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Outward investments and skill upgrading.
Evidence from Italian manufacturing firms.

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Abstract

The present paper investigates the effect of outward investments by Italian manufacturing firms on the domestic employment level and on its skill composition, as measured by the increase in the aggregate share of skilled workers (managers and clerks) in total employment. In doing so, the paper extends the existing empirical literature on the Italian case that has so far provided evidence on the changes in the employment intensity but not on the composition of the domestic employment. We carry out an analysis at the firm level based on the the behaviour of 108 Italian firms, which became multinational for the first time in 1998-2003, investing in either developed countries, CEECs or other developing economies, compared with the behaviour of a counterfactual group of firms constituted by 2,500 national firms that never invested abroad in the considered period. The econometric analysis supports that the internationalisation of activities by manufacturing firms does not reduce their domestic employment, independently of the destination of the investment, and that it may change the division of labour within the firm, thus leading to a higher share of skilled labour intensive activities, especially as a result of investments in CEECs.

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1   Introduction

The increasing extent of the internationalization of firms is associated to the employment reduction in advanced countries (mainly in the manufacturing sector) and to the reduction in low skilled workers' real wages, both in absolute terms and in relative terms as concerns high skilled workers. Within the least thirty years, the United States have, indeed, registered a loss of about 2,5 millions of labour force in the manufacturing sector (the share on the total has decreased from 26.4% to 14.7%); the United Kingdom has lost about 3,5 millions of workers in 1970-1998 (with a share of the employees in the manufacturing sector which dropped from 34.7% to 18.6%), and similar trends have also been registered in the other advanced countries (Legrain, 2002; Wolf, 2004). At the same time, since the beginning of the Eighties, a consistent acceleration in the growth rate's demand for skilled workers is observed (Katz and Murphy, 1992; Autor, Kats and Krueger, 1998).

The economics literature associates such phenomena with the following three events: (i) information and communication technologies, which are capital intensive and skill intensive (Bound and Johnson, 1992); (ii) changes and pressures induced by globalisation (Wood, 1994; Borjas and Rames, 1995); (iii) "revolution" due to the international fragmentation and reorganization of production (Wood, 1994) and to outsourcing (see among the others, Feenstra and Hanson, 2001). Nevertheless, while several empirical investigations have underlined the importance of the role of technological change and capital deepening on the increase of the high skilled workers' demand (for an overview, see Piva, Santarelli and Vivarelli, 2003), the empirical evidence on the impact of globalisation and international division of labour induced by multinational enterprises (MNE) on the change of both overall employment and wages of the firms and the countries involved (Piva and Vivarelli, 2004) is far from being conclusive.

Within this context, the present paper aims to investigate the influence of outward investment by Italian manufacturing firms on the domestic employment level and on its skill composition. In particular, as far as the latter is concerned, skill upgrading is measured by the increase in the aggregate share of skilled workers (managers and clerks) on total employment.

This issue has attracted the most interest in the scientific as well as in the public debate also in Italy especially for its social and economic consequences on domestic production and, hence, employment. Nonetheless, empirical studies have generally found that firms investing abroad are the best performers in terms of productivity and innovation, and that foreign output does not entirely substitute domestic output, although outward FDI

might actually induce some changes in both the labour intensity and in the employment composition (skill upgrading) of the parent company. However, those effects crucially depend on the type and on the underlying motivations of the investment itself (for recent exhaustive surveys, see Lipsey, 2002; Barba Navaretti and Venables, 2004), but the results change on the basis of the unit of analysis, countries and time periods, which are investigated, and, therefore of the adopted methodologies (Slaughter, 2000; Head and Ries, 2002, Girma and Görg, 2003; Hansson, 2004).

It is commonly accepted that a *skill upgrading* is induced by vertical FDI, which is adopted when a firm relocates labour-intensive stages of production in low-wage countries, while the skill-intensive activities remain focused in the home country, thus increasing the share of skilled workers on the total employment of the parent firm (Markusen *et al.*, 1996; Argawal, 1997; Carr *et al.*, 1998; Braconier and Ekholm, 2000; Hanson, 2001).

However, as the empirical evidence has underlined, horizontal (or market-seeking) investments may also induce skill upgrading in the parent company. Indeed, if this is the case, the expansion into large international markets is likely to require more supervision, coordination and control over the activities geographically dispersed, as well as the extension of those activities and functions that are generally centralised at the central headquarters level (i.e. R&D, marketing, logistics, etc.) (Blömstrom *et al.*, 1997; Fors and Kokko, 1999; Mariotti *et al.*, 2003). The parent company's requirements for highly skilled workers (white collars and managers) then increase as a consequence of this type of investment.

Nonetheless, the empirical evidence, so far provided, on the effects of outward FDI on the domestic employment in Italy, as well as on the skill upgrading, is far from being conclusive but agrees on a positive net effect concerning the average level of qualification of the MNE's employment. In particular, the studies carried out at firm level (Barba Navaretti and Castellani, 2004), "regional industry" level (Mariotti *et al.*, 2003), and "province-industry" level (Federico and Minerva, 2005) present similar results on the decreased domestic labour intensity originating from the foreign affiliates. Besides, the studies focussing on the impact of outward FDI on the average level of qualification of domestic employment, which are carried out at "industry" level (Falzoni and Grasseni, 2003) or at industrial district level (Mariotti and Piscitello, 2006) provide some evidence on the skill upgrading.

