FDI from emerging markets and the productivity gap-An analysis on affiliates of BRICS EMNEs in Europe

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Abstract

This paper analyses differences in productivity of foreign affiliates of emerging market multinationals (EMNEs) from the BRICS against their counterparts from developed countries and domestic MNEs. Based on a large database on foreign affiliates in Europe, results find EMNEs at the bottom of the productivity ladder, with an average productivity gap around 30 percentage points compared to more established competitors. The paper shows also that this effect is not homogeneously distributed since it varies in terms of sectorial distribution and technology intensity of activities performed, as well as by geographic destination. Moreover, firms' heterogeneity plays a key role given that productivity differentials are largely accounted for the least productive firms, while those at the top of the distribution tend to reach similar performances than their more established competitors, especially in services.

Keywords: Emerging market multinationals; Total factor productivity; Foreign direct investment.

JEL Codes: F21; F23

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Introduction

The literature on the internationalisation strategies of Multinational Enterprises (MNEs) has, to date, been built on the idea that such firms invest abroad on the basis of the possession of a superior set of assets compared to domestic firms. This view was initially supported by studies largely based on the "internalisation" theory (Hymer, 1976; Caves, 1996) and on the so-called Ownership-Location-Internalisation (OLI) paradigm (Dunning, 1993). The latter theory assumes that the decision of firms to invest abroad depends, among other factors, on the ownership of firm-specific resources which can be exploited in foreign markets. Such competitive advantages have been defined as unique capabilities proprietary to the organisation, which can be built upon product or process technology, marketing or distributional skills (Dunning, 1993; Rugman, 2007; Sharma, 2010, 2011, 2013). Given the fact that, for the most part, they are intangible in their very nature, such competitive advantages are more easily transferred through internalisation between parents and affiliates, rather than through arms' length transactions. This characteristic generally makes foreign affiliates more productive and profitable when compared to domestic firms. More recent literature on heterogeneous firms further emphasises the relevance of company-specific endowments in determining their internationalisation strategies. These studies theoretically and empirically support the existence of a productivity sorting among firms, and that the most productive firms are those with foreign affiliates abroad (Helpman *et al*., 2004).

A recent body of empirical research has followed with the aim of measuring the productivity premium and the performance of foreign affiliates. To date, this literature has focused on the role of MNEs from developed countries, which, generally speaking, show results consistent with the theory. A number of analyses go somewhat further and note the productivity leadership of US MNEs' affiliates compared to other firms (Criscuolo and Martin, 2009; Bloom *et al*., 2012)[i].

Strikingly, no analysis checks the provisions of existing theories on the group of the Emerging Markets Multinational Enterprises (EMNEs), despite FDI flows from emerging and developing economies have risen steadily over the past decade (and actually accelerated during the financial crisis) and represent now 21 per cent of the global FDI stock (UNCTAD, 2013). The recent rise of EMNEs has attracted a great deal of attention in the literature because of their "unconventional" patterns, characterised by early internationalisation

strategies driven by the need to develop, rather than exploit, the firm's resources. Some of the literature on EMNEs has pointed out that, as latecomers in international markets, they often invest abroad with little or no prior experience, lacking internal-management capacities and a deep knowledge of Western-style managerial practices and the social and economic aspects of the host country markets.

The unconventional traits of EMNEs usually get mentioned when an investment is directed at a developed country, i.e. where *asset-exploring* strategies are more likely to be undertaken than traditional *asset-exploiting* strategies (Mathews, 2002; Amighini *et al*., 2010). These investments, aimed at sourcing assets not fully developed at home, are changing the traditional direction of knowledge flows (Narula, 2010), giving rise to a "reverse positive spillover" from the affiliate to the parent (Chen *et al*., 2012). Recent case-study based evidence and cross-country regression analyses confirm the relevance of asset-augmenting motivations (Luo and Tung, 2007; Buckley et al., 2007), and highlights that a common objective of these firms is to invest overseas in order to accelerate their catching-up process with the established competitors from advanced countries (Chen *et al*., 2012).

In the light of the above discussion, this paper aims at measuring differences in Total Factor Productivity (TFP) for a group of foreign affiliates of EMNEs from Brazil, Russia, India, China and South Africa (BRICS) against their counterparts from developed countries as well as domestic-owned MNEs. Empirically, this is done by means of different approaches, including cross-company regressions, quantile analysis and semi-parametric tests, based on propensity score matching, an approach which is particularly useful in this context since it allows the building of a comparison group which reflects the characteristics of EMNEs' affiliates based in Europe. If, as suggested by the literature, the early internationalisation strategies of EMNEs are characterised by a lack of experience in diverse economic and cultural contexts, and it is explicitly driven by asset-exploration strategies, this should translate into significant differences in the performance of their affiliates, especially when they are based in more developed markets. The results of this paper confirm this hypothesis showing that EMNEs' affiliates in Europe are still at the bottom of the productivity ladder, registering a productivity gap around 30 percentage points (p.p.) with more established competitors, a gap which rises up consistently (around 45 p.p.) when they are compared with United States (US) affiliates.

The analysis goes further, however. Exploiting the richness of the data and employing different estimation techniques, it is shown that this effect is not homogeneously distributed

and that it varies in terms of sectorial distribution and technology intensity of activities performed, as well as by geographic destination. Moreover, firms' heterogeneity plays a key role given that productivity differentials are largely accounted for the least productive firms, while those at the top of the distribution tend to reach similar performances than their more established competitors, especially in services.

The remaining sections of the paper are structured as follows. Section 1 introduces the research background. Section 2 presents the data used for the analysis and some descriptive evidence of the presence of EMNEs in Europe as well as the methodology adopted to calculate the different indicators of firm-level performance, with particular attention to TFP. The methods adopted for the empirical analysis and the results are discussed in Section 3. Section 4 concludes.

1. Background

So far, the evidence on the productivity premium of MNEs' subsidiaries has been mainly explained by the parent's capacity to transfer their superior assets, especially intangibles, such as better management and organizational techniques or knowledge and technologies (Bloom et al., 2012). Given that most of the existing evidence has been focussing exclusively on subsidiaries from advanced countries' MNEs, this is still an unexplored issue for EMNEs. Most of the existing literature on EMNEs, in fact, has so far been looking at their location choices (Buckley et al., 2007; Carvalho et al., 2010) and entry modes (Rui and Yip, 2008; de Beule et al., 2014), putting emphasis on some of their unconventional features. For the purpose of this work, two of these features can contribute to explain the differences in performance of their foreign subsidiaries relative to MNEs from developed countries.

The first is the prevalence of asset-*exploring*, rather than asset-*exploiting*, motivations, especially when they invest in more advanced markets. This is nowadays a stylized fact in the literature, and it is especially true in the case of Mergers and Acquistions (M&As), often used to acquire the strategic resources needed to offset their competitive disadvantages (Luo and Tung, 2007; Nicholson and Salaber, 2013). According to the resource-based view of the firm (Barney, 1991), in fact, existing resources (including acquired ones) translate into the competitive advantage of firms and are therefore a determinant of their performance. One of the key characteristics of EMNEs has to do with the

nature of their competitive advantage. While MNEs from developed countries are most likely to possess advantages based on the ownership of key assets, such as technologies, brands and other intellectual properties, which give them an edge on productivity, EMNEs seem to rely much more on advantages related to production capabilities, networks and relationships and their organisational structure (UNCTAD, 2006). In addition, country-specific factors that give rise to idiosyncratic competitive advantages play a role in the internationalisation strategies of these firms (Ramamurti, 2009). Related to this, it has been showed that EMNEs invest abroad to get access to the strategic assets they miss with the final objective of acquiring such resources, generating so-called "reverse" spillovers flowing back from the affiliates to the parents (Chen et al., 2012; Giuliani et al., 2014). This has a direct implication on the affiliates' performance. If the aim of the investors is to acquire assets, reverse spillovers shall contribute to improve the performance of the parent company rather than of the foreign affiliate. But, while there is already some evidence showing how FDI do contribute to enhance the EMNEs' performance back home (Gubbi et al., 2010; Chen et al., 2012), little is still known on what happens at the subsidiary's level. A case study based analysis on EMNEs investments in Europe has brought some direct evidence on their "predatory" behaviour, which result in a negative effect at the level of the subsidiaries (Giuliani et al., 2014). Since, as mentioned, this strategy is more likely to be pursued through M&As, only a few studies have so far looked at the post-acquisition performance of foreign affiliates. The work by Chari et al. (2012) shows interestingly that after having been acquired by an EMNE, US firms experience a restructuring resulting in a reduction in their scale, including capital and sales. Buckley et al. (2014), on the other hand, look at EMNEs' acquisitions in advanced economies, and show that a negative impact on the performance of the acquired firms is correlated with a the level of unexperience of EMNEs.

