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The geography of acquisitions and greenfield investments:

firm heterogeneity and regional institutional conditions

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Abstract

This paper investigates how institutional conditions at national and regional levels shape the decisions of Multinational Enterprises (MNEs) to invest abroad by means of either acquisitions or greenfield investments. The empirical analysis covers all Foreign Direct Investment (FDI) projects in the European Union by the largest MNEs in the world to study alternative choices by the same firm and account for firm-level characteristics in investment decisions. The empirical results show that - other things being equal - MNEs prefer acquisitions to control activities in regions with stronger investment eco-systems, while they choose greenfield investments in regions with weaker systemic conditions. Moreover, the regional quality of government makes a fundamental difference to the nature of the investment projects attracted by regions: those with high quality of government can attract greenfield investments undertaken by the most productive MNEs. By improving their quality of government, local and regional policy makers can attract higher quality FDI to their constituencies, potentially breaking the vicious circle between low productivity areas and low productivity FDI.

Keywords: Greenfield FDI; Cross-border acquisitions; Firm heterogeneity; Regions; Europe; Institutions

JEL Codes R12; R58; F23.

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1. Introduction

Policy makers the world over have traditionally looked at the 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, by a reduction in domestic competition. The report also emphasized 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.

The differential impacts of greenfield investments and acquisitions have also been addressed in the economic literature. For instance, in a theoretical model, empirically validated on a large sample of countries, Harms and Méon (2018) show that while greenfield FDI expand capital stock in destination countries, M&As are just rents for the previous owners of the acquired companies, claiming that "*Despite the productivity gain that is associated with foreign ownership, any dollar of M&As sales therefore has a weaker effect on growth than a dollar of greenfield FDI*" (p.50).

The Covid-19 pandemic with heightened international tensions and increased national security concerns over foreign activities has further reinforced government skepticism on acquisitions (UNCTAD, 2021). Some EU countries, such as France, Germany, Italy, and Spain, have recently reduced the threshold share of acquired capital that activates investment screening, particularly in strategic sectors, such as telecommunication and biotechnology. In the United Kingdom a National Security and Investment Act was passed in May 2021, giving the Government new powers to investigate and intervene in potentially hostile mergers, acquisitions and other deals that could

threaten UK national security.[1] As a matter of fact, despite the number of acquisitions remaining relatively 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 worldwide compete fiercely for the attraction of greenfield FDI that involve building new facilities and are seen as a fundamental source of economic growth, knowledge transfer, innovation, and recovery after shocks (UNCTAD 2021; Wang and Wong, 2009). Moreover Covid-19 has 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.

The existing economic geography literature has extensively investigated the location choice of greenfield FDI, providing national and regional policy makers with consolidated evidence on key attraction factors (Coughlin and Segev, 2000; Crescenzi et al., 2014 and 2016). However, to the best of our knowledge, the drivers motivating the key decision between acquisitions and greenfield FDI have exclusively been investigated from a national standpoint in international economics, showing how different characteristics of the investing multinationals interact with host countries' national characteristics. Nocke and Yeaple (2008) model the choice between greenfield investments and acquisitions, showing that the two modes of FDI 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.

Conversely, the sub-national regional drivers of this decision remain largely under-explored and given the relevance of the economic and geo-political pros and cons of different FDI modes (i.e.,

[1] For more information see legislation.gov.uk.
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.

greenfield or acquisitions), this seems a very relevant gap to address to inform evidence-based FDI policies at regional and local level.

In this paper we build upon Nocke and Yeaple's (2008) empirical model by cross-fertilising the international economics literature with insights from economic geography and regional science. We bring to the center of the analysis the quality of sub-national regional institutions and local host eco-systems following a consolidated tradition in regional studies (Capello and Lenzi, 2014; Charron et al. 2014; Rodriguez-Pose and Di Cataldo 2015; Ascani et al. 2016; Sanso-Navarro and Vera-Cabello, 2016).

Our analysis is innovative in several ways. First, we introduce a sub-national regional analysis to account for the importance of local factors in shaping the choice between greenfield investments and acquisitions. Second, we consider technological dynamism and institutional conditions at both country and regional level as key features characterizing a strong and dynamic investment eco-system and accordingly, we hypothesize they can be potential determinants of FDI modes. Third, we explore how firm-level heterogeneity at the level of the investing multinationals interact with the characteristics of the host (national and regional) economy in shaping FDI mode decisions. In so doing we contribute to the literatures in economic geography and regional science that have often stressed the importance of understanding how firm strategies are influenced by the interaction between firm-level characteristics (such as efficiency or innovativeness), and the national and sub-national characteristics of their host territories (Beugelsdijk, 2007; Dicken and Malberg, 2001; Ottaviano, 2011; van Oort, 2012; Mariotti et al. 2014; Saito, 2015; Forslid and Okubo, 2015).

The empirical analysis is based on a new and original database including a large sample of MNEs selected from the Forbes Global 2000 list with at least one investment in the EU-28 (the 28 Member States forming the EU, including the UK) during the period from 2003 to 2014. We find that the sub-national dimension is indeed relevant in MNE decisions about their choice between greenfield investment and acquisition. Furthermore, we also find that both institutional quality and innovative

capacity of the host economies are positively related to a larger propensity to undertake acquisitions. Finally, when jointly considering 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 develops the key hypotheses tested in the empirical analysis; Sections 3 and 4 illustrate, respectively, the dataset and the variables; Section 5 presents the findings and Section 6 provides a discussion and concludes.

2. Hypotheses development: the choice between greenfield investment and acquisitions in regions

Acquisitions provide foreign firms with access to resources held by domestic firms through a complete or partial (depending on the type of acquisition) integration of the acquired company into the acquirer's own organizational boundaries. 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."* (Meyer et al 2009: 62). These two modes of accessing and controlling foreign activities are fundamentally different in their drivers, conditioning factors and, ultimately, geography. Location choices of greenfield FDI have been widely studied in the literature as well as the firm-level determinants of foreign acquisitions. However, the analysis of the fundamental choice between a greenfield investment or an acquisition in regions has been overlooked.

The existing literature in international trade has focused on country-level determinants of FDI mode, such as market size, competition intensity and degree of economic integration (Mattoo, et al., 2004; Eicher and Kang, 2005; Müller, 2007; Kim, 2009; Raff et al., 2009; Qiu and Wang, 2011; Buerger and Ianchovichina, 2017). Along these lines, the seminal contribution by Nocke and Yeaple (2008) models the MNE establishment strategy as the interaction between macro-level drivers and 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).

Nocke and Yeaple (2008) investigate the choice between greenfield FDIs and acquisitions as a positive assortative matching process between headquarters/investing companies and their new subsidiaries. In particular, Nocke and Yeaple (2007) show that this choice depends on the distribution of internationally mobile factors (such as technology) and internationally immobile resources (such as localized knowledge about domestic markets) that vary across firms.

If this framework can convincingly explain how firms choose between the greenfield FDI and acquisition, three key conceptual elements are still missing to understand the regional geography of FDI mode choices and its drivers. First, sub-national heterogeneity in the distribution of 'internationally mobile factors' should be considered and explicitly modelled. It is a well-established point in both economic geography and regional studies that MNE strategic choices are influenced by the variety and quality of highly localized assets (see for example Basile et al, 2008; Iammarino and McCann, 2013; Crescenzi et al., 2014 and 2016). Second, in a context of increased technological competition, the local innovative capacity and institutional conditions can be expected to take center stage in shaping firm strategies vis-à-vis their host economies, influencing the regional geography of FDI mode choices. Third, a fine-grained geography of FDI mode choices can be modelled as the result of the interactions between external (national and regional) conditions and firm-level characteristics (Baldwin and Okubo, 2006; Ottaviano, 2011, 2012; Saito, 2015; Forslid and Okubo, 2015).

Therefore, we analyse the regional geography of choices between greenfield FDIs and acquisitions proposing an original conceptual framework built on Nocke and Yeaple (2008), which is extended to account for a) the critical role in shaping MNE strategies of regional eco-systems in addition to national specificities; b) the spatial sub-national heterogeneity of technological dynamism and

institutional conditions; and c) the interaction of a) & b) with the diversity of investing companies. Following this line of reasoning we develop and test three hypotheses on the regional geography of FDI mode choice.