The present paper extends the existing empirical literature on the Italian case and it mainly refers to the study by Barba Navaretti and Castellani (2004). The analysis has been carried out at the firm level, which allows us to investigate the direct effects of outward FDI on the company's overall

employment and skill composition dynamics. In particular, the behaviour of 108 Italian firms which became multinationals for the first time in the period 1998-2003 is compared with that of a random sample constituted by 2,500 national firms that never invested abroad in the same period.

The empirical analysis consists of two steps: (1) a descriptive representation of the patterns of employment and skill composition dynamics of firms that became MNEs versus those remained national; (2) an econometric model, which allows to take into account the endogeneity of the choice to invest abroad (by specifying a dynamic equation for the trajectory of total employment and of the share of white collars), estimated using the System GMM estimator, proposed by Blundell and Bond (1998).

The remaining of the paper is organised as follows. The next Section provides a brief review on the effects of outward FDI on domestic employment and skill upgrading, and it puts forward the research issues to be empirically tested. Section three describes the data employed and the sample of firms considered in the analysis. Results are presented and discussed in Section four, while Section five concludes the paper.

2 The effects of outward FDI on the domestic employment. The state of the art and the research issues

The studies focusing on the impact of outward FDI on the domestic employment can be grouped into three main categories, which investigate the following issues:

1. the nature of substitution or complementarity of the employment in the foreign affiliates in relation to the domestic employment of the parent company (Brainard and Riker, 1997; Braconier and Ekholm, 2000; Konings and Murphy, 2001; Bruno and Falzoni, 2003).

2. The change in the labour intensity of the activities carried out in the home country. (Blömstrom *et al.*, 1997; Fors and Kokko, 1999; Lipsey, 1999; Mariotti *et al.*, 2003; Federico and Minerva, 2005).

3. The change of the division of labour within the multinational firm, which leads to a concentration of skilled labour intensive activities at home (skill-upgrading) (Kravis and Lipsey, 1998; Slaughter, 2000; Head

and Ries, 2002; Falzoni and Grasseni, 2003; Hansson, 2004; Mariotti and Piscitello, 2006).

The studies investigating (i), that is the impact of outward FDI on the overall domestic employment, find substitutability between foreign and domestic jobs when the foreign affiliates are located in advanced countries (horizontal FDI). 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. 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, by Braconier and Ekholm (2000), on the Swedish MNE in 1970-1994 and by Konings and Murphy (2001), on a sample of about 1,200 European MNE in 1994-1998. In particular, the authors of the last study find evidence of a higher substitution effect between labour at home and in foreign subsidiaries located within the EU, rather than in affiliates settled in cheap labour 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. The 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 of the other studies. However, the relationship between home employment in US MNEs and employment in their subsidiaries in Latin America gets reversed from the short to the long-run. While in the short-run there is evidence that the two are price substitutes, in the long-run home and foreign labour are complements. Home and foreign labour are instead always substitutes when US subsidiaries are based in North America and Europe, where FDI are mainly horizontal. Finally, Barba Navaretti and Castellani (2004) address this issue for Italy and confirm that foreign employment substitutes domestic employment and even if employment declines in firms that open up new plants, this decline is not larger and sometimes smaller than what it would have been if these firms had not invested abroad. Thus, foreign investments, even towards developing countries and even of labour-saving type are paradoxically a good strategy to preserve home employment.

The studies focusing on (ii), that is the impact of outward FDI on the labour intensity of the activities carried out in the home country (Blömstrom *et al.*, 1997 for Sweden and the USA; Mariotti *et al.*, 2003, for Italy) confirm a negative impact for those investments undertaken in less developed and low-wage countries (vertical investments), while the effects are positive in case of horizontal FDI (which are, therefore, located in advanced countries),

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probably because of the need of more supervision, coordination and control over the activities geographically dispersed, as well as to the extension of the activities and functions (i.e., R&D, marketing) generally centralised at the parent level. This effect is related to the skill upgrading at the parent company level. Nevertheless, also FDI, which is undertaken in less developed countries, and it is therefore more likely to be vertical in nature, implies a transfer of labour-intensive and low-skilled intensive activities abroad.

Within the studies belonging to the category (iii) about the impact of outward FDI on the skill upgrading of the parent company, actually, the analysis by Head and Ries (2002) on the Japanese MNE 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 eastern European countries, in 1990-1997 has contributed to the skill upgrading of their home activities.

Nevertheless, the evidence significantly differs with the unit level of analysis. Head and Ries in the same work published in 2002 carry out an investigation at industry level and, similarly to the results obtained by Slaughter (2000) on US MNE, do not find a significant effect of the foreign production on the qualitative composition of the domestic labour force. By contrast, as far as the Italian case is concerned, Falzoni and Grasseni (2003) show that the expansion of international production by Italian MNEs has a positive impact on the average relative wages at home that, however, does not depend on the location of foreign affiliates.

Within this context, in this paper we address the following three research questions. First, we investigate whether firms that invest abroad actually experience job losses at home. Second, we test to what extent outward investments determine skill upgrading in the domestic activities of the parent company. Third, we disentangle the effects on employment and skill composition according to the type of foreign investment in order to capture different impacts for investments towards advanced countries, which are more likely to be horizontal (or market-access), in central and eastern Europe, which are generally vertical (or resource-seeking), and in other developing countries, which are not univocally fitting in any of the above definitions.

