FDI mode, firm heterogeneity and institutional conditions

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Abstract

We explore how investor-level characteristics interact with some characteristics of the host economies, at the national and sub-national, regional, level, in shaping the decision to enter foreign markets by means of acquisitions or greenfield foreign direct investments. The empirical analysis focuses on 917 MNES selected from Forbes Global 2000 with at least one investment in the EU-28, during the period from 2003 to 2014. The main preliminary findings confirm that the more productive and innovative multinationals are more likely to choose greenfield investments. At the macro-level, richer regions are more likely to attract acquisitions and the country institutional quality and innovation capacity also enhance the chances of attracting acquisitions. Furthermore, the interaction between firm-level productivity and the relative institutional quality of the host region increases the probability to attract greenfield investments. Finally, the more innovative multinationals are more likely to invest through greenfield in the most innovative regional destinations.

JEL classification: F14, F23, D02

1. Introduction

Concerns about acquisitions as a mode of entry less beneficial for economic development than greenfield investments are not new in political discussion and the media. In its 2000 Investment Report, UNCTAD stresses that acquisitions do no 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 strategical 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]

Although policy makers 'opinions seem rather firm, these preferences do not seem to be driven by clear empirical evidence about the impact of different modes of entry on growth of countries, regions and territories. As a matter of facts, most of the studies rely on overall Foreign Direct Investments (FDI) inflows and do not disaggregate between greenfield investments (GFs), which involves building new facilities, and mergers and acquisitions (M&As) consisting in acquiring existing firms in the host country. While, the studies empirically assessing the impacts of GF relative to M&A offer a rather inconclusive picture in which the results depend on the type of host countries and the output under analysis. Considering the expected increase in productivity due to technological transfer, Ashraf et al (2016) find a positive role of M&A but not of GF in developed countries, while neither mode has a significant impact in developing countries. Other studies find that even if there is not a productivity increase, GF have a larger impact than M&A on GDP per capita growth (Wang and Wong, 2009; Harms and Méon, 2014; Gopalan et al., 2018), on capital accumulation and on employment (Kim, 2009; Ashraf and Herzer, 2014; Gopalan et al., 2018).

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.

Given the uncertainty about the potential impacts of greenfield investments with respect of acquisitions, for undertaking more informed policy making it could be valuable to know more about how different characteristics of the investing multinationals as well as some specificities of the host countries, regions or territories are more likely to attract one mode of entry than the other. This is studied by Nocke and Yeaple (2008), who model the choice between greenfield and M&As, showing that the two modes of entry differ according to characteristics such as the efficiency, the innovation capacity or the previous international experience of the investor as well as the openness, the market size of the host country and the geographical distance between home and host countries.

In this paper, we build on Nocke and Yeaple (2008) adding some unexplored dimensions. First, we introduce a sub-national (regional) analysis to account for the importance of sub-national factors in deciding the mode of entry. Second, we consider technological dynamism and institutional conditions at country and regional level as 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. Doing this we contribute at 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 917 MNES selected from Forbes Global 2000 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 the 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 M&As. Finally, if we jointly consider firms and host regions' characteristics we find that the most efficient and innovative firms choose to undertake greenfield investments in regions with good institutional environments and high innovation capacity.

The paper is structured as follows: Section 2 reviews the relevant literature; 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. Literature

Existing literature in international trade mostly focused on macro-drivers of FDI entry mode, such as market size, market 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). Regional aspects of foreign investors' choice between building new plants and acquiring existing companies abroad have been also considered (Huallachain and Reid, 1997; Basile, 2004), such as demand level, agglomeration factors, unit labor costs and public infrastructure. Particularly, GF FDI result to address regions with high demand levels, low labor costs and good public infrastructure quality; M&As are positively related to local agglomeration factors and the supply of potential targets.

Along with macro-level drivers, firm-level characteristics might also matter for establishment strategy. Nocke and Yeaple (2007, 2008) explain how "*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*" NY 2008, p.1). In particular, Nocke and Yeaple (2007) show that entry mode depends on the distribution of internationally mobile capabilities (such as technology) and international immobile capabilities (such as location specific knowledge of the local markets) over firms. NY 2008 exploits a theoretical framework to explain three stylized facts about FDI from US multinationals. First, multinationals opting for greenfield investments are more technologically efficient than those choosing cross-border acquisitions as an entry mode. Second, 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 cross-border acquisitions. Third, geographical proximity reduces the costs of setting up a new production division and increases the probability of greenfield-type investments. Tekin-Koru (2012) studies the asymmetric impact of trade tariffs on Swedish MNEs' entry mode choice. The finding is that reducing trade tariffs increases the probability of entering foreign markets by either exports or cross-border acquisitions, but it has not significant effects on the probability of greenfield-type entry; moreover, firm-level dimensions might also matter for entry-mode choice: previous investors' experience enhances the probability of undertaking cross-border acquisitions, while R&D intensity positively affects the chances of building new plants.