The first hypothesis is an elaboration from an economic geography standpoint of Nocke and Yeaple's (2008) fundamental idea that more efficient companies are more likely to opt for greenfield investments than acquisitions. This is because the cost for establishing new plants abroad is high, calling for larger investments to leverage scale economies. Therefore, only the more productive investors (i.e., those with higher managerial capabilities) can invest in large size foreign subsidiaries, established through greenfield investments. The higher entry cost of undertaking greenfield investments with respect to acquisitions and exports is modelled by Stepanok (2015), confirming that more productive companies are more likely to undertake greenfield investments. Empirically, this result has been confirmed for Japan (Raff et al., 2012) and Poland (Klimek, 2011). Given the diversity and heterogeneity of sub-national conditions that shape investment costs we can expect that firm efficiency will play a key role at the sub-national level over and above national level factors. In other words, we hypothesize that the existing literature has overlooked an important dimension of the investment mode choice of MNEs by neglecting the importance of firm-level capabilities in shaping also regional FDI mode decisions. In this regard our first hypothesis reads as follows.

> *H1: Other things being equal, more efficient firms with stronger scanning, learning and managerial capabilities will rely on greenfield investments when entering in host regions while less efficient firms will prefer acquisitions.*

Nocke and Yeaple (2008) also posit that the lower the gap in terms of production costs between the home economy of the investing company and the host economy of the foreign subsidiary, the higher the probability of acquisitions vis-à-vis greenfield investments, due to the diminished gains to compensate for the higher cost (and risk) of a completely new facility. Conversely, geographical proximity between the home and the host economy increases the probability of greenfield investments

by reducing the costs of setting up a new production division. This way of balancing the higher cost and inherent risk of greenfield investments with the higher potential gains from some sort of 'locational advantage' is the norm in the scant literature that has explored the sub-national drivers of the choice between greenfield FDIs and acquisitions. Greenfield investment projects 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 addition to the above drivers, and particularly in advanced economies, foreign presence is also motivated by access to new knowledge and learning, which is increasingly the true source of competitive advantage for most MNEs (Amendolagine et al., 2018). In this respect, to acquire intangible factors it is crucial to select the 'correct' FDI mode offering better access to localized networks and knowledge pools embedded into local eco-systems. 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 evidence is more limited (Phelps et al., 2003 on the UK; Du et al., 2008 looking at Chinese regions). Following the literature on the determinants of cross-border acquisitions (Rossi and Volpin, 2004; Lawrence et al., 2021), 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 second hypothesis as follows:

H2: Other things being equal, MNEs will choose acquisitions to invest in foreign regions with stronger eco-systems while they will rely on greenfield investments in regions with weaker systemic conditions.

Accounting for the interaction between heterogeneity at the firm level and in host regional eco-systems is a further original contribution in our hypothesis building on the regional geography of FDI mode choices. Although better institutional conditions are more likely to drive acquisitions (H2), in our framework, we hypothesize that more efficient MNEs possess the resources and managerial capabilities to leverage greenfield FDI and directly plug into regions endowed with stronger eco-systems, while less productive firms will still prefer acquisitions that offer an easier entry-point to the local pool of knowledge (Nocke and Yeaple, 2008). Therefore, our third hypothesis reads as follows:

H3: Other things being equal, more efficient MNEs will undertake greenfield investments to plug into foreign regions with stronger eco-systems while less efficient firms will prefer acquisitions.

If the three hypotheses above are verified, the geography of FDI mode choices can be modelled as a process of spatial matching between the most dynamic local institutional eco-systems and the most productive high-management-quality firms through greenfield FDI. These are the connections with the highest payoff for both investing firms and host economies. Conversely, the global geography of acquisitions serves as the backbone for more routine matching between investing firms and local economies.

3. The dataset

The new dataset built for testing the three hypotheses introduced in the previous section includes all greenfield investment projects and acquisitions in the EU-28 (i.e., the 28 Member States forming the EU, including the UK) undertaken by the 2,000 largest MNEs in the world, identified in terms of four

equally weighted metrics: assets, market value, sales and profits by Forbes Global 2000 list. We focus on MNEs included in the Forbes 2000 ranking (2015 Edition), which account for more than 40 per cent of the total value of FDI inflows in the EU-28 during the years from 2003 to 2014 (UNCTAD, 2018). Appendix A offers a validation of the sample.

Moreover, Forbes 2000 companies not only account for a large share of total inward investments in the EU regions, but they are also likely to undertake differentiated internationalization strategies in terms of their regional location and FDI mode, making it possible to unveil the patterns of interest. This is clearly a condition in our analysis of the geography of FDI mode choices (and its interaction with firm-level characteristics) because the sample necessarily needs to include only firms undertaking multiple foreign investments with different modes in different regions to generate enough variability for estimation.

The dataset combines multiple sources and Figure B-1 in Appendix B presents a visual representation about the different steps followed to build it. For each Forbes 2000 company we have tracked all greenfield investments and acquisitions between 2003 and 2014, linking a large sample of major investors with all their foreign investments. Information about the characteristics of the investing companies is compiled from Worldscope Database by Thomson Reuters, Orbis by Bureau van Dijk and Orbis Intellectual Property. Information about greenfield projects are drawn with a manual name-matching procedure from fDi Markets by the Financial Times, the best available source to analyze FDI at the sector and sub-national level.[3] Information about acquisitions are retrieved from Zephyr by Bureau van Dijk, identifying the BvD-ID associated to acquirers in each acquisition, restricting the sample to majority-owned foreign affiliates, and therefore excluding minority, non-controlling acquisitions because they could not be considered as an alternative choice to fully-owned greenfield projects. In addition, to guarantee that there is a real choice between greenfield FDIs and acquisitions, we have excluded from the sample greenfield investments in sub-national destinations where there is

[3] A detailed discussion of the features of the dataset and its coverage vis-à-vis other data sources on global FDI is included in Crescenzi et al. (2014) and Dogaru et al. (2015).

not any potential acquisition target in the same NACE 2-digit sector. Finally, we also dropped purely commercial greenfield subsidiaries by excluding all greenfield FDI that fDi Markets associate to a sales or retail business activity.

The final sample includes 7,338 investments, of which 2,001 are acquisitions (27%) and 5,337 are greenfield investment projects (73%). All investments have been geocoded at OECD Territorial Level 2, which combines EUROSTAT NUTS 1 and NUTS 2 regions in a consistent and harmonized fashion.

Following Nocke and Yeaple (2008), we aggregate investments so that for each firm a location-industry pair is counted at most once. In more detail, given the regional focus of our research, each observation in the dataset represents a new investment project of a company in one of the EU-28 sub-national regions in a particular industrial sector (defined at NAICS 2-digit level). In the empirical analysis we distinguish between two sub-periods, 2003-2008 and 2009-2014, for two reasons: (a) to shorten the timespan covered by the unit of analysis, making it like Nocke and Yeaple (six years); (b) to account for the international financial crisis of 2008. The empirical analysis then pools the two sub-periods.

Considering the geography of FDI projects, the UK and Germany receive the largest shares of total inward investment: 20% and 11% of the total respectively. Spain is also an important destination for greenfield investment (10.5%), while France is the third most important target for acquisitions (10.7%). Eastern European countries are attractive mainly for greenfield investments, in particular Poland (8.3%) and Romania (6.3%) (Table 1).

[TABLE 1 ABOUT HERE]

The Herfindahl Index (HHI), that captures the within-country concentration across sub-national regions, shows that investment projects 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, acquisitions are mostly concentrated within regions located in EU-15[4] countries, namely the UK, Germany, France, Spain, Netherlands, Italy (Figure 1.B) while greenfield projects are more geographically spread (Figure 1.A).

[FIGURES 1.A & 1.B ABOUT HERE]

Table 2 describes the sectoral distribution of investors according to the Eurostat classification.[5] Investments from MNEs in medium-high tech manufacturing sectors and knowledge-intensive services represent more than 60% of all projects. Greenfield investment projects are particularly concentrated in the automotive industry (9.2%), while acquisitions are concentrated in electronics (9.15%) and machinery (8.3%). Considering services, investments in financial and insurance industries attract the largest share of deals.