3 Data and description of the sample

The dataset we used to carry out the analysis at the firm level combines three different sources: (i) the Reprint database of the Politecnico di Milano[1], which provides a census of inward and outward FDI since 1986, and it is updated every year, (ii) the Observatory of the balance sheets of the incorporated company (*Osservatorio sui Bilanci delle società di capitale*) of Centro Studi Unioncamere Nazionale, which provides economic data on the Italian firms, and (iii) the Excelsior database of Unioncamere Nazionale[2], which provides data on the Italian firms' employment categories from 1998 to 2004.

Table 1: Description of the sample.

	NAT	INV	Destination of INV's FDI			
			ADV	CEE	DEV	Tot.
No. of firms	2,500	108				
North west	44.8	37.0	42.5	37.5	20.0	100
North east	31.6	42.6	34.8	45.7	19.6	100
Centre	14.2	17.6	15.8	52.6	31.6	100
South and Islands	9.3	2.8	33.3	66.7	0.0	100
Total Italy	100	100	34.3	44.4	21.3	100
Size* – average	190.3	209.7	285.8	182.0	145.0	209.7
Productivity** – average	54,452	59,125	60,959	51,977	71,094	59,125
Share of managers – average	0.02	0.02	0.023	0.021	0.015	0.021
Share of clerks – average	0.28	0.34	0.347	0.327	0.371	0.343
Share of manual workers – average	0.70	0.64	0.630	0.652	0.614	0.636

Legend: ADV: advanced countries (Europe, North America and OECD countries);
DEV: developing countries (Asia, Latin America, Africa);
CEE: Central and Eastern Europe. * Number of employees; ** value-added per employees.

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[1]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.

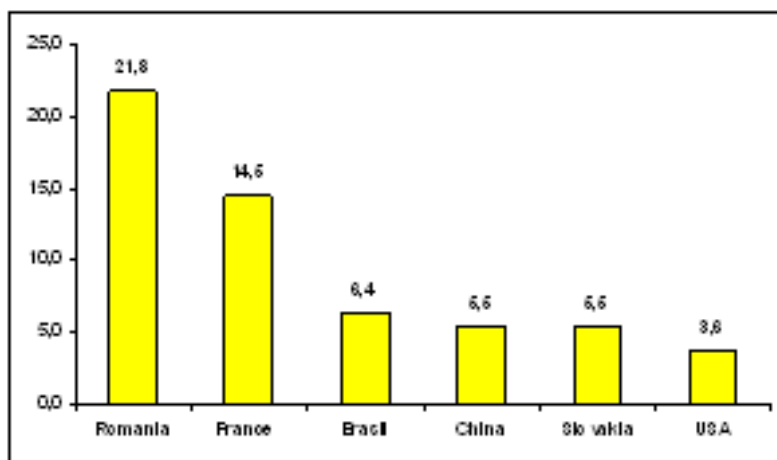[2]Unioncamere Nazionale is the Union of the Italian Chambers of Commerce.

Figure 1: First six countries of destination of Italian FDI (%)

The panel used concerns firms with more than 20 employees with observations between 1998 and 2004 and it includes two types of firms: INV, which set up their first foreign subsidiary in the period observed, and NAT, which do not have foreign subsidiaries at the beginning of the period and never invested abroad throughout the period observed. As far as the NAT sample is concerned, we draw a random sample of 2,500 national firms.

We consider 108 firms, which undertook only one investment abroad in the period of analysis, mainly in 1998-2001, in order to detect the effects of such an initiative on the parent company's employment. If we look at the geographical distribution of the sample firms (Table 1), we can see that they are mainly located in the north of Italy (almost 80%), while FDI are mostly concentrated in Central and Eatern Europe (44.4%) and in advanced countries (34.3%). Among the receiving countries, Figure 1 shows that Romania and France register the greater share of Italian FDI in the period considered (21.8% and 14.5%, respectively). As concerns investments' flows, CEE attracts the most of investments originating from the north east while developing countries tend to be preferred by firms located in the north west and centre of Italy.

For investing and national firms we define, according to the Excelsior classification, three types of employees: (i) managers; (ii) clerks; (iii) manual workers, which would allow us to relate FDI and change in employment composition.

Investing firms show a higher productivity, on average, than the national ones in the considered period (Table 1), are generally larger and also present a greater share of skilled workers (managers and clerks). Among INV, those

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preferring developing and advanced countries perform better than the others (as revealed by their average on productivity), while those firms investing in advanced countries are generally larger. As concerns the skill-composition of investing firms, INV choosing CEECs show a higher share of manual workers than the others due to the fact that they mainly operate in the traditional sectors (and therefore they are more labour-intensive).

4 Descriptive evidence on the relationship between investment abroad, domestic employment and skill upgrading

A descriptive analysis has been carried out in order both to investigate the dynamics in overall employment and skill composition of the labour force of investing firms. Figures 2, 3 and 4 compare the dynamics of overall employment, number and share of manual workers, in firms not investing abroad (NAT), to the corresponding dynamics in firms investing in ADV, DEV and CEE. In order to mitigate the impact of different characteristics of the various types of firms (as illustrated in Table 1), we normalize to 1 values in the initial year. This allows us to focus on the different dynamics of the four groups of firms. Among investing firms, those choosing ADV and DEV display a growing trend over the period. On the contrary, national firms show a downward employment trend, similarly to those investing in CEE areas (Figure 2). Although we are aware that nothing can be said about the causality between employment change and internationalisation, it is possible to observe that investing and national firms do present different employment dynamic profiles. Preliminary evidence on the employment composition of investing firms, compared to the national ones, is presented in Figure 3, where it is shown a reduction of the average number of low-skilled employees (manual workers) in the national firms as well as in the investing firms preferring CEE. This downward trend in the absolute number of manual workers also leads to a decrease in their share in total employment but there seems to be little difference in the dynamics of skill upgrading of national and investing firms (Figure 4).