We follow NY 2008 in looking at the entry mode choice as a positive assortative matching process between subsidiaries and headquarters, as long as not so much empirical evidence to their framework has been provided so far (Klimek, 2011, on Polish multinationals; Raff et al., 2012, on Japanese foreign investors). However, in our framework not only macro-level wages and productivity differences drive investment decisions, but also regional strategic assets and institutional conditions: firm-level characteristics interact with national and regional characteristics and institutional conditions shaping entry mode choices. We can thus rely also on the literature revealing how macro-level factors can have different effects on foreign investors' decisions, depending on firm-level characteristics (Baldwin and Okubo, 2006; Ottaviano, 2011, 2012; Forslid and Okubo, 2014).

A growing body of literature has explored the link between FDI and institutions at the national level. Economic research has largely focused on measurable aspects of (formal) institutions. Institutions influence MNE operations abroad by: a) directly shaping the returns on their investments and the associated risk (direct effect); b) indirectly impacting upon other key investment drivers such as human capital and infrastructure (indirect effect) (Knack and Keefer, 1995). Nevertheless, very limited evidence on the regional dimension of institutions (Phelps et al., 2003 on the UK; Du et al., 2008 looking at Chinese regions).

3. The dataset

The original dataset includes greenfield investments and acquisitions[3] 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 deals, of which 2,001 are acquisitions (27%) and 5,337 are greenfield investments (73%). Deals 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 level[5]) within a particular industrial 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 deals, the UK and Germany are the countries receiving the largest shares of deals, 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).

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

[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 placed within 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 per cent of all deals. Greenfield investments are particularly concentrated in the motor vehicles industry (9.2 per cent), 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 variables[7] 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.

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

[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.
[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.

(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.

Considering the characteristics of the host destinations, we include both the country-level mean values and the regional deviation from the country mean to disentangle the national from the regional effects. The institutional quality of the destinations (QoG_COUNTRY/REGION_REL) is 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 ad experiences. The innovation level (EPO_PC_COUNTRY/REGION_REL) 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

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 NY 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 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). As in NY 2008, 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 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 (Cai and Seviril, 2012; Higgins and Rodriguez, 2006), 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.

[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).

This result might be directly linked to the theoretical cross-border matching process between headquarters and subsidiaries presented in NY 2008.

[TABLE 3 ABOUT HERE]

Models reported in columns 4 and 5 split the regional measures of, respectively, institutional quality and innovation into two parts: the national mean of the variables and the regional deviation from the national mean. This is to investigate to which extent the regional effects we found in the previous models are driven by more general conditions at national level (Slangen, 2016). In terms of institutional quality, larger national mean values result to be significantly related to larger probabilities of acquisition-type FDI; however, the regional component is found to be not significantly relevant. Turning to innovation level of destination countries/regions, in this case the regional effect sums up with the national effect: within the more innovative countries, the relatively stronger regions have an additional advantage in attracting acquisition-type FDI.

The following models test the interactions terms between companies' and destinations' characteristics. The first model (Column 6) adds the interaction terms between productivity and innovation level of Forbes MNCs and institutional quality of host countries and regions. Figure 2 illustrates the results by showing the average marginal effects of companies' productivity (Figures 2a and 2b) and innovation (Figure 2c and 2d) on the probability of greenfield-type FDI in correspondence of different degrees of national and 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 national and the regional quality of institution increases. Therefore, the NY 2008 selection mechanism imposed to MNEs by alternative FDI modes becomes more evident within contexts endowed with higher quality of government. In particular, although higher position of regions itself in terms of the Charron et al. (2013, 2014) indexes does not matter for entry mode (Column 4), it can magnify the positive marginal effect of firms' productivity to even larger extent with respect to good institutional conditions at the national level. This is a possible further way through which institutions "foster regional development" (Rodrìguez-Pose, 2013), by making the selection of productive MNEs stricter and so enabling to pick up the very "best" investors. Moreover, institutional quality of destinations turns out to poorly (in case of the national aggregate values) or even not significantly (in case of regional components) condition the marginal effect of companies' innovation on the output variable.