Indeed, the second feature of EMNEs' internationalization has to do with the difficulties encountered by many EMNEs in their investment process, especially when their affiliates are located in more advanced economies. As latecomers in international markets (Mathews, 2006), EMNEs often invest abroad with little or no prior experience, lacking internal management capabilities[ii] and a complete knowledge over western style managerial practices and the social and economic aspects of the host country markets (Rugman and Li, 2007). This goes against traditional theories of international business, which have long highlighted how the process of internationalisation strongly relies on knowledge of foreign markets, accumulated experience of foreign business operations and an understanding of how

cultural distance with a host country can affect firm performance (Vernon, 1966; Johanson and Vahlne, 1977). In addition, it has been showed that previous investment experience moderates the relationship between firms' resources and affiliates' performance, allowing EMNEs to adapt their resources to the local context and exploit the full contribution of the target (Saxton, 1997; Buckley et al., 2014). Such accellerated internationalization process raises up risks related to the "liability of foreigness" or the "pyschic distance", often mentioned among the main causes of unsuccessfull takeovers or underperforming investments in advanced economies[iii] (Goldstein, 2007; Spigarelli et al., 2013; Deng, 2009). More recently, IB scholars have highlighted an additional risk faced by EMNEs, which has been labelled the "liability of origin", and that can influence the performance of the investment due to concerns related to the country firms come from rather than the one they invest in (Ramachandran and Pant, 2010). In light of such discussion, it is possible to assume that early internationalisation strategies of EMNEs, characterised by a lack of experience in diverse economic and cultural contexts and poor management capacities, should translate into productivity differences of their affiliates with established competitors, especially when the investments are directed to more developed markets.

2. Data and Descriptive Statistics

The data used for this work come from Amadeus, a firm-level database published by Bureau van Dijk. Amadeus has been used in the literature for multiple purposes, including the analysis of MNEs' performance (see, among the others, Helpman *et al*., 2004; Bloom *et al*., 2012). The database tracks a wide range of balance-sheet information for firms located in all European countries, including those outside the European Union (EU).[iv] Europe provides an ideal benchmark for analysing the relative performance of EMNEs. It offers these firms access to a large market, as well as advanced technologies and know-how for their asset-seeking investments.

A further advantage of the Amadeus dataset here is that it provides full information on the ownership structure of each company, including the degree of domestic and foreign ownership. This is important in constructing groups with clear-cut definitions of the nationality of foreign affiliates. For the purpose of this study, foreign affiliates are classified according to the nationality of their Global Ultimate Owner (GUO), defined as the corporate entity holding a controlling stake greater than 50.01 per cent.

Unfortunately, the dataset does not provide information on the year of entry of the

foreign investor nor on the establishment mode, thus limiting the scope for running panel-data analyses. Thus, any foreign ownership status can be attributed to the firm only for the last year for which data are available (2011), thing that in any case has a significant implication on the analysis, since it allows to compare firms' performance in the aftermath of the financial crisis.

Though widely adopted in the literature, the term "EMNEs" has no clear-cut boundaries. Most of the studies adopting this label refers more generally to firms from middle and low income countries (UNCTAD, 2006; Chen *et al*., 2012) or to the bigger emerging economies, especially China and India (Athreye and Kapur, 2009), while others have included also companies from higher income countries such as South Korea, Taiwan and Hong Kong (Mathews, 2002) or, still, from Eastern Europe (Svetlicic, 2004) and Turkey (Bonaglia *et al*., 2007). For the purpose of this analysis, only the group of EMNEs from the so-called BRICS countries are included, considering that they are the largest sources of OFDI from non-developed countries accounting for around 10% of global outflows of FDI (UNCTAD, 2013) and that some of the most relevant cases of such new MNEs originate from these countries (Goldstein, 2013).

Our database includes 2,013 European affiliates of BRICS EMNEs[v]. Indian firms are the most represented (over 39 per cent of the sample), and Brazilian companies the least (below 10 per cent). China, Russia and South Africa share the remaining in almost equal parts. FDI from BRICS EMNEs are concentrated at both the geographic and the sectorial levels. More than half of the foreign affiliates are located in the UK, the Netherlands and Germany. The top ten destinations (which includes all the major Western countries and Ukraine) account for almost 81 per cent of the total. As for the sectorial distribution, services (including financial services and trade) prevail over manufacturing activities, which are more concentrated in medium-technology industries such as machinery, chemicals and metals.

In the following discussion, EMNEs are compared against other firms grouped into the following categories:[vi]

- ***US MNEs*:** including the affiliates of US MNEs;
- ***OECD MNEs*:** including the affiliates of traditional high-income OECD countries (excluding US) MNEs;[vii]
- ***Other EMNEs*:** including affiliates from countries not in the previous categories, e.g. affiliates from emerging and developing countries (other than

BRICS).

As it is standard in such kind of analyses, the performance of foreign affiliates needs a comparison group, which is normally identified in randomly selected domestic companies in the host country. However, as remarked by some authors (Criscuolo and Martin, 2009; Temouri et al., 2008), this might lead to a "selection problem", given that domestic plants include both non-MNEs and MNEs, which can rival foreign-owned firms in terms of productivity levels. Thus, the superior productivity performance of foreign firms may not be a foreign ownership advantage per se, but may simply reflect a MNE advantage. With this purpose in mind, in order to make such comparison more robust, we create a reference group made by ***Domestic MNEs*** only, i.e. includign only firms based in the European countries in the sample and being identified as the GUO of at least one subsidiary abroad.

2.1 Measuring a firm's productivity

In the rest of the paper, the performance of the different groups of firms considered is compared using indicators of productivity, generally understood as the ability of a firm to transform inputs into outputs.

The literature provides several measures of firm productivity. Easy-to-compute measures include Labour Productivity, which is computed as a ratio between value added and the number of employees. Here, a relatively productive firm is one that produces more output with fewer workers.

This said, the rest of the paper will focus on measures of Total Factor Productivity (TFP), a more precise indicator of productivity.

The production function is assumed to take the form of a standard Cobb-Douglas:

$$Y_{it} = A_{it} L_{it}^{\alpha_L} K_{it}^{\alpha_K} M_{it}^{\alpha_M}, \qquad \alpha_L, \alpha_K, \alpha_M > 0\,, \tag{1}$$

where Y_{it} represents the output, L_{it}, K_{it}, M_{it} the inputs in the form of labour, capital and intermediate inputs, and A_{it} is the Hicks-neutral efficiency level that represents the TFP of firms. At the firm level, A includes difficult-to-measure factors such as R&D stocks, technology, quality and marginal efficiency.