While suggestive of important differences in the dynamics of employment and skill composition between investing and national firms, these graphs do not say much on the actual effect of investing on these dynamics. One way to provide some descriptive evidence in this direction would be to investigate the dynamics of the variable of interests before and after the year of investment.

Here the values are normalised to 1 in the year of investment. Unfortunately, this does not allow comparing the trajectories of foreign investors with those of national firms. However, the econometric analysis illustrated in the next section will take this issue into account. It emerges a weakly increasing post-investment trend, independently on the destination areas[3] (Figure 5). Additionally and rather interestingly, the figures show a decreasing trend before the investment, which inverts after the investment (especially, for companies that invested in CEE and DEV). Post-investment employment growth is higher for those firms, which invest in ADV, weaker although still positive, for the investors which prefer DEV and CEE countries (Figure 5). As far as the impact of outward FDI on the skill composition is concerned, it emerges an increase both in the number of skilled workers (managers and clerks) and in their share in total employment, especially for those firms investing in CEE (Figures 7 and 8). In this case, indeed, there is a reduction in the number of manual workers and an increase of managers and clerks (see Figures 6, 7 and 8).

Descriptive statistics illustrated above provided some evidence that investing abroad has not been associated with any decrease in employment. On the contrary, our results seem to suggest that firms investing in advanced countries an in developing countries outside Europe have slightly increased their employment levels, in managers and clerks, as well as in blue collar workers. The main rationale behind this trend is that investment in advanced countries allows to reach a larger market, thus increasing overall output and employment of the firm. Less optimism could be induced by the results of firms investing in CEECs, which have registered lower occupational performances, where blue collars in particular declined after investing in these countries. However, the average number of manual workers employed was already dropping before investing abroad and, indeed, the rate of employment loss appeared to decline after the investment, consistent with the idea that delocalisation of production is a 'defensive' strategy which allows to reduce costs and maintain the firm's competitiveness, which in turn boosts overall production and sustains employment at home.

In the case of firms investing in developing countries outside Europe, there may be a mix of both market access and cost reduction, which determines the growth rate of employment.

Consistently with the theory that we discussed earlier, investing abroad seems to determine some changes in the skill-composition of the labour force

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[3]It is worth observing that the post investment trend for those firms which invested in 2003 is not significant because it only refers to one year and to 7 firms.

employed at home. In particular, investments in CEE appear to be associated with an increase in the share of managers and clerks in total employment, while this relationship is less clear for firms investing in other developing countries and in advanced economies.

In the next section, we will test these conjectures using some econometric techniques, which will allow to properly accounting for the endogeneity of the choice to invest abroad, and to quantify the magnitude and statistical significance of the effects of investing abroad on firms' overall employment and skill upgrading.
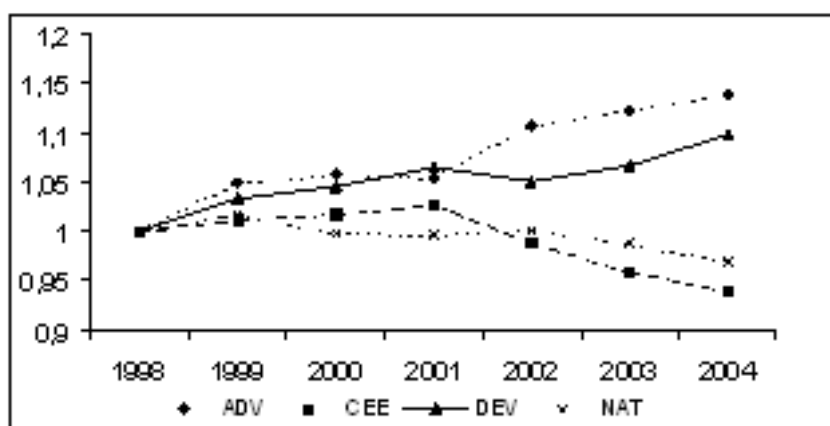

