Direct and indirect effects of outward foreign direct investments on employment and skill composition in Italian regions

(Very preliminary version, please do not quote)

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Abstract

The present paper provides further insights on the impact of foreign direct investment (FDI) on the home country employment composition. (Lipsey, 2002; Barba Navaretti and Venables, 2004; Molnar et al., 2007). The unit of analysis is the “regional industry” (Mariotti et al., 2003), i.e. each ensemble of firms operating in the same industrial sector and localised in the same region, in order to capture both direct effects on the parent company and indirect effects on its local environment. Specifically, the analysis refers to the Italian case along the period 1996-2002. The econometric analysis, which makes use of a SUR model, shows that high-skilled labour demand is not significantly affected by outward FDI, regardless the country of destination. On the other hand, low-skilled labour demand is negatively affected by FDI undertaken both in Central Eastern European countries and OECD countries.

Key words: Foreign direct investment, Employment, Skill-composition

JEL classifications:F2, J21
1. Introduction

The paper contributes to the debate concerning the relationship between internationalisation and employment, a debate according to which outward foreign direct investments (FDI) towards low-wage countries are responsible for the constrained employment upturn and the domestic skill upgrading. Specifically, outward FDI can have both direct effects on the company that undertakes the investments, and indirect ones, i.e. those on its relevant environment. As far as the former is concerned, international production may involve an increase in competitiveness of the firm investing abroad in terms of productivity, output and trade, labour intensity and skills, managerial capabilities, technology, etc. This holds intuitively when firms that relocate abroad are likely to move their relatively inefficient production phases to another country where costs are lower, thus becoming more efficient and expanding production and employment along in other stages for which they have a comparative advantage (Markusen et al., 1996; Agarwal, 1997; Carr et al., 1998). Therefore, when the firm undertakes a so-called vertical investment, the labour intensive activities are transferred towards low-wage countries while the focus of skill-intensive activities remains in the home country, thus giving rise to the phenomenon known as skill upgrading. However, even horizontal or market seeking investment may induce skill upgrading in the parent company. Indeed, the horizontal expansion into large international markets requires not only more supervision, coordination and control over the geographically-dispersed activities, but also the extension of activities and functions that are generally centralised at the headquarters level (i.e. R&D, marketing, logistics, etc.). As a consequence, the parent company’s requirements for highly skilled workers and white collar employees increase (Blömstrom et al., 1997; Fors and Kokko, 1999; Mariotti et al., 2003; Castellani et al., 2006; Driffield and Chiang, 2007). In contrast, direct effects may be negative when internationalisation induces: (i) a reduction of domestic low-skilled labour force; (ii) a loss of market shares by local suppliers, and loss of the opportunity to learn and grow through the relationship with the parent company; and (iii) the write-off of previous subcontracting relations.

As far as the indirect effects are concerned, the idea is that the internationalisation of a single firm is likely to impact also on the local context the firm belongs to (Mariotti et al., 2003; Savona and Schiattarella, 2004; Federico and Minerva, 2005; Mariotti and Piscitello, 2007). This impact may be translated into a reorganisation of the supply chain and, again, it can be both positive and negative. On the one hand, the transfer of production abroad may have a positive effect when the parent company’s suppliers become suppliers of the foreign
affiliates. In such a case, the market for suppliers could even expand, at least as long as the costs for logistics and reorganisation do not overwhelm the marginal advantage. Specifically, the vertical investment may induce an upgrade in the local system and in the supply chain competitiveness by promoting a differentiation in specialisation and competencies between countries, with the consequent development of a quality service sector linked to it (Savona and Schiattarella, 2000; Mariotti and Piscitello, 2007). On the other hand, the horizontal investment’s effects (for instance, in terms of greater requirements for highly skilled workers and white collar employees) could extend to the whole economic area in which the parent company operates, because of the externalities generated by the induced demand for specialised inputs and high-skilled labour.

The empirical literature on the impact of international production has so far mainly focused on the direct effects, while studies on indirect effects are still rather scanty. The present paper provides further insights on both direct and indirect effects of outward FDI on home country employment composition. Therefore, following Mariotti et al. (2003), the unit of analysis is the regional industry, i.e. the ensemble of firms operating in the same filiere and localised in the same region. Specifically, the analysis refers to the Italian case along the period 1996-2002. The econometric analysis, which makes use of a SUR model, shows that high-skilled labour demand is not affected by outward FDI, regardless the country of investment. On the other hand, low-skilled labour demand is negatively affected by FDI undertaken both in Central Eastern European countries and OECD countries.

