

Attracting foreign investments or promoting domestic multinationals?

Evidence from productivity spillovers in Italy

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Abstract

The main rationale for attracting foreign multinationals is that they bring in the host country a bundle of intangible assets which increase the average productivity in the country, both through a composition effect and through spillovers to national firms. In this paper we argue that domestic multinationals can be equally a good source of both direct and indirect effects on the home country. Using data on firms active in Italy in 1993-2000, this paper examines differences in productivity and innovative behaviour of multinationals (both foreign and domestic-owned) and national firms, as well as productivity spillovers to domestic firms. It is shown that parent companies of domestic multinationals are more productive than foreign-owned firms and exhibit a higher propensity to carry out innovative activities. As far as spillovers to domestic firms are concerned, exporters benefit relatively more from foreign presence than non internationalised companies. However, the latter seem to benefit from the activities of domestic-owned multinationals. These results are consistent with the idea that outward and inward FDIs might have complementary effects.

JEL Codes: F23, O33

Keywords: multinational firms, productivity spillovers, innovative behaviour

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1. Introduction

The last decades have witnessed an important change in governments' attitude towards multinational firms. While in the '60s and the '70s countries tended to discourage inward investments based on a presumption that foreign multinationals would deplete local economies, over the last 25 years, many (developed and developing) countries have eliminated their restrictions to inward FDIs (Unctad, 1999, Unctad 2005). More importantly, it is all the more frequent that (national and regional) governments support investment promotion agencies and grant special tax concessions and financial incentives to foreign multinationals (Hanson, 2001). This different attitude is largely the result of a changing view of the role played by MNFs in knowledge creation and dissemination. Multinationals are less and less seen as 'quasi-colonial' institutions that exploit technological advantages on a global scale, by monopolizing markets and appropriating rents in host economies (Hymer, 1960, Vernon 1966). Instead, the role of MNFs as key players in the global generation, adoption and diffusion of technology is increasingly recognised. In particular, firms belonging to multinational groups are larger, concentrate mainly in high-tech industries, exhibit higher productivity and pay higher wages, and have a higher propensity for innovation, for carrying out R&D. This has a *direct effect* on the countries where they operate: average productivity and innovation in a given country increase as the share of activities due to multinationals in the economy rises. This has to do with the fact that multinational firms bring in a bundle of assets which might not be available locally, such as technologies, market and employment opportunities, capital, and management skills (Barba Navaretti and Venables, 2004). This kind of direct effect might be relevant *per se*, justifying, for example, a significant increase in public incentives to attract foreign multinationals which we have witnessed in the last decades both in developed and developing countries (Hanson, 2001). However, while the most common view (which informs most of the policy measures) is that this effect is reached through the attraction of foreign multinationals (that is inward FDIs) in this paper we will argue that foreign-owned multinationals may not outperform the most dynamic component of the host economy, such as the domestic-owned multinationals. Nor will foreign firms necessarily generate more spillovers than the latter. This will

induce us to pose the dilemma whether attracting foreign investment is really more effective than promoting the expansion of domestic owned multinationals.

Using firm level data on ownership structure and performances of Italian firms over the 1993-2000 period, we investigate whether foreign-owned firms actually outperform domestic-owned ones, distinguishing uni-national and multinational firms. Results suggest that indeed parent companies of Italian multinationals outperform, both in terms of productivity and in terms of propensity to innovate affiliates of foreign multinationals in Italy. This leads us to question whether the expansion of foreign multinationals actually determine larger productivity gains for Italian firms. Our econometric evidence supports that exporters benefit more from foreign multinationals than non-internationalised firms. However, the latter benefit from the expansion of domestic multinationals in their home country. This result indicates that the expansion of domestic multinationals can be a source of spillovers for their home countries. Moreover, their spillovers accrue to different categories of local firms, as compared to those created by foreign multinationals. Our results thus suggest that domestic and foreign MNFs may play a complementary role as sources of spillovers, accruing to the benefit of uni-national firms and exporters respectively.

