

FDI mode, firm heterogeneity and institutional conditions

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THIS DRAFT 28 April 2021

Abstract

This paper looks at how national and regional institutional conditions shape the decision of large Multinational Enterprises (MNEs) to invest in their host regions by means of either acquisitions or greenfield investments. The empirical analysis covers all Foreign Direct Investments (FDIs) in the European Union by the largest MNEs in the world, making it possible to study alternative choices by the same firm and fully account for firm-level characteristics in investment choices. The empirical results show that - other things being equal - MNEs use acquisitions in order to control activities in regions with stronger investment eco-systems, while they rely on greenfield investments in regions with weaker systemic conditions. However, the regional quality of government makes fundamental difference on the nature of the investments attracted by the regions. Regions with high quality of government are able to attract greenfield investments by the most productive MNEs, therefore maximizing the potential for local spillovers.

1. Introduction

Policy makers all over the world have traditionally looked at foreign acquisition of domestic assets as a source of concern more than as an opportunity for domestic growth and development. Scepticism on the desirability of foreign acquisitions is widespread in political discussions and in the media. In the 2000 Investment Report, UNCTAD stressed that acquisitions do not add to productive capacity at the time of entry, but simply transfer ownership from domestic to foreign hands, often accompanied by lay-offs, closing of domestic facilities and potentially, also by a reduction in domestic competition. The report also emphasizes that the potential harms are not only economic but they can also be social, political and cultural and of course when acquisitions take place in key strategic industries, such as infrastructures, transports or communications, they may even be seen as threatening sovereignty and security in host countries. These considerations seem still actual, if following a trend towards tighter regulations already in place in countries such as Japan and the USA, in March 2019 the Council of the EU has approved a new framework to screen foreign direct investments coming into the European Union.¹ As a matter of facts, notwithstanding the number of acquisitions has remained rather constant over the last 10 years (European Commission, 2019), there are growing concerns in Europe about the impact that foreign acquisitions, in particular those undertaken by multinationals from emerging countries, may have on security and public order.² At the other end of the spectrum, policy makers all over the world compete fiercely for the attraction of greenfield FDI that involve building new facilities and are seen as a fundamental source of economic growth, innovation and recovery after shocks (Harms and Méon, 2018). Covid-19 has further exacerbated these polarized views, further increasing reservations on foreign acquisitions while placing the attraction of greenfield investments at the very center of national and regional recovery packages.

In sharp contrast with these rather clear-cut political preferences the existing economic geography literature on the location choice of MNEs has exclusively focused on greenfield FDI, providing national and regional policy makers with consolidated evidence on key attraction factors (Kim and Aguilera, 2016). However, to the best of our knowledge, the analysis of national and regional drivers on the decision between acquisitions and greenfield FDI has remained largely under-explored.

Given the relevance of the economic and geo-political pros and cons of different MNE entry mode choices, this seems a very relevant gap to address in order to inform evidence-based FDI policies. This question has been investigated – exclusively from a national stand-point – in international

1 Information is available at http://trade.ec.europa.eu/doclib/docs/2019/february/tradoc_157683.pdf (accessed on 18th march 2019).

2 According to European Commission (2019), the number of EU firms acquired by Chinese multinationals from 2007 to 2017 went up from 5,000 to 28,000, those acquired by Indian MNEs from 2,000 to 12,000 and by Russian companies from 1,600 to 12,000.

economics and management studies, shedding new light on how different characteristics of the investing multinationals interact with host countries national characteristics. In international economics, Nocke and Yeaple (2008) model the choice between greenfield and M&As, showing that the two modes of entry differ according to firm level characteristics such as efficiency, innovation capacity or previous international investment experience as well as host country level features such as openness, market size and geographical distance between home and host countries. In management studies, Meyer et al. (2009) investigate the impact of market-supporting institutions on business strategies by analysing the entry strategies of foreign investors entering emerging economies. They compare three modes of entry involving FDI: greenfield, acquisition, and joint venture. Their results suggest that where host country institutions are strong and MNEs search for intangible resources, they are more likely to use acquisitions (or joint ventures) rather than greenfield investments.

In this paper we revisit these questions by cross-fertilising the international economics and management perspectives in an economic geography framework. We build upon Nocke and Yeaple (2008) model by bringing the quality of the regional host eco-system to the center of the analysis. Our analysis is innovative in a number of ways. First, we introduce a sub-national regional analysis to account for the importance of local factors in shaping the mode of entry. Second, we consider technological dynamism and institutional conditions at country and regional level as key features of a strong and dynamic investment eco-system and hypothesize they can be potential determinants of FDI modes. Third, we explore how firm-level heterogeneity at the level of the investing multinational interact with the characteristics of the host (national and regional) economy in shaping FDI mode decisions. In so doing we contribute to the economic geography literature that has much stressed the relevance of understanding how firm strategies are influenced by the interaction between their characteristics such as efficiency or innovativeness and the national and sub-national dimensions of their host territories (Beugelsdijk, 2007; Dicken and Malberg, 2001; Ottaviano, 2011; van Oort, 2012).

Our empirical analysis focuses on a large sample of MNEs selected from the Forbes Global 2000 list with at least one investment in the EU-28 during the period from 2003 to 2014. We find that the sub-national dimension is indeed relevant in the decision about MNE mode of entry. Furthermore, we also find that the institutional quality and the innovative capacity of the host economies are both positively related to a larger propensity to undertake acquisitions. Finally, if we jointly consider firms and host regions' characteristics we find that the most efficient firms choose to undertake greenfield investments in regions with good institutional environments.

The paper is structured as follows: Section 2 reviews the relevant literature and develops the key hypotheses tested in the paper; Sections 3 and 4 illustrate, respectively, the dataset and the variables used in the empirical analysis; Section 5 presents the empirical results and Section 6 provides a discussion of the findings and concludes.

