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ABSTRACT

Investments Abroad and Performance at Home: Evidence from Italian Multinationals*

Foreign activities of MNEs have important effects on home economies. The debate is ambiguous: concerns that foreign investments deplete domestic economies are often coupled with pride in doing good business in foreign countries. This Paper addresses this question by defining the appropriate counterfactual: what would have happened to investing firms if they had not invested abroad. It applies propensity score matching to derive these hypothetical performance trajectories from a sample of national firms that have never invested abroad. For a sample of Italian firms, it finds that investments improve growth of total factor productivity and output. It also finds no significant effects on employment. These results support the view that foreign investments strengthen rather than deplete home activities.

JEL Classification: C14, D21 and F23
Keywords: multinational firms, productivity and propensity score matching

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1. Introduction

The activities of Multinationals (MNEs) have effects on home economies. The laymen's perception of these effects is mixed. They share national pride when their MNEs do well in Fortunes' ranking of the largest firms in the world, but they worry when they see their companies closing down domestic plants and opening up new ones abroad. The issue is indeed complex and there is very little empirical evidence supporting either the pessimist or the optimist. Outward investments divert national resources from home to foreign countries. This diversion could enrich home activities, as far as the value added of what is done at home increases, or it may impoverish them if the size of home activities shrinks and consequent externalities get depleted. This paper examines the effects of outward investments on the home activities of MNEs. It does so by analysing the performance of a sample of Italian firms which invest abroad for the first time in the period analysed and by comparing these firms to a sample of firms that do not invest abroad. It will focus on three measures of performance: total factor productivity, employment and output growth.

The key effect we are interested in is contribution to home real income. Do firms improve performance at home by investing abroad? Theoretical predictions are not clear cut. There are three main reasons why opening and running foreign subsidiaries affect domestic productivity: the exploitation of firm-level and plant-level scale economies; the change in the composition of inputs used in production; the opening of new channels of international sourcing of technological and managerial

knowledge. These sources of productivity change may work in both directions, depending on the features of the investment. The scale of home activities could decline or increase; technologies could be acquired in foreign markets or get depleted to foreign competitors; home activities could get strengthened or impoverished by changes in their factor use (see Barba Navaretti, Venables et al., 2003 for a thorough discussion of this issue).

Besides for performance, the size of economic activity at home per se (independently form its effects on productivity) is a major concern when firms invest abroad. But once more, theory provides good rationale for both options. It all depends on whether firms substitute domestic labour and output with foreign activities or whether expanding foreign activities complement domestic ones

Given that the theory does not provide any clear prediction, at this stage the question boils down to an empirical one. Earlier empirical works have examined the effects on output (Head and Ries, 2001, Blonigen, 2001), home employment (Brainard and Riker, 1997a, 1997b, Braconier and Eckholm, 2002, Konigs and Murphy, 2001, Bruno and Falzoni, 2000, Blomstrom, Fors and Lipsey, 1997, Lipsey, 1999, Bassino, 1998, Mariotti, Mutinelli and Piscitello, 2003) and productivity (Braconier, Eckholm, Midelfart Knarvik 2001, Van Pottelsberghe de la Potterie and Lichtenberg, 2001) of outward FDI. They generally find evidence that outward investments do not deplete home activities.

However, these studies focus either at the sectoral/regional level or, when addressing the question at the firm-level, focus on the activities of MNEs and thus fail to take into account the appropriate *counterfactual* to this problem. The effects of outward investments on home activities are not just relevant per se, but with respect to what would have happened if firms had not invested abroad. Think at firms in traditional sectors like textile, facing competition from imports from developing countries. Transferring stages of production to cheap labour countries could be the only strategy for survival for these firms. Even though home employment declines, it would have declined even more if these firms had not invested. Albeit this cannot be observed, their hypothetical behaviour can be proxied by the behaviour of a sample of other firms which have not invested. There are now only a few firm level studies comparing MNEs and national firms in home countries, mostly because of a lack of comprehensive data sets combining information for national and multinational firms[1]. These studies compare the activities of national firms, foreign subsidiaries and headquarters of multinationals based in their sample countries. They find that national firms generally perform worse than both types of multinationals. Anyway, these studies pursue a different objective than this paper. They are focussed on the analysis of the composition effect of MNEs (whether MNEs are different from national firms) rather than on the analysis of the effects of investing on performance.

With respect to these earlier works this paper introduces three innovations in the empirical analysis of these issues. *First,* it uses a new data base of Italian firms,

[1] In particular, Doms and Jensen (1998) provide evidence on the US, Criscuolo and Martin (2003) and Girma, Kneller and Pisu (2003) on the UK, Castellani and Zanfei (2003) on Italy, Pfaffermyr and Bellak (2002) on Austria, Bellman and Jungnickel (2002) on Germany and De Backer and Sleuwaegen (2003) on Belgium.

combining information on Italian multinationals and a random sample of national firms *Second*, it focuses on firms that change status from national to multinational by investing abroad for the first time. It is therefore possible to single out the effects of the investment by comparing firms' performance before and after the investment. *Third*, it uses propensity score matching to construct an appropriate counterfactual of national firms and uses a difference-in-difference estimator (DID) to compare the performance of the two types of firms.