[TABLE 2 ABOUT HERE]

4. The model and the variables

To test the hypotheses developed in Section 2, the empirical analysis models the choice of multinationals between either embarking on brand new greenfield projects or acquiring existing local firms when deciding to invest in a particular foreign region and sector. This approach departs from standard location choice analyses that aim to model *where* (usually greenfield) investments are located. Conversely, here we investigate *how* multinationals undertake their investments. This choice is modelled through a standard logit model that builds upon and extends Nocke and Yeaple (2008), estimating the probability of undertaking a greenfield investment (vs. an acquisition) as function of a set of characteristics of the host regions and of the investors. The model is specified as follows:

[4] The EU15 comprise the following 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
[5] The Eurostat classification refers to NACE 2-digit sectors.

$$P(y_{irsf}) = \frac{1}{1 + exp(-\alpha - X_{irsf}\beta)},$$

where *y* is the dependent variable, taking value 1 if investment project *i* is a greenfield investment and 0 if it is an acquisition[6], X is a vector of explanatory variables at firm, regional and national level, *r* is the region where the investment takes place, *s* is the sector, *f* is the investor/MNE. As in Nocke and Yeaple (2008) the model is static, and all variables are computed in the first year of each sub-period.

All models include investor-industry fixed effects and sub-period fixed effects (i.e., the model includes a dummy TIME CONTROL, taking value 1 for projects undertaken in the 2009-2014 sub-period and 0 for observations in the 2003-2008 sub-period). The fixed effects account for all time-invariant unobservable characteristics of the investing companies that might affect their investment decisions (including for example different home countries, company culture, managerial strategies etc.) as well as for sector-specific preferences for one foreign investment mode over the other. In addition, in a separate specification included in the section on robustness checks we also include fixed effects at the destination/target sector and country level. These additional sets of fixed effects also control for the specificities of the sectors of the foreign investment (over and above the main sector of operation of the investing company) and of the host country (including its overall investment and labor costs, historical legacy and quality of government etc.). Standard errors are clustered at investor level.

In line with our hypotheses the regressors include two sets of explanatory variables: a set of investor-level variables (Hypotheses #1 and #3) and an additional set at the host country/region level (Hypotheses #2 and #3). In what follows, we discuss and justify the key variables included in the

[6] Only 1% of the regional/industry units of analysis attracts multiple greenfield investments and/or acquisition by the same investor. In these rare cases, the observation is coded as an acquisition, given the lower frequency of acquisitions in the sample.

empirical analysis. Details about all variables and their sources are presented in Table B-1 in Appendix B.

In the selection of the key characteristics of the investors, we follow Nocke and Yeaple (2008) and introduce two variables:

- a proxy for the overall efficiency of the investing company, computed as the logarithm of net sales per employee in US$ dollars (SALES_EMPLOYEES);
- a proxy for the dynamic efficiency of investors and their innovation capacity, measured as the cumulative (log) number of patents filed at the European Patent Office (INNOV).[7]

In addition, we include in the model several additional controls at the level of the investing company, also following Nocke and Yeaple (2008):

- the size of the investors, measured by the log number of employees (EMP);
- the diversification in different industries (DIV) calculated as the number of industrial sectors (defined at SIC 4-digit level) in which the investor operates;[8]
- the (log) number of countries in which the investing companies operate to control for the investors' internationalization level (COUNTRIES);
- a dummy variable which takes value of 1 if the parent company already has at least one subsidiary in the same county at the year of the investment, and 0 otherwise (EXP).

Then, the model includes two proxies for the quality of the host-region eco-system. The first is a measure of the regional institutional quality (QoG_REGION), measured by the European Quality of Government Index (Charron et al., 2013 and 2014), a survey-based indicator on European regions compiled by the University of Gothenburg. The index is based on questionnaires gauging the quality and impartiality of public services and the perception of corruption by local citizens. Responses to

[7] This variable is different from the ratio of R&D expenditure on total sales included in Nocke and Yeaple (2008), which we could not calculate because of the high number of missing values in Worldscope.
[8] This is different from Nocke and Yeaple (2008), who calculate a concentration index of sales across industrial sectors. Because we lack such information, we prefer to use a different proxy for diversification.

the survey are aggregated at the NUTS1 or NUTS2 level for the EU-28, identifying four different dimensions of government quality: control of corruption, government effectiveness, rule of law, and government accountability (Charron et al. 2013 and 2014). 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.

A set of host economy controls at the national and regional level completes the specification of the model. At the regional level, we include the logarithm of the real GDP per capita of host regions (GDP_PC_REGION) – a key proxy for the level of productivity of the local economy and (indirectly) for its labor costs – as well as for other regional characteristics which are customary in the literature on MNE location choices (e.g., Basile et al., 2008) and that might also influence the investment mode. We control for the quality of infrastructure, measured by the kilometers of motorways per million euros of GDP (MOTORWAYS_GDP_REGION), for the level of human capital (HC_REGION) proxied by the percentage of employed people aged 25-64 with higher education and finally, for agglomeration effects by the total number of companies within the same region of the investment (AGGLOMERATION). At the country level the model includes controls for the host countries' degree of openness (OPEN) proxied by the ratio of the sum of exports and imports to GDP, along with the geographical distance between the origin and the destination country (DISTANCE).

5. Empirical results

Table 3 presents the results of the logit analysis. The estimation of the baseline model reported in Column 1 offers support to Hypothesis #1, adding a validation at regional level of the findings at country level by Nocke and Yeaple (2008).[9] More productive and efficient investing companies are more likely to invest in foreign host regions through greenfield investments rather than acquisitions.

[9] As a robustness check, we replicate the models presented in Table 1 in Nocke and Yeaple (2008). Results are provided in the Appendix C (Table C.1) and mostly confirm the original findings, suggesting that our model is well specified and offer regional-level results consistent with Nocke and Yeaple (2008).

Large sunk costs and higher risk associated with the creation of brand-new foreign subsidiaries can be covered more easily by more productive MNEs. Dynamic efficiency and innovation capabilities – proxied by the patenting portfolio of the investing company – go in the same direction: more innovative companies are – ceteris paribus - more likely to undertake greenfield investment projects to leverage their technological advantage in foreign markets directly (Meyer et al. 2009; Tekin-Koru, 2012). Being undertaken by more productive and innovative firms, greenfield investments can bring into the regional economy higher value added, including highly productive activities not otherwise present in the regional eco-system.

The inspection of other firm-level control variables can better qualify the main findings on Hypothesis 1. Previous investment experience in the same country as the new investment (EXPERIENCE) decreases the probability of opting for greenfield investments when accessing a new regional economy. By leveraging better availability of domestic knowledge to identify possible target companies, investing companies can avoid the higher costs associated with greenfield projects and opt for acquisitions. This finding is in line with the existing literature (Ravenscraft and Scherer, 1987; Slangen and Hennart, 2008; Tekin-Koru, 2012) and confirms the idea of greenfield investments as less influenced by path-dependency, making this form of investment more appealing when directed to less advanced economies. Both the industrial diversification (DIV)[10] and degree of internationalization (COUNT) of investing MNEs are not statistically significant. At the country level, our results confirm that more open economies (i.e., with larger values of OPEN_COUNTRY) are more likely to attract greenfield investments. However, in contrast to Nocke and Yeaple 2008, we do not find a significant effect of the geographical distance between FDI origin and destination countries.

In Column 2 the model is extended to include the full set of regional controls. Higher productivity regions – those with a higher GDP per capita - are less likely to attract greenfield investment projects

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

because they have higher local production costs[11] and more competition on the factor market, increasing start up sunk costs for the investors. In addition, more dynamic regions are more likely to offer suitable domestic targets for acquisitions. This aligns with the evidence that agglomeration economies - captured by the local density of domestic firms (AGGLOMERATION REGION) – offering a larger number of potential acquisition candidates lower the probability of greenfield projects. These results suggest that overall, low-productivity, low-agglomeration regions are – ceteris paribus – better positioned for the attraction of greenfield investment projects than acquisitions. This attractiveness for greenfield projects with respect to acquisitions is reinforced by better accessibility and infrastructural endowment captured by road density (MOTORWAYS) (Basile, 2004). In contrast to Tokin-Koru (2012), we do not find any significant effect in the FDI mode choice from the local human capital level.