Figure 2: Average number of employees in 1998-2004 – type of firms (baseline in 1998)
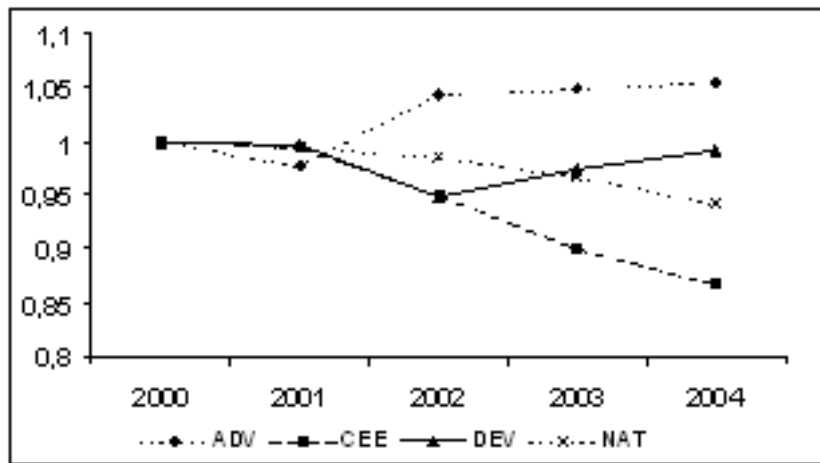
Figure 3: Average number of manual workers in 1998-2004 – type of firms (baseline in 2000)
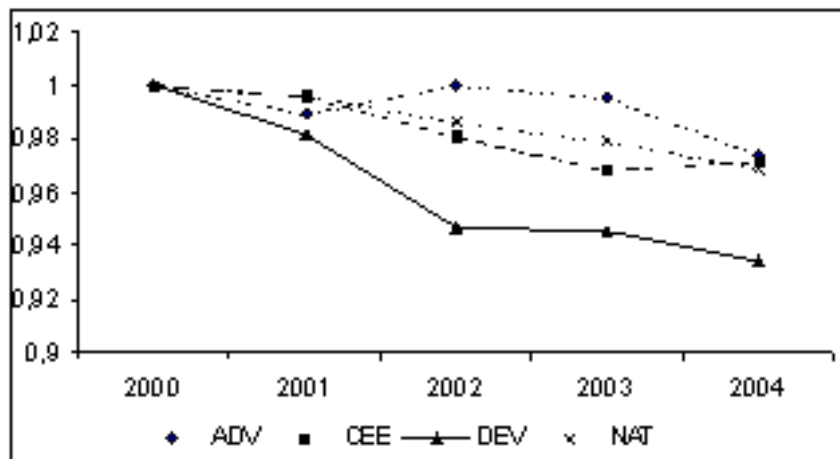

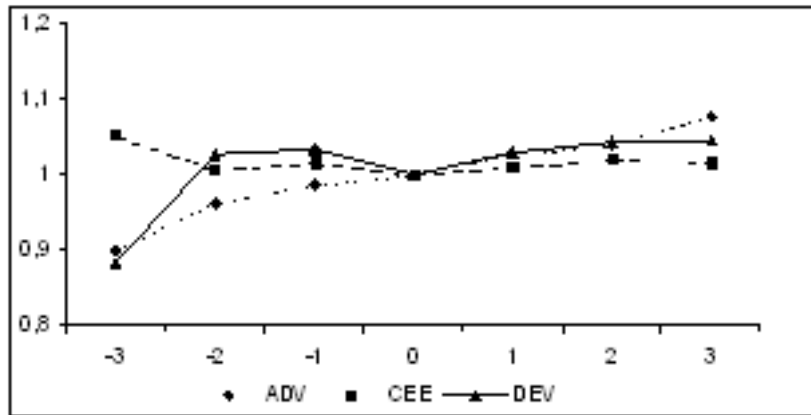Figure 4: Average share of manual workers in 2000-2004 – type of firms (baseline in 2000)

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Figure 5: Average number of employees before and after investment (baseline in the year of investment)
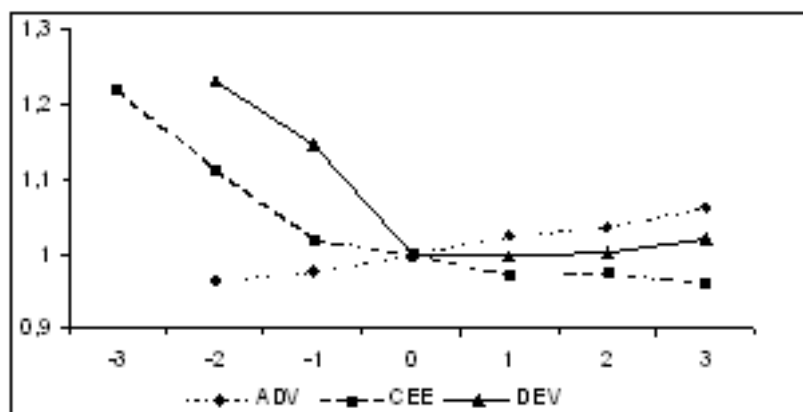
Figure 6: Figure 6 – Average number of manual workers before and after investment (baseline in the year of investment)
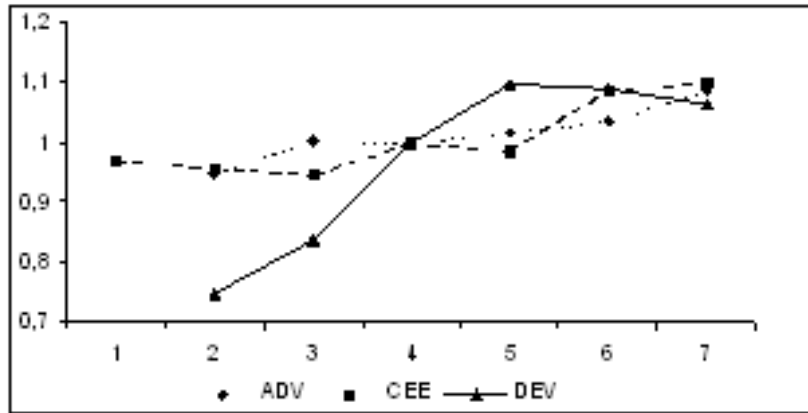
Figure 7: Average number of managers and clerks before and after investment (baseline in the year of investment)
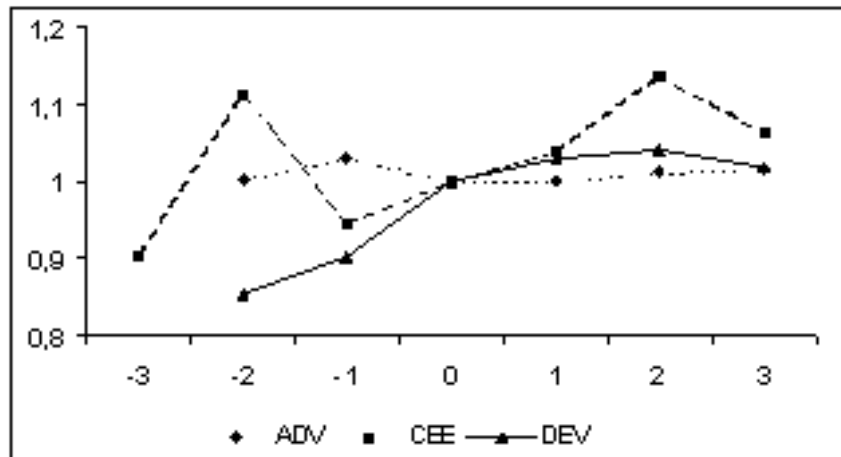
Figure 8: Average share of managers and clerks before and after investment (baseline in the year of investment)