2. Greenfield investments and acquisitions in the literature

Acquisitions provide access to resources held by local firms, whole or partially (depending on the type of acquisition) integrating the acquired company. Greenfield investment “*does not directly access a local firm as a bundle of organizational resources, but allows the entrant to buy or contract for resource components available on local markets, such as real estate and labor.*” (Mayer et al 2009: 62)

The existing literature in international trade has mostly focused on country level determinants of FDI entry mode, such as market size and competition intensity and economic integration (Buerger and Ianchovichina, 2017; Mattoo, et al., 2004; Eicher and Kang, 2005; Kim, 2009; Müller, 2007; Qiu and Wang, 2011; Raff et al., 2009). In their model of the MNE establishment strategy, Nocke and Yeaple (1) combine macro-level drivers with firm-level characteristics: “*the two modes of FDI differ significantly in both the characteristics of the firm that engage in these modes as well as in the characteristics of the host countries in which firms invest*” (1).

In this paper, following, we test the model proposed by Nocke and Yeaple (2008) to investigate the entry mode choice as a positive assortative matching process between subsidiaries and headquarters. In particular, Nocke and Yeaple (2007) show that the entry mode depends on the distribution of internationally mobile factors such as technology and on international immobile resources such as location specific knowledge of the local markets, varying across firms.

In our empirical testing we introduce some new elements, advancing the literature along three main directions. First, including the regional dimension we account for the well-established point that MNEs strategic choice does not only depend on country characteristics but it is also influenced by the variety and quality of highly localized assets (Iammarino and McCann, 2013). Second, we incorporate into the empirical analysis two neglected but crucial dimensions: technological dynamism and institutional conditions at country and regional level. Third, we account for how macro-level factors interacting with firm-level characteristics can have different effects on foreign investors' decisions (Baldwin and Okubo, 2006; Ottaviano, 2011, 2012).

Considering firm-level characteristics, the baseline hypothesis is that more efficient MNEs prefer greenfield investments. This is in line with what it is found by Nocke and Yeaple (2008) empirically investigating the entry mode choice undertaken by US multinationals: more efficient companies are significantly more likely to opt for greenfield investments than choosing acquisitions. This is because the cost for establishing new plants abroad is high and imposes large size in order to exploit scale economies. Therefore, only the more productive investors (i.e. those with higher managerial capabilities) can invest in large size foreign subsidiaries, built with greenfield investments. The larger entry costs of undertaking greenfield investments with respect to acquisitions and exports is modelled by Stepanok (2015), confirming that more productive companies undertake greenfield investments. Empirically, this result has been confirmed for Japan (Raff et al., 2012) and Poland (Klimek, 2011). Besides firm-level characteristics, Nocke and Yeaple (2008) find that the more developed the host country (i.e. the lower the gap in terms of production-costs between host and origin country), the larger the probability of acquisitions and that geographical proximity reduces the costs of setting up a new production division and increases the probability of greenfield investments. The regional dimension has also been explored finding that greenfield investments are more common in regions with high demand levels, low labor costs and good public infrastructures while acquisitions are positively related to local agglomeration factors and availability of potential targets (Huallachain and Reid, 1997; Basile, 2004).

In their model Nocke and Yeaple (2007 and 2008) do not include the institutional dimension which instead has been explored in a growing body of literature, mainly investigating the link between FDI and institutions at the national level. Economic research has largely focused on measurable aspects of (formal) institutions influencing MNE operations abroad by directly shaping the returns on their investments and the associated risk and indirectly impacting upon other key investment drivers such as human capital and infrastructure availability and quality (Knack and Keefer, 1995). While on the regional dimension of institutions, there is very limited evidence (Phelps et al., 2003 on the UK; Du et al., 2008 looking at Chinese regions).

Following Mayer et al. (2009) we hypothesize that a stronger institutional environment characterized by better and more supportive and transparent institutions will make it easier for investors to identify and capture the intangible assets available in the local eco-system. Conversely, opaquer and less well-defined institutional environments will make it necessary for MNEs to enter with a stronger direct presence on the ground, establishing local operations directly through greenfield investments. As result we specify the first hypothesis tested in the empirical analysis as follows.

H1: Other things being equal, in regions with stronger investment eco-systems MNEs will choose acquisitions to invest while in regions with weaker systemic conditions, they will rely on greenfield investments.

Accounting for the interaction between firm-level heterogeneity and macro-level heterogeneity at regional level is a further important step in the empirical analysis which can shape the entry mode strategies. A recent analysis on Chinese FDI shows that, although better institutional conditions are more likely to drive acquisitions, this result is reverted when investors have strong international experience because they have accumulated enough capabilities and confidence to directly manage investments (Alon et al, 2020). In our case, we hypothesize that more efficient MNEs will have the resources needed for facing the larger costs of undertaking greenfield FDI rather in stronger investment ecosystems (Nocke and Yeaple, 2008). Our second hypothesis is the following one.

H2: Other things being equal, the higher their productivity the more MNEs will be likely to choose greenfield investment in regions with stronger investment eco-systems.

3. The dataset

The dataset includes greenfield investments and acquisitions³ in the EU-28 from 2003 to 2014 undertaken by companies included in the list of Forbes 2000, accounting for more than 40 per cent of the total value of FDI inflows in the EU-28 during the years 2003-2014 (UNCTAD, 2016).⁴ The empirical focus on large companies is appropriate because it is likely that very large companies would follow complex internationalization strategies in terms of location and mode of entry, making our empirical exercise more interesting.

In the sample we include only majority-owned foreign affiliates and we eliminate greenfield investments targeting sub-national destinations (defined at NUTS-2 level) where there is not any potential acquisition target, i.e. domestic companies in the same NACE 2-digit sector. The final sample includes 7,338 investments, of which 2,001 are acquisitions (27%) and 5,337 are greenfield investments (73%). These are aggregated so that for each firm a destination region-industry pair is counted at most once. Thus, each observation of the dataset represents the investment(s) of a company in one of the EU-28 sub-national regions (defined at NUTS-1/2 level⁵) within a particular industrial

³ For greenfield investments the source is fDi Markets database and for acquisitions is Zephyr by Bureau van Dijk.