2. Domestic multinationals as a source of spillovers

The literature on multinational firms and productivity spillovers as largely addressed the impact of foreign firms in host countries¹. One of the main reasons for this focus is that foreign affiliates of multinational firms bring in host countries a bundle of tangible and intangible assets which can contribute directly and through spillovers to innovation and productivity in the host country. Empirical evidence has been finding that foreign affiliates of multinationals tend to outperform domestic firms, supporting the idea that expanding the activity of foreign-owned firms (i.e. attracting inward FDIs) will raise the average productivity and innovation in the economy, while less robust evidence has been provided on the spillover effect of foreign multinationals on host country firms (see Castellani and Zanfei, 2006 for a review). However, a growing literature has also been discussing the role of

¹ Notable exceptions are the works of Vahter and Masso (2005) using firm-level data on Estonia, Bitzer and Gorg (2005), Braconier et al. (2001) and van Pottelsberghe de la Potterie and Lichtenberg (2001) using sectoral and aggregated data from a panel of countries.

multinationality as opposed to foreignness in explaining differences in productivity and innovation. In particular, domestic multinationals share many characteristics of foreign-owned firms in given country and can be at least as productive, innovative and prone to invest in R&D (Criscuolo and Martin, 2003; Pfaffermayr and Bellak, 2001; Ietto-Gillies and Frenz, 2004, Castellani and Zanfei 2005). From this perspective, one could view domestic firms going abroad as a further source of externality for other domestic firms. When addressing spillover effects from domestic multinationals to other domestic firms, one needs to take into account that in this case, the focus of the analysis is on parent companies (PC), rather than on foreign affiliates (FA). The different position a firm occupies in the organisational structure of multinational groups may *per se* affect the amount of knowledge it gains access to. It is well known that the core activities and capabilities, such as R&D, strategic management and finance, are largely concentrated in PCs. These are the main sources of proprietary advantages of multinational firms and only part of these technological, managerial and organizational capabilities are transferred to FAs abroad in order to allow them to overcome the cost of doing business abroad and to face competition of other local and multinational firms in host countries. In principle, one may thus expect domestic PCs to have more knowledge to transfer than FAs. The dominant role of PCs in this respect is partially compensated by the fact that FAs can indeed accumulate further knowledge and capabilities through local R&D activities, learning and through external linkages with host country counterparts. Overall, the relative position between PCs and FAs cannot be expected to change significantly, though: in spite of the growing role of the latter in technological accumulation and knowledge absorption, the former are likely to keep a stronger grasp on technology. In fact, domestic PCs can also absorb external knowledge available locally, and it will eventually gain access to foreign knowledge through their foreign subsidiaries' reverse technology transfer.

How effective will technology transfer be *vis a vis* local counterparts? Conflicting forces might determine the overall extent of knowledge transfer of domestic multinationals (see Castellani and Zanfei 2006 for more extensive discussion on these forces). On the one hand, they can be expected to be more rooted in the home economy. Domestic multinationals do not need to overcome cultural and linguistic barriers, which on the contrary can hinder the relationships of foreign-

owned firms with the domestic economy. By contrast, in many instances foreign multinationals are perceived as ‘invaders’ by other domestic firms and this could make cooperation and knowledge transfer more difficult. The perception that foreign firms are more ‘footloose’ than domestic ones, or in other words, that they can move their establishments abroad when it becomes less convenient to produce in a given host country, may nourish the fear that it is too risky to rely on these firms for long term plans. For instance, this can happen both to firms which have to adopt a new client-specific organisational routine or to institutions which have to commit to building railways or pipeline to serve a specific plant. This sort of mistrust can thus reduce the potential externalities from foreign firms and increase the relative advantage of domestic multinationals.

On the other hand, competition effects may play a different role in the case of foreign *versus* domestic multinationals. Domestic multinationals are competing with domestic exporters in the international market. Think at two Italian shoemakers, one which delocalize some stages of production abroad, and the other which controls only national plants. Say that they both sell in the U.S. market. In our view the first is a multinational firm and the second is an exporter. However, in the U.S. market their products will be both perceived as Made in Italy and the two firms will be competing very hard to differentiate and gain international market shares, presumably at the expenses of the other Italian competitor. In the light of such a tough competition we can expect that the two firms will place a considerable effort in preventing information leakages which could advantage their competitor. FAs are less likely to consider local exporters as direct competitors outside the host country: provided that they both are active in the same foreign markets, their product will be perceived as more different (and eventually trade barriers might have different intensity) given their country of origin is not the same.

3. Sample and descriptive statistics

In this section we provide some evidence on the direct and indirect effects of multinational firms on productivity and innovation in Italy. Data for this empirical investigation come from the Cis-Elios dataset, which results from the intersection of two different sources: the Second Community Innovation Survey (CIS II) and ELIOS