The remaining of the paper is organised as follows. The next section provides a review on the direct and indirect effects of outward FDI on domestic employment and skill composition, and it puts forward the research issues to be empirically tested. Section three describes the model and the methodology employed. Section four illustrates the data together with some descriptive statistics. Results are presented and discussed in Section five, which also concludes the paper.

2. The effects of outward investments on domestic employment

The studies investigating the direct effects of outward FDI on the internationalising firm mainly refer to the impact on (i) productivity, (ii) output and trade, (iii) overall domestic employment, (iv) labour intensity and skills, (v) managerial capabilities and (vi) technology (for an overview see Lipsey, 2002; Barba Navaretti and Venables, 2004; Molnar et al., 2007). They generally find that firms investing abroad are the best performer in terms of productivity, that foreign output does not substitute for the home output of MNEs, and that
there are price complementarities between employment in foreign affiliates in low-wage countries and home employment (see among the others, Driffield et al. 2006; Castellani et al., 2007).

Empirical evidence on the overall domestic employment generally finds substitutability between foreign and domestic jobs when the foreign affiliates are located in advanced countries (horizontal FDI – HFDI). Indeed, in this case foreign production of the parent firm tends to substitute, at least partially, its export flows towards the same foreign markets. However, such a relationship between domestic and foreign employment is not so well defined when the investments are directed towards low-wages countries, as investigated by Brainard and Riker (1997) on the US multinationals in 1983-1992; Braconier and Ekholm (2000) on the Swedish MNEs in 1970-1994, and Konings and Murphy (2001) on a sample of about 1,200 European MNEs in 1994-1998. In particular, the latter finds evidence of a greater substitution effect when foreign subsidiaries are located within the EU, rather than in Central and Eastern European countries. Besides, an average decline of 10 percent in the wage costs in foreign subsidiaries is associated with a decline in employment at home of 1.5 to 2 percent on average. Results of the analysis carried out by Bruno and Falzoni (2003), which use industry level data on US MNEs for the period 1982-1994 and estimate short and long run cross wage elasticities conditional on home output, are consistent with those. However, they find that home and foreign labour are always substitutes when US subsidiaries are based in North America and Europe, where FDI are mainly horizontal.

Barba Navaretti and Castellani (2004), who address this issue for Italy, and Becker and Muendler (2006), who analyse the German case, confirm that foreign employment substitutes domestic employment. However, the decline in domestic employment is not larger, and sometimes, even smaller than what it would have been if these firms had not invested abroad. Thus, foreign investments, even when directed towards developing countries and/or even of labour-saving type are paradoxically a good strategy to preserve employment at home. Similarly, Castellani et al. (2006) in their study on the direct effects of outward FDI on domestic employment of a sample of Italian MNEs in 1998-2004 find that outward FDI do not induce a significant employment reduction at the parent company level in Italy. By contrast, the analysis of firms’ performance before and after the investment shows a slight increase in employment, but only when the investments aim to reach large and developed markets (market-seeking investments). Besides, the reduction in the number of employees associated to vertical and cost-saving investments is anyhow smaller than what has occurred
to the firms that did not internationalise. This is consistent with the idea that investing abroad is a ‘defensive’ strategy that allows reducing costs and maintaining firm’s competitiveness.

As far as the effects of outward FDI on domestic labour intensity, the empirical results are mixed. While US firms tend to use less labour per unit of output at home if they produce more abroad, the opposite holds for Swedish firms (Blöstrom et al., 1997). Likewise, the variation in employment in the foreign affiliates by of Italian manufacturing firms has significantly influenced the labour intensity of domestic production, in the period 1985-95 (Mariotti et al., 2003). Besides, changes in the labour intensity depend on the FDI destination country: larger employment in affiliates located in developing countries is associated with lower labour intensity at home, which is consistently with the re-allocation of labour-intensive activities; the opposite is instead observed, however, for affiliates located in advanced economies. Debaere e Lee (2004) in their work on Korea find a negative impact of outwards FDI towards low-wage countries undertaken by domestic MNEs and their labour intensity.