⁴ We consider the Forbes 2000 list in 2015. See Appendix 1 for a spatial and dynamic validation of the sample.

⁵ For including in the empirical analysis, the Quality of Governance indicator we adopt the OECD Territorial Level 2 definition of regions, including NUTS 1-digit and NUTS 2-digit level regions.

sector (defined at NAICS 2-digit level). The final dataset pools two sub-sample periods: 2003-2008 and 2009-2014.

Considering the geography of the investments, the UK and Germany are receiving the largest shares: 20% and 11% respectively. Spain is an important destination for greenfield investments (10.5%), while France is the third most important destination for acquisitions (10.7%). The Eastern European countries are attracting mainly greenfield investments, in particular Poland (8.3%) and Romania (6.3%) (Table 1).

[TABLE 1 ABOUT HERE]

Measuring the within-country concentration across sub-national regions by the Herfindahl index (HHI), we find that investments are rather spread in the top destination countries (such as the UK and Germany), while they are relatively more spatially concentrated in smaller Eastern European countries (such as Bulgaria, Hungary and Slovakia) and in Scandinavia (Denmark and Sweden). At the sub-national-level, M&As are mostly concentrated within regions located in the EU-core countries while greenfield deals are more spread than acquisitions (Figure 1).

[FIGURE 1 ABOUT HERE]

Table 2 describes the sectoral distribution of investors according to the Eurostat classification.⁶ Investments from MNEs in medium-high tech manufacturing sectors and knowledge-intensive services represent more than 60% of all deals. Greenfield investments are particularly concentrated in the motor vehicles industry (9.2%), while acquisitions are concentrated in the electronics (9.15%) and machinery industries (8.3%). Considering services, investments in financial and insurance industries attract the largest share of deals.

[TABLE 2 ABOUT HERE]

4. The variables

In this section we introduce the variables⁷ included in the empirical analysis, which are described with more details in the Appendix 2.

The dependent variable (GREEN) is a dichotomous variable, taking the value of 1 if the investment is a greenfield and 0 if it is an acquisition.

⁶ The Eurostat classification refers to NACE 2-digit sectors.

⁷ All variables are calculated in the first year of the 5-year sub-sample period.

Among the independent variables we introduce some characteristics of the investing companies. The efficiency (SALES_EMPLOYEES) is calculated as the logarithm of net sales in US\$ dollars per employee. The innovation capacity of the investors (INNOV) is measured as the cumulative (log) number of patents filed at the European Patent Office by the investment year.⁸

As controls, we also introduce a measure of experience (EXP) taking the value of 1 if the investor has at least one other affiliate in the same county at the year of the investment, and 0 otherwise. Then, we consider the diversification in different industries (DIV) including the number of industrial sectors (defined at SIC 4-digit level) in which the investor operates. To account for the degree of internationalization (COUNT), we include a variable which is the (log) number of countries in which the investors have foreign affiliates.

We include the quality of host-region investment ecosystems by two different variables. The first is institutional quality (QoG_REGION), measured by the European Quality of Government Index (Charron et al., 2013 and 2014), which estimates the level of public sector corruption on the basis of a survey on citizens' perceptions and experiences. The second is the innovation level (EPO_PC_REGION), which is proxied by the number of patent applications (per million inhabitants) to the European Patent Office.

At the country-level we control for the host countries' degree of openness (OPEN) including the ratio of the sum of exports and imports to GDP which is likely to affect FDI entry mode opportunities. Then, we consider the geographical distance between the origin and the destination country (DISTANCE).

At the regional level, we control for possible agglomeration effects with the total number of companies within the same region of the investment (AGGLOMERATION). Further, we control for the level of development of the host regions with the logarithm of the real GDP per capita (GDP_PC_REGION); for the quality of infrastructure, measured with the kilometers of motorways per million euros of GDP (MOTORWAYS_GDP_REGION) and for the level of human capital (HC_REGION) proxied by the percentage of employed people aged 25-64 with higher education: data.

5. Empirical analysis

⁸ Due to the high number of missing values in Worldscope, we cannot rely on the NY 2008 measure of R&D expenditure to total sales.

Given the dichotomous nature of the dependent variable, we test the probability of investing by greenfield entry mode (rather than by acquisition) with a logit model:

$$P(y_i) = \frac{1}{1 + \exp(-\alpha - X_i\beta)}$$

where y_i is the dependent variable, taking value 1 if the investment entry mode is greenfield and 0 if it is acquisition, X_i is a vector of explanatory variables at firm-, regional- and national- level related to observation i . Table 3 presents the results of the logit analysis.

The baseline model in Column 1 confirms the main findings of the empirical exercise undertaken in Nocke and Yeaple (2008).⁹ At the firm-level, the more productive investors are more likely to choose greenfield rather than acquisitions. This can be explained by the large sunk investment costs to create new plants abroad that only the more productive foreign investors can afford. Considering more innovative companies, they are more likely to undertake greenfield investments for the sake of exploiting their technological advantage in the foreign markets: this result is also in Meyer et al. (2009) and Tekin-Koru (2012). Previous investment experience in the same country increases the probability of opting for acquisitions due to better availability of local knowledge needed for identifying possible target companies to acquire: this finding is also common to other works (Ravenscraft and Scherer, 1987; Slangen and Hennart, 2008; Tekin-Koru, 2012). Both companies' industrial diversification (DIV)¹⁰ and their internationalization degree (COUNT) are not statistically significantly related to multinationals' FDI entry mode choice. At the country level, we confirm that more open economies (i.e. with larger values of OPEN_COUNTRY) are more likely to attract greenfield-type FDI). However, differently from the original framework, we do not find a significant effect from the geographical distance between FDI origin and destination countries. At the regional level, similarly to the original framework, we find that more developed regions (i.e. with larger GDP per capita) are more likely to attract acquisitions: they are likely to have larger production costs and, therefore, provide less opportunities for building new production division. In the next model (Column 2), we add further regional controls that might affect FDI entry mode by Forbes MNCs. As in Basile (2004), we find that a larger amount of potential acquisition candidates, measured by the AGGLOMERATION_REGION variable, is related to a larger probability that an acquisition-type FDI occurs: in addition, the endowment of larger quality infrastructure boosts the chances multinationals opt for greenfield-type FDI. Differently from Tokin-Koru (2012), we do not find any

⁹ As a robustness check, we replicated the models in NY 2008's Table 1 on a country-level based dataset. Results are provided in the Appendix (Table A.2) and mostly confirm the original findings.