5   Econometric analysis

In this section we provide more robust evidence on the effects of investing abroad on firms' overall employment and skill upgrading. As we have already noted, this issue is complicated by the fact that firms, which become multinationals are ex-ante different from those that choose not to invest abroad. In particular, they tend to be larger, more productive, more innovative and more skill-intensive and these factors, as well as other unobserved shocks

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may affect both the decision to invest abroad and the subsequent employment dynamics. This induces a self-selection problem that, in econometric terms, creates endogeneity problems in the variable capturing foreign investment. In order to take this issue into account, several solutions have been proposed in the literature. In particular, considering that our measure of investment is dummy taking value 1 when a firm changes status from national to multinational, one could apply *propensity score matching* and *difference-in-difference* estimators (Blundell and Costa Dias, 2000). The idea of these techniques is that endogeneity can be accounted for by selecting a control group of national firms with characteristics very similar to the sample of firms actually investing abroad. Comparing pre and post-investment dynamics of these two samples one could gather an estimate of the effect of investing abroad. Barba Navaretti and Castellani (2004) in their work on the effect of investing abroad on productivity, output and employment of Italian firms followed this approach. In the present context, the application of this methodology is complicated by the fact that we have multiple indicators of foreign investment, identifying firm opening up foreign plants in either advanced countries, central and eastern Europe and other developing countries.[4] Therefore, we choose to use a rather standard parametric instrumental variable estimation. In order to capture the dynamic nature of the trajectories followed by firms' employment and skill structure, we specified a linear equation with a lagged dependent variable and introduced a set of dummy variables taking value 1 when a firm invest in ADV, CEE and DEV. In other words, we hypothesize an autoregressive structure of the dynamics of employment and share of skilled workers, but this trajectory is allowed to shift (upward of downwards) in the event of a foreign investment[5]. The panel dimension of our data (from 1998 to 2004) further reinforces our choice of this specification, as it allows to use past observations of the dependent variable and of the regressors as instruments, as suggested by dynamic panel data models proposed by Arellano and Bond (1991) and Blundell and Bond (1998).

Thus, the estimated equation has the following form:

$$y_{it} = \sum_{\ell=1}^{L} \alpha_\ell y_{it-\ell} + \sum_{m=1}^{M} \beta_m^{ADV} d_{it-\ell}^{ADV} +$$

$$+ \sum_{m=1}^{M} \beta_m^{CEE} d_{it-\ell}^{CEE} + \sum_{m=1}^{M} \beta_m^{DEV} d_{it-\ell}^{DEV} + \eta_i + \varepsilon_{it}$$

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[4]See Barba Navaretti, Castellani and Disdier (2006) and De Baere, Lee and Lee (2006) for analyses on Franche, Italy and Korea, addressing these issues in a propensity score matching framework.

[5]A similar specification has been used in Castellani (2001) to estimate the effect of creating foreign subsidiaries on the productivity trajectory of Italian manufacturing firms.

where up to L years of lags in the dependent variable y (share of white collars or log of total employment) enters as regressor. This process can be shifted upwards or downwards by the event of a foreign investment (either in ADV, CEE or DEV), and we capture this effect by introducing three dummy variables (ds), which take value 1 if firm i invests abroad at time t. We allow for some lag (up to M years) also in the effect of those dummies. These dummies tell us the extent to which the dynamics of employment and the share of skilled workers in firms investing in different foreign contexts change relative to those remaining national. The error term is modelled as a fixed effect (η) and the usual disturbance (ε). In this equation both the lagged dependent variable and the foreign investment dummies are either endogenous or predetermined, so we will use the System GMM estimator proposed by Blundell and Bond (1998). In Table 2 we report the results from the estimation of our specification of the process governing the dynamics of employment (columns 1 to 4) and of the share of skilled workers (columns 5 to 8).

Using (the log of) total employment as the dependent variable, we see that if we specify a static equation (i.e. with no lagged dependent variable in column 1), we find a positive effect of investing in ADV on total employment, which disappears once we allow for lags. This is consistent with the findings from the previous section, where we showed that the growing trend in employment of firms investing in ADV was already in place before investment, so one cannot conclude that this event has changed the dynamic trajectory of employment. This further supports our dynamic specification. When we introduce one lag in the dependent variable, the autocorrelation test is not consistent with the assumptions of the underlying theoretical model, which would require negative first-order serial correlation and no second order serial correlation. Therefore, our preferred specification uses two lags in the dependent variable (column 3 and 4)[6]. Results suggest that, as expected, employment shows a very high degree of persistence (the coefficient on the lagged dependent variable is close to 1) and firms investing abroad do not seem to experience any significant employment loss, relative to firms remaining national.