However, outward FDI does also impact on the domestic skill composition (high-skilled vs. low-skilled labour). The analysis by Head and Ries (2002) on the Japanese MNEs in the period 1956-1990 shows a positive and significant effect on the parent company’s skill intensity that is higher when foreign affiliates are located in low-income countries. Likewise, Hansson (2004) finds that the relocation of activities by Swedish MNEs to non-OECD regions, in particular in Central and Eastern European countries in 1990-1997, has contributed to the skill upgrading of their home activities. Sasaki and Sakura (2004) find that overseas production shifted labour demand towards high-skilled workers, and also Ito and Fukao (2005) report that overseas activities contribute to skill upgrading at home and increase the demand for skilled workers. Castellani et al. (2006) in the study mentioned earlier find a positive and significant impact only when foreign initiatives are undertaken in Central Eastern European countries (CEEC), supporting the hypothesis that the transfer of labour intensive production activities, which requires lower-skilled employees, leads to an increase in higher-skilled workers at the parent company level, where other production phases and coordination and control phases are concentrated.

Driffie et al. (2006) investigate the effects of outward FDI on the employment composition in the UK and find that foreign investments reduce demand for low-skilled labour and to some extent also for high-skilled labour. Outward investment increases labour demand for high-skilled labour only when the UK sector has a technology advantage, but this
form of investment typically accounts for less than 10% of total UK outward FDI. Finally, Becker and Muendler (2006) find that foreign expansion increases high-skilled workers retention in Germany.

In addiction, empirical studies generally find substitutability between foreign and domestic jobs when the foreign affiliates are located in advanced countries (HFDI). In this case, indeed, the foreign production of the parent firm tends to substitute, at least partially, its export flows towards the same foreign markets (among the others, Blomstrom et al., 1997; Markusen et al., 1996). Such a relationship between domestic and foreign employment is, nevertheless, not so well defined when the investments are directed towards low-wages countries (VFDI). Besides, while FDI in CEE are mainly vertical investments, those undertaken in developing countries (DEV), due to their heterogeneity, might be both horizontal and vertical FDI (i.e. Latin America versus Ukraine).

Nevertheless, the evidence significantly differs with the unit level of analysis because this implies a study of different effects: only direct effects when the investigation is run at firm-level; indirect effects also when it is undertaken at the industry or geographical level. Slaughter (2000) points out that foreign production has no effects on skill intensity at home within industries, while Falzoni and Grasseni (2003) show that the expansion of international production by Italian multinationals has a positive impact on average relative wages at home that does not depend on the location of foreign affiliates. Head and Ries (2002), when running the analysis at industry level, do not find a significant effect of the foreign production on the qualitative composition of the domestic labour force.

In order to better capture indirect effects, Mariotti et al. (2003) take into account also the geographical dimension and consider the “regional industry”, which is defined as the ensemble of firms operating in the same industrial macro-sector – constituted of interdependent sectors belonging to the same filière – and localised in the same geographical region. The authors found that the variation in employment in foreign affiliates of Italian manufacturing firms significantly influenced the labour intensity of domestic production. In each regional industry, in particular, the impact is negative in case of vertical investments undertaken in less developed countries and positive for horizontal and market-seeking investments in advanced countries. Likewise, Federico and Minerva (2005) run the analysis at the Italian industrial NUTS 3 level confirming a positive and statistically significant effect on the local employment, especially when FDI is concentrated in the advanced countries (while the opposite is true when FDI targeted Eastern Europe).
Additionally, outward FDI in manufacturing may also induce a sectoral recomposition within the local system. Savona and Schiattarella (2004), for example, investigating the impact of outward manufacturing FDI on the local service sector businesses, find that the more internationally involved a NUTS 3 province, the higher the employment growth in the service sector, especially for the most traditional branches like trade, transport and financial services. Conversely, a negative relationship emerges in the case of business services and, in particular, for the science-based ones (engineering, R&D, software industry). Such a negative impact might be explained by the relocation of such activities. Similar results are found by Mariotti and Piscitello (2007), who analysed the impact of outward FDI by the Italian industrial districts located in Veneto region.