¹⁰ Industrial diversification is found insignificant also in Slangen and Hennart (2008).

significant effect in the FDI entry mode choice from the local human capital level. The model in column 3 adds the two main FDI destination-level variables we focus on in our empirical analysis: the quality of institution and the innovation level. We find that better quality institutions are related to lower probabilities to undertake greenfield-type FDI. Good institutions are important to undertake very complex operations such as cross-border acquisitions and because it is likely that they will also guarantee a more transparent and informative business context (Alon et al., 2020; Cai and Seviril, 2012; Higgins and Rodriguez, 2006; Meyer et al., 2009), reducing the uncertainty about the quality of potential targets (Akerlof, 1970, 1995; Stigler, 1961). Moreover, we find that the coefficient of the regional indicator of innovation is negative and significant. This indicates that where there are more valuable (and internationally scarce) corporate assets available it is more likely foreign acquisitions to happen (Nocke and Yeaple, 2008).

[TABLE 3 ABOUT HERE]

The following models test the interactions terms between investors' productivity and destinations' investment ecosystem. The first model (Column 4) adds the interaction terms between productivity of Forbes MNCs and institutional quality of host regions, which results to be positive and significant. Figure 2 shows the average marginal effects of companies' productivity (Figures 2a) on the probability of greenfield-type FDI in correspondence of different degrees of regional quality of institutions. It comes out that the positive effect from multinationals' productivity on the probability of undertaking greenfield FDI becomes larger and larger as both the regional quality of institution increases. Therefore, the Nocke and Yeaple 2008 selection mechanism imposed to MNEs by alternative FDI modes becomes more evident within contexts endowed with higher quality of government. This is a possible further way through which institutions "foster regional development" (Rodriguez-Pose, 2013), by enhancing the opportunity for more productive investors to undertake greenfield-type investments.

The following model (Column 5) investigates the interaction terms between multinational-level productivity and the innovation level of host regions. In this case, the interaction term is not statistically significant; moreover, also the regional level of innovation is not significant anymore. Figure 2 (b) shows how the marginal effect of investors' productivity on the probability of greenfield-FDI varies across different degrees of innovation of host regions. On the one hand, more innovative host regions seem to work such as those with better institutions as they make it easier for more productive companies to undertake greenfield investments. On the other hand, the mediating role of regional innovation with respect to investors' productivity in the choice of FDI entry mode turns out to have lower magnitude and scarce statistical significance than regional institutions. Finally, the last

model (Column 6) includes both the interaction terms studied in the previous two models, confirming the significance of the only interaction between investors' productivity and host region institutional quality.

[FIGURE 2]

Robustness checks

Table 4 reports some robustness checks. In particular, we replicate models 4 and 5 in Table 3 in three ways. First, we add target country and target industry fixed effects (columns 1 and 2); second, we replace the quality of government index by Rule of Law (column 3) and Government Effectiveness (column 4) indexes and the destinations' number of EPO patents per capita with the R&D expenses share on GDP (column 5). The results reported in Table 3 are confirmed. Lastly, in order disentangle the national from the regional effects, in Columns 5 and 6 we split regional values of institutional quality and innovation in two parts: country-level mean values and the regional deviation from the country mean. The results confirm the specific role of the regional quality of institution in the interaction with investors' productivity, since the interaction involving the country-level mean value is not statistically significant.

[TABLE 4 ABOUT HERE]

6. Discussion of the results and conclusions

This work investigates the FDI-entry mode choice by Forbes 2000 multinationals investing in the EU-28 between 2003 and 2013. It extends the Nocke and Yeaple (2008) framework in three ways. First, it introduces two novel destination-level variables, that are the quality of institutions and the innovativeness degree. Second, it tries to disentangle national-level from the sub-national regional effects of those variables on the output. Third, it analyses how MNCs' characteristics interact with national and regional levels. The empirical analysis confirms the original framework. On the one hand, more productive and innovative multinationals are more likely to invest by greenfield-type FDI. On the other hand, richer regions are associated to larger probability to host cross-border acquisitions. In addition, we find that institutional quality and innovation capacity of destinations also enhance the chances of attracting acquisitions. Turning to interactions between MNCs' and destinations' characteristics, we show that both better quality of institutions and higher levels of innovations at national level can boost the NY 2008 selection mechanism, making the more productive companies more likely to undertake greenfield-type FDI. At the sub-national, the interaction between firm-level productivity and the institutional quality of the host region increases even more the probability to

attract greenfield investments. This is a possible further way through which institutions “foster regional development” (Rodríguez-Pose, 2013), by making the selection of productive MNEs stricter and so enabling to pick up the very “best” investors. Moreover, the most innovative regions boost the chances for more innovative MNCs to opt for greenfield FDI.