Transforming (1) into logarithms allows to introduce a linear estimation of the production function (small letters represent logs):

$$y_{it} = \beta_0 + \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + v_{it} + \varepsilon_{it} \quad , \qquad (2)$$

where the error term has two components, v_{it}, which represents the level of productivity of the firm, and ε_{it}, the i.i.d. component that is uncorrelated with input choices. v_{it} represents the key variable to be computed after having estimated (2) and solved for $\widehat{\omega}_{it}$ as the standard Solow residual:

$$\widehat{\omega}_{it} = \hat{v}_{it} + \hat{\beta}_0 = y_{it} - \hat{\beta}_l l_{it} - \hat{\beta}_k k_{it} - \hat{\beta}_m m_{it} \quad . \qquad (3)$$

Considering that $\widehat{\omega}$ is observed by the firms and influences their choice of inputs, making the error term correlated with the dependent variables in (2) and thus the coefficients of a standard OLS model biased, alternative methods to estimate TFP have been proposed in the literature (for review, see van Beveren, 2012). More consistent approaches include adopting semi-parametric estimators using proxies to correct for the unobservable productivity shocks and input levels. Olley and Pakes (1996) use investments decisions, while Levinsohn and Petrin (LP) (2003) adopt intermediate inputs as proxies. The latter approach improves on the former in two ways. The first is that investment (given its lumpy nature) is a proxy that can only adjust smoothly to productivity shocks. The second issue is computational feasibility. Firms often report more regularly on the usage of intermediate inputs rather than on investments.

Wooldrige (2009) recently proposed a GMM framework with two equations using the same dependent variable, but different sets of instruments. As affirmed by the same proponents of the LP estimator in a more recent work (Levinsohn and Petrin, 2012), this approach improves on the former in a number of ways, including the simultaneous determination of inputs and technical efficiency, as well as eliminating problems of over-identification of the parameters for labour and intermediate inputs in the first-stage equation. For the above reasons, WLP is used as the main specification for the empirical analysis.

Estimates of TFP functions have been run separately for each industry identified by its 2-digit NACE (Rev. 2) code.[viii] Output is measured by value added, labour by the number of employees, capital by total assets,[ix] and intermediate inputs are proxied by the cost of materials. All variables reported in monetary terms are deflated with Eurostat industry price indexes.

Average productivity of the different groups of foreign affiliates are reported in Table 1. Not surprisingly, a rank seems to emerge quite clearly from these statistics, with MNEs from more advanced countries recording higher levels of productivity, and EMNEs' affiliates holding back, suggesting the existence of a productivity gap.

Table 1. Summary statistics, TFP

	Obs.	Mean	Std. Dev.	Min	Max
All sample	39170	5.078037	2.634094	-3.263354	11.8935
US	3823	5.564613	2.580588	-3.154404	11.87899
OECD	19988	5.166945	2.619829	-3.263354	11.8935
Domestic	13196	4.859186	2.637533	-3.257016	11.88847
BRICS	613	4.79315	2.832799	-2.741264	11.83744
Other	1314	4.655029	2.588386	-3.256499	11.45533

3. Results

Testing for the existence of a productivity ranking among MNEs has mainly been done with non-parametric tests of stochastic dominance (Gelübcke, 2013) or through traditional regression analyses that include dummies related to the nationality of MNEs (Temouri *et al*., 2008; Bloom *et al*., 2012). The following discussion presents alternative approaches to obtain a more precise assessment of the performance of EMNEs and compare them with restricted groups of competitors. More specifically, section 3.2 presents results based on a quantile regression approach. Quantile regression allows to understand whether the average differences in performance that are found by the OLS regressions can be generalized to account for the high heterogeneity in terms of productivity levels of foreign affiliates included in the sample. In more practical terms – compared to the OLS results – this will allow to know whether EMNEs' affiliates experience a more (or less) severe gap as far as higher levels of productivity are taken into account. Furthermore, section 3.3 presents results based on propensity score matching estimators. This approach is particularly useful in the context of this paper, since it allows to compare the performance of BRICS EMNEs' affiliates with a sub-sample of affiliates from other countries that share with them a set of similar characteristics related to their ownership structure. As a matter of fact, it is based on such more detailed comparison that we are able to quantify more precisely the size of the difference in the relative performance among the groups considered.

3.1. Regression analysis

An OLS estimator with robust standard errors on TFP values is estimated according to the following equation:

$$\widehat{\omega}_{i,x} = \beta_1 \text{Controls} + \beta_2 \text{FO} + \tau_x + \delta_j + \varepsilon_{i,x} , \qquad (4)$$

where $\widehat{\omega}_{i,x}$ refers to the logarithm of TFP computed at firm *i* and sector *x* level. Controls include both firm specific variables, i.e. the size of the affiliates (*SIZE*), firms' age (*AGE*) and their relative capital endowments (*K/E*), as well as country specific ones. Among the latter, we consider the impact of geographic (*DIST*) and cultural distance (*CSL*)[x] between the affiliate's country of origin and the host country. FO is a set of dummy variables representing the different groups of affiliates, as described in section 2, while τ_x and δ_j are two-digit sector and host country dummies, respectively. Summary statistics are reported in table A1 in the appendix, together with a description of the variables.

Results of the general model are reported in Table 2, for different measures of firms' performance, including labor productivity and TFP estimated by the OLS, LP and WLP approaches. This comparison shows that results are generally robust to the adoption of the different indicators of productivity, leaving high confidence on the predictive capacity of the model. Besides running the model on the sample as a whole, Table 3 reports the results by disaggregating the data by main sector and technology/knowledge intensity as well as at geographic levels.

Next, comments on the results will be based on columns IV-VI of Table 2, and discussed jointly with more detailed findings from Table 3.

Table 2. Regression Results, TFP (Reference group: Domestic MNEs)

	(I) lab_prod	(II) tfp_OLS	(III) tfp_LP	(IV) tfp_WLP	(V) tfp_WLP	(VI) tfp_WLP
SIZE	-0.4188***	0.0326***	0.0874***	0.0743***	0.0742***	0.0741***
	[0.008]	[0.005]	[0.006]	[0.006]	[0.006]	[0.006]
DIST	0.0248***	-0.0219***	-0.0183***	-0.0158***	-0.0158***	-0.0161***
	[0.007]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
CSL	-0.0354	-0.0469**	-0.0554***	-0.0557***	-0.0554***	-0.0628***
	[0.028]	[0.020]	[0.021]	[0.021]	[0.021]	[0.021]
CSL*BRICS						0.5326***
						[0.194]
K/E	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AGE	0.0881***	0.0423***	0.0486***	0.0479***	0.0495***	0.0476***
	[0.011]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
AGE*BRICS					-0.0789	
					[0.068]	
US	0.1646***	0.1835***	0.1871***	0.1837***	0.1839***	0.1812***
	[0.026]	[0.019]	[0.020]	[0.020]	[0.020]	[0.020]
OECD	0.0257	0.0771***	0.0702***	0.0642***	0.0643***	0.0612***
	[0.016]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
BRICS	-0.1671***	-0.0975***	-0.1326***	-0.1352***	-0.0997*	-0.2185***
	[0.051]	[0.038]	[0.039]	[0.039]	[0.052]	[0.052]
OTHER	-0.1157***	-0.0805***	-0.1078***	-0.1108***	-0.1106***	-0.1090***
	[0.038]	[0.027]	[0.029]	[0.028]	[0.028]	[0.028]
Constant	12.0920***	1.6687***	5.4263***	-2.2847***	-2.2858***	-2.2739***
	[0.105]	[0.066]	[0.078]	[0.072]	[0.072]	[0.073]
Observations	30,674	30,674	30,673	30,663	30,663	30,663
R-squared	0.324	0.796	0.947	0.946	0.946	0.946
Country effects	Yes	Yes	Yes	Yes	Yes	Yes
Sector effects	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Overall, coefficients representing size, age and relative capital endowments show a systematic positive correlation with productivity[xi], confirming previous literature on heterogeneous firms. The positive coefficient of the age of the affiliate, a proxy for experience, is relevant to the case of EMNEs, since many of them invested more recently and might therefore not enjoy this positive effect, as discussed in section 1. In view of this, in column V, this coefficient is interacted with the BRICS dummy to check whether the effect is the same compared to the rest of the sample. Not surprisingly, the sign of the new coefficient is negative (though not significant), supporting the view the lack of experience is negatively related to the performance of EMNEs' affiliates.