The second model (Column 7) investigates the interaction terms between multinational-level features and the innovation level of destination countries and regions. Figure 3 shows how marginal effects of MNEs' characteristics on the probability of greenfield-FDI are mediated by different degrees of

innovation of host countries and regions. On the one hand, more innovative host countries seem to work such as those with better institutions as they significantly magnify the NY 2008 selection mechanism in favor of the most productive companies (Figure 3a). In turn, they weakly condition the marginal effect of multinationals' innovation (Figure 3c): the marginal effect of companies' innovation is quite flat along most of the innovation levels of destination countries. On the other hand, the most innovative regions are more likely to host greenfield-type FDI from the more innovative MNEs (Figure 4d), but acquisitions from productive companies that might lack innovation resources (Figure 4c). In fact, our dataset includes companies with large productivity but very poorly endowed with patents that undertake acquisition in very innovative regions. Examples are the French insurance corporation CNP Assurance, which undertook an acquisition in Lombardy in 2005, the Swiss insurance company Swiss Life Holding, which in 2014 acquired the German Corpus Sireo placed in the Nordrhein-Westfalen region, and the American IT company Tech Data , which in 2008 made an acquisition in the Stockholm region.

[FIGURES 2 AND 3 ABOUT HERE]

6. Robustness checks

We replicate the full models in columns 6 and 7 of Table 3 by replacing measures of multinationals' efficiency and innovation with alternative variables. We measure companies' productivity by Total Factor Productivity, which considers capital intensity; [11] Forbes 2000 multinationals' innovation is measured by the log of the number of patents filed at the USPTO Patent Office. Results are reported in Table 4 and mostly confirm what has been previously discussed.

[TABLE 4 ABOUT HERE]

Table 5 reports further robustness checks. In particular, we replicate models 6 and 7 in Table 3 in two 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). Even in this case, most of the results reported in Table 3 are confirmed.

[TABLE 5 ABOUT HERE]

7. Preliminary discussion and conclusions

11 This is an "Approximate Total Factor Productivity" measure, which follows Grilliches and Mairesse (1990). It is equal to the variable SALES_EMPLOYESS minus 1/3 of the log of the capital-labour ratio. We are aware that such a measure might suffer from simultaneity bias. However, we cannot correct this bias by more appropriate approaches, such as Levinsohn and Petrin (2003), because data on companies' intermediate input purchases contain several missing values.

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" (Rodrìguez-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 (# and % 2003-14)

	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

*$HHI_i = \sum s_{ij}^s$, 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 (# and % 2003-14)

	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 results

	Baseline			National Vs. Regional effects		Interactions	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SALES_EMPLOYEES	0.5356***	0.5303***	0.5173***	0.5268***	0.5195***	0.4910***	0.3111
	(0.0897)	(0.0908)	(0.0912)	(0.0908)	(0.0915)	(.0941)	(.1912)
INNOV	0.0400*	0.0403*	0.0421*	0.0422*	0.0425*	0.0719***	.2085***
	(0.0231)	(0.0232)	(0.0231)	(0.0232)	(0.0232)	(0.0249)	(0.0553)
EXP	-0.7164***	-0.7174***	-0.6488***	-0.6413***	-0.6550***	-0.6406***	-0.6515***
	(0.1534)	(0.1544)	(0.1568)	(0.1568)	(0.1577)	(0.1580)	(0.1574)
EMP	0.5071***	0.5084***	0.4873***	0.4955***	0.4849***	0.4949***	0.4847***
	(0.0552)	(0.0552)	(0.0552)	(0.0550)	(0.0552)	(0.0552)	(0.0550)
DIV	-0.0270	-0.0278	-0.0263	-0.0272	-0.0268	-0.0278	-0.0272
	(0.0328)	(0.0328)	(0.0329)	(0.0328)	(0.0330)	(0.0328)	(0.0331)
COUNT	-0.1112	-0.1168	-0.1356	-0.1386	-0.1331	-0.1395	-0.1334
	(0.1029)	(0.1033)	(0.1033)	(0.1030)	(0.1044)	(0.1016)	(0.1040)
OPEN_COUNTRY	0.4096**	0.2659	0.6351***	0.4564**	0.6875***	0.4407**	0.6976***
	(0.1876)	(0.1914)	(0.2090)	(0.2004)	(0.2095)	(0.2021)	(0.2120)
DISTANCE_COUNTRY	0.0507	0.0547	0.0488	0.0553	0.0478	0.0508	0.0452
	(0.0456)	(0.0458)	(0.0455)	(0.0450)	(0.0457)	(0.0451)	(0.0457)
GDP_PC_REGION	-1.2203***	-1.0939***	-0.4743**	-0.6661***	-0.4671**	-0.6796***	-0.5130***
	(0.1203)	(0.1519)	(0.1842)	(0.1702)	(0.1848)	(0.1660)	(0.1836)
AGGLOMERATION_REGION		-0.0823*	-0.0948*	-0.1574***	-0.0688	-0.1635***	-0.0779
		(0.0451)	(0.0503)	(0.0489)	(0.0471)	(0.0495)	(0.0480)
MOTORWAYS_GDP_REGION		17.1185**	28.3945***	31.5532***	28.4204***	31.4352***	28.2604***
		(8.4450)	(9.8697)	(9.6158)	(10.2539)	(9.3526)	(10.2830)
HC_REGION		0.0009	-0.0033	0.0071	-0.0067	0.0079	-0.0054
		(0.0064)	(0.0067)	(0.0069)	(0.0063)	(0.0070)	(0.0063)
QoG_REGION			-0.1678**				
			(0.0785)				
EPO_PC_REGION			-0.1983***				
			(0.0531)				
QoG_COUNTRY				-0.4026***		-.7881**	
				(0.0839)		(0.3983)	
QoG_REGION_REL				-0.1756		-2.0218***	
				(0.1245)		(.7567)	
EPO_PC_COUNTRY					-0.2927***		-.4653**
					(0.0492)		(.2263)
EPO_PC_REGION_REL					-0.1710**		.3800
					(0.0676)		(.3925)
SALES_EMPLOYEES # QoG_COUNTRY						0.0966	
						(0.0672)	
SALES_EMPLOYEES # QoG_REGION_REL						0.3375***	
						(0.1272)	
INNOV# QoG_COUNTRY						-0.0673***	
						(0.0190)	
INNOV #QoG_REGION_REL						-0.0339	
						(0.0340)	
SALES_EMPLOYEES#EPO_PC_COUNTRY							0.0472
							(0.0379)
SALES_EMPLOYEES#EPO_PC_REGION_REL							-0.1062
							(0.0677)
INNOV#EPO_PC_COUNTRY							-0.0380***
							(0.0111)
INNOV#EPO_PC_REGION_REL							0.0274
							(0.0205)
Constant	3.6488*	3.0156	-2.3757	-0.9471	-2.2708	-0.5015	-0.9308
	(2.1236)	(2.1268)	(2.2318)	(2.2503)	(2.2042)	(2.2260)	(2.4303)
TIME CONTROL	YES	YES	YES	YES	YES	YES	YES
INVESTOR INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES
Observations	5031	4995	4961	4995	4961	4995	4961
Log-likelihood	-2.6e+03	-2.5e+03	-2.5e+03	-2.5e+03	-2.5e+03	-2.5e+03	-2.5e+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%.