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Tables and figures

Table 1. Destination of investments by mode of entry: 2003-14 (# and %)

	Greenfield	Acquisitions	Total	HHI*
United Kingdom	929 (17.41)	538 (26.89)	1467 (19.99)	0.10
Germany	562 (10.53)	258 (12.89)	820 (11.17)	0.07
Spain	559 (10.47)	119 (5.95)	678 (9.24)	0.19
France	442 (8.28)	214 (10.69)	656 (8.94)	0.19
Poland	444 (8.32)	54 (2.7)	498 (6.79)	0.14
Romania	334 (6.26)	32 (1.6)	366 (4.99)	0.18
Netherlands	211 (3.95)	143 (7.15)	354 (4.82)	0.18
Ireland	226 (4.23)	61 (3.05)	287 (3.91)	0.81
Italy	148 (2.77)	139 (6.95)	287 (3.91)	0.24
Czech Republic	246 (4.61)	37 (1.85)	283 (3.86)	0.22
Belgium	185 (3.47)	69 (3.45)	254 (3.46)	0.19
Hungary	240 (4.5)	13 (0.65)	253 (3.45)	0.33
Sweden	125 (2.34)	72 (3.6)	197 (2.68)	0.31
Austria	115 (2.15)	28 (1.4)	143 (1.95)	0.27
Denmark	68 (1.27)	64 (3.2)	132 (1.8)	0.45
Slovakia	112 (2.1)	9 (0.45)	121 (1.65)	0.29
Bulgaria	91 (1.71)	15 (0.75)	106 (1.44)	0.31
Portugal	76 (1.42)	17 (0.85)	93 (1.27)	0.37
Other EU countries**	224 (4.19)	119 (5.95)	343 (4.69)	0.80
Total	5337 (100)	2001 (100)	7338 (100)	0.46

* $HHI_i = \sum s_{ij}^2$, where s_{ij} is the share of investments to region j of total investments to country i

** Cyprus, Estonia, Finland, Greece, Hungary, Lithuania, Latvia, Luxemburg, Malta, and Slovenia

Data source: fDi Markets and BvD Zephyr

Table 2. Sectoral distribution: 2003-14 (# and %)

	Greenfield	Acquisitions	Total
Agriculture & Mining	91 (1.71)	43 (2.15)	134 (1.83)
Mining and quarrying	90 (1.69)	40 (2)	130 (1.77)
Medium-low tech manufacturing	542 (10.16)	281 (14.04)	823 (11.22)
Food, beverage, tobacco	144 (2.70)	48 (2.4)	192 (2.62)
Rubber; plastics; other non-metallic mineral products	147 (2.75)	48 (2.4)	195 (2.66)
Metals	94 (1.76)	88 (4.4)	182 (2.48)
Other manufacturing	157 (2.94)	97 (4.85)	254 (3.46)
Medium-high tech manufacturing	1692 (31.7)	625 (31.23)	2317 (31.58)
Chemicals	184 (3.45)	97 (4.85)	281 (3.83)
Pharmaceuticals	219 (4.1)	59 (2.95)	278 (3.79)
Electronics	352 (6.6)	183 (9.15)	535 (7.29)
Electrical equipment	185 (3.47)	54 (2.7)	239 (3.26)
Machinery & equipment	260 (4.87)	166 (8.3)	426 (5.81)
Motor vehicles & other transport equipment	492 (9.22)	66 (3.3)	558 (7.6)
Less intensive knowledge services	1299 (24.34)	452 (22.59)	1751 (23.86)
Electricity and gas	243 (4.55)	51 (2.55)	294 (4.01)
Wholesale and retail trade	302 (5.66)	173 (8.65)	475 (6.47)
Transportation and storage	335 (6.28)	44 (2.2)	379 (5.16)
Knowledge-intensive services	1713 (32.1)	600 (29.99)	2313 (31.52)
Information & communication	415 (7.78)	171 (8.55)	586 (7.99)
Financial and insurance activities	1016 (19.04)	249 (12.44)	1265 (17.24)
Other service activities	282 (5.28)	180 (9)	462 (6.3)
Total	5337 (100)	2001 (100)	7338 (100)

Data source: fDi Markets and BvD Zephyr

Table 3. Econometric Analysis

GREEN: 1: greenfield, 0: acquisitions	(1)	(2)	(3)	(4)	(5)	(6)
SALES_EMPLOYEES	0.5356*** (0.0897)	0.5303*** (0.0908)	0.5173*** (0.0912)	0.4619*** (0.0899)	0.4527** (0.1945)	0.7482*** (0.2040)
INNOV	0.0400* (0.0231)	0.0403* (0.0232)	0.0421* (0.0231)	0.0419* (0.0231)	0.0420* (0.0231)	0.0423* (0.0231)
EXPERIENCE	-0.7164*** (0.1534)	-0.7174*** (0.1544)	-0.6488*** (0.1568)	-0.6527*** (0.1570)	-0.6492*** (0.1568)	-0.6520*** (0.1571)
EMPLOYEES	0.5071*** (0.0552)	0.5084*** (0.0552)	0.4873*** (0.0552)	0.4868*** (0.0553)	0.4869*** (0.0552)	0.4887*** (0.0551)
DIV	-0.0270 (0.0328)	-0.0278 (0.0328)	-0.0263 (0.0329)	-0.0261 (0.0329)	-0.0261 (0.0330)	-0.0272 (0.0329)
COUNTRIES	-0.1112 (0.1029)	-0.1168 (0.1033)	-0.1356 (0.1033)	-0.1340 (0.1031)	-0.1354 (0.1033)	-0.1348 (0.1024)
OPEN_COUNTRY	0.4096** (0.1876)	0.2659 (0.1914)	0.6351*** (0.2090)	0.6217*** (0.2089)	0.6330*** (0.2095)	0.6242*** (0.2086)
DISTANCE_COUNTRY	0.0507 (0.0456)	0.0547 (0.0458)	0.0488 (0.0455)	0.0508 (0.0455)	0.0493 (0.0455)	0.0491 (0.0455)
GDP_PC_REGION	-1.2203*** (0.1203)	-1.0939*** (0.1519)	-0.4743** (0.1842)	-0.4616** (0.1847)	-0.4714** (0.1843)	-0.4651** (0.1836)
AGGLOMERATION_REGION		-0.0823* (0.0451)	-0.0948* (0.0503)	-0.0978* (0.0506)	-0.0953* (0.0504)	-0.0957* (0.0508)
MOTORWAYS_GDP_REGION		17.1185** (8.4450)	28.3945*** (9.8697)	28.9724*** (9.8642)	28.4126*** (9.8738)	29.5056*** (9.8602)
HC_REGION		0.0009 (0.0064)	-0.0033 (0.0067)	-0.0035 (0.0067)	-0.0033 (0.0067)	-0.0036 (0.0067)
QoG_REGION			-0.1678** (0.0785)	-1.0423*** (0.3484)	-0.1685** (0.0785)	-1.4989*** (0.4359)
EPO_PC_REGION			-0.1983*** (0.0531)	-0.1986*** (0.0531)	-0.2822 (0.2236)	0.2141 (0.2586)
SALES_EMPLOYEES x QoG_REGION				0.1508** (0.0593)		0.2305*** (0.0756)
SALES_EMPLOYEES x EPO_PC_REGION					0.0146 (0.0377)	-0.0720 (0.0446)
Constant	3.6488* (2.1236)	3.0156 (2.1268)	-2.3757 (2.2318)	-2.1618 (2.2456)	-2.0275 (2.4557)	-3.7998 (2.4421)
TIME CONTROL	YES	YES	YES	YES	YES	YES
INVESTOR INDUSTRY FE	YES	YES	YES	YES	YES	YES
Observations	5031	4995	4961	4961	4961	4961
Log-likelihood	-2.6e+03	-2.5e+03	-2.5e+03	-2.5e+03	-2.5e+03	-2.5e+03