We find that the home performance of Italian firms that invest abroad for the first time during the period analysed improves after the investment. The post-investment rate of growth of output and productivity is higher than the one observed over the same period for the counterfactual of non-investing firms. Also, there is no significant evidence of a slowing down of the rate of employment growth. Thus, the evidence supports the optimistic view that foreign investments do strengthen and do not deplete economic activities at home.

The next section outlines the main channels through which foreign investments may influence performance at home. Section three revises the available evidence on these effects. Section 4 discusses the methodology used to construct the counterfactual of NEs and the DID estimators. Section 5 and 6 report the data used and the main results of the empirical analysis. Section 7 concludes.

2. Analysing the performance of investing firms: the issue

An empirical test of the effects of foreign investments on performance at home poses several methodological problems. *First*, if we observe only MNEs we cannot single out the hypothetical benchmark: performance if the MNEs had not invested abroad. Moreover, if we observe only MNEs, we do not know if changes in performance are due to unobservable shocks equally affecting all firms, national and multinational alike. It is therefore important to benchmark MNEs to a sample of national firms. However, when comparing the performance of MNEs and national firms, we face a *second* problem: we do not know if differences are due to other observable or unobservable characteristics of the two types of firms (e.g. size, ability of management etc.) rather than to their being multinational or strictly national. In particular, foreign investments and performance are jointly determined. Given that investing abroad entices large costs, with imperfect financial markets only the (*ex-ante*) most productive firms will invest abroad. Thus, if we observe that *ex-post* MNEs perform better than national firms, we do not know if this is so because of foreign investments or because these firms performed better anyway, even before the investment.

To address these problems, it is possible to draw on the now well established literature investigating the effects of exporting on firms' performance (Bernard and Jensen, 1999, Clerides, Lach and Tybout, 1998, Aw, Chung and Roberts, 2000,

Castellani, 2002b, Delgado et al., 2002, Girma et al. 2002, Kraay, 1999). Indeed, the exporter faces the same problem of a firm investing abroad. Consequently, the analysis of the effects of these two decisions raises similar methodological problems.

To illustrate the kind of exercise we carry out in this paper, it is useful to discuss Figure 1 which is derived from Clerides, Lach and Tybout (1998) and adapted to the case of foreign investments. We draw average hypothetical trajectories in home performance for three types of firms: those which are always MNEs, i.e. with at least one foreign subsidiary during all the period observed; those which never have a foreign subsidiary in the period observed (NATIONAL) and those that open their first foreign subsidiary in the period observed and therefore switch from being national into being MNEs (SWs) at time t.

Compare the trajectory of MNEs and NATIONALs. We assume that MNEs perform better than NATIONALs. This assumption reflects what emerges from all available studies: on average MNEs at home always perform better than NATIONALs (Barba Navaretti, Venables et al. 2003, Castellani and Zanfei, 2003; Criscuolo and Martin, 2002; Girma, Kneller and Pisu, 2003, Doms and Jensen, 1998; Frenz et al., 2002, Pfaffermayr and Bellak, 2002, Bellman and Jungnickel, 2002, De Backer and Sleuwaegen, 2003). However, the trajectory of MNEs could lie above the one of NATIONALs both because they were the best performing firms even before becoming multinationals, or because performances improved as a result of international production

More can be learned if we now focus on SWs, those which invest for the first time at t_0. If the investment has a positive effect on productivity their trajectory becomes steeper at t_0 and performance converges to the one of MNEs. Thus, our empirical question can be answered by comparing their trajectory after the investment to the one that they would have followed had they not invested. If the investment does indeed improve performance, this hypothetical trajectory lies below the one of the SWs after t, as represented by the dotted line in figure 1. This comparison is important, as if we just focus on effective performance, even if we observe that it improves, this could be the outcome of other unobserved random factors which have nothing to do with the investment. Unfortunately, the dotted line cannot be observed and we need to proxy it. Good candidates for the counterfactual are NATIONAL firms, so we could compare the performance trajectory of SWs, with the one of NATIONALs. However, we still have a problem. The trajectory of the appropriate counterfactual should differ from the one of SWs just because of the different investment decision. But firms are heterogeneous, even within the same industry, and SWs could be different from NATIONALs even before the investment. The assumption of most of the literature is that operating in a foreign environment involves additional costs and risks and then only firms possessing some intangible capital giving them a competitive edge over national firms are able to overcome such disadvantage and invest abroad (Dunning, 1993; Markusen, 1995). Because of this self-selection the average NATIONAL is not a good benchmark: it is *ex-ante* different from the SW, and this difference may affect *ex-post* performance. Accordingly, we draw the performance trajectory of SWs before the investment above the one of NATIONALs. If we want to isolate the effect of investing, we need to build a

counterfactual made of NATIONALs which are as similar as possible to firms which have invested.