Table 4. Alternative measures for firm-level efficiency and innovativeness

	TFP		USPTO	
	(1)	(2)	(3)	(4)
TFP	0.4260***	0.2369		
	(0.1217)	(0.2449)		
INNOV	0.0889***	.2293***		
	(0.0246)	(.0554)		
INNOV_USPTO			0.0563**	.1910***
			(.0262)	(.0539)
SALES_EMPLOYEES			.5001***	.3230*
			(.0952)	(.1962)
EXP	-0.6257***	-0.6338***	-0.6380***	-0.6453***
	(0.1552)	(0.1549)	(0.1588)	(0.1579)
EMP	0.4292***	0.4184***	0.5005***	0.4896***
	(0.0555)	(0.0553)	(0.0559)	(0.0556)
DIV	-0.0231	-0.0227	-0.0272	-0.0270
	(0.0337)	(0.0339)	(0.0331)	(0.0333)
COUNT	-0.1254	-0.1194	-0.1322	-0.1270
	(0.1084)	(0.1104)	(0.1014)	(0.1035)
GDP_PC_REGION	-0.6724***	-0.4907***	-0.6860***	-0.5206***
	(0.1678)	(0.1838)	(0.1669)	(0.1839)
QoG_COUNTRY	-0.7237*		-0.7541*	
	(0.3735)		(0.4062)	
QoG_REGION_REL	-1.3534*		-2.0353***	
	(0.7676)		(0.7582)	
EPO_PC_COUNTRY		-.3960**		-0.4523**
		(.2020)		(0.2307)
EPO_PC_REGION_REL		.4820		0.3953
		(.3618)		(0.3919)
TFP # QoG	0.1275			
	(0.0933)			
TFP # QoG_TL2_REL	0.3192*			
	(0.1873)			
INNOV# QoG_COUNTRY	-0.0692***			
	(0.0191)			
INNOV#QoG_REGION_REL	-0.0332			
	(0.0338)			
TFP # EPO_PC_COUNTRY		0.0514		
		(0.0497)		
TFP # EPO_PC_REGION_REL		-0.1870**		
		(0.0928)		
INNOV # EPO_PC_COUNTRY		-0.0391***		
		(0.0112)		
INNOV # EPO_PC_REGION_REL		0.0293		
		(0.0204)		
SALES_EMPLOYEES # QoG_COUNTRY			0.0919	
			(0.0686)	
SALES_EMPLOYEES # QoG_REGION_REL			0.3372***	
			(0.1269)	
INNOV_USPTO # QoG_COUNTRY			-0.0646***	
			(0.0180)	
INNOV_USPTO # QoG_REGION_REL			-0.0270	
			(0.0323)	
SALES_EMPLOYEES#EPO_PC_COUNTRY				0.0461
				(0.0387)
SALES_EMPLOYEES#EPO_PC_REGION_REL				-0.1041
				(0.0673)
INNOV_USPTO # EPO_PC_COUNTRY				-0.0371***
				(0.0106)
INNOV_USPTO # EPO_PC_REGION_REL				0.0184
				(0.0190)
Constant	1.0534	0.1196	-0.5990	-1.0515
	(2.1424)	(2.3129)	(2.2353)	(2.4596)
TIME CONTROL	YES	YES	YES	YES
INVESTOR INDUSTRY FE	YES	YES	YES	YES
Observations	4989	4955	4995	4961
Log-likelihood	-2.5e+03	-2.5e+03	-2.5e+03	-2.5e+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%. All country- and region-level controls presented in Table 3 are included in the analysis, but they are not shown to save space.