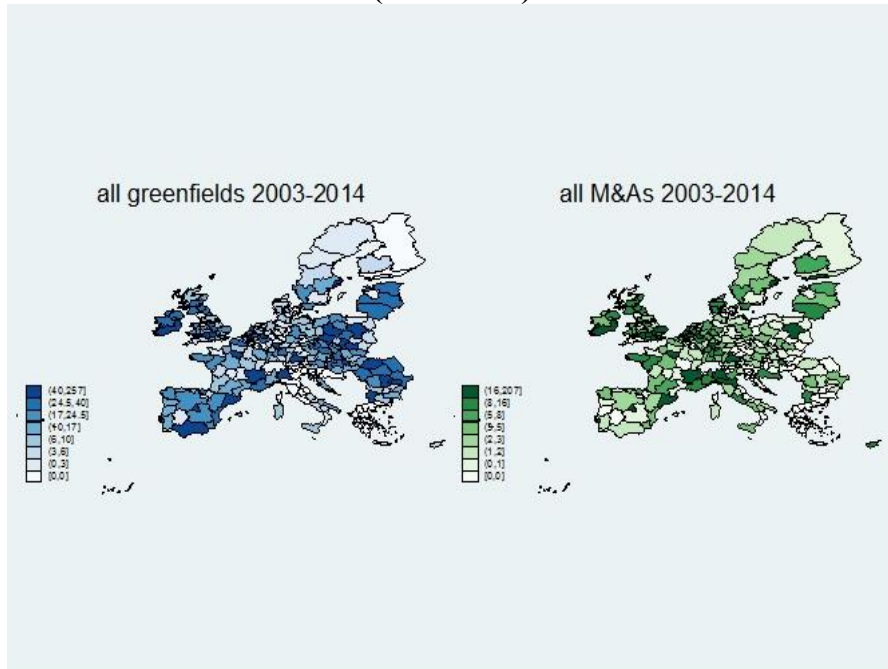
Robust standard errors are shown in parentheses and clustered by investor

***, **, * indicate significance level at 1%, 5%, 10%

SALES_EMPLOYEES x QoG_REGION	0.1343**						(0.3952)
	(0.0545)						
SALES_EMPLOYEES x EPO_PC_REGION		0.0277					
		(0.0382)					
SALES_EMPLOYEES x RULE_LAW_REGION			0.1162**				
			(0.0588)				
SALES_EMPLOYEES x GOV_EFF_REGION				0.1905***			
				(0.0525)			
SALES_EMPLOYEES x RDGDP					0.0385		
					(0.0420)		
SALES_EMPLOYEES x QoG_COUNTRY						0.0895	
						(0.0713)	
SALES_EMPLOYEES x QoG_REGION_REL						0.3338**	
						(0.1296)	
SALES_EMPLOYEES x EPO_PC_COUNTRY							0.0397
							(0.0408)
SALES_EMPLOYEES x EPO_PC_REGION_REL							-0.0994
							(0.0685)
Constant	-	-	-2.1488	-1.9238	0.1729	-0.8988	-1.3058
	16.2687***	15.0775***	(2.2341)	(2.2160)	(2.2454)	(2.2473)	(2.4776)
	(2.4794)	(3.1127)					
INVESTOR INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES
TIME CONTROL	YES	YES	YES	YES	YES	YES	YES
SUBSIDIARY INDUSTRY FE	YES	YES	NO	NO	NO	NO	NO
DESTINATION COUNTRY FE	YES	YES	NO	NO	NO	NO	NO
Observations	4940	4940	4961	4961	4505	4995	4961
II	-2.3e+03	-2.3e+03	-2.5e+03	-2.5e+03	-2.2e+03	-2.5e+03	-2.5e+03