Both the coefficients measuring the geographic and cultural distance between the host and home countries of the MNEs report a negative relation. While the result on the

geographic distance is in line with findings of earlier studies (Helpman *et al*., 2004), suggesting that the productivity premium reduces as MNEs move to more distant markets as it makes it harder to transfer resources from the parents[xii], the result on the common language variable is more surprising. This result shows in fact that cultural proximity in terms of communication capacities negatively influence performance. Given the large size of the sample, it could be argued that such result is influenced by the high heterogeneity among foreign affiliates, and hardly fit the specific case of EMNEs. Thus, also in this case, column VI introduces an interaction term between the CSL and the BRICS variables. As it is possible to see, the sign of the coefficient switches to positive (keeping also its statistical significance), proving that the cultural proximity is a relevant dimension to explain the performance of EMNEs, especially in more distant markets such as the European ones.

Moving to the other variables, the results confirm existing literature (Bloom *et al*., 2012; Criscuolo and Martin, 2009) in that they show a superior performance of US affiliates, whose premium is constantly above the average of domestic MNEs, and larger compared to the other groups. Somewhat in line with the findings by Bloom *et al*. (2012), US affiliates show a higher performance in technology-intensive industries within the manufacturing (Column II in Table 3) and in knowledge intensive services (Columns V-VII). A similar pattern is observed when looking at the performance of affiliates from other high-income OECD countries, whose premia are nonetheless consistently smaller compared to their US counterparts.

When looking at the performance of EMNEs' affiliates, the results reveal that on average they are less productive than their competitors and domestic MNEs. Notably, BRICS EMNEs show a significant productivity gap in the manufacturing sector. This gap significantly increases when more technology-intensive sectors are taken into account (Column II in Table 3). Interestingly, they are also less productive in services, and especially in IT intensive ones (Column VII). Taken together, these results seem to support some of the more general assumptions made in section 1, and especially that EMNEs (i) pay for their lack of a set of sound ownership advantages; and (ii) tend to invest more in those advanced contexts and industries where they can gain access to the resources necessary to fill their gap with competitors (Hp. 1).

Indeed, only EMNEs' affiliates based in Western European countries report a significant productivity gap (Column IX in Table 3). This is consistent with other evidence that supports the asset-augmenting nature of EMNEs' investments in richer countries such as

the UK, France, Germany and Italy, or in R&D-intensive sectors in the sub-continent (Di Minin *et al*., 2012; Carvalho *et al*., 2010). On the other hand, no such gap is recorded when considering the sub-sample of affiliates in Eastern Europe. Though the limitation of the data do not allow to explore this argument further, a potential explanation could be that Eastern European countries provide EMNEs' affiliates with a less complex context to explore, and are approached through more traditional modalities and motivations.

Table 3. Regression Results, TFP (Reference group: Domestic MNEs)

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
	MANUFACTURING			SERVICES					European countries	
	Total	High-tech	Low-tech	Total	kis	k_mkt_serv	k_it_serv	lkis	west	east
SIZE	0.1495***	0.1887***	0.1097***	0.0465***	-0.0060	-0.0687***	0.0684***	0.0816***	0.0761***	0.0326
	[0.008]	[0.012]	[0.012]	[0.007]	[0.015]	[0.021]	[0.022]	[0.009]	[0.006]	[0.035]
DIST	-0.0120*	-0.0355***	0.0097	-0.0185***	-0.0152	-0.0531***	0.0135	-0.0270***	-0.0167***	-0.0305
	[0.007]	[0.010]	[0.010]	[0.007]	[0.013]	[0.019]	[0.021]	[0.009]	[0.006]	[0.024]
CLS	-0.0030	-0.0772*	0.0590	-0.0993***	-0.0744	-0.1650**	-0.0528	-0.1180***	-0.0583***	-0.0562
	[0.028]	[0.040]	[0.038]	[0.028]	[0.052]	[0.077]	[0.077]	[0.036]	[0.021]	[0.095]
K/E	0.0000***	0.0000***	0.0000	0.0000***	0.0000***	0.0000***	0.0000***	0.0000*	0.0000***	0.0000**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AGE	0.0441***	0.0648***	0.0208	0.0489***	0.0459**	0.0427*	0.0773***	0.0476***	0.0500***	-0.0204
	[0.012]	[0.017]	[0.017]	[0.011]	[0.018]	[0.025]	[0.029]	[0.015]	[0.009]	[0.052]
US	0.1055***	0.1361***	0.0767**	0.2318***	0.2255***	0.2896***	0.1635**	0.2500***	0.1807***	0.6667***
	[0.027]	[0.038]	[0.039]	[0.027]	[0.050]	[0.076]	[0.078]	[0.033]	[0.020]	[0.205]
oecd	0.0563***	0.0678***	0.0346	0.0623***	0.0405	0.0606	-0.0072	0.0890***	0.0617***	0.2000**
	[0.017]	[0.025]	[0.024]	[0.016]	[0.030]	[0.043]	[0.050]	[0.021]	[0.012]	[0.081]
brics	-0.1451**	-0.1893**	-0.1145	-0.1407***	-0.0405	0.1171	-0.2309*	-0.1243*	-0.1505***	0.0867
	[0.056]	[0.075]	[0.083]	[0.053]	[0.092]	[0.137]	[0.127]	[0.067]	[0.042]	[0.113]
other	-0.0488	0.0160	-0.1264**	-0.1657***	-0.1962**	-0.1622	-0.2787**	-0.1464***	-0.0921***	-0.0949
	[0.040]	[0.061]	[0.054]	[0.038]	[0.080]	[0.116]	[0.130]	[0.044]	[0.032]	[0.085]
Constant	2.7707***	4.9155***	2.6980***	1.7253***	-1.8693***	-1.4327***	3.6087***	4.0067***	-2.2774***	-3.3053***
	[0.071]	[0.096]	[0.097]	[0.077]	[0.145]	[0.196]	[0.215]	[0.087]	[0.075]	[0.237]
Observations	11,195	5,395	5,800	19,187	7,015	3,769	2,507	10,665	29,588	1,075
R-squared	0.952	0.947	0.944	0.942	0.955	0.924	0.974	0.929	0.947	0.939
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in brackets,
*** p<0.01, ** p<0.05, * p<0.1

Note: Manufacturing sector includes NACE Rev. 2 codes 10-33; high-tech includes industries classified by Eurostat at high- and medium-high- technology intensity in the production process; low-tech includes industries classified by Eurostat at medium-low- and low- technology intensity in the production process; Services NACE codes 35-99; kis includes knowledge intensive services; k_mkt_serv includes knowledge intensive market services; k_it_serv includes high-tech knowledge intensive services; lkis includes less knowledge intensive services. For more information on Eurostat classification, see:
http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an3.pdf

3.2. Quantile regression analysis

While previous results provide a fairly clear picture of the differences in the average productivity among various groups of affiliates, this section tries to move further to examine the shape of the distribution of TFP.