(European Linkages and Ownership Structure). The former is a survey based on a common questionnaire administered by Eurostat to firms from all European countries, which aims at assessing various aspects of firms' innovative behaviour and performances. Subject to a confidentiality agreement, we were allowed to access micro data for Italy from the survey carried out in 1997 and covering innovation occurring in 1994-1996. Innovation data were complemented with ownership, multinationality and economic performance data from ELIOS dataset developed by the University of Urbino, Italy, which combines information from Dun & Bradstreet's Who Owns Whom and Bureau Van Dijck's Amadeus. The sample resulting from this matching comprises a 634 firms with manufacturing plants in Italy². Exploiting information on the ultimate owner, available from ELIOS, we broke down the sample distinguishing between Italian affiliates of foreign multinationals (187), and domestic-owned firms (447). The information on subsidiaries controlled abroad, available from ELIOS, allowed us to further distinguish parent companies of Italian multinationals (87), from uni-national firms. The information on export status available from CIS, allows us to identify, within the 360 uninationals firms, those serving the international market through exports (203). For each firm we have data on innovative behaviour (from the Second Community Innovation Survey, CISII) for the year 1996, while output, capital, labour and material inputs are drawn from the ELIOS dataset and observed over the 1994-2000 period. Table 2 provides an overview of the distribution of our sample by sectors and size classes, as well as across multinational status. The size distribution highlights that our sample is biased in favour of medium-large firms, however, the sectoral distribution is not significantly different from the distribution of the universe of Italian firms with more than 50 employees.

The first step of the analysis is to assess the extent of the direct contribution of multinational firms to the the productivity and innovation in Italy. To this end, one can notice from Table 1 that multinational firms are relatively more concentrated in science based and high and medium-high tech sectors. While on average 22.4% of firms in our sample is active in science based industries, this share rises to 33.2% in the case of foreign affiliates of multinational firms in Italy. Similarly, while only 45.9% of firms operate in high and medium-high tech industries, 55.6% of foreign

² The overall sample resulting from the intersection includes 1,114 firms, but for the purpose of this study, we required firms to have a complete time series on economic and financial data from 1993 to 2000 and this left us with a considerably lower number of firms.

affiliates are in those industries. However, not only foreign multinationals are more likely to operate in high-tech industries. In fact, also domestic multinationals are relatively more frequent in those industries: more than a half of domestic parent companies are in high and medium-high tech industries. In sum, an increase in the share of foreign multinationals is likely to change the structural composition of the economy, increasing the relative weight of more technology-intensive industries. Nevertheless, one should bear in mind that an increase in the share of domestic multinationals is likely to yield a similar effect.

Besides the direct effect through the sectoral composition, multinationals are likely to increase the overall performance within industries, due to their inherently higher productivity and propensity to innovate. We investigate this issue by comparing the average TFP and propensity to carry out innovative activities of foreign affiliates relative to Italian-owned firms, after controlling for sector, size and geographic location. In the first column of Table 2, we report conditional differences in the average TFP, as well as in a number of characteristics of the innovative behaviour (such as the propensity to introduce process and product innovation, to carry out R&D, to establish technological collaboration with counterparts outside or inside Italy and, within this category, we distinguish the propensity to cooperate with competitors, clients, suppliers and Universities). Results suggest that, even accounting for differences in size, location and sectoral distribution, foreign affiliates are about 3.7% more productive than domestic-owned firms, but they do not display significantly higher propensity to carry out innovative activities. If we compare performance of foreign multinationals to the sub-sample of domestic firms which are indeed uni-national, the TFP premium reaches 6.2%. This suggests that Italian firms which are themselves multinational (which we have denoted as parent companies, PC) may be very productive as well. Column 3 and 4 of Table 3 shed some light in this respect. In particular, Italian PCs are 11% more productive than uninational firms and denote a significantly higher TFP also relative to FAs (5.1% higher). Furthermore, this group of firms exhibit a significantly higher propensity to innovate product and process, to carry out R&D and to establish technological cooperation with national counterparts, and with Universities in particular.

In sum, we have provided some evidence consistent with the idea that the expansion of foreign multinationals in Italy may increase the average productivity of the country, by means both of a sectoral shift and a within sector effect. However, our

results also point out that, after controlling for sector, size and location, Italian multinationals are even more productive than foreign ones, exhibit a significantly higher propensity to innovate and are more embedded in a network of technological collaborations with national counterparts. This place them in a privileged position to determine spillovers to the rest of the economy. We will investigate this indirect effect in the rest of this section.

4. Econometric specification and results

As it is customary in the literature on productivity spillovers from multinational firms, we specify an augmented production function, which will be estimated only on a sample of domestic-owned firms.

$$\log(Y_{ijt}) = \alpha_j \log(K_{it}) + \beta_j \log(L_{it}) + \gamma_j \log(M_{it}) + \log(A_{ijt}) \quad (1)$$

where $\log(A_{ijt})$ is specified as:

$$\log(A_{it}) = \delta_1 \log F_{jt} + \phi \log D_{jt} + \eta_i + \varepsilon_{it} \quad (2)$$

The subscript j on the parameters associated with each physical input (capital, labour and materials) indicates that we estimate the production functions sector by sector, allowing the input elasticities to vary across 14 2-digit sectors³. Following most of the recent literature estimating productivity spillovers from multinational firms (see for example Smarzynska-Javorcik, 2004), we estimate the production function parameters using Levinshon and Petrin (2004) modification of the Olley and Pakes (1996) semi-parametric method⁴.