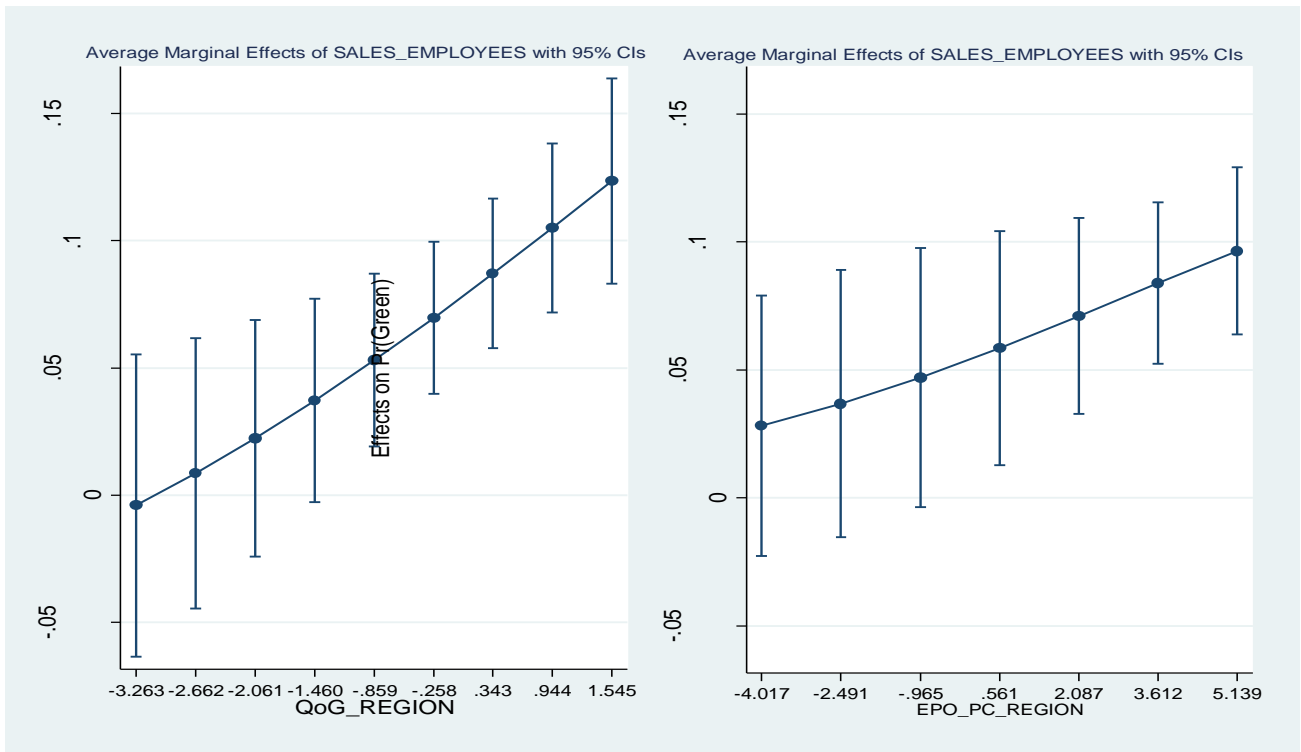
Robust standard errors are shown in parentheses and clustered by investor
***, **, * indicate significance level at, respectively, 1%, 5%, 10%

Figure 1 – Geographical distribution of acquisitions and greenfield FDI in the EU-28 (2003-2014)



Data source: fDi Markets and BvD Zephyr

Figure 2. Marginal effects of firm-level productivity at different region-level investment ecosystems



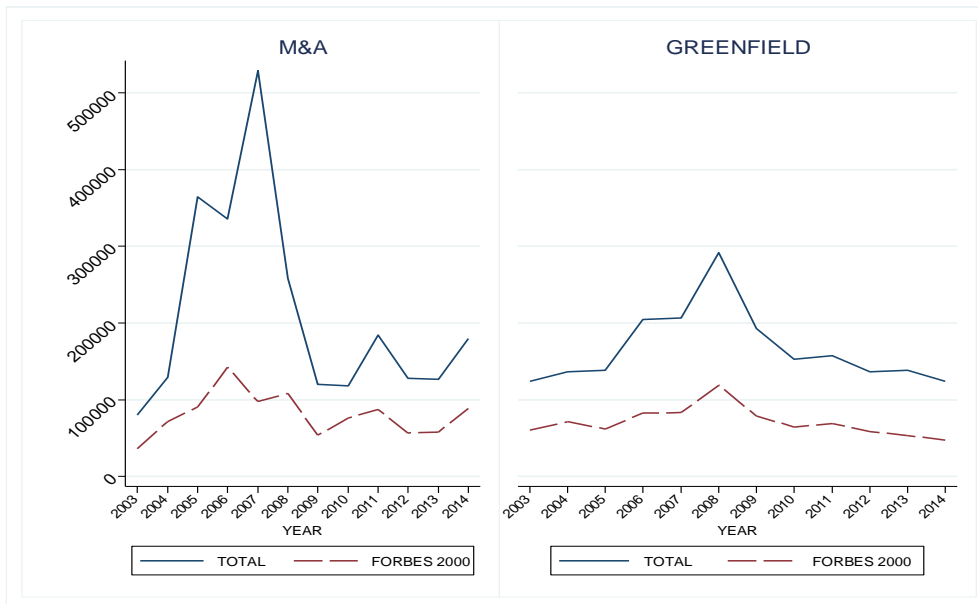
Source: Authors' elaborations

Appendix 1

Sample validation

Figure A.1 shows that the total value of Forbes 2000 investments to the EU follows similar patterns with respect to the aggregate value of inward FDI flows over time. Splitting destinations into EU-core (i.e. France, Germany, Italy, Netherlands, Spain, and United Kingdom) and EU-periphery, it comes out that overall the “core” and the “periphery” countries both host similar shares of FDI flows from Forbes 2000 (42% and 36.6%, respectively). However, some differences result when we look at the specific FDI entry mode. Forbes 2000’s M&As represent 34.4% of the aggregate value of cross-border acquisitions to EU-core and 51.7% of the total value of acquisitions of targets placed in the periphery (between 2003 and 2014). Finally, in terms of greenfield-type investments, Forbes 2000’s deals represent 60% of the aggregate value of deals placed in the core of the EU, and 31% of the value of deals to the periphery.