This section presents results based on a quantile regression approach to examine the partial effects of the explanatory variables across the different segments of productivity distribution. Technically, this is done by minimising the sum of the squared deviation of the dependent variable from the respective mean of the deciles of the series, i.e. by modifying (6) as follows:

$$\mathrm{Quant}\left(\widehat{\omega}_{i,x}\middle|\mathrm{X_i}\right) = \beta_\theta \mathrm{Controls} + \beta_\theta \mathrm{FO} + \tau_x + \delta_j + \varepsilon_{i,x} \qquad (5)$$

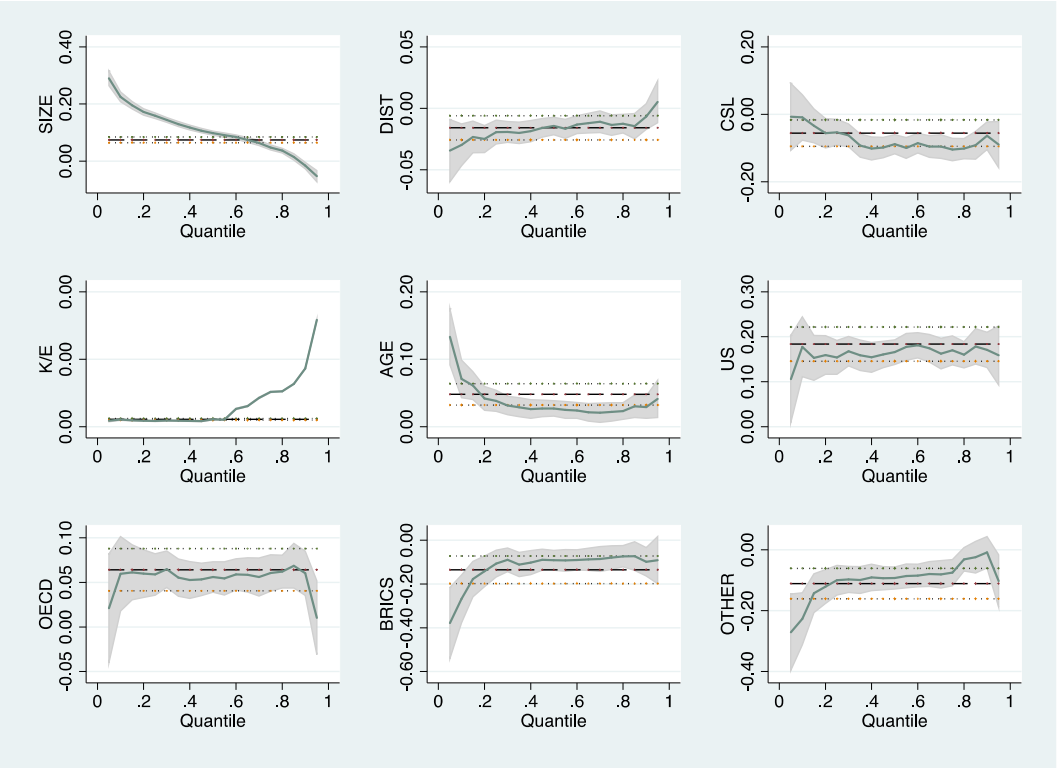
where X_i is the vector of exogenous variables affecting the distribution of the dependent variable, and β is the vector of parameters to be estimated corresponding to the θ^{th} conditional decile of the productivity of the firms. Compared to a standard OLS estimator, quantile regression is robust to the presence of outliers and sample heterogeneity, and more flexible with regard to assumptions about the parametric distribution of the errors (Wooldridge, 2010). In order to get more correct standard error and to account for the large number of dummies, estimations of (7) have been computed with bootstrapped standard errors.

The results, reported in Table A2 in the Appendix are plotted in Figure 1 for the overall sample and in Figures A1 and A2 (in the Appendix) for the manufacturing and the services, respectively.

Overall, size, age and the relative capital endowments generally keep their positive sign, but nonetheless follow two distinct trends. While the importance of company's size and age tends to be reduced in correspondence to higher levels of productivity, the opposite is true for capital endowments. The latter are more relevant predictors of productivity only when firms at the top of the distribution are duly taken into account, meaning that the more productive firms (and especially those in the services) are those using a larger share of (tangible and intangible) assets compared to labour. Interestingly, the coefficient representing the distance also shows an upward trend, meaning that more productive firms are only marginally (if at all) affected by the higher costs related to investing in geographically distant markets, and thus that the distance matters more for least productive firms. Conversely,

differently from the results observed in Table 2, cultural proximity still appears to be positively related to firms' performance for firms at the lower deciles of the productivity distribution, especially when looking at the manufacturing sector only (Figure A1).

Figure 1. Coefficients of quantile regression analysis, whole sample



Source: Author's elaboration using the STATA command grqreg.

Looking at the foreign ownership of firms, the results suggest stability in developed-country affiliates' behaviour. Both US and other OECD affiliates report rather stable productivity premium compared to domestic MNEs, given that their coefficients are very close to the average values reported in Table 2. Conversely, the behaviour of EMNEs' affiliates (both from the BRICS and other countries) vary according to the levels of productivity, showing a progressive reduction of the gap with domestic MNEs as the productivity distribution moves to upper levels. In the case of BRICS affiliates, the gap is stronger for less productive firms and reduces as higher values of the distribution are approached. When considering the main sectors separately (Figures A1 and A2), this pattern becomes more evident in the services, where for firms at the top two deciles of the distribution the gap even disappears. This seems to suggest that the group of EMNEs' affiliates based in Europe is quite heterogeneous. At the top of the distribution, in fact, it

includes firms that are already at similar levels of productivity compared to the most productive domestic MNEs. This is in line with the existing evidence, which shows how some of the most successful cases of EMNEs, including those with affiliates in Europe, are already as competitive as traditional MNEs. Examples of EMNEs fitting this description include Haier and Huawei from China, Tata and AcelorMittal from India, Embraier from Brazil, Gazprom from Russia and Sab Miller from South Africa. These companies are generally considered established players globally in their sectors of specialisation (Atrheye and Kapur, 2009; Goldstein, 2013).

3.3. Propensity score matching

Having proven the existence of significant productivity differentials between groups of affiliates based in Europe, the objective of this section is to provide a more precise estimation of the gap between those belonging to EMNEs and their competitors.

To isolate the performance differentials of EMNEs' affiliates against their counterparts, we match firms with the same observable characteristics but their country of origin by performing a propensity score matching. There are two main advantages of the matching procedures over the regression analyses: (i) first, matching, under the common support condition, focuses on comparable subjects only; (ii) second, it is a non-parametric technique, thus avoiding potential misspecification of the conditional mean.

Propensity scores are first computed to select from other sample firms as close as possible to EMNEs' affiliates in terms of structure (measured by turnover and the total number of employees), age, legal form (public, private, other), sector (according to 1-digit NACE rev. 2) and destination country. The nearest neighbour matching without replacement and with common support is then used to compare EMNEs' affiliates with a control group of firms that share similar characteristics with the exception of their origin, on the basis of their propensity scores, by means of the Leuven-Sianesi (2003) algorithm. Formally, the average treatment effect (ATT) that results from this match is equal to the differences in the average outcomes for the firms included in the treated and those in the control group (Imbens and Wooldridge, 2009):

$$\hat{\alpha} = \mathrm{E}(y^{t}\text{-}y^{c}|\mathrm{D}=1) = \mathrm{E}(y^{t}|\mathrm{D}=1)\text{-}\mathrm{E}(y^{c}|\mathrm{D}=1)\,, \qquad (6)$$

where y^t and y^c are the outcomes of the treated and the control groups, respectively, and D is a

dummy equal to 1 if the firm is treated.

Propensity score matching estimators rely on the so-called balancing hypothesis, which means that observations with the same score need to have the same distribution of the observable characteristics independently of the treatment. This hypothesis can be tested both before and after the matching, and the two samples are considered well-balanced when the standardized percentage bias is minor or around the 5 per cent threshold, and that the t-tests on the selected variables are not significant (Rosenbaum and Rubin, 1985). Furthermore, following Sianesi (2004), a comparison of the *pseudo* R^2 before and after the matching is performed. As the *pseudo* R^2 represents an indicator of how well the regressors explain the probability of selection, after matching its value should reduce considerably compared to before the procedures.

Average differences in the TFP between the treatment and the control groups are used to measure of the impact of the nationality of the affiliate on its productivity.