To do so, in what follows we derive a control group from a propensity score matching procedure. The performance trajectory of this control group is the closest approximation to the dotted line. We will then be able to compare post-investment performances in the two groups. To do so we will use standard matching estimators which essentially compare the post t slope of the thick line to the one of the dotted line and difference-in-difference estimators, which compare the change in the slope of the thick line and of the dotted line before and after t.

3. The evaluation problem: propensity score matching and difference-in-difference estimators

As illustrated in section 2, our aim is to evaluate the effect of becoming a multinational firm on economic performance at home, Δy (where Δy denotes the rate of growth of employment, output or total factor productivity (TFP))[2]. To gather this effect we need to understand what would have happened to the firm's economic performance had it not invested abroad. Let SW_{it} be an indicator taking value equal to one if firm i switches into becoming a multinational by investing abroad for the first time at time t (i.e. between t-1 and t). Let also $\Delta y^1_{i,t+1}$ be firm i's post-investment performance and $\Delta y^0_{i,t+1}$ the hypothetical performance achieved at t+1 had i not invested abroad. The effect of investing abroad on economic performances for firm i would then be measured by $\Delta y^1_{i,t+1} - \Delta y^0_{i,t+1}$. More formally, this average effect can be expressed as follows[3]:

$$\hat{a} = E(\Delta y^1_{t+1} - \Delta y^0_{t+1} \mid SW_{it} = 1) = E(\Delta y^1_{t+1} \mid SW_{it} = 1) - E(\Delta y^0_{t+1} \mid SW_{it} = 1) \quad (1)$$

The key problem is that the last term is unobservable, i.e. we do not know what would have been the average performance of SWs if they had not invested. We need to

[2] This is usually defined the 'outcome' in the evaluation literature. See Blundell and Costa Dias (1999, 2002), and Wooldridge (2002, Ch. 18) for reviews.

[3] In the literature this is referred to as the average treatment effect on the treated (ATT). The original idea is derived from natural sciences, where some outcome from individuals who receive a treatment (i.e. a medical treatment) is compared to identical individuals (randomly drawn from a population) who did not receive treatment. In economics things are complicated by the fact that non-treated individuals are non-randomly selected.

find an appropriate measure for the last term in our sample or, in other words, we need to construct an appropriate counterfactual, based on the right control group. If we were to run a natural experiment, we could randomly draw a sample of firms from a population and let one half to invest and the other not to invest. This latter group would be the appropriate control group. Unfortunately, as argued in section 2, firms choose endogenously whether to invest or not. A path followed in the literature to overcome self-selection is to use the Instrumental Variable (IV) estimator[4]. This estimator has however the drawback that the choice of instruments is not straightforward, in particular in cross-sections, and results might be sensitive to the choice of the instrument set[5].

An alternative approach, which we follow here, is the method of matching, which aims at re-establishing the conditions of a natural experiment with non-experimental data. Economic applications of matching estimators have been growing in recent years and they have been used for various tasks like the evaluation of policy intervention on the labour market (Heckman et al. 1997, Blundell et al. 2002), the impact of constitutions on the size of governments (Persson and Tabellini, 2002), the effect of dollarization on country's economic growth (Edwards and Magendzo, 2001, 2002). Particulary relevant to our paper are Girma, Greenaway and Kneller (2002), Girma, Kneller and Pisu (2002b), Wagner (2002) and Girma and Gorg (2002) who evaluate the effects of exporting and of acquisitions on firms' performances and returns to scale.

[4] For example, in Castellani (2002a), Barba Navaretti, Castellani and Zanfei (2002), a dynamic panel GMM-IV estimator is implemented to test the impact of foreign investments on productivity and employment.

[5] The Heckman two-step estimator is another robust alternative to the IV, but it requires more assumptions about the structure of the model.

The idea is to construct an appropriate counterfactual by matching each investing firm with one with similar characteristics drawn from a sample of non-investing ones. Here we use the *nearest neighbour* matching, based on the *propensity score* method, which computes the probability of investing (the propensity score) conditional on a number of observables. The key assumption needed to perform matching based on the propensity score is that, conditional on a vector of observables, the choice of investing abroad does not depend on future performance (conditional independence assumption). In other words we need to rule out that relevant unobserved factors affect both the decision to invest and the future performance.. Then, a good selection on observables is critical for the success of matching, which allows to obtain a measure of the effect of investing abroad on performance at home as free as possible from any self-selection bias. This is done by estimating a probit model of the decision to become MNE that can be represented as follows:

$$P(SW_{it} = 1 | X_{i,t-1})$$

where $X_{i,t-1}$ is a vector of observable firm *i*'s characteristics at t-1.