Figure A.1. FDI to EU-28 over time: Forbes 2000’s and total values



Data source: fDi Markets and BvD Zephyr

Appendix 2

The variables

	Mean	S.D.	# of obs.	Description	Source
GREEN	0.71	0.45	4995	1 if greenfield, 0 if acquisition	Zephyr (Bureau van Dijk); fDi Market (Financial Times)
SALES_EMPLOYEE	5.82	0.87	4995	Sales/Employee (log)	Worldscope (Thomson Reuters)
TFP	3.95	0.61	4989	Log (Sales/Employee) -1/3 log (Capital/Employee)	Worldscope (Thomson Reuters)
INNOV	3.07	3.37	4995	# EPO patents (log)	EPO PATASTAT
INNOV_USPTO	3.29	3.63	4995	# USPTO patents (log)	Orbis (Bureau van Dijk)
EXPERIENCE	0.80	0.40	4995	Previous country experience dummy	Orbis (Bureau van Dijk)
EMPLOYEES	10.72	1.48	4995	# Employees (log)	Worldscope Database (Thomson Reuters)
DIV	5.703	2.19	4995	# SIC sectors	Worldscope (Thomson Reuters)
COUNTRIES	3.51	0.89	4995	# countries with affiliate (log)	Orbis (Bureau van Dijk)
QoG_REGION	0.16	0.95	4995	Quality of Government (regional level)	Charron et al., 2013, 2014
QoG_COUNTRY	0.16	0.88	4995	Quality of Government (national average)	Charron et al., 2013, 2014
QoG_REGION_REL	0.01	0.35	4995	Quality of Government (regional deviation from national average)	Charron et al., 2013, 2014
RULE_LAW_COUNTRY	0.15	0.90	4995	Rule of Law index (country-level average)	Charron et al., 2013, 2014
RULE_LAW_REGION_REL	0.01	0.34	4995	Rule of Law index (regional deviation from country-level average)	Charron et al., 2013, 2014
EPO_PC_REGION	3.95	1.71	4961	N. of EPO patents per capita (region-level, log)	OECD Database
EPO_PC_COUNTRY	3.95	1.53	4961	N. of EPO patents per capita (country-level average, log)	OECD Database
EPO_PC_REGION_REL	-0.01	0.76	4961	N. of EPO patents per capita (regional deviation from country-level average, log)	OECD Database
R&D_GDP_COUNTRY	1.72	0.79	4505	Total R&D expenditure (in percent of GDP (country-level average)	EUROSTAT
R&D_GDP_REGION_REL	-0.01	0.72	4505	Total R&D expenditure (in percent of GDP (regional deviation from the country-level average)	EUROSTAT
OPEN	0.58	0.21	4995	Log of (Exports plus imports)/GDP	Penn World Tables
DISTANCE	7.71	1.19	4995	Origin-Destination country distance (log)	CEPII Database
AGGLOMERATION	9.21	1.07	4995	# companies in the target region (log)	Orbis (Bureau van Dijk)
GDP_PC_REGION	10.18	0.60	4995	GDP per capita (region, log)	EUROSTAT
MOTORWAYS_GDP_REGION	0.01	0.01	4995	Km of motorways per million euros of GDP	EUROSTAT
HC_REGION	26.63	8.68	4995	% of employed people (aged 25-64) with completed higher education	EUROSTAT

The benchmark model: Nocke and Yeaple (2008)

As a benchmark, we replicate the models in Table 1 of NY (2008) with our data sorted at national-level: firms' establishment mode choice is undertaken across different countries, rather than across sub-national regions. Differently from the original framework, our output takes value 1 for greenfield FDI and 0 for acquisitions. In order this test as similar as possible to original framework, with respect to the analysis we present in the main text we also include firm-level sales as alternative measure of efficiency and destination countries' population size (POP) as control. Results reported in Table A.2 below are largely consistent with those found by our benchmark model, also when we introduce fixed effects for affiliated industries and host countries. The only difference is the sign of the geographical distance between origin and destination countries.¹¹

Table A.2. The benchmark models: Nocke and Yeaple (2008)

	<i>Baseline</i>		<i>Firm-level controls</i>		<i>Industry/Country fixed effects</i>	
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>	<i>(6)</i>
USSALE	0.3354*** (0.0374)		0.3968*** (0.0455)		0.3917*** (0.0483)	
SALES_EMPLOYEES		0.4337*** (0.0726)		0.4682*** (0.0798)		0.4677*** (0.0860)
LOG_EPO			0.0424** (0.0208)	0.0389* (0.0210)	0.0256 (0.0213)	0.0222 (0.0215)
EMP		0.3404*** (0.0391)		0.4035*** (0.0483)		0.4008*** (0.0508)
EXP_D			-0.6394*** (0.1245)	-0.6251*** (0.1291)	-0.7399*** (0.1293)	-0.7343*** (0.1339)
DIV			-0.0153 (0.0290)	-0.0219 (0.0287)	-0.0025 (0.0297)	-0.0073 (0.0296)
COUNT			-0.1299 (0.0872)	-0.1030 (0.0903)	-0.1403 (0.0868)	-0.1090 (0.0904)
RGDPPC	-0.8771*** (0.0777)	-0.8831*** (0.0797)	-0.8702*** (0.0789)	-0.8716*** (0.0808)		
POP	-0.0459 (0.0375)	-0.0752** (0.0380)	-0.0085 (0.0390)	-0.0392 (0.0394)		
OPEN	0.7865*** (0.2076)	0.7001*** (0.2110)	0.8780*** (0.2126)	0.7746*** (0.2147)		
DISTANCE	0.1671*** (0.0405)	0.1492*** (0.0406)	0.0996** (0.0412)	0.0859** (0.0411)		
Constant	0.5996 (1.6472)	0.3851 (1.6400)	0.9559 (1.8568)	0.7765 (1.8510)	-19.0046*** (1.6632)	-19.9850*** (1.5953)
FE:Parent Industry	YES	YES	YES	YES	YES	YES
FE: Pre-crisis period	YES	YES	YES	YES	YES	YES
FE:Affiliate Industry	NO	NO	NO	NO	YES	YES
FE: Host Country	NO	NO	NO	NO	YES	YES
Observations	4901	4777	4858	4735	4821	4701
ll	-2.8e+03	-2.7e+03	-2.8e+03	-2.7e+03	-2.5e+03	-2.4e+03

Dependent variable: GREEN=1 if greenfield and 0 if acquisitions. Robust standard errors are shown in parentheses and clustered by investor. ***, **, * indicate significance level at, respectively, 1%, 5%, 10%

¹¹ In order to make our exercise even more directly comparable to the benchmark model, we also tried to drop out smaller value deals (i.e. < than 50 US\$ million) and to select the only deals from tradable goods sectors. Results were very similar to those reported in Table A.2.