Table 4 reports the results of the tests performed to control for the balancing of the samples before and after the matching procedures. Overall, the table shows that the balance hypothesis is generally respected given that after matching the standardized percentage bias goes consistently below 5 per cent, that the t-tests are not significant and that the *pseudo* R^2 reduces consistently.

Table 4. Sample bias distribution and Pseudo R2 before and after matching

	Sample	Pseudo R2	LR chi2	p>chi2	MeanBias	MedBias
BRICS/total	Raw	0.083	467.49	0	11.6	7.9
	Matched	0.006	8.8	1	2.4	1.7
BRICS/US	Raw	0.124	388.9	0	12.3	7.1
	Matched	0.005	7.62	1	2.7	2.6
BRICS/OECD	Raw	0.108	527.69	0	12.4	10.8
	Matched	0.021	32.62	0.339	4.3	2.8
BRICS/DOM	Raw	0.192	832.21	0	15.2	10.4
	Matched	0.017	26.75	0.771	3.7	3.1
BRICS/OTHR	Raw	0.101	219.93	0	11.5	10.4
	Matched	0.009	14.18	0.997	3	2.3

Table 5 reports the results, which confirms the overall trends depicted in Table 2, but

adding more detailed insights based on the direct comparison between affiliates from BRICS EMNEs with all the other groups taken individually. Based on such comparison, it comes clearly out that the levels of productivity of BRICS' affiliates lag behind those of the main groups of foreign companies. On the other hand, when compared to the residual group that includes affiliates from other emerging and developing countries, the results report a slight (but not significant) advantage for BRICS companies. It is relevant to observe that these results are consistent to the adoption of different matching strategies, as showed in tables A3 and A4 in the appendix, where 2 and 3 nearest neighbours have been used as robustness checks, resulting in very close ATTs compared to those reported in Table 5.

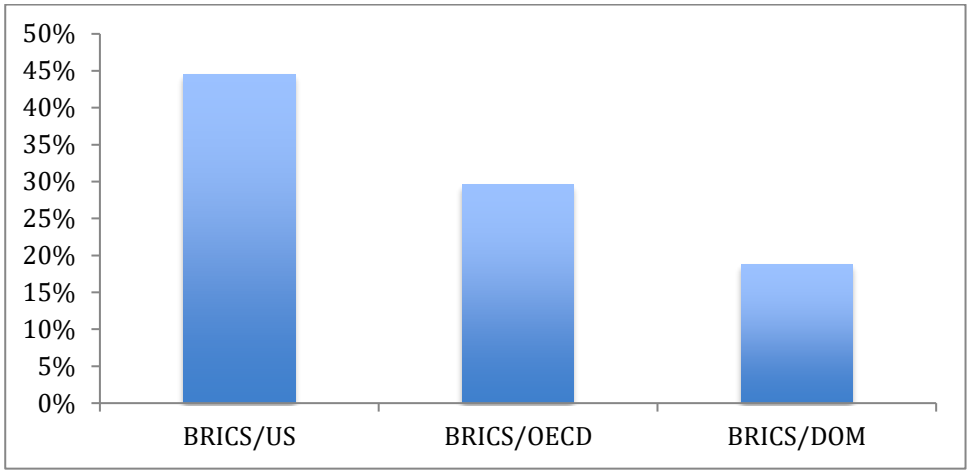
Table 5. Difference in TFP after matching

		Treated	Controls	Diff	s.e.	T-stat
ATT	BRICS/total	4.80799	5.17444	-0.36645**	0.15766	-2.32
ATT	BRICS/US	4.85966	5.44921	-0.58955***	0.16928	-3.48
ATT	BRICS/OECD	4.83108	5.18194	-0.35086**	0.16596	-2.11
ATT	BRICS/DOM	4.80616	5.01477	-0.20861	0.16150	-1.29
ATT	BRICS/OTHR	4.80799	4.70549	0.10250	0.16085	0.64

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

Recalling that the difference between the logs reported in the fifth column of Table 5 represents the log of the ratio between the ATT of treated and controls, the exponential of the value shows that BRICS' affiliates average around 70 per cent of the productivity level of other firms. Thus, based on such calculations, it is possible to affirm that the average productivity gap of BRICS EMNEs ranges between 19 percentage points with domestic MNEs and rises up to 44.5 points with US affiliates, i.e. those at the very top of the productivity frontier (Figure 3).

Figure 3. The productivity gap of EMNEs with other groups (percentage points)



Source: Author's elaboration

As an additional robustness check, a similar exercise is performed to compare the relative performance of BRICS firms in Europe, using labour productivity as an alternative indicator of performance (Table 6). In line with previous findings, the results report a gap between BRICS effiliates and others, with similar magnitudes on average, but this time the gap is larger when they are compared to domestic MNEs.

Table 6. Difference in labor productivity after matching

		Treated	Controls	Diff	s.e.	T-stat
ATT	BRICS/total	11.12941	11.31404	-0.18463**	0.08286	-2.23
ATT	BRICS/US	11.28564	11.64619	-0.36055***	0.07540	-4.78
ATT	BRICS/OECD	11.12997	11.38760	-0.25763***	0.08209	-3.14
ATT	BRICS/DOM	11.14452	11.60608	-0.46157***	0.08877	-5.2
ATT	BRICS/OTHR	11.12941	11.12615	0.00326	0.07991	0.04

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

4. Conclusions

Recent research has emphasised the unconventional nature of FDI from emerging market multinational enterprises. Rather than investing to exploit their existing assets, many EMNEs invest abroad at an early stage of their internationalisation process, despite the fact that they still lack sound ownership advantages, including managerial capacities. This behaviour challenges existing theory on multinational investment strategies.

If it is true that the competitive advantages transferred from parent companies to affiliates are inferior or only equal to those of other firms in the host countries and that EMNEs lack the international experience and organisational practices that would enhance their competitive advantage, and that the motivation for their investments, especially in advanced countries, is to gain access to new assets and capabilities, one would reasonably expect such firms to invest from the bottom of the international productivity ladder.

Based on a large database on foreign affiliates and domestic MNEs in Europe, this paper tested this hypothesis, measuring the relative performance of BRICS' and developed countries' foreign affiliates using several methodologies.

In line with the expectations, the results show that EMNEs' affiliates based in Europe are still at the bottom of the productivity ladder. In addition, they show that the productivity gap between EMNEs' affiliates and others is significantly larger in more sophisticated industries within the manufacturing and the services. Geographically, the gap appears to be relevant only for investments directed to Western Europe.

When the performance of EMNEs' affiliates is compared over the different deciles of productivity by means of quantile regression analysis, the results show that the productivity gap is lower for those at the top of the distribution, especially in the services. Again, this is in line with the existing evidence that shows how some of the most successful EMNEs, including those based in Europe, have achieved levels of competitiveness already comparable to traditional MNEs.

The results from semi-parametric tests based on matching estimators show that the productivity gap of affiliates of BRICS EMNEs can be still set around 30 p.p. of that of MNEs' affiliates sharing similar characteristics (with the exception of country of origin), and becomes even larger when they are compared to US' affiliates. Consistent differences are also found when comparing firms according to other performance indicators than TFP, including in particular labor productivity.

