNEs do better than NATs with respect to operating profit.

Figure 4. NATs' and FMNEs' ROI (2007-2013), pre-counterfactual

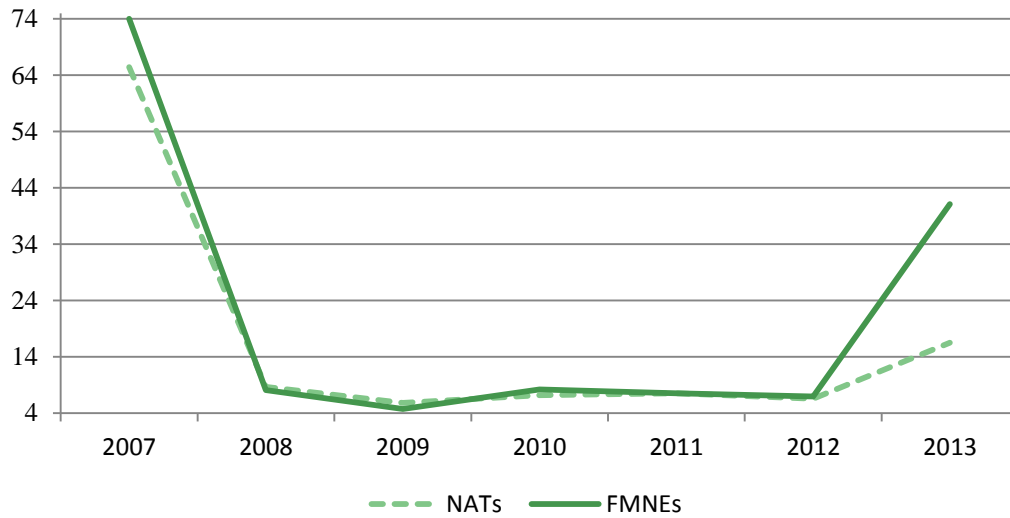
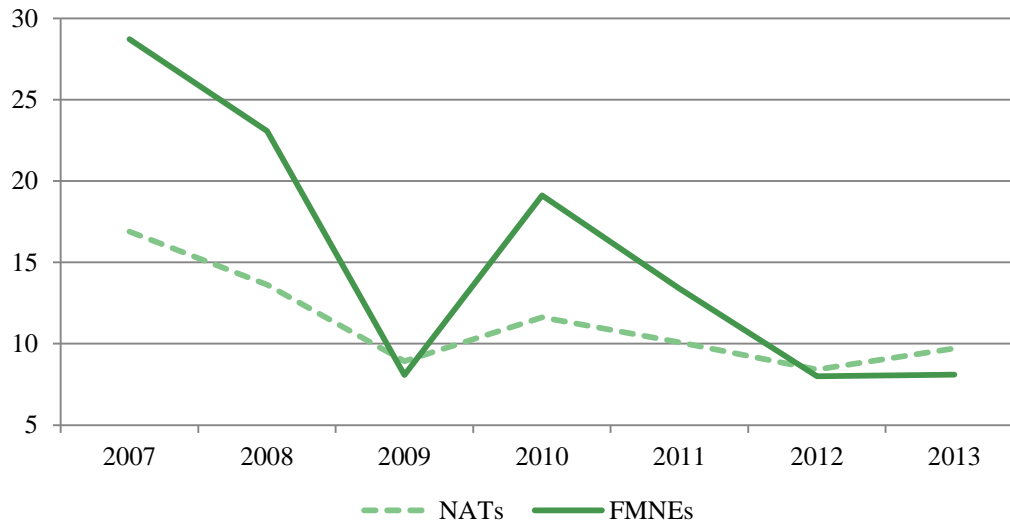


Figure 5. NATs' and FMNEs' operating profit per employee (2007-2013), pre-counterfactual



5. COUNTERFACTUAL ANALYSIS

In order to compare the two groups of firms (FMNEs and NATS) that are similar in key characteristics, a counterfactual analysis has been developed, referring to the last year of the period of analysis: 2013 for firms' characteristics and performance, and 2014 for the labour composition data. The crucial assumption behind the matching is that, conditional on a set of observable characteristics X , the potential outcomes ($\sum Y_i$) are independent of the outcome. When selecting cases on this assumption, the counterfactual outcome of the cases in group A (i.e. FMNEs) should be the average outcome of group B (NATs) with the same selected observable characteristics (Caliendo, 2008). The distribution of the vector of observable characteristics has to be balanced across the two groups (Becker & Ichino, 2002, in Brouwer & Mariotti, 2014). We have used propensity score (p-score) matching, developed by Rubin (1974), to construct an appropriate counterfactual of NATs similar to FMNEs. Building on Crinò & Onida's work (2007), the counterfactual has been defined by matching each FMNE with firms of the

NAT sample according to the following two characteristics: sector and dimension, expressed in terms of turnover.