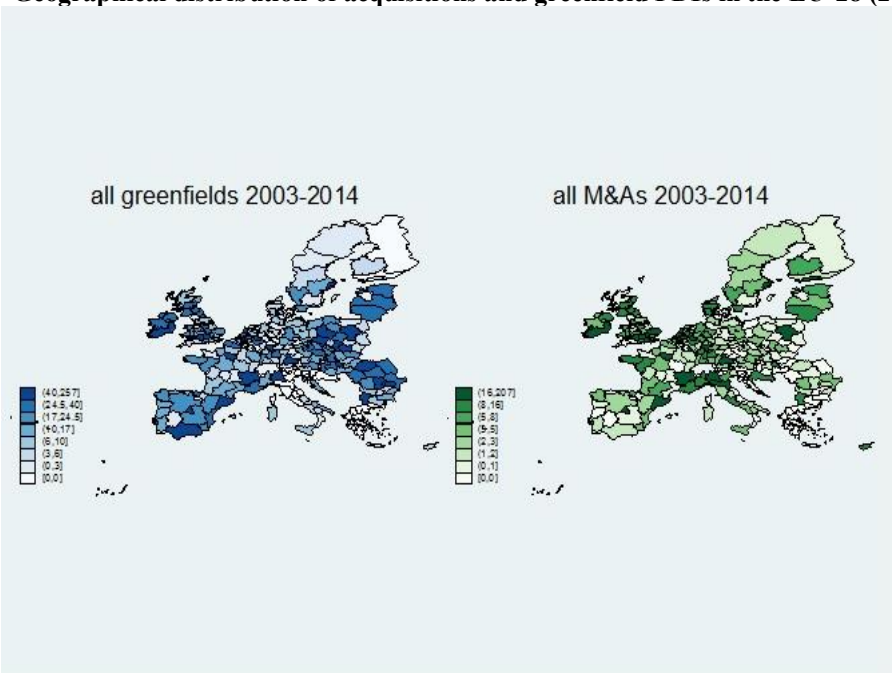
Table 5. Alternative measures of institutional quality and destinations' innovativeness