That said, the discussion of these results lead to important managerial and practical implications. This work shows that attracting EMNEs or traditional MNEs can result in different impacts for the host economies. Looking at the overall performance of the economy, in particular, the results seem to indicate that attracting EMNEs leads to a reduction in the average productivity levels of the industries where they operate. In addition, the scope for technology- and knowledge-spillovers may be marginal while the motivations for EMNE investment is to obtain access to such strategic assets, rather than transfer them to the host

country. Even if – due to data limitations – a more detailed analysis of the specific causes of the productivity gap is out of the scope of this paper, these effects can be attributed to different factors. On the one hand, as productivity is mostly about the organization of the production process rather than the consistency or the cost of resources, intangible assets including management and organisational practices or knowledge and technologies are more easily transferred from advanced markets' MNEs to their affiliates (Bloom et al., 2012) rather than from EMNEs, which still lags relatively behind in these dimensions, and are more likely to transfer tangible assets (Buckley et al., 2014). In addition, compared to their counterparts from advanced economies, and especially from the US, managers of EMNEs seem still to pay their lack of international experience, as well as the pressure to undertake early internationalization to fastly catch-up with their competitors. Following the existing evidence on EMNEs, this seems especially true in the case of M&As, some of which have consistently underperformed, if not failed, due to the above mentioned reasons (Rugman and Li, 2007; Spigarelli et al., 2013). On the other hand, the causes of EMNEs' affiliates lower performance need to be analysed together with the motivation of the investment. Asset-seeking investments from EMNEs are, in most cases, finalized to bring back home the resources accessed abroad with the explicit aim of improving the parent performance. In some cases, such "predatory" strategies, as showed by some case-study based analysis (Giuliani et al., 2014), may results in little or not transfer of resources to the affiliates, whose performance can therefore even worsen over time.

If, as discussed, this paper brings some new evidence to the existing literature on the internationalization of EMNEs, there are some limitations to address in future work. Further research is needed to understand the causes of the productivity gap better, as well as the exact nature of the assets transferred to the parent firms and, more generally, the overall benefits of the investments to the home country. All these questions could be more properly addressed in future work that includes more information on the parent/affiliate relation, the exact motivation of the investment and a panel dimension of the data.

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Appendix

Table A1. Summary Statistics

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
PROD_W	log of TFP, WLP method	39170	5.078037	2.634094	-3.263354	11.8935
PROD_LP	log of TFP, LP method	39180	4.834883	2.677752	-5.271128	13.43674
PROD_OLS	log of TFP, OLS method	39182	4.329386	1.312539	-7.945225	11.0929
LAB_PROD	log of labor productivity	39220	11.25323	1.074743	4.070774	21.3257
SIZE	size classes (1-49; 50-249; >250)	65515	2.008761	0.7715221	1	3
DIST	log of the bilateral distance (in km)	102353	6.668375	1.430732	1.900041	9.88258
CSL	Common spoken language (Prob)	103495	.6588625	.3359504	0	1
K/E	Total assets on employees	62070	2.25E+07	4.04E+08	82.57449	4.21E+10
AGE	age dummy (1 if >10 years and 0 otherwise)	82212	0.4100861	0.491852	0	1
US	dummy, 1 if US MNEs affiliate	102982	0.1216329	0.3268629	0	1
OECD	dummy, 1 if OECD MNEs affiliate	102982	0.5260434	0.4993237	0	1
BRICS	dummy, 1 if BRICS EMNEs affiliate	102982	0.0195471	0.1384384	0	1
OTHER	dummy, 1 if other EMNEs affiliate	102982	0.0438523	0.2047674	0	1

Table A2. Quantile regression analysis, whole sample

	q10	q20	q30	q40	q50	q60	q70	q80	q90
SIZE	0.2250***	0.1724***	0.1440***	0.1175***	0.0980***	0.0843***	0.0636***	0.0368***	-0.0156*
	[0.011]	[0.009]	[0.006]	[0.005]	[0.004]	[0.007]	[0.006]	[0.006]	[0.008]
DIST	-0.0297**	-0.0249***	-0.0191***	-0.0185***	-0.0144**	-0.0132**	-0.0109***	-0.0125**	-0.0067*
	[0.012]	[0.007]	[0.004]	[0.005]	[0.007]	[0.005]	[0.004]	[0.006]	[0.004]
CLS	-0.0090	-0.0559***	-0.0623***	-0.1013***	-0.0885***	-0.0852***	-0.0955***	-0.1017***	-0.0634**
	[0.051]	[0.017]	[0.015]	[0.021]	[0.026]	[0.011]	[0.012]	[0.033]	[0.025]
K/E	0.0000***	0.0000***	0.0000***	0.0000	0.0000	0.0000	0.0000***	0.0000***	0.0000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AGE	0.0709***	0.0418***	0.0314***	0.0261***	0.0270***	0.0240***	0.0207***	0.0231***	0.0291***
	[0.012]	[0.009]	[0.010]	[0.008]	[0.008]	[0.006]	[0.007]	[0.009]	[0.011]
US	0.1776***	0.1593***	0.1679***	0.1543***	0.1657***	0.1810***	0.1625***	0.1601***	0.1709***
	[0.034]	[0.019]	[0.017]	[0.025]	[0.014]	[0.018]	[0.023]	[0.021]	[0.032]
OECD	0.0596***	0.0598***	0.0647***	0.0527***	0.0560***	0.0589***	0.0560***	0.0621***	0.0602***
	[0.022]	[0.012]	[0.007]	[0.012]	[0.008]	[0.009]	[0.012]	[0.017]	[0.012]
BRICS	-0.2679***	-0.1420***	-0.0893***	-0.1024**	-0.0914***	-0.0901***	-0.0858***	-0.0733**	-0.0985***
	[0.084]	[0.050]	[0.025]	[0.042]	[0.018]	[0.028]	[0.030]	[0.032]	[0.038]
OTHER	-0.2267***	-0.1207***	-0.0971***	-0.0908***	-0.0926***	-0.0844***	-0.0804***	-0.0313	-0.0082
	[0.080]	[0.027]	[0.026]	[0.034]	[0.012]	[0.021]	[0.019]	[0.034]	[0.039]
Constant	-3.5645***	-3.3324***	-3.2891***	-2.8552***	-2.8802***	-2.8896***	-2.4448***	-2.3207***	-1.6126***
	[0.310]	[0.657]	[0.477]	[0.289]	[0.396]	[0.366]	[0.414]	[0.449]	[0.514]
Observations	30,663	30,663	30,663	30,663	30,663	30,663	30,663	30,663	30,663

Bootstrapped standard errors in brackets (estimated using STATA's command bsqreg)
*** p<0.01, ** p<0.05, * p<0.1

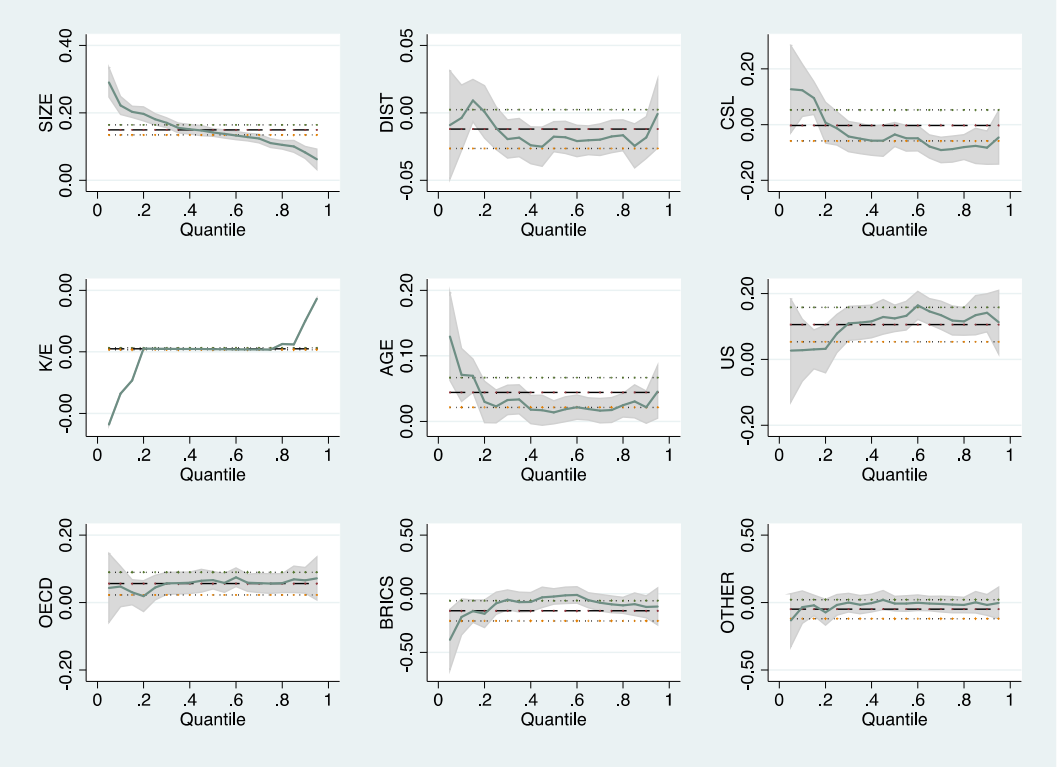
Table A3. Difference in TFP after matching, 2 nearest neighbors