Specifically, a logit model has been estimated (Table 3), where the dichotomy – which assumes value 1 if the company has a foreign participation – is regressed on the dimension proxy (natural logarithm of the turnover in 2010) and on sector dummy variables (OECD sector classification on manufacturing industries, which refers to their global technological intensity⁹). Turnover refers to 2010 in order to control for the FMNE cherry-picking argument, which is that the best performing local firms are taken over by foreign investors (amongst others, Criscuolo & Martin, 2004; Crinò & Onida, 2007).

It results that FMNEs tend to have higher turnovers than NATs, and are more willing to operate in the high technology sector than in the others (Table 3). This is consistent with the evidence which indicates that the R&D investment per employee in Italy in 2013 was, on average, four times higher in the affiliates of foreign MNEs than in Italian manufacturing firms and five times higher in the services (Mariotti & Mutinelli, 2014).

Table 3. Logistic regression

Variable	Coeff.
LnTurnover 2010	1.0306***
Medium/High-tech sector	-0.6844***
Medium/Low-tech sector	-1.6632***
Low-tech sector	-2.1061***
Constant	-11.1912***
Number of obs	8709
Prob > chi2	0.0000
Pseudo R2	0.2547
Log likelihood	-756.8212

Note: *, **, *** are significant at 10%, 5% and 1%.

The new sample, after the p-score matching, is composed of 173 FMNEs and 637 NATs.

The analysis of the dynamics of the two groups of firms (FMNEs and the counterfactual of NATs) in terms of value-added per employee, labour cost, and profitability (ROI and operating profit per employee) does not significantly differ from the previous analysis concerning the total sample (Figures 6-9), with the exception of profitability, measured in terms of operating profit per employee, where NATs perform better.

Building on Caliendo & Kopeinig's (2008) work, we computed ATT (Average Treatment on the Treated) in STATA14 according to the 5-nearest neighbor matching method (random draw version) with replacement and caliper (=0.01), and conditioning on the common support. We applied this specific matching method since goodness of model fit complied with the method requirements. The sample validity has been checked through econometric tests, to evaluate the absence of statistically significant difference between the two groups of companies along the dimensions used to create the counterfactual sample.

It results that FMNEs show a larger proportion of highly skilled labour force, pay higher wages, but show lower value added per employee and are less profitable, as underlined by the operating profit per employee. This last finding might be related to FMNEs' behaviour and characteristics: arbitrage in taxation, higher operating costs for facilities, higher exposure to price fluctuation of raw materials, and higher competition with large and productive companies which leads to the minimisation of costs. Besides, FMNEs are less willing to hire young or foreign workers (Table 4).

⁹ The OECD classification (NACE Rev. 1) comprises high-technology, high-low technology, low-high technology, and low-technology (see appendix).

Figure 6. NATs' and FMNEs' value added per employee (2007-2013), post-counterfactual

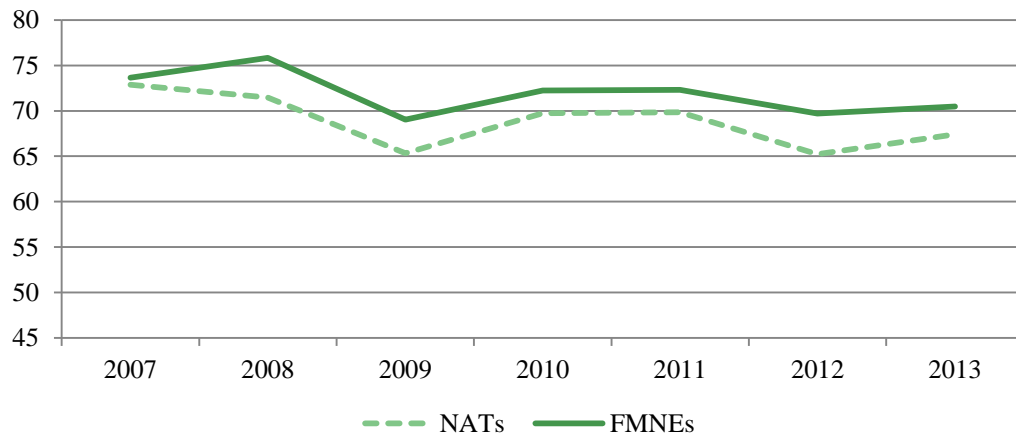


Figure 7. NATs' and FMNEs' labour cost per employee (2007-2013), post-counterfactual