The residual of this production function, $\log(A_{ijt})$ (i.e. firm i TFP) is modelled as a function of foreign $(F_{jt} = \sum_{i \in j} FOR_i * K_{ijt})$ and domestic

³ Allowing for sector-specific production function is important not only for an unbiased estimation of TFP, but also because estimating an economy-wide production function would bias the estimated external effect from foreign presence. In particular, imposing common input elasticities for all firms will result in an overestimation of productivity for firms and sectors which have higher returns to inputs. For example, if in a given sector the “true” return is higher than one estimated on the whole economy, an increase in input use in that sector will determine a growth in output higher than one would expect from the estimated (economy-wide) production function, and this difference will then wrongly be considered productivity gain. To the extent that foreign presence is positively correlated with sectoral returns to scale (i.e. multinationals are attracted to higher return to scale industries) the estimated external effect will likely be biased upward.

⁴ Details on the LP method and on its implementation in Stata, can be found in Levinshon, Petrin and Poi (2004).

$(D_{jt} = \sum_{i \in j} (1 - FOR_i) * K_{ijt})$ activities in the sector (j) where firm i operates, a firm-specific fixed effect.

Externalities from domestic multinationals are captured by splitting the effects from the activities at home of parent companies (P), from any effect stemming from other firms belonging to an Italian owned multinational group different from a PC (O).

$$\log(A_{it}) = \delta_1 \log F_{jt} + \delta_2 \log P_{jt} + \phi \log O_{jt} + \eta_i + \varepsilon_{it} \quad (7)$$

$$\text{where } P_{jt} = \sum_{i \in j} PC_i * K_{ijt} \text{ and } O_{jt} = \sum_{i \in j} (1 - PC_i) * (1 - FOR_i) * K_{ijt} .$$

From column 1 of Table 2 we would conclude that neither foreign nor domestic multinationals cause any spillover to domestic firms. However, a composition effect is at play here. In fact, if we allow heterogeneity of the domestic firms, by estimating different externality effects accruing to exporters, multinationals and non-internationalised firms, we obtain interesting insights. In particular, results in column (2) suggest that domestic multinationals have a positive impact on non-internationalised domestic firms and a insignificant effect on exporters and other multinationals⁵. On the contrary, foreign multinationals do not seem to affect productivity of Italian firms significantly. However, results suggest that some positive effect from the presence of foreign affiliates could accrue to Italian exporters. In fact, the coefficient on the interaction between $\log(F)$ and the exporter dummy is positive although rather imprecisely estimated, and if we estimate only the effects from foreign multinationals (column (3)) it turns marginally significant. One way to interpret these results is to stress that exporters have the adequate absorptive capacity to benefit from FA, and the competition effect is not as strong as it is with domestic multinationals⁶. Conversely, non-internationalised Italian firms may lack the adequate absorptive capacity to learn from the foreign firm, but they could benefit from the expansion of Italian multinationals, which are more rooted in the home economy and should be

⁵ In fact, the spillover on exporters and domestic multinationals is the sum of the parameter on the baseline category and the coefficient of appropriate interaction term. In both cases we cannot reject the hypothesis that the sum is different from zero.

⁶ Extending the example about shoemakers, the degree of competition between the Italian affiliate of a U.S. multinational, say Nike, and an Italian exporter, say Lotto, can be lower than the one between two Italian producers.

associated with relatively lower barriers to learning than foreign affiliates (such as the linguistic obstacles).

In sum, foreign and domestic multinationals appear to have complementary effects on the Italian economy. An expansion of foreign firms' activity in Italy seems to benefit home exporters, while an increase in home activities of Italian multinationals would benefit other national firms. A word of caution is required in interpreting these results. When addressing the issue of the home effects Italian multinationals one should to address also the role of an increase in foreign activities on productivity in non-internationalised firms at home, rather than the effect of an increase in home activities of domestic multinationals. In fact, an increase in foreign activities may well deplete the home economy by moving production and employment abroad, causing a negative externality for the rest of the economy. However, other works in this line of analysis provide some evidence that firms investing abroad increase their productivity and output at home and do not decrease employment. Or at least they do so less than non internationalised firms (Barba Navaretti and Castellani, 2004).