When we use the share of white collars as the dependent variable (columns 5 to 8), both the static specification (column 1) and the dynamic specification in column 2 (L=2 and M=1) are not supported by our data. In particular, in the former, the validity of instruments is rejected, while in the latter the AR(2) is positive and significant. Thus, we can improve the estimation

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[6]In both the specifications the autocorrelation tests are in line with the theory and the over identification test supports the validity of the instruments used.

Table 2: Investing abroad and the dynamics of the total employment and of skilled workers, 1998-2004 (GMM Regressions)

Dependent variable	(Log of) Overall employment				Share of skilled workers			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	GMM-SYS	GMM-SYS	GMM-SYS	GMM-SYS	GMM-SYS	GMM-SYS	GMM-SYS	GMM-SYS
$y_{i,t-1}$		1.038***	0.932***	0.937***		0.620***	0.600***	0.595***
		(0.016)	(0.073)	(0.085)		(0.082)	(0.069)	(0.057)
$y_{i,t-2}$			0.109	0.106			0.242***	0.242***
			(0.069)	(0.077)			(0.038)	(0.030)
$d^{ADV}_{i,t-1}$	0.370***	-0.005	-0.008	-0.009	4.881	1.412	0.522	0.595
	(0.102)	(0.012)	(0.012)	(0.015)	(4.109)	(0.937)	(0.517)	(0.667)
$d^{ADV}_{i,t-2}$				-0.027				0.816
				(0.019)				(0.670)
$d^{CEE}_{i,t-1}$	-0.038	0.012	0.001	0.008	0.190	0.113	-0.578**	-0.366
	(0.065)	(0.028)	(0.028)	(0.030)	(0.578)	(0.460)	(0.248)	(0.244)
$d^{CEE}_{i,t-2}$				0.026				0.997**
				(0.035)				(0.420)
$d^{DEV}_{i,t-1}$	0.024	0.006	0.006	0.014	2.163	1.086	2.152	2.188
	(0.098)	(0.021)	(0.024)	(0.011)	(1.692)	(1.218)	(1.436)	(2.353)
$d^{DEV}_{i,t-2}$				0.018				0.266
				(0.021)				(0.847)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. firms	2610	2610	2610	2610	2610	2610	2610	2610
N. observations	15660	15659	13049	13049	15660	15660	13050	13050
N. instruments	64	75	72	72	75	75	71	71
Arellano-Bond serial correlation tests								
AR(1)	-7.653	-13.726	-5.924	-5.367	-6.737	-7.079	-6.884	-7.781
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AR(2)	-1.097	2.872	0.264	0.293	0.198	3.914	-0.359	-0.538
p-value	[0.272]	[0.004]	[0.792]	[0.769]	[0.843]	[0.000]	[0.720]	[0.591]
Overidentification test (Hansen J)								
Chi-squared	62.852	115.468	107.547	105.190	153.722	118.211	83.255	77.310
D.o.f	87	100	100	97	109	108	108	105
p-value	[0.976]	[0.138]	[0.285]	[0.268]	[0.003]	[0.236]	[0.963]	[0.980]

Notes: each equation assumes time dummies as exogenous variables and the lagged y and d as predetermined variables. The third and forth lags of y and all lags from t-3 of ds are used as instruments.

by allowing L=2. Besides a significant persistence in the skill composition, setting M=1 we find that firms investing in CEE would experience a drop in the share of skilled workers one year after investment. This result, which would be rather odd, according to the theoretical prediction is reversed if we allowed more time for the adjustment process in the workforce. In fact, if we set M=2, we find that the share of skilled workers rises significantly two years after the investment in CEE, as predicted by the theory. In sum, we find that no significant skill-upgrading is induced by FDI, except for the case of investments in CEE. In this case, it seems to be skill-upgrading starting from the second year after investment. In Table 3 we report some robustness checks. First, we ran the difference estimator proposed by Arellano and Bond (1991). Results remain unchanged (column 1 and 6), but comparing the Hansen J tests in the two specifications, we cannot reject the validity of the additional identification restrictions used by the System GMM. Second, we estimate our preferred specification on a subsample of years (from 2000 onward in column 2 and 7, and before 2004 in column 3 and 8) and the results are qualitatively very similar. Finally, we added two important control variables: total factor productivity and average wages (in column 4, 5, 9 and 10), which, do not affect the results, even if the number of observations drops due to missing values.

6 Conclusions

The paper contributes to tbhe debate concerning the relationship between globalisation and employment, a debate – especially in Italy – according to which the delocalisation of production activities towards low-wage countries is responsible for the constrained employment upturn. Advanced countries share the fear of job loss associated to firms' international production when they see their companies closing down domestic plants and opening up new ones abroad.

This issue cannot, however, be examined without taking into account the problems linked to the skill upgrading, and the analysis needs to be extended to the broader relationship involving international division of labour, innovation and employment changes (qualitatitive as well as quantitative), at the firm and country levels. The empirical analysis carried out in the paper aims at providing further evidence about such causal relationship, with reference to foreign investments undertaken by Italian firms. Specifically, the counterfactual analysis shows that foreign investment itself does not induce a significant employment reduction at the parent company level. Actually,

when employment declines in firms that open up new plants, this decline is not larger and sometimes smaller than what has been experienced by firms, which have not invested abroad. By contrast, the analysis of firms' performance before and after the investment shows a slight increase in employment, when the investments aim to reach a larger market (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, which have not internationalised. This is consistent with the idea that investing abroad is a 'defensive' strategy that allows reducing costs and maintaining firm's competitiveness.

