Highly skilled and well connected:
Migrant inventors in Cross-Border M&As

Short running title: **Highly skilled and well connected**

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Acknowledgements

This paper has benefited from helpful discussions with colleagues at GREThA- Université de Bordeaux and URU-University of Utrecht. Previous drafts were also discussed by colleagues at several conferences (CERDI workshop on International Migration 2015, Université d'Auvergne; ENEF meeting 2015, Toulouse; AAG Annual Meeting 2016, San Francisco; and AFSE Annual Meeting 2016, Nancy). In particular, we would like to thank Pierre Alexandre Balland, Mathieu Clement, Koen Frenken, Dieter Kogler and Eric Rougier. This study has received financial support from the French State in the frame of the "Investments for the future" Programme IdEx Bordeaux, reference ANR-10-IDEX-03-02 and from the Regional Council of Nouvelle Aquitaine, Chaire d'Accueil Programme

This is a pre-print of an article published in *Journal of International Business Studies*.
The definitive publisher-authenticated version Useche, D., Miguelez, E. & Lissoni, F. J Int Bus Stud (2019). https://doi.org/10.1057/s41267-018-0203-3 is available online at:
https://doi.org/10.1057/s41267-018-0203-3

ABSTRACT

Based on a relational view of international business, we investigate the role of migrant inventors in Cross-Border Merger & Acquisitions (CBM&As) undertaken by R&D-active firms. We hypothesize that the migrant inventors' international social networks can be leveraged upon by their employers in order to spot and/or integrate the knowledge bases of acquisition targets in the inventors' home country. We nuance our hypothesis by means of several conditional logistic regressions on a large matched sample of deals and control cases. The impact of migrant inventors increases with the distance between countries and for targets located in countries with weak administrative/legal systems, as well as when targets are either innovative or belong to high-tech sectors or to the same sector as the acquirer, and for full versus partial acquisitions.

Keywords: Cross-border Mergers and Acquisitions, Migration, Inventors, PCT patents

JEL: C8, D21, J61, F2, 031, 033

1. INTRODUCTION

This paper explores the role of international migrants in orienting Foreign Direct Investments (FDIs). It focusses on a specific type of operations, namely cross-border merger and acquisitions (CBM&As), as undertaken by R&D-active firms, and on a specific group of migrants, which consists of the foreign scientists and engineers engaged in such firms' inventive activities (migrant inventors). Based on both a relational view of asset-seeking FDIs (Dunning, 1998; Johanson & Vahlne, 2009) and a portrait of migrant inventors as professionals embedded in dense, multi-layered, and global social networks (Aghion, Akcigit, Hyytinen, & Toivanen, 2017; Agrawal, Kapur, McHale, & Oettl, 2011; Balconi, Breschi, & Lissoni, 2004; Simonton, 1992; Singh, 2005), we ask whether and under what conditions these migrants may favour the choice of targets located in their countries of origin. Our study contributes both to the general literature on social networks in international business (IB) and to the emerging research on the specific networks originated by one important globalization trend, namely the migration of highly skilled individuals working for Multinational Enterprises (MNEs) (Kerr, Kerr, Özden, & Parsons, 2016).

The role of social networks in orienting FDIs is explored by several authors (Bathelt & Glückler, 2011; Ellis, 2000, 2011; Sharma & Blomstermo, 2003). For instance, Ellis (2000) finds that social networks play an important role for identifying exchange partners in foreign markets. Bathelt & Glückler (2011) suggest that employees' cross-border social networks may help their firms to identify and exploit international opportunities, while minimizing the risk of new business development failure. They help their employers to overcome their 'outsider status' and facilitate riskier international activities (Brouthers, Geisser, & Rothlauf, 2016; Coviello & Munro, 1997; Ellis, 2000). When it comes to CBM&As, professional figures such as scientists and engineers may be highly important, to the extent that this form of FDIs is particularly relevant in knowledge-intensive industries, especially when it comes to getting access to external knowledge from abroad (Hagedoorn & Duysters, 2002; Jovanovic & Rousseau, 2008; UNCTAD, 2008). We conceive the relevant knowledge assets as distributed across several actors, both within and outside the target firm (Cantwell, 2013; Johanson &

Vahlne, 2009). Such actors relate one to another through personal, work or business relationships, which acquirers need to understand and integrate, by establishing their own relationships of the same kind.