The model in Column 3 aims at testing Hypothesis #2 by introducing the two key regional-level variables of interest: the regional quality of government (QoG) and innovation performance (EPO_PC). The estimated coefficients show that higher institutional quality at the regional level lowers the probability of choosing greenfield FDIs with respect to acquisitions. Good institutions offer transparency and reduce information asymmetries and market failures, making it possible to pursue complex operations such as cross-border acquisitions, saving on the huge sunk costs associated with greenfield investments. Sound regional institutions guarantee a more transparent and information-rich business context (Alon 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; Stigler, 1961). Moreover, innovative regional economies offer similar opportunities to investors: high innovative regions are also less likely to attract greenfield projects. Where more valuable (and internationally scarce) corporate assets are available locally, foreign acquisitions are more likely to happen. By pursuing this strategy, foreign MNEs have more to gain when they acquire

[11] More direct proxies for production costs at the regional level are notoriously not available for a sufficiently large sample of EU regions.

a company with all its existing linkages within a domestic innovative eco-system, characterized by a good institutional environment, and much less to lose in terms of entry and sunk costs as well as possible knowledge leakages. For regions that on the contrary would ideally want to maximize knowledge leakages to enhance their local economy, good quality institutions might be a double-edged sword when it comes to international connectivity through FDI, as they might expose the local environment to foreign absorption through higher transparency.

[TABLE 3 ABOUT HERE]

The ultimate balance and assessment of the role of local quality of government and innovation for the possibility to reap the benefits from global connectivity comes from the testing of Hypothesis #3. The models reported in Columns 4 and 5 investigate what types of firms are attracted to high innovation high institutional quality places by means of a set of interactions terms between investors' productivity and host economy eco-systems. The first model (Column 4) introduces an interaction term between investors' productivity and institutional quality of the host region. The interaction term is positive and significant, suggesting that high productivity MNEs are more likely to invest through greenfield FDIs than with acquisitions in regions with high quality of government. Figure 2 shows the average marginal effects of MNE productivity (Figures 2a) on the probability of greenfield investments corresponding to different intensities of regional quality of government. The positive effect of MNE productivity on the probability of undertaking greenfield investments with respect to acquisitions becomes larger when the regional quality of government is higher. This suggests that the regional quality of government fosters a selection of more productive MNEs that invest – as they typically do – through greenfield FDI projects. This result unveils a possible additional channel through which institutions foster regional development (Rodrìguez-Pose, 2013), by enhancing the opportunity for attracting greenfield investment projects by more productive investors.

The following model (Column 5) estimates the interaction terms between MNE productivity and the innovation capacity in the host regions. In this case, the interaction term is not statistically significant.

Figure 2 (b) shows how the marginal effect of MNE productivity on the probability of greenfield investments with respect to acquisitions varies across different intensities of regional innovation. On the one hand, regional innovation seems to behave as better institutions, by making it easier for more productive MNEs to undertake greenfield investments rather than acquisitions. On the other hand, the mediating role of regional innovation with respect to MNE productivity in the choice between greenfield FDIs and acquisitions has a lower magnitude and weaker statistical significance vis-à-vis the quality of regional institutions.

Finally, the last model (Column 6) includes both interaction terms studied in the two previous models, confirming the strong significance of the interaction term between MNE productivity and the host region institutional quality.

[FIGURE 2]

5.1.Robustness checks

Tables 4 and 5 report a set of replications of robustness checks. In Table 4 we estimate alternative measures of regional ecosystems and investors' productivity: a) the quality of government is measured with two alternatives indexes - Rule of Law (Column 1) and Government Effectiveness (Column 2) and b) the innovative capacity with the regional R&D expenses share on GDP (Column 3). The results reported in Columns 4 and 5 of Table 4 confirm the results in Table 3, measuring investors' productivity by Total Factor Productivity, calculated as ln (SALES/EMPLOYEES)-1/3 ln (CAPITAL/EMPLOYEES) (Raff et al., 2012).[12]

Table 5 shows additional robustness checks. To disentangle national from regional effects, in Columns 1 and 2 we split regional values of institutional quality and innovation capacity in two dimensions: country-level mean values and regional deviation from the country mean. The results

[12] This measure of total factor productivity can suffer from endogeneity and simultaneity biases due to measurement errors and potential correlation between inputs and unobserved productivity. Nevertheless, more precise measures of Total Factor Productivity (see for instance Levinsohn and Petrin, 2003) are not available since in the dataset the values of the intermediate inputs are missing for many companies.

confirm the dominant 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.

The empirical analysis suggests that – ceteris paribus - higher institutional quality at the regional level correlates with a lower probability of undertaking greenfield FDI. However, this correlation might well be the outcome of broader structural processes. For example, regions with higher institutional quality are often more developed and, therefore, have higher production costs. This is the reason why the model controls – under the constraint of data availability for our large sample of EU regions - for a number of regional characteristics associated with higher overall economic development and, possibly, production costs such as GDP per capita and infrastructural density. The same logic can be applied to more innovative regional economies: core regions are more innovative than peripheral regions, but core regions also have higher production costs than peripheral regions, which make them less likely to attract greenfield FDI. To rule out these possible confounding factors and further test the robustness of our main results in Columns 3 and 4, we also include target/destination country and industry fixed effects. These additional set of fixed effects controls more fully for potentially unobserved (or unobservable) characteristics of the host economies and their sectors. The main results remain qualitatively unchanged.

[TABLE 4 ABOUT HERE]

[TABLE 5 ABOUT HERE]

6. Conclusions

While policy debates are characterized by polarized views on the differential benefits of greenfield investments vis-à-vis acquisitions the drivers of these decisions have remained significantly under-researched. This paper has tried to fill this gap by developing and testing a new set of hypotheses on the regional dimension of this process. By leveraging an original dataset which combines a

multiplicity of data sources at firm, country and regional levels, the empirical analysis sheds new light on the role of firm and regional level determinants on the MNE choice between greenfield investments and acquisitions. The findings show that - other things being equal - MNEs prefer acquisitions to control activities in regions with stronger investment eco-systems, while they choose greenfield investments in regions with weaker systemic conditions. However, the regional quality of government makes a fundamental difference on the nature of the investments attracted by regions: those with high quality of government can attract greenfield investments undertaken by the most productive MNEs.

The empirical analysis has some limitations that should be carefully considered when assessing these results. First, similarly to Nocke and Yeaple (2008) and all the existent literature on the topic, the empirical analysis does not consider a more complex decision framework where companies first decide whether to invest abroad and, in a second stage, choose between establishing a new subsidiary or acquiring a foreign company. Second, the measures of firm-level productivity and innovation are significantly constrained by data availability issues at both firm and regional level.

While more research and better data are certainly needed to address these limitations, these findings confirm the importance of accounting simultaneously for heterogeneity at firm-level and in host regional eco-systems and corroborate the need to provide granular evidence to inform policy making in this area of growing strategic interest. They indicate that by reinforcing their investment eco-system, and by improving their quality of government, local and regional policy makers can attract higher quality investments to their constituencies, potentially breaking the vicious circle between low productivity areas and low productivity FDI. This vicious circle is a fundamental problem for regional policies in less developed regions. Our results unveil an important channel that can explain how stronger institutions and more supportive eco-systems can boost regional development trajectories. By increasing the probability of greenfield investments by more productive firms in weaker regions, the quality of the regional investment eco-system can make a real difference.

Even though global capital markets are increasingly competitive, it is possible for all types of regions to take action and improve the quality of their investment eco-systems. Most countries have active Investment Promotion Agencies (IPAs) operating at national and sub-national levels to attract inward investments. Recent empirical evidence on the impact of IPAs in Europe (Crescenzi et al. 2021) shows that sub-national regional IPAs, operating near investors' operations, play a key role in boosting the total amount of greenfield FDI received as well as the jobs directly created by foreign investors, and this is particularly true in less developed regions. These findings are highly complementary to the evidence offered by our paper: local institutional quality and investment eco-system characteristics interact with firm-level decisions and in so doing they can potentially shape regional development trajectories.