The impact of outward FDI on domestic skill upgrading is positive and significant only when foreign initiatives are undertaken in CEEC, supporting the hypothesis that the transfer of labour intensive production activities, which requires unskilled employees, leads to an increase in skilled workers at the parent company level, where other production phases and coordination and control phases are concentrated.

Nevertheless, additional investigations are needed to corroborate the positive impact of outward FDI on skill upgrading, and to investigate their causal relation. For this purpose, the sample of firms might be enlarged and the analysis might be extended to comprise long run effects.

Besides, it is important to stress that the impact of outward FDI might concern not only the single firm but also the company's supply chain and the broader business environment in which it operates. Some empirical investigations (Savona and Schiattarella, 2004; Mariotti and Piscitello, 2006) show that the transfer of production activities abroad can induce a skill upgrading within the local context the MNE belongs to. This impact may be translated into a reorganisation of the supply chain. The transfer of production abroad may have a positive effect if and when the suppliers of the parent company 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. Besides, 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 skilled labour.

Finally, the analysis of the determinants promoting employment skill upgrading requires additional research in order to investigate the causal relationships among innovation, technologies and internationalisation.

The understanding of these mutual relations can help the achievement of

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the technological frontier, although still far away, and increase the competitiveness of our enterprises.

Table 3: Robustness checks

Dependent variable	(Log of) Overall employment					Share of skilled workers				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
y_{it-1}	0.549***	0.962***	0.925***	0.966***	0.944***	0.427**	0.784***	0.817***	0.584***	0.620***
	(0.121)	(0.079)	(0.097)	(0.062)	(0.067)	(0.182)	(0.116)	(0.093)	(0.062)	(0.055)
y_{it-2}	0.134*	0.094	0.129*	-0.041	-0.023	0.151*	0.112	0.125	0.298***	0.326***
	(0.076)	(0.076)	(0.072)	(0.056)	(0.058)	(0.084)	(0.076)	(0.085)	(0.053)	(0.050)
$d^{ADV}_{i,t-1}$	-0.004	-0.013	-0.004	-0.008	-0.013	-0.267	0.373	0.269	0.197	-0.052
	(0.020)	(0.014)	(0.014)	(0.026)	(0.028)	(0.540)	(0.455)	(0.377)	(0.664)	(0.531)
$d^{ADV}_{i,t-2}$	-0.017	-0.028	-0.024	-0.023	-0.028	-0.210	0.623	0.226	-0.409	-0.679
	(0.016)	(0.020)	(0.020)	(0.027)	(0.029)	(0.522)	(0.482)	(0.466)	(0.687)	(0.452)
$d^{CEE}_{i,t-1}$	0.015	0.009	0.041	0.023	0.021	-0.494	-0.243	-0.260	-0.171	-0.086
	(0.035)	(0.031)	(0.033)	(0.032)	(0.034)	(0.483)	(0.234)	(0.255)	(0.336)	(0.330)
$d^{CEE}_{i,t-2}$	0.024	0.025	0.040	0.018	0.019	0.904***	0.967***	0.710***	0.762**	0.766*
	(0.034)	(0.034)	(0.034)	(0.032)	(0.033)	(0.320)	(0.370)	(0.254)	(0.378)	(0.423)
$d^{DEV}_{i,t-1}$	-0.030	0.016	0.042	0.054	0.071	1.602	2.353	2.343	0.510	0.519
	(0.041)	(0.012)	(0.027)	(0.073)	(0.073)	(1.778)	(2.356)	(3.172)	(1.466)	(1.452)
$d^{DEV}_{i,t-2}$	-0.021	0.020	0.016	0.018	0.036	-0.067	0.094	-0.024	-0.742	-0.502
	(0.035)	(0.022)	(0.017)	(0.030)	(0.039)	(0.862)	(0.932)	(1.145)	(0.820)	(0.914)
TFP_{it}				0.139***	0.101***				0.691	-0.103
				(0.030)	(0.035)				(0.457)	(0.366)
$Wage_{it}$					0.131					1.051
					(0.080)					(0.652)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. firms	2610	2610	2610	2591	2591	2610	2610	2610	2591	2591
N. observations	10439	10440	10439	10349	10349	10440	10440	10440	10349	10349
N. instruments	53	69	51	67	67	53	65	47	74	90
Arellano-Bond serial correlation tests										
AR(1)	-3.482	-5.713	-5.329	-8.407	-8.230	-4.041	-5.021	-5.605	-6.408	-6.535
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AR(2)	-0.368	0.447	0.102	2.150	2.112	0.286	1.368	1.663	-0.690	-0.822
p-value	[0.713]	[0.655]	[0.919]	[0.032]	[0.035]	[0.775]	[0.171]	[0.096]	[0.490]	[0.411]
Overidentification test (Hansen J)										
Chi-squared	44.934	103.527	81.151	116.268	107.451	66.324	71.598	57.635	91.144	117.891
D.o.f	62	97	98	125	124	70	100	101	157	184
p-value	[0.949]	[0.306]	[0.891]	[0.700]	[0.855]	[0.602]	[0.986]	[1.000]	[1.000]	[1.000]

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