	F.E.		RULE LAW	GOV EFF	R&D
	(1)	(2)	(3)	(4)	(5)
SALES_EMPLOYEES	.4956***	.2478	.5094***	.4953***	.3388**
	(.0967)	(.1846)	(.1004)	(.0941)	(.1597)
INNOV	.0480*	.1744***	.0659***	.0694***	.1485***
	(.0246)	(.0546)	(.0248)	(.0250)	(.0397)
EXP	-0.5958***	-0.6121***	-0.5929***	-0.5901***	-0.5844***
	(0.1596)	(0.1586)	(0.1594)	(0.1593)	(0.1649)
EMP	0.5009***	0.4983***	0.4776***	0.4811***	0.4825***
	(0.0582)	(0.0577)	(0.0560)	(0.0559)	(0.0593)
DIV	-0.0115	-0.0108	-0.0273	-0.0253	-0.0292
	(0.0335)	(0.0332)	(0.0335)	(0.0333)	(0.0344)
COUNT	-0.1685*	-0.1619	-0.1453	-0.1495	-0.1357
	(0.1011)	(0.1005)	(0.1081)	(0.1060)	(0.1184)
GDP_PC_REGION	-0.8321***	-0.5366**	-0.8975***	-0.9460***	-0.8814***
	(0.2187)	(0.2421)	(0.2142)	(0.2180)	(0.2204)
QoG_COUNTRY	-.6885				
	(.4280)				
QoG_REGION_REL	-1.4531**				
	(.7112)				
EPO_PC_COUNTRY		-.4698*			
		(0.2614)			
EPO_PC_REGION_REL		.4834			
		(.3919)			
RULE_LAW_COUNTRY			-.4401		
			(.4170)		
RULE_LAW_REGION_REL			-1.6267**		
			(.7117)		
GOV_EFF_COUNTRY				-0.8695*	
				(.4506)	
GOV_EFF_REL_REL				-1.7089***	
				(.5398)	
RD_GDP_COUNTRY					-.6941*
					(.4207)
RD_GDP_REGION_REL					.0799
					(.3260)
SALES_EMPLOYEES # QoG_COUNTRY	0.1129*				
	(0.0615)				
SALES_EMPLOYEES # QoG_REGION_REL	0.2141*				
	(0.1194)				
INNOV# QoG_COUNTRY	-0.0584***				
	(0.0173)				
INNOV#QoG_REGION_REL	0.0034				
	(0.0323)				
SALES_EMPLOYEES#EPO_PC_COUNTRY		0.0661*			
		(0.0373)			
SALES_EMPLOYEES#EPO_PC_REGION_REL		-0.1313**			
		(0.0669)			
INNOV # EPO_PC_COUNTRY		-0.0345***			
		(0.0110)			
INNOV # EPO_PC_REGION_REL		0.0246			
		(0.0190)			
SALES_EMPLOYEES # RULE_LAW_COUNTRY			0.0620		
			(0.0637)		
SALES_EMPLOYEES# RULE_LAW_REGION_REL			0.2929**		
			(0.1226)		
INNOV#RULE_LAW_COUNTRY			-0.0499***		
			(0.0160)		
INNOV#RULE_LAW_REGION_REL			-0.0375		
			(0.0304)		
SALES_EMPLOYEES # GOV_EFF_COUNTRY				0.1326**	
				(0.0596)	
SALES_EMPLOYEES # GOV_EFF_REGION_REL				0.2802***	
				(0.0919)	
INNOV # GOV_EFF_TL2_AVG				-0.0654***	
				(0.0182)	

INNOV # GOV_EFF_TL2_REL				-0.0112	
				(0.0209)	
SALES_EMPLOYEES # RD_GDP_COUNTRY					0.1089*
					(0.0634)
SALES_EMPLOYEES# RD_GDP_REGION_REL					-0.0363
					(0.0550)
INNOV # RD_GDP_COUNTRY					-0.0534***
					(0.0161)
INNOV # RD_GDP_REGION_REL					0.0011
					(0.0164)
Constant	-13.7591***	-14.4464***	1.3646	1.3629	1.9704
	(2.7861)	(3.0750)	(2.5079)	(2.5080)	(2.7230)
Observations	4974	4940	4995	4995	4505
TIME CONTROL	YES	YES	YES	YES	YES
INVESTOR INDUSTRY FE	YES	YES	YES	YES	YES
INVESTMENT INDUSTRY FE	YES	YES	NO	NO	NO
DESTINATION COUNTRY FE	YES	YES	NO	NO	NO
Log-likelihood	-2.3e+03	-2.3e+03	-2.5e+03	-2.5e+03	-2.2e+03

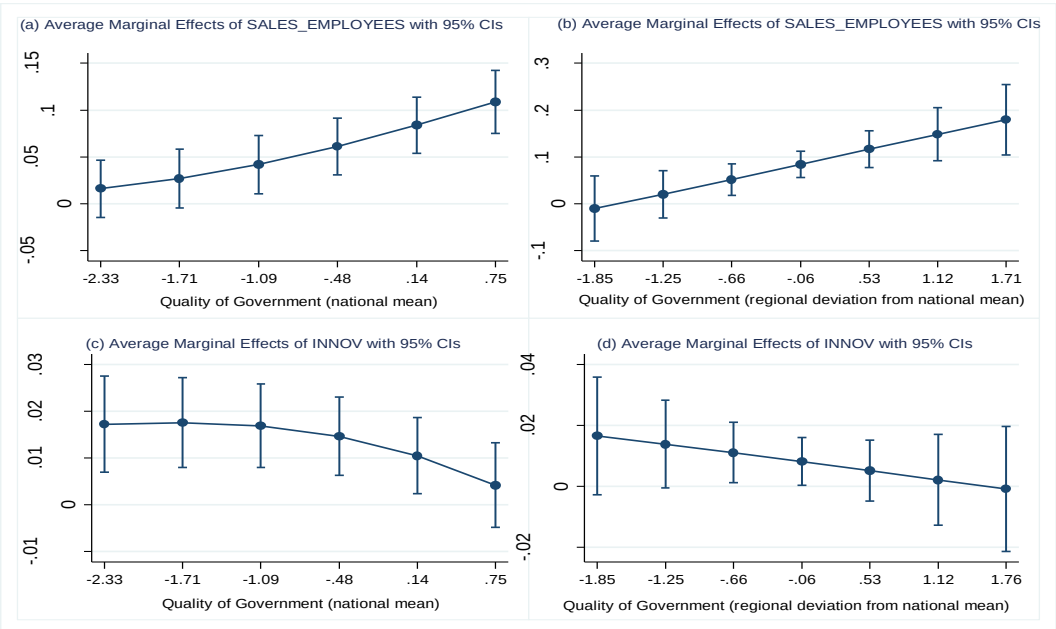
Dependent variable: GREEN=1 if greenfield and 0 if acquisitions. Robust standard errors are shown in parentheses and clustered by investor. ***, **, * indicate significance level at, respectively, 1%, 5%, 10%. All country- and region-level controls presented in Table 3 are included in the analysis, but they are not shown to save space.