Nevertheless, we know that FDI – even by the most productive MNEs – are neither a necessary nor a sufficient condition for local economic development in less advanced regions. There are several examples of foreign-owned plants specialized in low value-added activities in peripheral regions. The attraction of the 'right' type of investments to maximise local employment and spillovers remains a complex task that needs to balance a multiplicity of factors. Understanding the drivers of the choice between greenfield FDI and acquisition of an existing company is a key (although still partial) input for these policies, to allow for better focused and tailored national and regional policies.

Finally, the evidence produced in this paper sheds some new light on the geographical implications of supranational (e.g., at the EU level) or national policies aimed at discouraging the foreign acquisition of domestic firms. These policies – often justified on strategic or national security grounds – might curtail an important global connectivity channel for the most advanced regions with implications on overall efficiency, but potentially rebalancing effects in favor of less developed regions with good institutional quality. The latter might benefit from a partial shift towards greenfield investments in a context where acquisitions are actively discouraged.

References

Alon, I., Elia, S., & Li, S. (2020). Greenfield or M&A? An institutional and learning perspective on the establishment mode choice of Chinese outward investments. *Journal of International Management*, *26*(3).

Amendolagine, V., Giuliani, E., Martinelli, A., & Rabellotti, R. (2018). Chinese and Indian MNEs' shopping spree in advanced countries. How good is it for their innovative output? *Journal of Economic Geography*, *18*(5), 1149-1176.

Akerlof, G.A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *American Economic Review*, 84 (3), 488-500.

Ascani, A., Crescenzi, R., & Iammarino, S. (2016). Economic institutions and the location strategies of European multinationals in their geographic neighborhood. *Economic Geography*, *92*(4), 401-429.

Baldwin, R., Okubo, T. (2006). Heterogeneous firms, agglomeration and economic geography: spatial selection and sorting, *Journal of Economic Geography*, 6 (3), 323–346

Basile, R. (2004). Acquisition versus greenfield investment: the location of foreign manufacturers in Italy, *Regional Science and Urban Economics*, 34, 3-25.

Basile, R., Castellani, D., & Zanfei, A. (2008). Location choices of multinational firms in Europe: The role of EU cohesion policy. *Journal of International Economics*, *74*(2), 328-340.

Beugelsdijk, S. (2007). The regional environment and a firm's innovative performance: a plea for a multilevel interactionist approach. *Economic Geography,* 83(2), 181-199.

Burger, M. J., & Ianchovichina, E. I. (2017). Surges and stops in greenfield and M&A FDI flows to developing countries: analysis by mode of entry. *Review of World Economics*, 153(2), 411-432.

Du, J., Lu, Y., Tao, Z. (2008). Economic institutions and FDI location choice: Evidence from US multinationals in China. *Journal of Comparative Economics*, 36, 412-429.

Cai, Y., Seviril, M. (2012). Board connections and M&A transactions, *Journal of Financial Economics*, 103, 327-349.

Capello, R., & Lenzi, C. (2014). Spatial heterogeneity in knowledge, innovation, and economic growth nexus: conceptual reflections and empirical evidence. *Journal of Regional Science*, 54(2), 186-214

Charron, N., Dijkstra, L., Lapuente, V. (2014). Regional Governance Matters: Quality of Government within European Union Member States, *Regional Studies*, 48(1): 68-90.

Charron, N., Lapuente, V., Rothstein, B. (2013) Quality of Government and Corruption from a European Perspective: A Comparative Study of Good Government in EU Regions. Edward Elgar Publishing.

Coughlin, C. C., & Segev, E. (2000). Location determinants of new foreign-owned manufacturing plants. *Journal of Regional Science*, 40(2), 323-351.

Crescenzi, R., Pietrobelli, C., & Rabellotti, R. (2014). Innovation drivers, value chains and the geography of multinational corporations in Europe. *Journal of Economic Geography*, 14(6), 1053-1086.

Crescenzi, R., Pietrobelli, C., & Rabellotti, R. (2016). Regional strategic assets and the location strategies of emerging countries' multinationals in Europe. *European Planning Studies*, *24*(4), 645-667.

Crescenzi, R., Di Cataldo, M., Giua, M. (2021). FDI inflows in Europe: Does investment promotion work?. *Journal of International Economics*, 132.

Dicken P., Malmberg A. (2001). Firms in Territories: A relational Perspective, *Economic geography*, 77: 345-363.

Dogaru, T., Burger, M., Karreman, B., & van Oort, F. (2015). Functional and Sectoral Division of Labour within C entral and Eastern European Countries: Evidence from Greenfield FDI. *Tijdschrift voor economische en sociale geografie*, *106*(1), 120-129.

Du, J., Lu, Y., Tao, Z. (2008). Economic institutions and FDI location choice: Evidence from US multinationals in China. *Journal of Comparative Economics*, 36, 412-429.

Eicher, T., Kang, J. W. (2005). Trade, foreign direct investment or acquisition: Optimal entry modes for multinationals, *Journal of Development Economics*, 77, 207-228.

European Commission (2019). Foreign Direct Investments in the EU, Commission Staff Working Document, march, Brussels.

Forslid, R., & Okubo, T. (2015). Which firms are left in the periphery? Spatial sorting of heterogeneous firms with scale economies in transportation. *Journal of Regional Science*, *55*(1), 51-65.

Harms, P., & Méon, P. G. (2018). Good and useless FDI: The growth effects of greenfield investment and mergers and acquisitions. *Review of International Economics*, 26(1), 37-59.

Higgins, M.J., Rodriguez, J. (2006). The outsourcing of R&D through acquisitions in the pharmaceutical industry, *Journal of Financial Economics*, 80, 351-383.

Huallacháin, B. O., Reid, N. (1997). Acquisition versus Greenfield Investment: The Location and Growth of Japanese Manufacturers in the United States, *Regional studies*, 31, 403-416.

Iammarino, S., & McCann, P. (2013). Multinationals and economic geography: Location, technology and innovation. Edward Elgar Publishing.

Kim, Y.-H. (2009). Cross-border M&A vs. greenfield FDI: Economic integration and its welfare impact, *Journal of Policy Modeling*, 31, 87–101.

Klimek, A. (2011). Greenfield Foreign Direct Investment Versus Cross-Border Mergers and Acquisitions: The Evidence of Multinational Firms from Emerging Countries, *Eastern European Economics*, 49(6), 60-73.

Knack, S., Keefer, P. (1995). Institutions and economic performance: cross-country tests using alternative institutional measures, *Economics & Politics*, 7 (3), 207-227.

Lawrence, E. R., Raithatha, M., & Rodriguez, I. (2021). The effect of cultural and institutional factors on initiation, completion, and duration of cross-border acquisitions. *Journal of Corporate Finance*, *68*, 101950.

Levinsohn, J., & Petrin, A. (2003). Estimating production functions using inputs to control for unobservables. *The review of economic studies*, *70*(2), 317-341.

Mariotti, S., Piscitello, L., & Elia, S. (2014). Local externalities and ownership choices in foreign acquisitions by multinational enterprises. *Economic Geography*, *90*(2), 187-211.

Mattoo, A, Olarreaga, M., Saggi, K. (2004), Mode of foreign entry, technology transfer, and FDI policy, *Journal of Development Economics*, 75, 95-111.

Meyer, K. E., Estrin, S., Bhaumik, S. K., Peng, M. W. (2009) Institutions, resources and entry strategies in emerging economies. *Strategic management journal*, 30 (1), 61-80.

Müller, T. (2007). Analyzing Modes of Foreign Entry: Greenfield Investment versus Acquisition, *Review of International Economics*, 15 (1), 93-111.

Nocke, V. and S.Yeaple (2007), Cross-border mergers and acquisitions vs Greenfield foreign direct investment: The role of firm heterogeneity, *Journal of International Economics*, Vol. 72, pp.336-365.