While some existing IB literature emphasizes the role of ethnic ties in multinational firms' location choices (Chen & Chen, 1998; Ellis, 2000; Ellis, 2011; Hernandez, 2014; Kogut & Singh, 1988; Zaheer, Lamin, & Subramani, 2009) none of it has examined in detail the role of a specific professional group, with well-known social characteristics, in relation to a specific form of investment. Hence, the literature has more hinted to several influence possibilities, rather than venturing into their exploration.

To this end, migrant inventors may represent a unique resource, in that they consist of highly educated workers characterized by both a dense social structure and a deep involvement in the creation and diffusion of knowledge (Agrawal, Cockburn, & McHale, 2006; Agrawal et al., 2011; Almeida & Kogut, 1999; Breschi & Lissoni, 2009; Breschi, Lissoni, & Miguelez, 2017). Besides, due to their prevailing social origins, the inventors' family and friendship ties tend to be localized in innovation-oriented cities and/or influential social groups (Aghion et al., 2017; Bell, Chetty, Jaravel, Petkova, & Van Reenen, 2016). Finally, while they do not decide upon their companies' CBM&A operations, some inventors may be senior and competent enough to affect them, witness their knowledge of patents' value and strategic relevance, which goes beyond that of pure technologists (Giuri et al., 2007; Torrisi, Gambardella, Giuri, Harhoff, Hoisl, & Mariani, 2016; Walsh, Lee, & Jung, 2016). At the same time, they are in a privileged position when it comes to accessing technical knowledge held by targets, as this requires a common professional background and short social distance from fellow knowledge actors (Agrawal et al., 2006; Almeida & Kogut, 1999; Breschi & Lissoni, 2009).

By focusing on a specific socio-economic group, and discussing its multiple interactions with the phenomenon under observation, we can point out the circumstances under which the expected effect becomes more evident, and why. In order to do so, we first put forward a baseline hypothesis by which the presence of migrant inventors among the employees of R&D-active acquirers may direct the latter's choice of target towards their countries of origin. We then develop a number of dependent hypotheses concerning the boundary conditions under which this influence becomes more evident, also in connection to one or another feature of migrant inventors as individual professionals and members of a socio-economic group. In particular, we propose that the migrant inventors' influence is stronger when their companies invest into less familiar or more distant countries, as well as in countries with weaker institutions, and when the target firms are innovative, high-technology and knowledge-related. The same applies to full versus partial acquisitions.

In order to test both our baseline hypothesis and the dependent ones we build and exploit a large, original dataset that combines information on inventors' nationality with records on CBM&A operations performed by their employers. In particular, we adopt a matched control sample approach in which acquired targets in any observed CBM&A operations are paired to similar firms involved in different operations and from different countries of origin. While our results for the baseline hypothesis are positive but weak, we test successfully all the dependent ones.

The paper is organized as follows. In Section 2, we review the relevant literature and develop a number of hypotheses to guide our empirical investigation. In section 3, we describe our data and reduced form model. In section 4 we present and discuss our results. Section 5 concludes.

2. THEORY AND HYPOTHESES

In this section we first put forward our general argument, namely that migrant inventors may affect the direction of knowledge-seeking outward FDIs through their cross-border networks (section 2.1). We then discuss how our argument applies to a specific form of investment, CBM&As (section 2.2). Finally, we develop a number of hypotheses for empirical testing (section 2.3).

2.1 Migrant inventors: cross-border networks and international economic influence

Migrant inventors belong to multiple, concentric social groups, each of which has some potential to affect the direction of FDIs towards their countries of origin (or, in some cases, destination). These groups are the worldwide migrant population, its highly skilled component, and a professional group therein, namely the R&D staff (scientists and engineers) from whom most patented inventions originate. By belonging to all three groups, migrant inventors can introduce their employers to multiple social networks. Such networks provide access to increasingly specific knowledge and relationships, moving from basic language and lifestyle notions or general social norms, to administrative and legal information, as well as useful business contacts (know-who) and an understanding of the knowledge assets at stake (Mahroum, 2000; Vertovec, 2002). Members of the three concentric groups are also likely to occupy different positions within their companies, the more educated migrants being closer to decision-makers than the less educated ones, and migrant inventors being possibly the closest when it comes to technology-oriented operations.