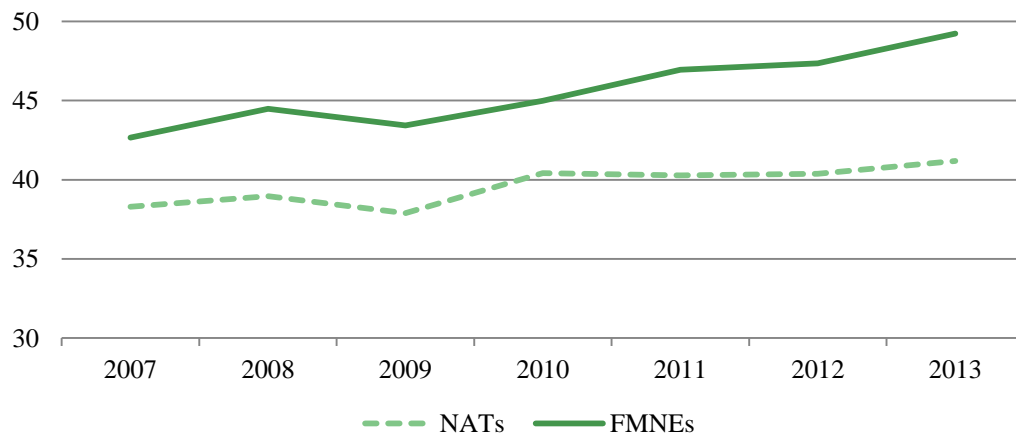


Figure 8. NATs' and FMNEs' ROI (2007-2013), post-counterfactual

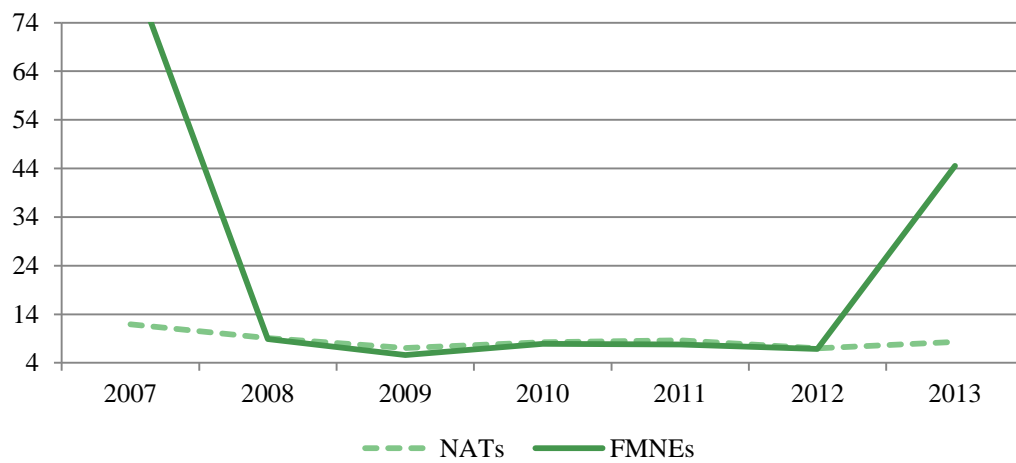


Figure 9. NATs' and FMNEs' operating profit per employee (2007-2013), post-counterfactual