3. The model and the methodology

The dynamics of high and low skilled employment is analyzed in the literature mainly through the use of the cost function, where only the high-skilled and low-skilled labor are assumed to be factors of production, while the capital (K) and technology are considered to be quasi-fixed factors. This approach, which has been developed by Bartel and Lichtenberg (1987), Berman et al. (1994) and Machin and Van Reenen (1998), starts from the cost function minimization and leads to a trans-log functional form of the cost function where the partial derivative with respect to a factor price equals the demand for that factor. Hence, following Piva et al. (2003, 2005), our equations are the following:

\[
\begin{align*}
\log H_{i,r} &= \alpha_{i,r} + \beta_1 \log w_{iH,r} + \beta_2 \log Y_{i,r} + \beta_3 \log K_{i,r} + \beta_4 \log FDI_{i,r} + \epsilon_{i,r} \\
\log L_{i,r} &= \alpha_{i,r} + \beta_1 \log w_{iL,r} + \beta_2 \log Y_{i,r} + \beta_3 K_{i,r} + \beta_5 \log FDI_{i,r} + \epsilon_{i,r}
\end{align*}
\]

where \( i \) identifies the 10 macro-sectors and \( r \) the 20 NUTS 2 regions (Table 1).

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2 By taking the partial derivative of the trans-log cost function with respect to the wage of high (\( w_H \)) and low skilled workers (\( w_L \)), it is possible to obtain a system of two equations where the labor demand for high (H) and low (L) skilled workers are function of output (\( Y \)), capital (\( K \)), technology change, FDI and the respective wages.
3 Technology, which has been proxied by the number of patents for each couple of region-industry, has been dropped by the model since it was highly correlated with FDI.
Since the aim of this work is to see whether and how FDI impact on the variation of high and low skilled workers, a specification in differences (\( \Delta \)) has been taken into account. Specifically, we test whether the total amount of FDI, cumulated during the period 1994-2000, has changed the demand for high and low skilled workers in 2002 with respect to the starting year 1996\(^4\). In other words, the system of employment equations (1) at time \( t \) (2002) has been compared to the same system of employment equations at time \( t-n \) (1996), by taking the differences between the levels of high (low) skilled employment in 2002 and the level of high (low) skilled workers in 1996. These differences have been then regressed on the differences between the explanatory variables at time \( t \) and \( t-n \), and on the cumulated sum of FDI in the period 1994-2000. The final specifications that have been used to investigate whether and how FDI impact on the labor demands for high and low skilled workers between 2002 and 1996 are the following:

\[
\begin{align*}
\Delta_{96}^{02} \log H_{i,r} &= \alpha_{i,r} + \beta_1 \Delta_{96}^{02} \log w_{i,r} + \beta_2 \Delta_{96}^{02} \log Y_{i,r} + \beta_3 \Delta_{96}^{02} \log K_{i,r} + \beta_5 \log \sum_{r=94}^{00} FDI_{t,i,r} + \epsilon_{i,r} \\
\Delta_{96}^{02} \log L_{i,r} &= \alpha_{i,r} + \bar{\beta}_1 \Delta_{96}^{02} \log w_{i,r} + \bar{\beta}_2 \Delta_{96}^{02} \log Y_{i,r} + \bar{\beta}_3 \Delta_{96}^{02} \log K_{i,r} + \bar{\beta}_5 \log \sum_{r=94}^{00} FDI_{t,i,r} + \bar{\epsilon}_{i,r}
\end{align*}
\]

The proxy for FDI has been then disaggregated into three different variables according to the country of destination, namely: OECD (OECD countries), CEE (Central Eastern

\(^4\) It is worth noting that FDI have been lagged two years because we expect the effect on employment will manifest after a certain time lag. A sensitivity analysis will be run to check whether this lag is the most appropriate.
European countries) and DEV (Developing countries). This allows taking into account the different impact of FDI on employment change according to the investments’ typology\(^5\). The final specification becomes therefore:

\[
\begin{align*}
\Delta^{\text{HFDI}}_{t} \log H_{i,r} &= \alpha_r + \beta_1 \Delta^{\text{HFDI}}_{t} \log w_{i,r} + \beta_2 \Delta^{\text{HFDI}}_{t} \log Y_{i,r} + \beta_3 \Delta^{\text{VFDI}}_{t} \log K_{i,r} + \beta_4 \log \sum_{i=1}^{60} \text{OECD}_{i,r} + \beta_5 \log \sum_{i=1}^{30} \text{CEE}_{i,r} + \beta_6 \log \sum_{i=1}^{30} \text{DEV}_{i,r} + \varepsilon_{i,r} \\
\Delta^{\text{VFDI}}_{t} \log L_{i,r} &= \alpha_r + \beta_1 \Delta^{\text{HFDI}}_{t} \log w_{i,r} + \beta_2 \Delta^{\text{HFDI}}_{t} \log Y_{i,r} + \beta_3 \Delta^{\text{VFDI}}_{t} \log K_{i,r} + \beta_4 \log \sum_{i=1}^{60} \text{OECD}_{i,r} + \beta_5 \log \sum_{i=1}^{30} \text{CEE}_{i,r} + \beta_6 \log \sum_{i=1}^{30} \text{DEV}_{i,r} + \varepsilon_{i,r}
\end{align*}
\]

The econometric technique used to estimate these equations is the SUR model, which is based on the assumption that the right-hand part of the equations is independent of the error terms and that the errors of the two equations are crossed: if this is the case, the method guarantees a greater efficiency compared with an OLS estimation of the single equations (Zellner, 1962). In the present case the two equations must be correlated through the error terms because, as Piva et al. (2005) claim, high- and low-skilled workers are two different components of the same factor (the labor).

4. Data and descriptive statistics

The distinction between high and low skilled workers follows the classical dichotomy between blue and white collars\(^6\). Data come from the Italian National Institute for Social Security (INPS) concerning manual workers, clerks and managers. The first type of workers represents the blue collar category, while the second and the third ones constitute the white collars category. Data refers to the number of workers in the 20 Italian NUTS 2 regions in the years 2002 (year \(t\)) and 1996 (year \(t-n\)). The workers are distributed in each region among 10 macro-sectors, 9 of which are manufacturing sectors and the remaining ones relates to services\(^7\).

Wage data come from the same INPS database and have been provided for each pair of industry-NUTS 2 for the years 1996 and 2002. The salary of high skilled workers has been computed as mean between the wages of clerks and of managers.

The proxy used for capital are the gross fixed investments (for each couple of industry-NUTS 2 region) at current prices for the years 2002 and 1996, and come from the

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\(^5\) Throughout the paper we will follow the convention largely used in literature that considers investments towards advanced countries as mainly horizontal investments (HFDI), and investments towards less developed countries as vertical investments (VFDI).

\(^6\) Another way to distinguish between high and low skilled workers is to look at the education of workers (see Hansson, 2001).

\(^7\) The authors wish to thank Antonietta Mundo from INPS for providing the employment and wage data.
Eurostat database. The added value, which comes from the Italian Statistical Institute (ISTAT), is also expressed at current prices for the years 2002 and 1996. Since it was not possible to obtain punctual data for each NUTS 2 region, the added value of every single industry has been distributed among the 20 regions, proportionally to the number of plants operating in that specific industry in each NUTS 2 region.

Outward FDI are measured as the number of employees in foreign affiliates of Italian multinational firms. These data come from the Reprint database\(^8\), which provides a census of inward and outward FDI since 1986, and it is updated every year\(^9\). Data on FDI have been then divided into three categories according to the country of destination of the investments (OECD countries, CEE countries, and Developing countries)\(^{10}\).

Table 2 presents some descriptive statistics concerning the variables that have been employed to account for the variation of labor demand. As it can be noticed, the medium growth rate of high and low skilled workers (given by the DeltaLog) is negative, thus revealing that during the period considered the employment has decreased. Conversely, the capital, the added value and the high and low skilled wages have grown between 1996 and 2002, even if the variance of salary is much lower than the variance of capital and added value: this might be due to the fact that the wage are much more similar among the geographic units and industries with respects to capital and added value, hence some fixed effects might be present in some particular couple of region-industry, which need to be controlled. This explain why a dummy for regions and for industries have been introduced in two different regression. Finally, the table shows that between 1994 and 2000 the outward investments stemming from Italian regions have increased towards all the destinations, even if with a high heterogeneity among the industrial regions as it is shown by the high variance. Given that employment has decreased during the same period, the econometric analysis is required in order to define whether there is any correlation between the two phenomena.

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\(^8\) The database is developed by the Department of Economics, Management and Industrial Engineering of the Politecnico di Milano and it is sponsored by ICE (National Institute for Foreign Trade) since the beginning of 2001. The authors wish to thank Marco Mutinelli for providing the data of Reprint database.