A rather composite literature suggests that all three groups may affect the international flow of goods, capital, and knowledge. The broadest group, the worldwide migrant population, includes a multitude of communities kept together by family and friendship ties spanning across national boundaries (Boyd, 1989; Castles, 2002). These transnational communities increase the intensive margins of trade between home and destination countries, which implies that their cross-border social networks diffuse otherwise unavailable or costly business information (Combes, Lafourcade, & Mayer, 2005; Iranzo & Peri, 2009; Rauch & Trindade, 2002). Studies on cross-border financial flows reach the same conclusions. For example, Bhattacharya and Groznik (2008) observe a significant correlation between aggregate US firms' equity investments in a given country and the number of second-generation, prosperous immigrants from that same country. This is indicative of immigrants influencing the geographical destination of US firms' assets by circulating information on investment opportunities, and not just out of a mere emotional attachment to the homeland (more in: Javorcik, Özden, Spatareanu, & Neagu, 2011; Kugler, Levintal, & Rapoport, 2018; Kugler & Rapoport, 2007; Leblang, 2010).

Moving to highly skilled migrants, we first remark that they are the fastest growing group of migrants worldwide (Arslan, Dumont, Kone, & Özden, 2016; Artuc, Docquier, Özden, & Parsons, 2015; Hatton, 2014; Kerr et al., 2016), especially for what concerns scientists and engineers (Freeman, 2010; Kerr et al., 2016). Far from moving exclusively along a South-North or East-West axis, they move also between advanced economies (Auriol, 2010; De Grip, Fouarge, & Sauermann, 2010; Franzoni, Scellato, & Paula, 2012; Freeman, 2010). Their family and friendship ties are supplemented by or intermingle with educational or professional networks. The latter can be both national (an example being ASEI, the American Society of Engineers of Indian Origin, whose stated objectives include promoting technology transfer between India and the US) and international (an example being the Global Alumni Network of the Fulbright Association, which connects home and US-based former recipients of Fulbright scholarships) (Kuznetsov, 2006). Several studies point at the special role of highly skilled migrants, relative to low skilled ones, when it comes to orienting FDIs towards their countries of origin (Javorcik et al., 2011; Leblang, 2010). Others find evidence for FDIs going from the migrants' countries of origin to specific locations in the countries of destination, in particular those hosting the largest migrant communities (Hernandez, 2014; Karreman, Burger, & van Oort, 2017; Shukla & Cantwell, 2018).

As for migrant inventors, they are a subset of migrant scientists and engineers whose inventive activity in one or more specific points in time and locations is attested by patent records (Hoisl, 2007; Lenzi, 2009). The same records show that inventors work most often in teams, on the basis of both horizontal and vertical division of labour (Jones, 2009). Information obtained by matching patent data to other archival data suggests that their position inside the patenting companies ranges from junior, subordinate staff to more senior figures such as chief of R&D labs, whose distance from decision-makers we presume low, and the probability to be consulted high (Jaravel, Petkova, & Bell, 2015; Jung & Ejermo, 2014).

The latter case is intuitively more likely in small firms, with shorter managerial chains, but not infrequent in large companies, whose inventor-naming policy may be stretched to include increasingly highly ranked managerial figures, possibly for reputation if not celebratory purposes. (Take the case of Steve Jobs, whose name we find in over 150 USPTO patents filed by Apple after 2001, on inventions ranging from power adapters to file management software). The highly skewed distribution of inventors' earnings, recently uncovered by matching patent information and fiscal records, is in accordance with this possibility (Aghion, Akcigit, Bergeaud, Blundell, & Hmous, 2015). Besides, several questionnaire surveys find that inventors do not only understand the technological contents of their patents, but can also evaluate their economic potential or strategic importance with some accuracy, which witnesses of their involvement in decision-making (Giuri et al., 2007; Torrisi et al., 2016; Walsh et al., 2016). Finally, it is from the inventors' ranks and files that many transnational entrepreneurs or MNE executives eventually emerge (Wadhwa, Saxenian, Rissing, & Gereffi, 2007). This is not surprising, in light of the expansion of intellectual property markets and of the related international dispersal of innovative capacities. We read this evidence as indicative of the presence among inventors of professional figures whose expertise can be directly relevant for decision-makers considering a foreign acquisition, especially if aimed at purchasing knowledge assets or entering an interesting innovation hub.