It is then possible to compute the probability of switching (*propensity score*) for each firm and pair each investor with its *nearest neighbour*, i.e. the non-investing firm with the closest propensity score. In other words, we build a sample where for each investing firm there is a firm which had a very similar *ex-ante* probability of switching but remained national. This latter group is our counterfactual[6]. Subsequently, average

[6] In principle the number of controls should equal the number of switching firms, but in practice one control can be matched to more than one investing firm, so the number of control can be lower than the number of switching firms. The opposite may also occur: some switching firms might not have any "sufficiently close" neighbour and get dropped from the matched sample.

performances in the group of investing firms and in the counterfactual can be compared by using a standard matching estimator (SM) given by the following equation:

$$\hat{a}_{SM} = \Delta\bar{y}^{1}_{t+1} - \Delta\bar{y}^{0}_{t+1} \qquad (2)$$

where $\Delta\bar{y}^{1}_{t+1}$ is the mean performance growth of investing firms after switching and $\Delta\bar{y}^{0}_{t+1}$ is a weighted mean of performance growth the control group over the same period[7]. In other words, the standard matching estimator (SM) can be thought as a test for the equality of means in performance growth over the switching and the matched control groups.

As noted in section 2, it is possible to also use another estimator than the SM estimator. This is the difference-in-difference estimator (DID). Whereas the SM estimators compares post-investment performance growth for the two groups of firms, the DID estimator compares the difference between pre and post-investment performance growth in both groups. In other words, it measures the difference in the change of the steepness of the performance trajectories for the two groups of firms. Formally, DID, is given by:

$$\hat{a}_{DID} = (\Delta\bar{y}^{1}_{t+1} - \Delta\bar{y}^{1}_{t-1}) - (\Delta\bar{y}^{0}_{t+1} - \Delta\bar{y}^{0}_{t-1}), \qquad (3)$$

where upper bars denote averages in each group performances before (t-1) and after (t+1) the investment year. In substance, the DID measures the differential performance in the group of investing firms relative to the non-investing ones, once ex-ante

[7] In the nearest neighbour matching used in this paper, weighting is simply used to account for the fact that one control can be matched to more than one switching firm. Given the extremely low number of such multiple matching (six) we prefer to run unweighted means which facilitate the implementation of DID in a regression framework. However, weighted results for standard matching estimators are identical to unweighted ones.

differences in performance are accounted for[8] and can be estimated from the following regression (Meyer, 1995):

$$\Delta y_{it}^{j} = c + g_1 d_t + g_2 d^{j} + a_{DID} d_t^{j} + x_{it}^{j}'d + e_{it}^{j} \qquad (4)$$

where j = 0,1 denote the control and the switching firms groups respectively, t = 0,1 denote pre- and post-investment period, while the *d*s are dummies taking the following values

d_t = 1 if t = 1 and zero otherwise,

d^{j} = 1 if j = 1 and zero otherwise,

d_t^{j} = 1 if t = 1 and j = 1 and zero otherwise.

The OLS estimate of $\hat{a}_{DID}$ is the difference-in-difference estimator of the effect of investing on performance growth, conditional on the vector of covariates *x*, which control for other sources of heterogeneity in the dependent variable. Setting t=1 we can estimate

$$\Delta y_{i}^{j} = a + a_{SM} d^{j} + x_{i}^{j}'d + n_{i}^{j} \qquad (5)$$

where the OLS estimate of $\hat{a}_{SM}$ is now the standard matching estimator.

4. Data and description of the sample

The dataset we use combines the Reprint data base of the Politecnico of Milan (which contains information on Italian multinationals and foreign firms operating in

[8] Like a first-difference estimator in linear panel data the DID aims at eliminating unobserved heterogeneity which might not be captured by matching and can affect post investment performance

Italy) with the Aida data base of Bureau Van Dijck (which has information on balance sheet and other economic data of Italian firms). The two data bases have been merged by the Centro Studi Luca d'Agliano. The panel used in this paper includes Italian firms with more that 20 employees with observations between1993 and 1998. The panel includes the three types of firms discussed in the earlier section. *SWs,* which set up their first foreign subsidiary in the period observed, *MNEs* which have at least one foreign subsidiary at the beginning of the period and *NATIONALs* which do not have foreign subsidiaries at the beginning of the period and never invest in the period observed[9]. The starting sample included 3,029 firms, but the number of firms for which we can construct a balanced panel is finally 1,587 because of missing values[10]. Table 1 summarises the composition of the sample by investing status for each year. The first row includes firms which were MNEs at the beginning of the period or become such because they have invested abroad in the previous period. The second one reports firms that invested abroad that year and therefore switched status. The third one, just includes national firms. Thus, every year t a number of SWs transit from being NATIONAL in t-1 into being MNEs in t +1[11]. SWs are 193 all together.

Figure 2 a-c is the empirical implementation of figure 1. We report average performance trajectories for the there groups of firms between 1993 and 1997. Note that firms that are classified as MNEs are only those that were already such at the beginning

[9] The reprint data base contains a representative sample of Italian foreign investors. National firms, which are not reported in the Reprint data base, are drawn at random from the Aida data base

[10] In particular, firms with less than 4 out of 6 years of data on employment, output and TFP were excluded. Occasional missing values occurring in the series for the remaining 1,587 firms were estimated using linear interpolation.