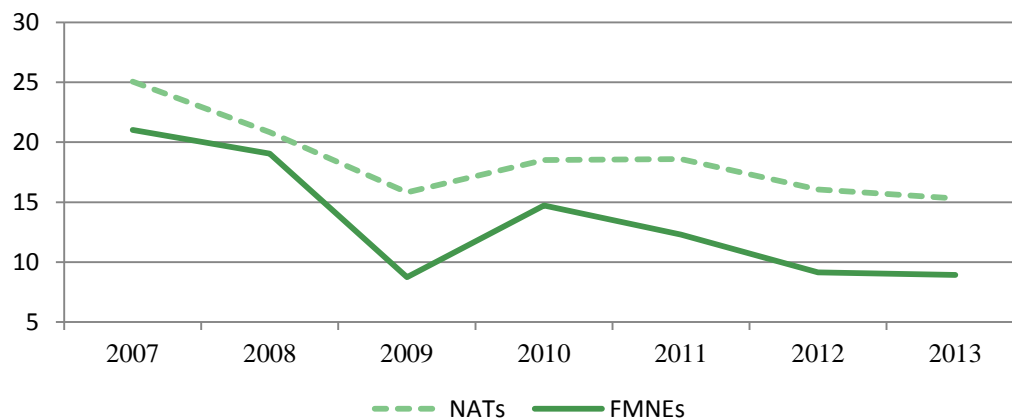


Table 4. ATT estimation

Variable	Year	NATs	FMNEs	ATT	Std. Err.	Sign.
Share of high skilled workers	2014	637	173	.048	.0235	Sig.
Share of under 30 workers	2014	637	173	-.053	.0126	Sig.
Share of women workers	2014	637	173	.0334	.0186	Not Sig.
Share of foreign workers	2014	637	173	-.0294	.0105	Sig.
Labour cost per employee	2013	637	173	7.079	1.086	Sig.
Added value per employee	2013	637	173	-.414	3.123	Not Sig.
ROI	2013	637	173	36.417	26.160	Not Sig.
Operating profit per employee	2013	637	173	-6.570	3.143	Sig.

6. RESULTS AND CONCLUSIONS

As the literature suggests, firms operating in international markets are more likely to adopt new technologies, achieve higher productivity, and therefore employ a more highly skilled labour force. In advanced economies, this last aspect plays a crucial role in enhancing local and regional innovation capabilities. There is, indeed, a strong relationship between firms' and workers' competitiveness, and workers' competitiveness crucially depends on skills (education and training). Hence, analysis of the labour composition within the domestic and foreign firms in a particular area is important to understand what the impact on skilled workers' upgrading can be, and whether this impact is related to firms' ownership.

The results of the counterfactual analysis have corroborated the evidence of the descriptive statistics: FMNEs are larger in terms of turnover than NATs in the manufacturing sector in the Veneto region, and are more willing to operate in the high-technology sectors. These findings confirm, on one hand, the demand for high-tech operations in the country, and on the other, the investments in high-tech and R&D activities by foreign MNEs. The investment in high value added sectors is closely related to the demand for a highly skilled labour force, and the empirical analysis underlines that FMNEs have a significantly higher probability of hiring highly skilled workers, paying higher wages, and being less profitable. Reasons for FMNEs' lower profitability might be related to arbitrage in taxation; higher operating costs for facilities; higher exposure to price fluctuations of raw materials; and greater competition with large and productive companies, which leads to the minimisation of costs.

Besides, some evidence is provided on the extent to which FMNEs use the host country's highly skilled human capital. The more intense use of local highly skilled workers made by FMNEs might trigger a concentration of specialised workers, which, in turn, might lead to 'virtuous processes of economic growth' (Moretti, 2012). Indeed, it fosters know-how circulation and knowledge spillovers (e.g. Capello & Lenzi, 2015), enabling human capital regeneration and development.

Knowing firms' heterogeneity, therefore, offers some insights into the likely impact of foreign manufacturing MNEs on the host economy, which can be of interest for policy makers. Specifically, the location of foreign manufacturing MNEs might have a positive impact on the industry itself and the local context because these firms may: (i) increase the number of employees who can be directly employed by the FMNE and by its local suppliers; (ii) foster knowledge spillover towards domestic suppliers and competitors, which can give birth to spin-off firms; (iii) develop backward and forward linkages; and (iv) strengthen the high tech sectors and the national innovative system.

Further research might focus on the indirect effects of inward FDIs on the local resource system (suppliers' network and its labour composition, education system, public/associative institutions and financial system) to better disentangle the effects on labour composition.