5. Concluding remarks

In this paper we have identified parent companies of domestic MNFs as a source of externality and compared their impact to the effect of foreign affiliates (FAs) in host countries. Results from a sample of firms active in Italy over the 1993-2000 period suggest that this distinction can have important implications for policy towards multinationals, but highlights also the crucial role that heterogeneity in (domestic) beneficiary firms can play. In fact, we estimated the intra-industry productivity spillover from PCs and FAs on Italian exporters, parent companies and non-internationalised firms and find that the former have a positive impact on purely domestic firms, while the latter have an impact on exporters. The differential effect can be explained by the different types of absorptive capacity required to benefit from domestic and foreign multinationals, and by the different degree of competition between Italian firms, domestic PCs and FAs. The policy message which we could derive from these results is that there could be potential complementarities between policies directed towards Italian outward investors and policies to attract foreign

investors in Italy. The former seem to have a larger effect on non-internationalised firms, while the latter have a more significant externality on productivity of exporters.

Table 1 – Distribution of the sample firms, by internationalisation status, sector and employment

	Domestic firms			Foreign	Total
	Uni	PC	Tot. dom.		
<i>Pavitt sectors</i>					
Science based	16.4%	24.1%	17.9%	33.2%	22.4%
Scale intensive	39.7%	36.8%	39.1%	41.7%	39.9%
Spec. suppliers	14.4%	20.7%	15.7%	15.5%	15.6%
Supplier dominated	29.4%	18.4%	27.3%	9.6%	22.1%
<i>Technology classes</i>					
High tech	5.0%	5.7%	5.1%	12.8%	7.4%
Medium-high tech	33.1%	44.8%	35.3%	42.8%	37.5%
Low tech	34.7%	23.0%	32.4%	19.3%	28.5%
Medium-low tech	27.2%	26.4%	27.1%	25.1%	26.5%
<i>Employment classes</i>					
< 100	10,6%	4,6%	9,4%	5,9%	8,4%
100-250	27,8%	20,7%	26,4%	24,6%	25,9%
250-500	36,9%	28,7%	35,3%	32,6%	34,5%
>500	24,7%	46,0%	28,9%	36,9%	31,2%
Total	100%	100%	100%	100%	100.0%
N. of firms	360	87	447	187	634

Table 2 – The direct effect of multinational firms on productivity and innovation in Italy

	FA vs. DOM	FA vs. UNI	PC vs. UNI	FA vs. PC§	N. obs.
	b	b1	b2	b1 – b2	
TFP premium	.037**	.062***	.113***	-.051**	3170
Difference in the probability of					
Process innovation	-.026	-.004	.102*	-.106*	634
Product innovation	.052	.081*	.138***	-.057	634
Carrying out R&D	-.004	.024	.135***	-.111**	634
Technological Cooperation in Italy	-.036	-.005	.143**	-.148***	634
Technological Cooperation abroad	.028	.059*	.130**	-.071	634
Tech. Coop. with <i>competitors</i> in Italy	-.006	-.005	.001	-.006*	306
Tech. Coop. with <i>clients</i> in Italy	.006	.013	.027	-.014	559
Tech. Coop. with <i>suppliers</i> in Italy	.011	.032	.078*	-.046	634
Tech. Coop. with <i>Universities</i> in Italy	-.018	-.004	.064*	-.068**	597

Notes: each estimation controls for sector, geographic area and size dummies

§ Chi-squared test of H0: b1 - b2 = 0

Table 3 - Heterogeneity of domestic firms and productivity spillovers in Italy, 1993-2000: Fixed-effects estimation

	(1)	(2)	(3)
Log (F _{jt})	-0.005 (0.024)	-0.051 (0.061)	-0.062 (0.061)
(EXP)* Log (F _{jt})		0.081 (0.068)	0.119* (0.068)
(PC)* Log (F _{jt})		0.026 (0.069)	0.073 (0.068)
Log (M _{jt})	0.027 (0.025)	0.116* (0.062)	
(EXP)* Log (M _{jt})		-0.121* (0.066)	
(PC)* Log (M _{jt})		-0.071 (0.066)	
Log (D _{jt})			-0.044 (0.033)
Log (O _{jt})	-0.253*** (0.049)	-0.247*** (0.049)	
Constant	4.517*** (0.816)	4.392*** (0.820)	1.860*** (0.606)
Year Dummies	Yes	Yes	Yes
Observations	3576	3576	3576
Number of firms	447	447	447

Standard errors in brackets

* p<0.1, ** p<0.05, *** p<0.01

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