Nocke, V., Yeaple, S. (2008), An Assignment Theory of Foreign Direct Investment. *Review of Economic Studies*, 75, 529-557.

Ottaviano, G. I.P. (2011). 'New' new economic geography: firm heterogeneity and agglomeration economies. *Journal of Economic Geography*, 11, 231–240

Ottaviano, G. I. P. (2012). Agglomeration, trade and selection, *Regional Science and Urban Economics*, 42, 987–997.

Phelps, N.A., MacKinnon, D., Stone, I., Braidford, P. (2003). Embedding the Multinationals? Institutions and the Development of Overseas Manufacturing Affiliates in Wales and Northeast England, *Regional Studies*, 37 (1), 27-40.

Qiu, L.D., Wang, S. (2011). FDI Policy, Greenfield Investment and Cross-border Mergers, *Review of International Economics*, 19 (5), 836-851.

Raff, H., Ryan, M., Stähler, F. (2009). The choice of market entry mode: Greenfield investment, M&A and joint venture, *International Review of Economics and Finance,* 18, 3–10

Raff, H., Rayan, M., Stahler, F. (2012). Firm Productivity and the Foreign-Market Entry Decision, *Journal of Economics & Management Strategy*, 21(3), 849-871.

Ravenscraft, D., Scherer, F.M., 1987. Mergers, Sell-Offs, and Economic Efficiency. Brookings, Washington, DC.

Rodríguez-Pose, A. (2013). Do institutions matter for regional development? *Regional Studies*, 47, 1034-1047.

Rodríguez-Pose, A., & Di Cataldo, M. (2015). Quality of government and innovative performance in the regions of Europe. *Journal of Economic Geography*, *15*(4), 673-706.

Rossi, S., & Volpin, P. F. (2004). Cross-country determinants of mergers and acquisitions. *Journal of Financial Economics*, *74*(2), 277-304.

Saito, H. (2015). Firm heterogeneity, multiplant choice, and agglomeration. *Journal of Regional Science*, *55*(4), 540-559.

Sanso-Navarro, M., & Vera-Cabello, M. (2016). Regional growth, innovation, and latent nonlinear effects. *Journal of Regional Science*, 56(5), 814-847.

Slangen, A., Hennart, J.F. (2008)., *Journal of International Business Studies*, 39, 472-490.

Stepanok, I. (2015). Cross-border mergers and greenfield foreign direct investment. *Review of International Economics*, 23(1), 111-136.

Stigler, G.J., 1961. The economics of information. *Journal of Political Economy* 69, 213–225.

Tekin-Koru, A. (2012). Asymmetric effects of trade costs on entry modes: Firm level evidence, *European Economic Review,* 56, 277–294.

United Nations Conference on Trade and Development (2018). FDI Statistics 2016. United Nations Conference on Trade and Development, Geneva.

United Nations Conference on Trade and Development (2000). World Investment Report. United Nations Conference on Trade and Development, Geneva.

United Nations Conference on Trade and Development (2021), World Investment report 2021 – Investing in a sustainable recovery, United Nations publication, New York

Van Oort, F. G., Burger, M. J., Knoben, J., & Raspe, O. (2012). Multilevel approaches and the firm-agglomeration ambiguity in economic growth studies. *Journal of Economic Surveys*, 26(3), 468-491.

Wang, M., & Sunny Wong, M. C. (2009). What drives economic growth? The case of cross-border M&A and greenfield FDI activities. *Kyklos*, 62(2), 316-330.

Appendix A

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-15 countries (see Footnote 5) and EU-new members[13], they host respectively 38.3% and 44.5% of FDI flows from Forbes 2000 investments. Considering cross-border acquisitions, Forbes 2000 M&As represent 36% of the aggregate value of cross-border acquisitions to EU-15 and 74% of the total value of acquisitions to EU-new members (between 2003 and 2014). In terms of greenfield investments, Forbes 2000 investments represent 42.3% of the aggregate value of FDI located in the EU-15 members, and 40.4% of the value of the investments in the EU-new members.

[FIGURE A.1 ABOUT HERE]

Appendix B

[FIGURE B.1 ABOUT HERE]

[13] The Eu-new members comprise the following countries: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

Appendix C

The benchmark model: Nocke and Yeaple (2008)

As a benchmark, in Table 1 we replicate the models of Nocke and Yeaple (2008) with our database testing the choice between greenfield investments and acquisitions across different countries, and in Table 3 across sub-national regions. The output variable is equal to 1 when a greenfield investment is undertaken and to 0 for an acquisition. To test a model as similar as possible to Nocke and Yeaple (2008), we also include firm-level sales as an alternative measure for efficiency and the population size of the host countries (POP) as an additional control Table C.1 reports the results, which are largely consistent with those obtained by Nocke and Yeaple (2008), including when we introduce fixed effects for affiliated industries and host countries. The only difference is the sign of the geographical distance between home and host countries.

[TABLE C.1 ABOUT HERE]

Tables and figures

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

Country	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, Lithuania, Latvia, Luxemburg, Malta, and Slovenia.

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)*

Source: fDi Markets and BvD Zephyr

Table 3. Econometric Analysis

GREEN: 1: greenfield, 0: acquisitions	(1)	(2)	(3)	(4)	(5)	(6)
SALES_EMPLOYEES	0.5299***	0.5287***	0.5173***	0.4619***	0.4527**	0.7482***
	(0.0904)	(0.0910)	(0.0912)	(0.0899)	(0.1945)	(0.2040)
INNOV	0.0366	0.0380*	0.0421*	0.0419*	0.0420*	0.0423*
	(0.0228)	(0.0229)	(0.0231)	(0.0231)	(0.0231)	(0.0231)
EXPERIENCE	-0.7299***	-0.7323***	-0.6488***	-0.6527***	-0.6492***	-0.6520***
	(0.1550)	(0.1547)	(0.1568)	(0.1570)	(0.1568)	(0.1571)
EMPLOYEES	0.5075***	0.5092***	0.4873***	0.4868***	0.4869***	0.4887***
	(0.0552)	(0.0552)	(0.0552)	(0.0553)	(0.0552)	(0.0551)
DIV	-0.0246	-0.0264	-0.0263	-0.0261	-0.0261	-0.0272
	(0.0326)	(0.0328)	(0.0329)	(0.0329)	(0.0330)	(0.0329)
COUNTRIES	-0.1131	-0.1158	-0.1356	-0.1340	-0.1354	-0.1348
	(0.1030)	(0.1037)	(0.1033)	(0.1031)	(0.1033)	(0.1024)
OPEN_COUNTRY	0.4117**	0.2675	0.6351***	0.6217***	0.6330***	0.6242***
	(0.1888)	(0.1939)	(0.2090)	(0.2089)	(0.2095)	(0.2086)
DISTANCE_COUNTRY	0.0495	0.0539	0.0488	0.0508	0.0493	0.0491
	(0.0456)	(0.0458)	(0.0455)	(0.0455)	(0.0455)	(0.0455)
GDP_PC_REGION	-1.2789***	-1.1219***	-0.4743**	-0.4616**	-0.4714**	-0.4651**
	(0.1232)	(0.1589)	(0.1842)	(0.1847)	(0.1843)	(0.1836)
AGGLOMERATION_ REGION		-0.0794*	-0.0948*	-0.0978*	-0.0953*	-0.0957*
		(0.0458)	(0.0503)	(0.0506)	(0.0504)	(0.0508)
MOTORWAYS_GDP_ REGION		16.4034*	28.3945***	28.9724***	28.4126***	29.5056***
		(8.5093)	(9.8697)	(9.8642)	(9.8738)	(9.8602)
HC_REGION		0.0011	-0.0033	-0.0035	-0.0033	-0.0036
		(0.0064)	(0.0067)	(0.0067)	(0.0067)	(0.0067)
QoG_REGION			-0.1678**	-1.0423***	-0.1685**	-1.4989***
			(0.0785)	(0.3484)	(0.0785)	(0.4359)
EPO_PC_REGION			-0.1983***	-0.1986***	-0.2822	0.2141
			(0.0531)	(0.0531)	(0.2236)	(0.2586)
SALES_EMPLOYEES x QoG_REGION				0.1508**		0.2305***
				(0.0593)		(0.0756)
SALES_EMPLOYEES x EPO_PC_REGION					0.0146	-0.0720
					(0.0377)	(0.0446)
Constant	4.2935**	3.2830	-2.3757	-2.1618	-2.0275	-3.7998
	(2.1380)	(2.1707)	(2.2318)	(2.2456)	(2.4557)	(2.4421)
TIME CONTROL	YES	YES	YES	YES	YES	YES
INVESTOR INDUSTRY FE	YES	YES	YES	YES	YES	YES
Observations	4961	4961	4961	4961	4961	4961
Log-likelihood	-2.5e+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