Coming to the inventors' social networks, those originating from professional activities (co-inventorship ties) have been extensively studied and found to exhibit distinctive "small world" properties (review by Uzzi, Amaral, & Reed- Tsochas, 2007). First, they display very high connectivity, organised around a giant component that include a vast majority of nodes. Second, they combine short average interpersonal distances and high clustering coefficients (Breschi & Lenzi, 2016; Lissoni, Llerena, & Sanditov, 2013; Uzzi et al., 2007; Zhang, Guan, & Liu, 2013). These properties are reflected in the dual role that such networks play in keeping knowledge flows highly localized in space, while allowing for geographical dispersion in the presence of cross-cluster ties created by mobile inventors (Agrawal et al., 2006; Almeida & Kogut, 1999; Breschi & Lissoni, 2009; Miguelez & Moreno, 2013; Oettl & Agrawal, 2008; Singh & Marx, 2013). Several studies have focussed on migrant inventors and found that ethnic ties among those from the same country of origin may also vehicle knowledge outside local clusters, possibly towards their home countries (Agrawal, Kapur, & McHale, 2008; Agrawal et al., 2011; Breschi, Lissoni, & Miguelez, 2017; Kerr, 2008).

As for the inventors' family and friendship ties, some recent evidence on the socio-economic characteristics of inventors, albeit limited to very few countries, suggests them to be highly specific. The inventors' parents are on average wealthier and more educated than the general population, often holding a technical degree, while their cities of origin are more likely to host or be located within an innovation hub (Aghion et al., 2017; Bell et al., 2016).

Specific evidence on migrant inventors' affecting FDIs is still lacking, but Foley and Kerr (2013) examine the ethnic composition of the home-based inventor workforce of R&D-active US MNEs, and find a correlation to such firms' international distribution of assets, sales, and employment. The two authors also put forward evidence suggesting a causal relationship.

2.2 Social networks and CBM&As

CBM&As are long-term investments with diverse strategic objectives, ranging from the exploitation of cross-country differences in production costs to foreign market penetration or the purchase of location-specific resources (Helpman, 2006; Stellner, 2015; Stiebale & Reize, 2011). In knowledge intensive industries, CBM&A may especially serve the purpose of improving the efficiency of the partners' R&D activities by exploiting complementarities (Röller, Stennek, & Verboven, 2000; Stiebale & Reize, 2011), and allowing the acquirers to access the targets' intangible assets (Hagedoorn & Duysters, 2002; Jovanovic & Rousseau, 2008; Ruckman, 2005). The latter include highly skilled human capital (Ranft & Lord, 2002) and, increasingly, the social capital represented by the targets' relationships with other firm actors such as suppliers, clients and competitors, as well as non-firm actors such as universities, public research institutes, and government agencies (Bathelt & Glückler, 2011; Meyer, Mudambi, & Narula, 2011). Both forms of capital comprise several social networks, either internal or external to the target firms.

Internally, we consider the organizational relationships between the various units of the target, and the related personal relationships between its employees, especially those involved in knowledge-oriented tasks. As knowledge integration entails both teaching and learning on each side (Haspeslagh & Jemison, 1991), meetings within and between R&D units and extensive face-to-face communication are integral parts of the process (Gerpott, 1995).

At the same time, foreign investors may face high "social cost(s) of doing business abroad" (Eden & Miller, 2004). Not only they are at a disadvantage with respect to local competitors when it comes to anticipate or interpret local policies or regulations. They are also exposed to relational hazards, such as when a lack of understanding of motivations and goals in an alien culture increases the cost of supervising and integrating local employees. For example, acquisitions may push the most valuable among the target's employees to quit the company or resist integration, if they perceive the acquirer's intent as predatory (Dyer, Kale, & Singh, 2004). Pre-existing or newly established personal relationships between acquirer's and target's employees and managers may counter this risk. Paruchuri and Eisenman (2012) provide an illustrative case for a target firms' inventors, whose reactions to the merger were at same time emotionally charged and heterogeneous, as they depended on the inventors' perceived position in the firm's internal social network.

Externally, the target's knowledge base comprises both what Cantwell (2013) describes as "closed" and "open" inter-firm network relationships, the former roughly coinciding with contractual and exclusive partnerships, the latter with participation to local innovation systems, on the basis of flexible and non-exclusive arrangements. In line with Ellis (2011) and Lorenzen and Mudambi (2013), we argue that establishing or leveraging upon kinship, friendship, and other types of personal relationships, held directly by the decision-makers or by influential employees such as migrants inventors, is crucial for entering the open networks.

Notice that the distinction we draw between target firms' internal and external networks is largely conceptual, as in reality the two may overlap. As stressed by Cantwell (2013) the connections between internal and external components of international business networks have risen constantly along with the importance of open innovation systems and strategies. "Individual corporate teams or subunits of larger firms now belong not just to the firm, but also to various business networks [which] join together parties from other parts of its corporate groups with partners outside the firm" (Cantwell, 2013; pp.23-24); and so do the underlying social networks that make business relationships viable.