ACKNOWLEDGEMENTS

We gratefully acknowledge the support of Bruno Anastasia, Maurizio Gambuzza and Maurizio Resera of Veneto Lavoro in providing data on employment in the Veneto Region and supporting us over the data analysis. An earlier version of this study was presented at the c.MET05 Workshop, AISRe Conference in 2015, Milan AIB in 2015, the Global Value Chain Workshop in Birmingham in 2015, and the URSI seminar at the University of Groningen in 2016. We thank these audiences.

APPENDIX

OECD classification.

This is the statistical classification of economic activities in the European Community - NACE Rev. 1.1 that has been aggregated into the agreed Eurostat high technology sectors.

REFERENCES

- Barbosa, N., & Louris H. (2005). Corporate Performance: Does Ownership Matter? A Comparison of Foreign- and Domestic-Owned Firms in Greece and Portugal. *Review of Industrial Organization* 27: 73-102.
- Barzotto, M., Corò, G., & Volpe, M. (2016). Territorial capital as a company intangible: Exploratory evidence from ten Italian multinational corporations, *Journal of Intellectual Capital*, 17(1): 148 – 167.
- Becattini G. (1990). The Marshallian industrial district. In Pyke F. and Sengenberger W. (1990), Introduction, in Pyke F., Becattini G., Sengenberger W. (eds.), *Industrial districts and inter-firm cooperation in Italy*, International Institute for Labour, Geneva, 37-51.
- Benfratello L., & Sembenelli A. (2006). Foreign ownership and productivity: Is the direction of causality so obvious?. *International Journal of Industrial Organization*, 24, pp. 733-751.
- Becker, S.O., & Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *The Stata Journal*, 2(4): 358-377.
- Berger, S. (2013). *Making in America. From Innovation to Market*. Cambridge, Massachusetts: The MIT Press.
- Blakely, E. J & Green Leigh, N. (2009). *Planning Local Economic Development* (4th ed.). Los Angeles: Sage Publications.
- Brainard S.L., & Riker D.A. (1997). U.S. multinationals and competition from low-wage countries, Cambridge Mass. *NBER working paper*, n.5959.
- Brouwer A., & Mariotti I. (2014). Firm heterogeneity in multinational and domestic firms in Italian logistics. *European Transport - Trasporti Europei*, 56(8): 1-17.
- Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of economic surveys*, 22(1): 31-72.
- Capello, R., & Lenzi, C. (2015). *The Knowledge–Innovation Nexus. Its Spatially Differentiated Returns to Innovation, Growth and Change*. doi: 10.1111/grow.12098
- Castellani, D. & Giovannetti, G. (2010). Productivity and the international firm: dissecting heterogeneity. *Journal of Economic Policy Reform*, 13(1): 25-42.
- Castellani, D., Mariotti, I., & Piscitello, L. (2008). The impact of outward investments on parent