Table 4. Robustness checks for alternative measures of regional quality of government, regional innovation, and investors' productivity

GREEN: 1: greenfield, 0: acquisitions	**Regional quality of government and innovation**			**Investors' productivity**	
	(1)	(2)	(3)	(4)	(5)
SALES EMPLOYEES	0.4741***	0.4625***	0.4697***		
	(0.0922)	(0.0869)	(0.1330)		
TFP				0.4012***	0.4587*
				(0.1174)	(0.2503)
GDP_PC_REGION	-0.4622**	-0.4935***	-0.7022***	-0.4375**	-0.4472**
	(0.1822)	(0.1830)	(0.1532)	(0.1860)	(0.1836)
QoG_REGION			-0.2543***	-0.8282**	-0.1651**
			(0.0767)	(0.3473)	(0.0779)
EPO_PC_REGION	-0.2098***	-0.2391***		-0.2072***	-0.2054
	(0.0504)	(0.0491)		(0.0527)	(0.1994)
RULE_LAW_REGION	-0.8114**				
	(0.3437)				
SALES_EMPLOYEES x RULE_LAW_REGION	0.1162**				
	(0.0588)				
GOV_EFF_REGION		-1.1853***			
		(0.3068)			
SALES_EMPLOYEES x GOV_EFF_REGION		0.1905***			
		(0.0525)			
RDGDP_REGION			-0.3231		
			(0.2535)		
SALES_EMPLOYEES x RDGDP_REGION			0.0385		
			(0.0420)		
TFP x QoG_REGION				0.1678*	
				(0.0871)	
TFP x EPO_PC_REGION					-0.0001
					(0.0485)
Constant	-2.1488	-1.9238	0.1729	-0.8449	-0.9967
	(2.2341)	(2.2160)	(2.2454)	(2.1843)	(2.3398)
INVESTOR INDUSTRY FE	YES	YES	YES	YES	YES
TIME CONTROL	YES	YES	YES	YES	YES
SUBSIDIARY INDUSTRY FE	NO	NO	NO	NO	NO
DESTINATION COUNTRY FE	NO	NO	NO	NO	NO
Observations	4961	4961	4505	4955	4955
Log pseudolikelihood	-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. INNOV, EXPER, EMPLOYEES, DIV, COUNTRIES, AGGLOMERATION, REGION, OPEN_COUNTRY, DISTANCE_COUNTRY, MOTORWAYS_GDP_REGION, HC_REGION controls are included in all models.

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

Table 5. Robustness checks splitting regional effects and adding fixed effects

GREEN: 1: greenfield, 0: acquisitions	Splitting regional effects		Additional fixed effects	
	(1)	(2)	(3)	(4)
SALES EMPLOYEES	0.4993***	0.3516*	0.4866***	0.4134**
	(0.0952)	(0.2052)	(0.0951)	(0.1918)
GDP_PC_REGION	-0.6557***	-0.4664**	-0.5489**	-0.5462**
	(0.1688)	(0.1850)	(0.2399)	(0.2406)
QoG_REGION			-0.9440***	-0.1632
			(0.3388)	(0.1126)
EPO_PC_REGION			-0.2029***	-0.3622
			(0.0687)	(0.2272)
SALES_EMPLOYEES x QoG_REGION			0.1343**	
			-0.0545	
SALES_EMPLOYEES x EPO_PC_REGION				0.0277
				(0.0382)
QoG_COUNTRY	-0.9256**			
	(0.4169)			
QoG_REGION_REL	-2.0986***			
	(0.7649)			
SALES_EMPLOYEES x QoG_COUNTRY	0.0895			
	(0.0713)			
SALES_EMPLOYEES x QoG_REGION_REL	0.3338**			
	(0.1296)			
EPO_PC_COUNTRY		-0.5221**		
		(0.2404)		
EPO_PC_REGION_REL		0.4037		
		(0.3952)		
SALES_EMPLOYEES x EPO_PC_COUNTRY		0.0397		
		(0.0408)		
SALES_EMPLOYEES x EPO_PC_REGION_REL		-0.0994		
		(0.0685)		
Constant	-0.8988	-1.3058	-16.2687***	-15.0775***
	(2.2473)	(2.4776)	(2.7407)	(3.0206)
INVESTOR INDUSTRY FE	YES	YES	YES	YES
TIME CONTROL	YES	YES	YES	YES
SUBSIDIARY INDUSTRY FE	NO	NO	YES	YES
DESTINATION COUNTRY FE	NO	NO	YES	YES
Observations	4995	4961	4940	4940
Log pseudolikelihood	-2.5e+03	-2.5e+03	-2.3e+03	-2.3e+03

Robust standard errors are shown in parentheses and clustered by investor. INNOV, EXPER, EMPLOYEES, DIV, COUNTRIES, AGGLOMERATION, REGION, OPEN_COUNTRY, DISTANCE_COUNTRY, MOTORWAYS_GDP_REGION, HC_REGION controls are included in all models.

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

Table B.1 - 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	3.96	0.61	4955	Sales/Employee (log)-1/3 Capital/Employee (log)	Worldscope (Thomson Reuters)
INNOV	3.07	3.37	4995	# EPO patents (log)	Orbis Intellectual Property
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 subsidiaries (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
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
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_REGION	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