While we focus our discussion on CBM&As, it is undeniable that some of our arguments may apply also to other forms of FDIs, ranging from the establishment of subsidiaries and affiliates to loose non-contractual forms of inter-firm cooperation (as discussed by Dunning, 1995). Following Johanson and Vahlne (2009), any foreign market entrant could be described as facing the problem of accessing or establishing new networks of business relationships, to overcome the risk of being considered as outsiders. While the existing IB literature on the role of ethnic ties in firms' location choices deal with several forms of investment (Chen & Chen, 1998; Ellis, 2000, 2011; Kogut & Singh, 1988; Zaheer et al., 2009), it attaches great importance to interpersonal relationships in terms of either business intelligence (signalling or informing on potential targets) or operational activities (integration of targets' assets).

Bathelt and Glückler (2011) provide both a colourful illustration of the role cross-border social networks may play in orienting a foreign investment, at least in the investor's intentions, and a useful conceptual discussion. The illustration is as follows: "[A] top German management consulting firm tried to enter Spain in a market-seeking mode. […] The CEO reported the experience as follows: « […] we had a colleague whose wife was Spanish. Since personal relations matter in Spain and since the lady belonged to the inner circle in Madrid, we thought to send them to Spain… Yet we never won a project and after a while we decided not to continue »" (Bathelt & Glückler, 2011; p. 165). Pushing the narrative to its extreme consequences, one wonders whether things would have gone better if, instead of a Spanish spouse's social network, this German company could have relied more directly on the network of a Spanish, highly skilled migrant employee.

As for the conceptual discussion, this states, in extreme synthesis, that "social networks minimize the risk of new business development failure while international experience compensates for the lack of relational access to the host market. [Hence] young firms with little international experience [would] likely internationalize through Greenfield [investments] whereas large, multinational firms […] generally have the experience and competencies needed for successful atomistic market entries by acquiring and integrating local companies" (Bathelt & Glückler, 2011; p. 173 – where by "atomistic" the authors mean "in the absence of relational ties" with the target's location or market).

While we will partially incorporate this line of reasoning in our hypothesis development, we also argue that it refers mainly to companies seeking new markets for their products or services, rather than knowledge assets. In the latter case, accessing networks is both the goal and the challenge for all type of investors (Beugelsdijk & Mudambi, 2013; Iammarino & McCann, 2013).

2.3 Hypotheses

As members of three concentric social groups, characterized by increasingly specific and relevant cross-border connections, migrant inventors can introduce foreign acquirers to multiple social networks, increasingly specific from both a geographical and informational perspective. Geographic specificity relates to the locations over which the various social networks are distributed, with highly skilled migrants having been educated or having entered the labour market in a more selected set of locations than other migrants, possibly coinciding with more interesting locations for technology-oriented foreign investments (Ewers, 2007; Glaeser & Maré, 2001; Koser & Salt, 1997). Informational specificity relates to the type of knowledge held by nodes in the networks, which we expect to move from basic knowledge of the destination country and location (including language, social norms and administrative and legal notions), to an understanding of the technical and scientific issues most relevant for a technology-oriented foreign investment (Mahroum, 2000; Vertovec, 2002).

Accordingly, we can envisage several ways in which migrant inventors may end up directing CBM&As towards their countries of origin. They can help identifying potential targets or reduce the acquirer's information gap with respect to the target firms within their countries of origin or specific locations therein. Migrant inventors can also increase the likelihood of a successful completion of the deal by assisting in the negotiations or being dispatched on-site to inspect or help integrating the local operations (witness the presence of US-based, foreign-origin inventors' names on US MNEs' patent applications filed in collaboration with foreign subsidiaries or partners; Kerr & Kerr, 2018).

Which of these contributions may apply to each specific case depends on the combination of characteristics of the acquirer, the target firm, and the inventors themselves. At the same time, as explained in section 3, we cannot observe all of these characteristics. For these reasons, in what follows, we first put forward a baseline hypothesis, which does not distinguish among any of them, and then break it down by considering a number of moderating effects. While none of our moderators can be defined in enough detail to capture the specific role played by the migrant inventors in each case (also due to the absence of biographical information such as their job position or seniority at the time of the CBM&A), they may be suggestive of it. The moderators we consider also serve the purpose to support our general argument for social ties to play a role besides the migrants' generic knowledge of the language or administrative and legal norms in the targets' countries.

Our baseline hypothesis is then as follows:

H1 - Migrant inventors affect their companies' choice of cross-border targets by increasing the probability of the target to be located in their country of origin.