- company's employment and skill composition: evidence from the Italian case. *Structural change and economic dynamics*, 19(1): 81-94.
- Castellani, D., & Zanfei, A. (2007). Multinational companies and productivity spillovers: Is there a specification error. *Applied Economics Letters*, 14: 1047–1051
- Castellani D., & Zanfei A., (2006). *Multinational firms, Innovation and productivity*. Edward Elgar, USA.
- Crescenzi R., Gagliardi L., & Iammarino S. (2015). Foreign multinationals and domestic innovation: intra-industry effects and firm heterogeneity, *Research Policy*, 44 (3): 596-609.
- Crinò R., & Onida F. (2007). Foreign Ownership and Economic Performance in Italy: Not all is Cherry-Picking!. *CESPRI WP 207*, November, Bocconi University, Milan, Italy.
- Criscuolo C., & Martin R. (2004). Multinationals and US productivity leadership: Evidence from Great Britain. *STI Working Paper n.5*.
- Davies, S. W., & Morris, C. (1995). A new index of vertical integration: Some estimates for UK manufacturing. *International Journal of Industrial Organization*, 13(2), 151-177.
- De Backer, K., & Sleuwaegen, L. (2002) Foreign ownership and productivity dynamics. *Vlerick Working Papers n. 13*.
- Doms, M., & Jensen, B. (1998). Comparing Wages, Skills, and Productivity between Domestically and Foreign-Owned Manufacturing Establishments in the United States, In Baldwin R., Lipsey R., Richardson J. (eds) *Geography and Ownership as Bases for Economic Accounting, Studies in Income and Wealth*, Vol. 59, The University of Chicago Press, Chicago and London, pp.235-255.
- Dunning, J.H. (1993), *Multinational enterprises and the global economy*. Addison-Wesley, Workingham.
- Elia, S., Mariotti, I. & Piscitello, L. (2009). The impact of outward FDI on the home country's labour demand and skill composition. *International Business Review* 18(4): 357-372.
- Gattai V. (2015). Internationalisation and performance at the firm-level: what we learn from Italy. *Economia e Politica Industriale*, 42(4): 475-509.
- Gereffi, G., Humphrey, J., Kaplinsky R., & Sturgeon, T. J. (2001). Introduction: Globalisation, Value Chains and Development. *IDS Bulletin*, 32:1-8. doi: 10.1111/j.1759-5436.2001.mp32003001.x
- Girma, S., & Gorg, H. (2007). Evaluating the foreign ownership wage premium using a difference-in-differences matching approach. *Journal of International Economics*, 72: 97-112.
- Giuliani, E., Gorgoni, S., Günther, C. & Rabellotti, R. (2014). Emerging versus advanced country MNEs investing in Europe: A typology of subsidiary global–local connections. *International Business Review*, 23(4): 680-691.
- Greenaway, D., & Kneller, R. (2007). Firm heterogeneity, exporting and foreign direct investment: a survey. *The Economic Journal*, 117 (517): F134–F161.
- Griffith R., & Simpson H. (2001). Characteristics of foreign-owned firms in British manufacturing. *IFS Working Paper 01/10*.
- Ietto-Gillies, G. (2012, 2nd edition). *Transnational corporations and international production: concepts, theories and effects*. Edward Elgar Publishing.
- ISTAT (2015). *Rapporto Annuale 2015. La situazione del Paese*. ISTAT, Rome.
- Iammarino S., & McCann P. (2013). *Multinationals and Economic Geography. Location, Technology and Innovation*. Edward Elgar, Cheltenham, UK.
- Jacobs, R. L. & Hawley, J. D. (2009). *The Emergence of "Workforce Development": Definition, Conceptual Boundaries and Implications*. International Handbook of Education for the Changing World of Work (pp. 2537-2552).
- Lipsey, R.E. (2002), Home and host country effects of FDI. *NBER Working Papers 9293*. National Bureau of Economic Research.
- Mariotti, I. & Piscitello, L. (2007). The impact of outward FDI on local employment. Evidence from the Italian case, in M. Arauzo, D. Liviano and M. Martín (Eds), *Entrepreneurship, Economic Growth and Industrial Location* (pp.299–320). London, UK: Edward Elgar.
- Mariotti, S. & Mutinelli, M. (2014). *Italia multinazionale 2014. Le partecipazioni italiane all'estero ed estere in Italia*. Rubbettino Editore, Soveria Mannelli.
- Mariotti, S., Mutinelli, M., & Piscitello, L. (2003). Home country employment and foreign direct investment: evidence from the Italian case. *Cambridge Journal of Economics*, 27(3): 419-431.
- Mayer, T. & Ottaviano, G.I.P. (2008). The happy few: The Internationalisation of European Firms. New facts based on firm-level evidence. *Intereconomics*, May/June: 135-148.
- Moretti, E. (2012). *The New Geography of Jobs*. New York: Houghton Mifflin Harcourt.
- Nielsen, P. B., & Sturgeon, T. J. (2014). *Using Business Functions to Measure International Trade and Economic Globalization*. International Conference on Trade and Economic Globalization, Aguascalientes, Mexico.

- Pisano, G. P., & Shih, W. C. (2012). *Producing Prosperity. Why America Needs a Manufacturing Renaissance*. Boston: Harvard Business School Press.
- Pisano, G. P., & Shih, W. C. (2009). Restoring American Competitiveness. *Harvard Business Review*, 87, 7-8: 114-125.
- Sader F. (1995). *Privatizing public enterprises and foreign direct investment in developing countries, 1988-93*, World Bank, Washington.
- Schmitz, J.A. (2005). What Determines Productivity? Lessons from the Dramatic Recovery of the U.S. and Canadian Iron Ore Industries Following Their Early 1980s Crisis. *Journal of Political Economy*, 113(3): 582-625.
- Unctad (2014). *World Investment Report 2014*, UNCTAD, New York and Geneva.
- Unctad (1994). *World Investment Report 1994*. UNCTAD, New York and Geneva.