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



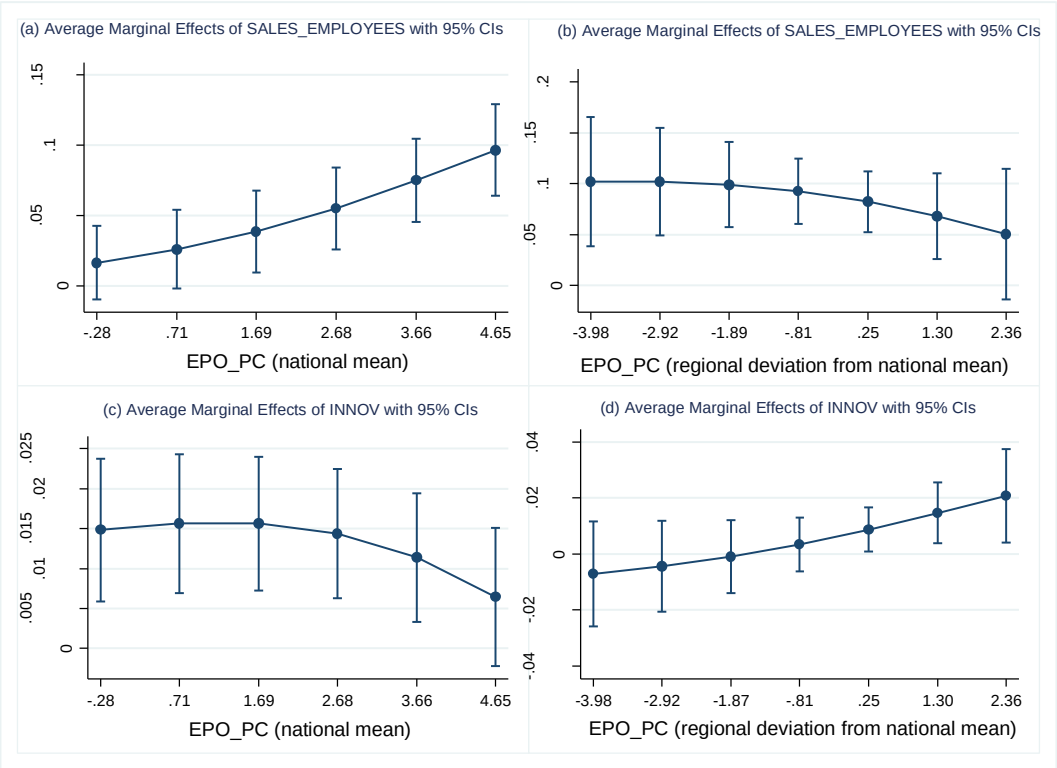
Data source: fDi Markets and BvD Zephyr

Figure 2. Marginal effects of firm-level variables at different country- and region-level components of Quality of Government



Source: Author' elaborations based on the dataset.