\(^9\) It is worth observing that, given a certain Multinational Enterprise (MNE), the workers of its foreign affiliates have been distributed among all those NUTS 2 where that MNE is present with its plants. The share of foreign-affiliate’s workers that has been attributed to each NUTS 2 where the MNE is present with a plant is proportional to the number of employees working in those plants. This method makes it possible to look at the impact of outward FDI not only on the employment of the region where the firm resides, but also in the employment of all the regions where the firm is present with plants. The data have been then aggregated for each NUTS 2 at industry level.

\(^{10}\) Countries belonging to the categories developing countries are those from Asia, Latin America and Africa. The CEE countries are the Eastern Europe Countries including Russia.
Table 2: Descriptive statistics of the variables employed in the model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆ Log H</td>
<td>192</td>
<td>-0.0430</td>
<td>0.2118</td>
<td>-0.8414</td>
<td>0.5716</td>
</tr>
<tr>
<td>∆ Log L</td>
<td>192</td>
<td>-0.0020</td>
<td>0.2012</td>
<td>-0.5535</td>
<td>0.4819</td>
</tr>
<tr>
<td>∆ Log K</td>
<td>192</td>
<td>0.3761</td>
<td>1.7875</td>
<td>-6.7089</td>
<td>7.1118</td>
</tr>
<tr>
<td>∆ Log Y</td>
<td>192</td>
<td>0.7701</td>
<td>1.9384</td>
<td>-0.6888</td>
<td>9.4031</td>
</tr>
<tr>
<td>∆ Log WH</td>
<td>185</td>
<td>0.1570</td>
<td>0.0805</td>
<td>-0.1216</td>
<td>0.3796</td>
</tr>
<tr>
<td>∆ Log WL</td>
<td>185</td>
<td>0.2359</td>
<td>0.0815</td>
<td>-0.0579</td>
<td>0.5928</td>
</tr>
<tr>
<td>Log Σ CEE</td>
<td>192</td>
<td>3.4165</td>
<td>2.6038</td>
<td>0.0000</td>
<td>9.6451</td>
</tr>
<tr>
<td>Log Σ OECD</td>
<td>192</td>
<td>3.8541</td>
<td>2.8753</td>
<td>0.0000</td>
<td>10.3608</td>
</tr>
<tr>
<td>Log Σ DEV</td>
<td>192</td>
<td>3.5726</td>
<td>2.7272</td>
<td>0.0000</td>
<td>8.9703</td>
</tr>
</tbody>
</table>

5. Results and conclusions

Tables 3, 4, 5 report the results of the estimation for the high and low-skilled workers according to the country of destination of outward FDI. Indeed, since there is a high correlation between the different types of FDI (OECD, CEE and DEV), the three types of investments have been introduced separately.

The R-square and the P-value of all the regressions confirm the significance of our model, even if the R-square is quite low in the models without dummies. The Breusch-Pagan test for the independence of errors, which have not been reported in the tables, rejects the hypothesis that the errors of the two equations are independent for all the specifications, hence, it confirms that the two equations are highly correlated and that the SUR analysis is appropriate for our specification.

Among the explanatory variables, the only one that turns out to be significant when dummies are introduced is the capital, with a positive sign. Wage does not seem to be important to explain the labor demand, probably because of the low increase of the relative wage of high over low skilled workers during the period considered, has it has been shown by Acemoglu (2002a) and Skaksen and Sorensen (2002). Strangely enough the output is not significant to explain the variation of labor demand: however, this might be due to the poor proxy that has been used (since the added value has been distributed among the NUTS 2 according to the number of firms operating in each couple of industry-region).
The most interesting results are associated to the FDI’s destination areas (OECD; CEE; DEV). Specifically, high-skilled labor demand is not affected by outward FDI, regardless of their foreign location. On the other hand, outward investments undertaken in CEE and OECD are negatively and significantly correlated with the demand for low-skilled workers. The decrease in the demand for low-skilled workers when FDI are undertaken in CEE is consistent with the idea that investments in low wage countries are of a cost-saving type, thus implying the transfer of labor-intensive activities from the home to the host countries and, hence, a decrease of demand for domestic low-skilled workers.