		Treated	Controls	Diff	s.e.	T-stat
ATT	BRICS/total	4.80799	5.19494	-0.38695***	0.14931	-2.59
ATT	BRICS/US	4.85966	5.55710	-0.69745***	0.17431	-4
ATT	BRICS/OECD	4.83108	5.17161	-0.34053**	0.17142	-1.99
ATT	BRICS/DOM	4.80616	4.94629	-0.14013	0.16336	-0.86
ATT	BRICS/OTHR	4.80799	4.75088	0.05711	0.18124	0.32

Table A4. Difference in TFP after matching, 3 nearest neighbors

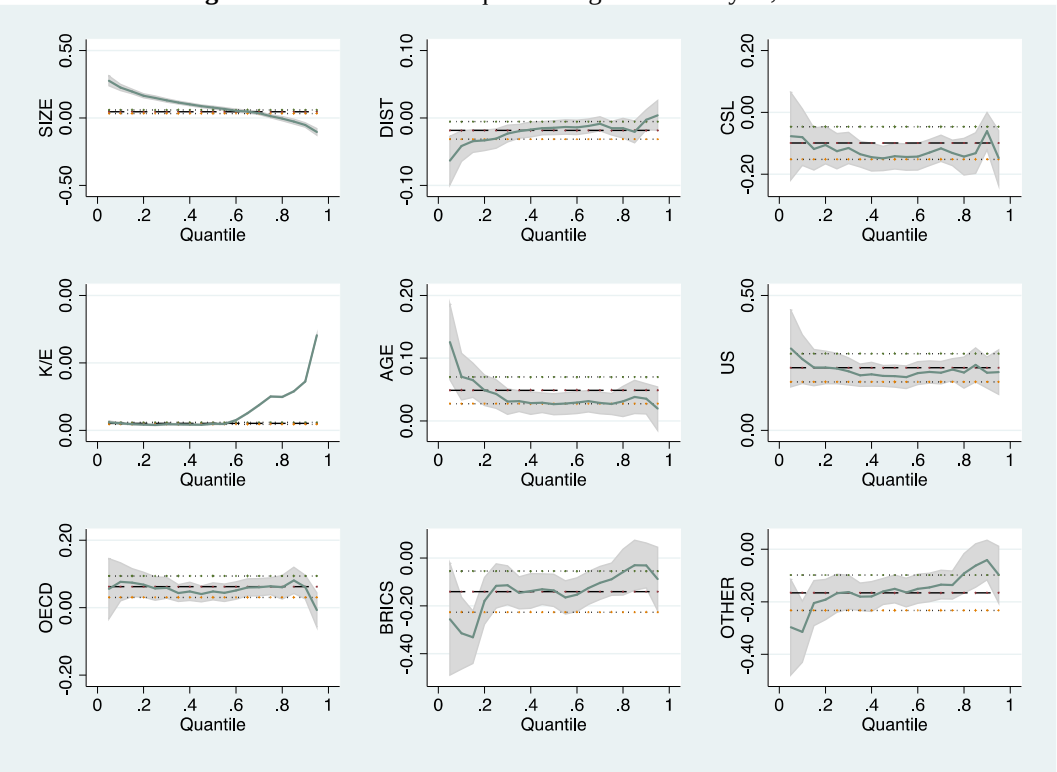
		Treated	Controls	Diff	s.e.	T-stat
ATT	BRICS/total	4.80799	5.08797	-0.27998**	0.13975	-2
ATT	BRICS/US	4.85966	5.54499	-0.68533***	0.16307	-4.2
ATT	BRICS/OECD	4.83108	5.13041	-0.29933**	0.15956	-1.88
ATT	BRICS/DOM	4.80616	5.02148	-0.21532	0.15611	-1.38
ATT	BRICS/OTHR	4.80799	4.75752	0.05047	0.17348	0.29

Figure 1A. Coefficients of quantile regression analysis, Manufacturing sector



Source: Author's elaboration using STATA's command grqreg

Figure 2A. Coefficients of quantile regression analysis, Services



Source: Author's elaboration using STATA's command grqreg

[i] Bloom et al., (2012) attribute the US advantage to superior capacity in "IT intensive" industries and better management. Criscuolo and Martin (2009), in contrast, argue that US leadership reflects a tendency of US MNEs to "cherry pick" the best plants in host countries.

[ii] Recent approaches stress the importance of superior management and organisational practices in fostering firm performance. They demonstrate how the relative backwardness of the main emerging economies in such areas contributes to their low productivity (Bloom et al., 2010).

[iii] For the same reasons, at least initially, M&As from EMNEs (especially Chinese) have often been targeted to financially troubled firms, so to reduce the risks of investing abroad (Rugman and Li, 2007). To some extent, this might be one of the reasons why affiliates of EMNEs have a lower performance compared to others.

[iv] The version of Amadeus used for this paper gives access to information for companies defined as "Large" and "Very Large," i.e. those with operating revenues greater than €10 million and total assets greater than €20 million.

[v] This number refers to the observations initially available in the dataset. The effective number of EMNEs used for the empirical analysis is lower, as a number of observations drops out after the estimation of TFP functions (see Table 3).

[vi] When cleaning the data, firms belonging to those countries included by international organisations such as the IMF and OECD in their lists of fiscal havens have been dropped

from the sample due to uncertanty regarding the country of origin of their ultimate owners.

[vii] This includes all OECD members classified as high-income by the World Bank and that joined the organisation before 1990. This excludes Korea and middle-income countries such as Mexico and Turkey, as well as certain eastern European countries, which are considered as homes to EMNEs in some studies.

[viii] In order to retrieve more reliable estimates of firms' productivity for the year 2011, for the purpose of estimating TFP functions according to the LP and WLP methods, data on the inputs have been used for the latest three years available (2009–2011).

[ix] Total assets are used instead of fixed assets given the presence of a large number of firms operating in the service sectors, where intangibles are relevant.

[x] As a proxy for the cultural proximity between two countries, we rely on a newly released variable from Melitz and Toubal (2014), common spoken language (*CSL*), which measures the "..probability that a pair of people at random from the two countries understand one another in *some* language" (emphasis added, p. 351). Not only is common language at the core of the many definitions of cultural distance (Shenkar, 2012), but this newly constructed variable allows to overcome the limitation of the usually adopted dummy variable based on official status, and – as stated by its proponents – it might help to reflect different sources of linguistic influence including ethnic ties and trust, besides the ability to communicate, directly and indirectly (Melitz and Toubal, 2014).

[xi] A notable exception is represented by the negative (and significant) coefficient of size in column I. However, this might be due to the construction of the independent variable,

labour productivity, which includes the number of employees at the denominator. So, in this specific case, the higher the size in terms of employees, the lower the productivity of labour.

[xii] In the case of EMNEs, it appears that they invest in more distant markets to obtain access to strategic resources not available in nearby countries. Indeed, contrary to the provisions of sequential internationalisation models based on the concept of "psychic" distance (Johansonn and Vahlne, 1977), many EMNEs follow a "leapfrogging" strategy, whereby acquisition of resources is part of the internationalisation process, rather than a prerequisite.