Figure 3. Marginal effects of firm-level variables at different country- and region-level components of EPO patents per capita



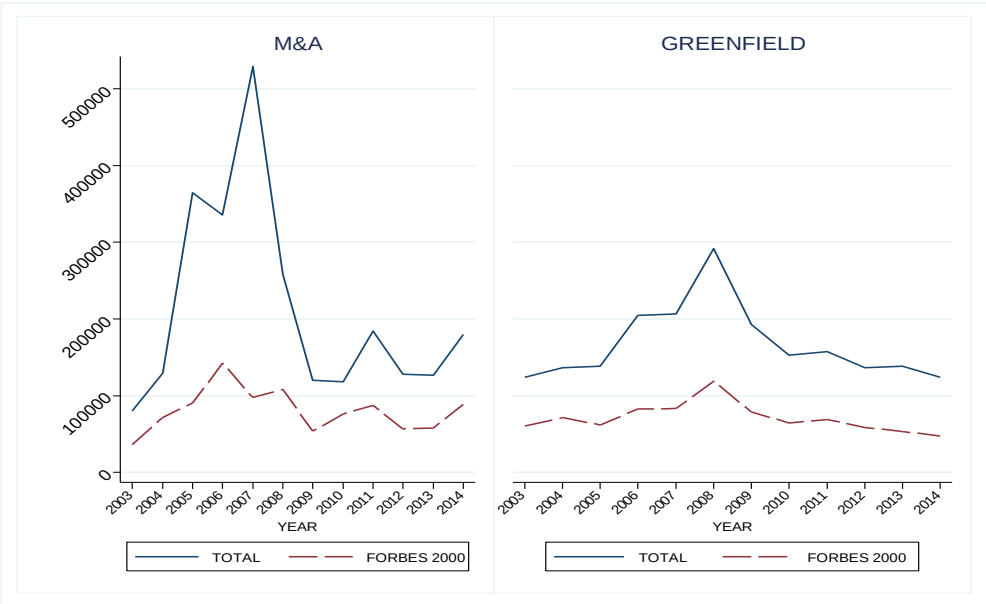
Source: Authors' elaborations based on the dataset.

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
Dependent Variable (GREEN)	0.71	0.45	4995	1 for greenfield, 0 for acquisition investment	Zephyr (Bureau van Dijk); fDi Market (Financial Times)
SALES_EMPLOYEES	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)
EXP	0.80	0.40	4995	Previous country experience dummy	Orbis (Bureau van Dijk)
EMP	10.72	1.48	4995	# Employees (log)	Worldscope Database (Thomson Reuters)
DIV	5.703	2.19	4995	# SIC sectors	Worldscope (Thomson Reuters)
COUNT	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
GOV_EFF_COUNTRY	0.12	0.86	4995	Government Effectiveness index (country-level average)	Charron et al., 2013, 2014
GOV_EFF_REGION_REL	0.01	0.47	4995	Government Effectiveness index (regional deviation from the 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	-.01	0.76	4961	N. of EPO patents per capita (regional deviation from country-level average, log)	OECD Database
RD_GDP_COUNTRY	1.72	0.79	4505	Total R&D expenditure (in percent of GDP (country-level average)	EUROSTAT
RD_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-level, log)	EUROSTAT
MOTORWAYS_GDP_REGION	0.01	0.01	4995	Kms 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 counties' 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.[12]

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

	Baseline		*Firm-level controls*		*Industry/Country fixed effects*	
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
USSALE	0.3354***		0.3968***		0.3917***	
	(0.0374)		(0.0455)		(0.0483)	
SALES_EMPLOYEES		0.4337***		0.4682***		0.4677***
		(0.0726)		(0.0798)		(0.0860)
LOG_EPO			0.0424**	0.0389*	0.0256	0.0222
			(0.0208)	(0.0210)	(0.0213)	(0.0215)
EMP		0.3404***		0.4035***		0.4008***
		(0.0391)		(0.0483)		(0.0508)
EXP_D			-0.6394***	-0.6251***	-0.7399***	-0.7343***
			(0.1245)	(0.1291)	(0.1293)	(0.1339)
DIV			-0.0153	-0.0219	-0.0025	-0.0073
			(0.0290)	(0.0287)	(0.0297)	(0.0296)
COUNT			-0.1299	-0.1030	-0.1403	-0.1090
			(0.0872)	(0.0903)	(0.0868)	(0.0904)
RGDPPC	-0.8771***	-0.8831***	-0.8702***	-0.8716***		
	(0.0777)	(0.0797)	(0.0789)	(0.0808)		
POP	-0.0459	-0.0752**	-0.0085	-0.0392		
	(0.0375)	(0.0380)	(0.0390)	(0.0394)		
OPEN	0.7865***	0.7001***	0.8780***	0.7746***		
	(0.2076)	(0.2110)	(0.2126)	(0.2147)		
DISTANCE	0.1671***	0.1492***	0.0996**	0.0859**		
	(0.0405)	(0.0406)	(0.0412)	(0.0411)		
Constant	0.5996	0.3851	0.9559	0.7765	-19.0046***	-19.9850***
	(1.6472)	(1.6400)	(1.8568)	(1.8510)	(1.6632)	(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%

[12] 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.