[11] Reprint allows to recover disinvestments only every two years (1995 and 1997), so in 1995 and 1997 $MNE_t = MNE_{t-1} + SW_{t-1} - EXIT$, where EXIT denote firms which were multinationals in t-2 and have no foreign subsidiaries in t. Similarly, in 1995 and 1997, $NATIONAL_t = NATIONAL_{t-1} - SW_{t-1} + EXIT$.

of the period and those classified as switching are those which switched in any year between 1994 and 1997. Thus we cannot single out a specific year of the investment in this picture, but all firms classified as SWs had no foreign investments at the beginning of the period and have at least one at the end of it.

These real world trajectories fit remarkably the theoretical ones of Figure 1. MNEs are larger and more productive than NATIONALs. Switching firms outperform NATIONALs ex-ante. TFP and turnover (and, to a lesser extent, employment) trajectories of SWs become steeper during the period under investigation, supporting the idea that investing abroad enhances their economic performance. However, not much can be concluded from these average trends. To single out the effects of the investment we proceed as outlined in sections 2 and 3. We focus our analysis on the comparison between SWs and NATIONALs (we leave out MNEs from now onwards); we construct a counterfactual of nationals by using the matching technique; we compare performance of SWs and the counterfactual.

5. Construction of the counterfactual

We now focus on switching firms. As we need to compare pre and post investment performances we are forced to drop firms which invest in 1993 and 1994. In fact, we can observe pre-investment performance growth only starting with firms switching in 1995. Thus, the number of switching firms analysed falls to 119. These firms become

multinationals either in 1995, in 1996 or 1997. We observe their economic performance from 1993 to 1998. In Figure 3 we report the time structure of the investment pattern of SWs

As discussed in the previous section a careful analysis of the effect of investing abroad requires that the appropriate counterfactual is constructed. This will be derived from the sub-sample of NATIONALs that do not invest over the 1995-1997 period by way of the propensity score matching technique. We start by running a Probit regression to derive the probability of investing as a function of observable firm-specific characteristics:

$$P(SW_{it} = 1 | Z_{i,t-1}, E_{i,t-1}, F_{i,t-1}, S_i, P_i, yr95, yr96) \quad (5)$$

where $Z_{i,t-1}$ is a vector of firms' attributes such as size, age, share of intangible assets on total assets, $E_{i,t-1}$ is a vector of efficiency and profitability measures such as TFP, operating margin per employee and ROI, $F_{i,t-1}$ is a vector of financial variables such as the ratio of debt to total assets and the share of cash flow in total capital, while S_i and P_i are sector and province dummies, while *yr95* and *yr96* are two time dummies. The results of the estimation of (5) are reported in table 2 and support the hypothesis that size, productivity and profitability are important determinants of the choice of becoming a multinational firm. In other words, we confirm that multinationals have some ex-ante advantage over national firms, which allow them to overcome the costs and risks of running business abroad.

As recalled in section 3, matching techniques assume conditional independence, that is we need to rule out that the choice of investing abroad is significantly affected by unobservable variables which also determine post investment performance. This is not easy to ensure and test in empirical work, mainly due to data limitation. Here we tried to

control for as many observable firms' characteristics as possible (including a large set of sector and province dummies) given our data constraint, and reached a satisfactory result in terms of explained variance, as indicated by a Pseudo-R^2 of 22.7%, which is in line with most existing works using matching techniques.

A good matching should also result in characteristics of the counterfactual as close as possible to those of the investing firms. In formal terms, the matched sample should satisfy the balancing property, that is the distribution of the vector of observables should be balanced across switching and control firms. In Table 3 we compare the average characteristics of SWs to those of NATIONALs before the matching and to those of the matched sample of NATIONALs, the counterfactual. SWs and NATIONALs are quite different firms. The first two columns of Table 3 report the mean values of characteristics of the two groups of firms and the third column reports the p-value for the test of equality of means in the two groups. Switching firms are larger (employment and turnover are four times larger, while total assets are more than 7 times higher in switching firms), more productive (TFP is 20% higher) and profitable (operating profit per employee is twice as high), pay higher wages, and are less vertically integrated (value added per unit of output is 1.7% lower).

Propensity score matching mitigates such differences substantially. As shown in the last three columns of table 3, there are no significant differences in the means between SWs firms and matched[12]. It is noticeable that differences disappear not only in

[12] The number of switching firms decreases from 119 to 109 in the matched sample. This is due to the fact in 10 cases the propensity score of nearest neighbour was more than 5% different from the switching firm, so we decided to drop such firm, increasing the overall quality of the matching. The number of control is lower than the number of switching simply because some national firm is matched to more than one investor.

variables used as regressors in (5) (TFP, employment, profits per employee, share of R&D to total assets, age, share of debt to total assets, cash flow to tangible capital), but also other variables such as wages, value added per unit of output, total, tangible, intangible and current assets, profits[13].