Hence, no empirical evidence has been found on skill-upgrading, irrespectively by the destination area. This result is not in line with the findings of a recent study presented by Castellani et al. (2006) who showed that outward FDI undertaken in CEE induced a skill upgrading in the 108 Italian multinational firms which invested abroad in 1998-2003. The possible explanation of such a contrasting result may be found in the different level of analysis: the multinational firm in the work by Castellani et al. (2006) and the industry-NUTS 2 region in the present paper. Similarly, Head and Ries (2002) found an opposite result when, in their study on the Japanese MNE, moved from the firm to the industrial level.

Finally, several sectors and NUTS 2 dummies turned out to be significant, which means that there are some fixed effects associated with industries and geographical units that affected the labor demand variations. Specifically, an increase in the skilled labour demand in the service sectors is experienced, in accordance with the service industry of the economy.

Further research might focus on the impact of outward FDI in each NUTS 2 region on the labour demand of the other nearby regions: indeed, it is likely that the FDI of an area will affect the employment of other areas (i.e. through the backward and forward linkages), and these effects can be measured through spatial econometrics.
**Table 3 - Results of the SUR analysis for outward FDI in OECD countries**

<table>
<thead>
<tr>
<th></th>
<th>High Skilled Labor</th>
<th>Low Skilled Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta Log W</td>
<td>0.2678</td>
<td>0.1999</td>
</tr>
<tr>
<td>Delta Log K</td>
<td>0.0290 ***</td>
<td>0.0190</td>
</tr>
<tr>
<td>Delta log Y</td>
<td>-0.0107</td>
<td>-0.0019</td>
</tr>
<tr>
<td>Log OECD</td>
<td>-0.0022</td>
<td>-0.0079</td>
</tr>
<tr>
<td>Dummy Industry</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Dummy Regions</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>cons.</td>
<td>-0.0993 **</td>
<td>-0.1375 *</td>
</tr>
<tr>
<td>n. of obs.</td>
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<td>185</td>
</tr>
<tr>
<td>Chi-2</td>
<td>11.09</td>
<td>49.48</td>
</tr>
<tr>
<td>P-value</td>
<td>0.0256</td>
<td>0.2079</td>
</tr>
<tr>
<td>R-2</td>
<td>0.0511</td>
<td>0.0000</td>
</tr>
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</table>

Notes: ***Significant at 1%, **Significant at 5%, *Significant at 10%
Table 4 - Results of the SUR analysis for outward FDI in CEE countries

<table>
<thead>
<tr>
<th></th>
<th>High Skilled Labor</th>
<th>Low Skilled Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta Log W</td>
<td>0.2393</td>
<td>0.1974</td>
</tr>
<tr>
<td>Delta Log K</td>
<td>0.0308 ***</td>
<td>0.0197</td>
</tr>
<tr>
<td>Delta log Y</td>
<td>-0.0117</td>
<td>-0.0030</td>
</tr>
<tr>
<td>Log CEE</td>
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<td>-0.0060</td>
</tr>
<tr>
<td>Dummy Industry</td>
<td>no</td>
<td>yes</td>
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<tr>
<td>Dummy Regions</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>cons.</td>
<td>-0.1072</td>
<td>-0.2519 ***</td>
</tr>
<tr>
<td>n. of obs.</td>
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<td>185</td>
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<tr>
<td>Chi-2</td>
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<td>48.06</td>
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<tr>
<td>P-value</td>
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<tr>
<td>R-2</td>
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<td>0.2034</td>
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Notes: ***Significant at 1%, **Significant at 5%, *Significant at 10%
Table 5 - Results of the SUR analysis for outward FDI in Developing countries

<table>
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<th>High Skilled Labor</th>
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<td>Delta Log W</td>
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<td>Delta Log K</td>
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<td>0.0217</td>
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<tr>
<td>Delta log Y</td>
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<tr>
<td>Log DEV</td>
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<tr>
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<tr>
<td>Dummy Regions</td>
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<td>no</td>
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<tr>
<td>cons.</td>
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<td>-0.1594 **</td>
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<tr>
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<td>185</td>
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<tr>
<td>Chi-2</td>
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<tr>
<td>P-value</td>
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<tr>
<td>R-2</td>
<td>0.0516</td>
<td>0.1995</td>
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</tbody>
</table>

Notes: ***Significant at 1%, **Significant at 5%, *Significant at 10%
References