Table C.1. 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%

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

Fig. 1.A

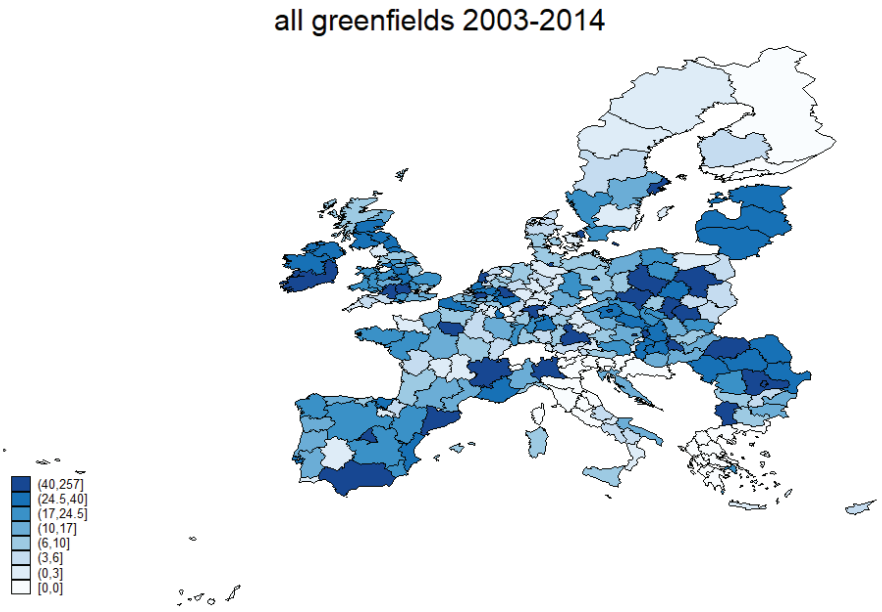
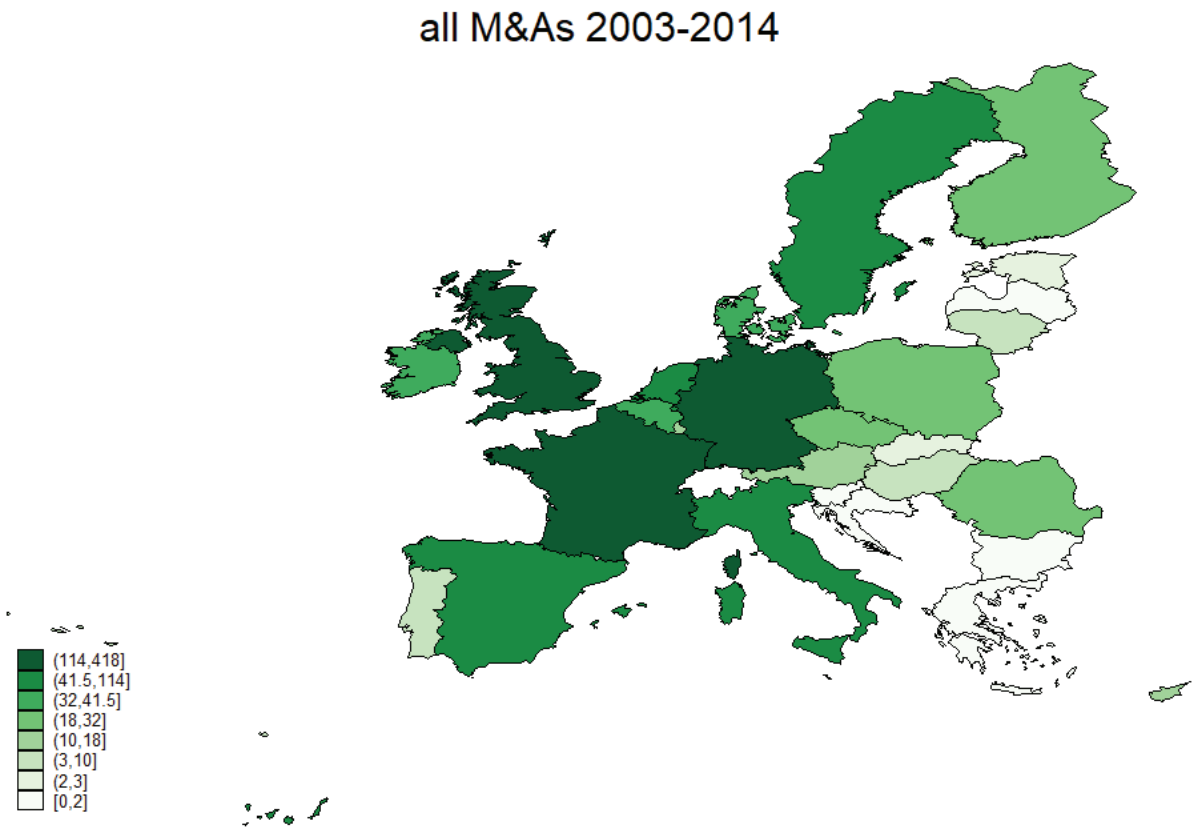
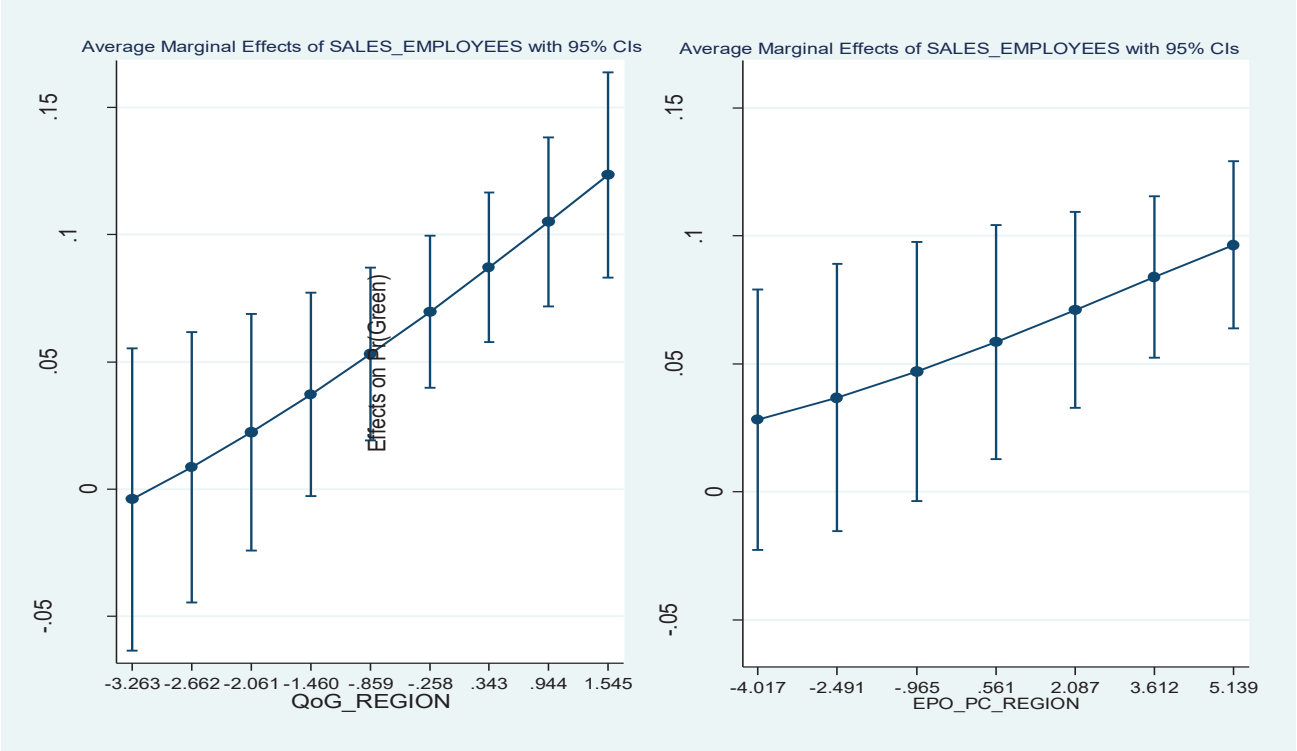


Fig. 1.B



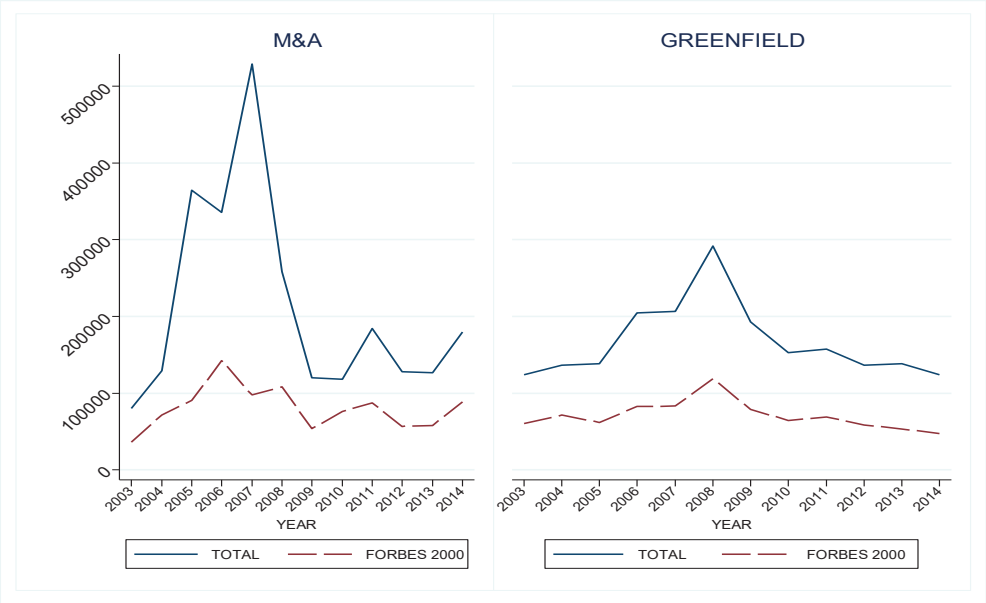
Source: fDi Markets and BvD Zephyr

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



Source: Authors' elaborations

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



Source: fDi Markets and BvD Zephyr

Figure B.1 – The dataset