6. The effects of investing abroad: results

We now use the matched sample to estimate the impact of the creation of foreign subsidiaries on firms' performances. We use both the standard matching estimator (SM) and the difference-in-difference (DID) estimator. Our outcome variables are three indicators of firms' economic performances: TFP growth[14], employment growth and output (measured by total sales) growth. There are obvious relations among these three indicators, such as for example the effect of an expansion in output on employment growth and on productive efficiency (through economies of scale), or the impact of an increase in TFP on output growth (through an increase of international competitiveness or employment (through factor mix reallocation), which we leave for further investigation. Here we just concentrate on a robust estimation of the partial effect of investing abroad on the three indicators, without discussing their interlinkages and the channels through which these effects occur.

[13] As a more formal test for the matching satisfying the balancing property, we followed Sianesi (2004) and ran the selection probit on the matched sample. As expected, we found that Pseudo R^2 drops significantly (from .22 in the whole sample to .07 in the matched sample) and no regressor is significant, neither individually nor jointly.

[14] TFP growth is obtained as the residual of a Cobb-Douglas gross output production function estimated from a random effect model with an AR(1) disturbance term. Elasticities to capital, labour and materials have been allowed to vary across 2-digit industries.

In table 4 we report estimates of the effect of investing abroad, using both DID and SM (from equations 4 and 5). We compute bootstrapped standard errors to adjust for additional sources of variability introduced by the estimation of the propensity score as well as the matching process and we control for other post-investment sources of variation in performances, such as the contemporaneous growth rate in the stock of capital, the operating profit per employee, the average wage, the share of intangible on total assets and of cash flow on tangible assets. The effect of investing slightly drops when we introduce such controls, and the SM estimate of the effect on TFP growth turns out to be non-significantly different from zero. However, DID estimators are robust to the introduction of controls and suggest that switching firms experience a 8.8% higher growth rate in output and a 4.9% higher growth rate in TFP[15]. We find no significant effect on the rate of employment growth after accounting for pre-investment performance (DID) and controlling for other sources of variation.

7. Conclusions

Most of the literature focuses on the impact of MNEs in host economies. However, the activities of MNEs have also important effects in home economies. The debate is ambiguous: concerns that foreign investments may deplete domestic economies are often coupled with the pride for doing good business in foreign countries. This ambiguity derives from a poor understanding of the problem and from the lack of data sets allowing for targeted empirical analysis. This paper can address

[15] It is worth mentioning that standard NN yields lower causal effect of investing on performances then DID. This result is comforting as DID improves upon standard matching estimators as it controls for unobserved heterogeneity in performances of treated firms as opposed to non-treated ones (Blundell and Costa Dias, 1999, 2002).

these concerns by comparing the home performance of a sample of Italian firms which have invested abroad for the first time in the period observed to the one of a counterfactual of firms which have not invested abroad. This type of analysis is possible thanks to a new data set on Italy which combines information on multinationals and national firms. The time frame of the data set also makes it possible to compare performances before and after the investment.

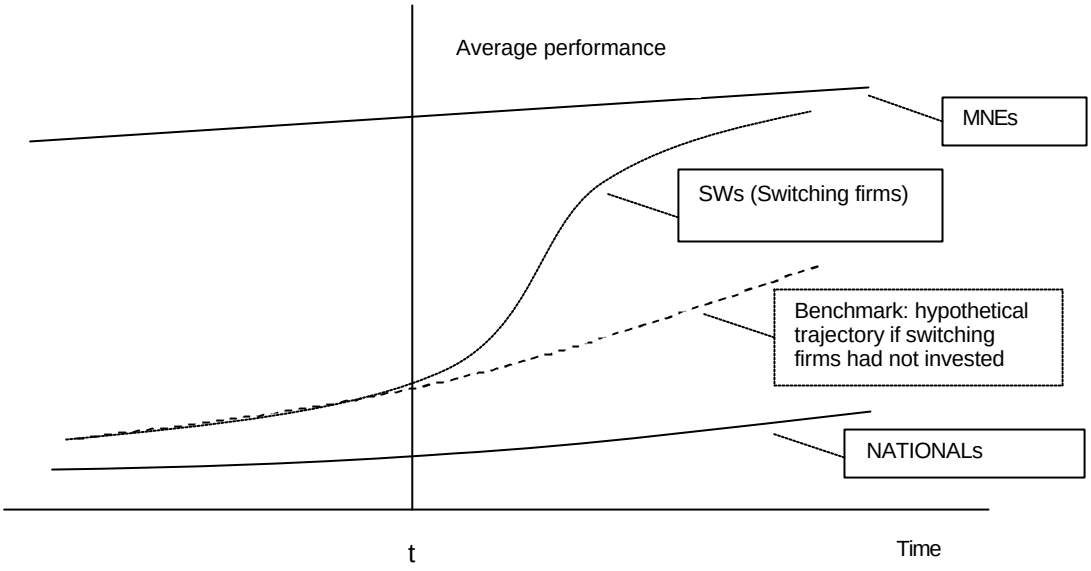
The problem is defining the right counterfactual. For the welfare of the home country what matters is what would have happened to investing firms if they had not invested. By using propensity score matching, it is possible to construct a counterfactual of national firms that never invest abroad which replicates this hypothetical performance.

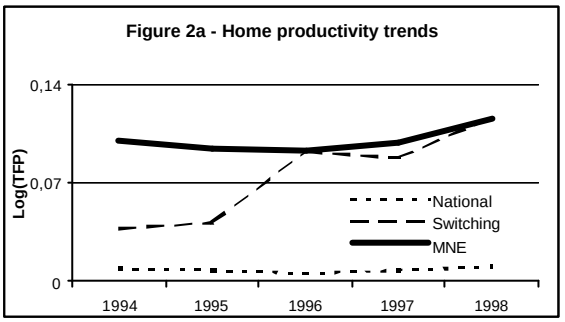
We find that investing abroad significantly enhances performance at home. The rate of growth of total factor productivity and of output is significantly higher for investing firms and it accelerates after the investment takes place. This result is robust to the inclusion of different controls. We also find that investing has no significant effect on employment growth.

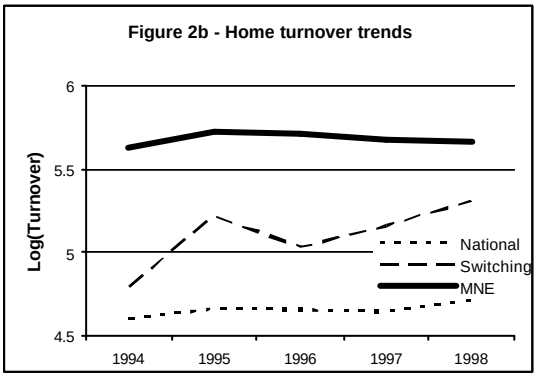
These findings imply that foreign investments are often strategic moves undertaken to strengthen home activities. Also, concerns about the employment effects of foreign investments and delocalisation are not supported by our analysis. In our sample the employment trend of investing firms is never worse and under some tests even better than for the counterfactual. In this perspective actions aimed at discouraging

foreign investments and the creation of foreign employments seem short sighted and they risk at weakening the domestic economy rather than strengthening it.

Figure 1 – Performance trajectories in home plants







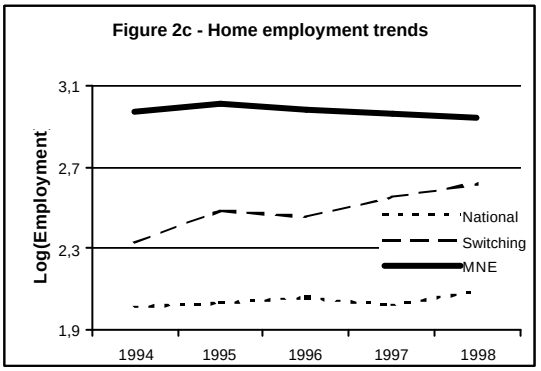


Figure 3 – The time structure of investment patterns

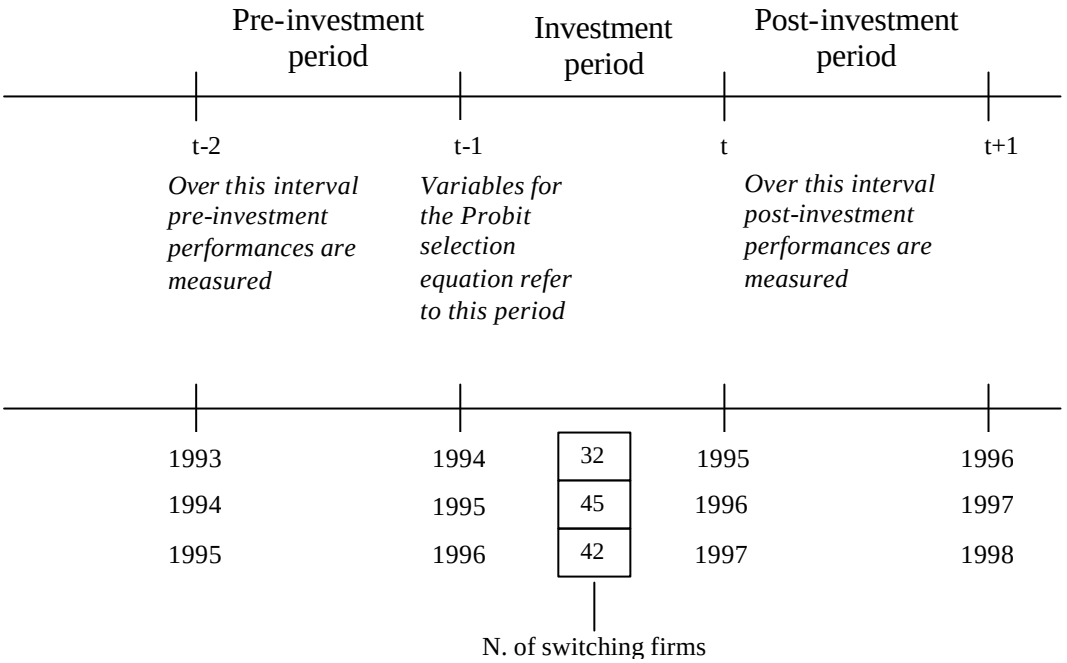


Table 1 – Number of firms in the sample, by size class and investing status

Year	1993	1994	1995	1996	1997
Multinational in year t (beginning of period)	279	321	330	362	371
Switch in year t	42	32	32	45	42
National in year t	1,266	1,234	1,225	1,180	1,174

Table 2 – Probit for the probability of switching

Variable	Coeff.	Std. Error
(Log) $TFP_{i, t-1}$	.411**	(.197)
(Log) N. $employees_{i, t-1}$	.509**	(.058)
$Profits\ per\ employee_{i, t-1}$	.007**	(.002)
$ROI_{i, t-1}$	.799	(.919)
(Log) $Age_{i, t-1}$	.129	(.084)
Capitalized R&D/$Total\ assets_{i, t-1}$	4.130	(3.349)
$Debt/Total\ assets_{i, t-1}$	.397	(.326)
Cash $flow/fixed\ capital_{I, t-1}$	-.197**	(.056)
Sector dummies	Yes	
Province dummies	Yes	
Year dummies	Yes	
N. observations	2,960	
Pseudo R-squared	.227	

**: p<.05; *: p<.10

Table 3 – Switching firms and control groups, various characteristics (means)

	Unmatched sample			Matched sample		
	Switching	**Control**	**Test for the equality of means (p-value)**	**Switching**	**Control**	**Test for the equality of means (p-value)**
N. of observations	119	3,415		109	103	
Turnover[§]	145,726	37,579	3.082**	110,086	144,669	-.773
N. employees	347	92	2.709**	263	256	.099
TFP	1.214	.997	4.503**	1.176	1.196	-.347
Pre-tax P/L[§]	6,187	1,185	3.363**	4,610	3,642	.461
Operating P/L[§]	8,676	1,932	3.186**	6,270	7,419	-.529
Operating profit per employee	38.4	21.9	3.42**	35.7	39.4	-.471
Average wage[§]	60.8	57.8	2.059**	60.4	61.0	-.297
Value added per unit of output[§]	27.4%	29.1%	-1.59*	27.6	28.5	-.547
Age	24	23	1.291	24	23	.243
Total assets[§]	213,303	29,476	1.819**	116,474	103,328	.351
Tangibile assets[§]	23,004	6,583	2.925**	19,277	21,726	-.456
Intangibile assets [§]	3,314	750	1.636**	1,671	4,003	-.986
Share of intang. assets on total[§]	2.1%	1.6%	.824	1.6%	2.4%	-1.246
Capitalized R&D investments[§]	274.0	29.4	1.116	286.5	153.8	.548
R&D on total assets	0.2%	0.1%	.986	0.3%	0.4%	-.535
Current assets [§]	169,619	19,778	1.687**	84,684	61,515	.808
Share of debt on total assets	67.6%	67%	.401	67.6%	67.8%	-.087
Interests paid on total debt[§]	6.1%	5.8%	.92	6%	6.2%	-.358
Cash flow on tangible capital	.521	.727	-1.335	.468	.611	-1.027

[§] Variables which were not included in the *probit* used to compute the propensity score

Table 4 – The effect of investing abroad on firms' performances, 1993-1998

Dep. Variable	Turnover Growth			
Estimator	SM Unconditional difference	DID Unconditional difference	SM Conditional difference	DID Conditional difference
Effect of investing *(α)*	.056**	.110**	.044*	.087**
	(.029)	(.039)	(.028)	(.039)
Constant	Yes	Yes	Yes	Yes
Control variables*	No	No	Yes	Yes
Observations	212	422	212	422
R-squared	.018	.029	.224	.187

Dep. Variable	TFP Growth			
Estimator	SM Unconditional difference	DID Unconditional difference	SM Conditional difference	DID Conditional difference
Effect of investing *(α)*	.036**	.075**	.015	.049**
	(.014)	(.024)	(.010)	(.017)
Constant	Yes	Yes	Yes	Yes
Control variables*	No	No	Yes	Yes
Observations	212	422	212	422
R-squared	.018	.029	.528	.466

Dep. Variable	Employment growth			
Estimator	SM Unconditional difference	DID Unconditional difference	SM Conditional difference	DID Conditional difference
Effect of investing *(α)*	.036*	.022	.005	-.032
	(.021)	(.031)	(.014)	(.026)
Constant	Yes	Yes	Yes	Yes
Control variables*	No	No	Yes	Yes
Observations	212	422	212	422
R-squared	.013	.049	.585	.461

***** Control variables include: growth rate in share in intangible assets, capital stock, profits per employee, wage, share of cash flow in total capital and turnover (only for TFP and employment growth). Asterisks denote significance level at 5% (**) and 10% (*), based on bootstrapped standard errors (500 repetitions).

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