A first limitation of H1 is that it leaves open the possibility of a linear effect. We explicitly posit this not to be the case, as we expect the relevance of migrant employees on their employers' location choice to increase with both the physical and informational distance between countries. This may be due to a threshold effect and/or a substitution effect, each of which relates to one or another of migrant inventors' characteristics and networks.

A threshold effect exists insofar the company decision-makers find that relating to migrant inventors within their companies and exploiting their competences is not costless, and such costs may offset the benefits obtained by involving the inventors when the distance from the target firm and its country are low (Bhattacharya & Groznik, 2008; Kugler et al., 2018; Leblang, 2010). This may be the case for basic distance dimensions such as the absence/presence of a common language, a common political past (for example, former colonial ties) or a common physical border (which would have eased the flow of people and information; by extension, we can consider continuous measures of physical distance in the same way). The IB literature has widely investigated how cultural (linguistic, historical) distance may affect firms' internationalization patterns, such as their location choices (Davidson, 1980; Erel, Liao, & Weisbach, 2012; Johanson & Vahlne, 1977; Shenkar, 2001) and their choice of targets in CBM&As (Chen & Hu, 2002; Hennart & Larimo, 1998; Kogut & Singh, 1988; Tihanyi, Griffith, & Russell, 2005). Other studies have obtained similar findings for spatial proximity (Boschma, Marrocu, & Paci, 2016; Ellwanger & Boschma, 2015; Ragozzino, 2009), both for the identification of partners, the monitoring of the acquisition process, and the post-acquisition period (Böckerman & Lehto, 2006).

Hence, we put forward the following set of hypotheses:

H2 – All else equal, the influence exerted by migrant inventors on location choice is higher when the acquirer's and target's countries do not share the same colonial past (H2a) or have no common official language (H2b). The same applies when the two countries do not share a physical border (H2c) or are located at great physical distance (H2d).

As for the substitution effect, we mean that the migrants' personal connections may provide an alternative to other, more formal ways to deal with the target's economic environment. This may be true for senior figures, who may be close enough to decision makers in their companies for influencing their foreign investment decisions and/or for being involved in the negotiations, but do not necessarily have a direct knowledge of issues such as their country legal or administrative system. Still, such senior figures may compensate by leveraging their personal relationships in what we described the second concentric social network of migrant inventors. This contribution is all too important when the target country's legal or administrative systems are opaque and subject to arbitrariness. This is in accordance with evidence on how relational proximity may be necessary in case of weak or ineffective institutions in the target countries, which may magnify the transaction and learning costs (Habib & Zurawicki, 2002; Jandik & Kali, 2009; Kunčič, 2014; Lu, Liu, Wright, & Filatotchev, 2014; Meyer, 2001). This suggests us a further hypothesis:

H3 – All else equal, the influence exerted by migrant inventors on location choice is higher when the target's country has a weak administrative/legal system

Hypotheses 2 and 3 focus on distance-related hazards acquirers may incur into. Other things equal, however, such hazards should be lower when foreign investors have already gained some insider knowledge with respect to targets (Eden & Miller, 2004). Again, social networks should appear to be more important when the lack of information on the target is higher. The lack of information makes it more difficult for potential acquirers to assess the target firms' value. The latter makes the operation particularly risky (Malhotra & Gaur, 2014; Zhao, Luo, & Suh, 2004). In this case, migrant inventors might provide valuable information about the investment oppportunity and bring confidence to the acquirer. When it comes to CBM&As, a distinction may be drawn between first acquisitions and participation increases. In the latter's case, not only the acquirer already knows the company it is investing in, but, thanks to such company, it may have gained some relevant contextual knowledge.

We then expect the role of migrant employees to be less significant, an hypothesis we formulate as follows:

H4 – All else equal, the influence exerted by migrant inventors on location choice is higher for first acquisitions, as opposed to participation increases

Coming to the specific role of inventors in CBM&A, as discussed in section 2.2, we expect it to depend on the strategic objectives of the acquisition. Differently from more explicit forms of technology-oriented internationalization, such as licensing agreements or strategic technological alliances, CBM&As do not always serve innovation or technological strategies. At the same time, when they do, they require a close interaction between the R&D staff of the acquirer, the R&D or technical staff of the target, and possibly the target's local contacts. Migrant inventors acting on behalf of the acquirers, but socially close to the targets' scientists and engineers, may play a bridging role. It is this variability that we can exploit for our research design. As we will discuss in section 3 on data, we cannot directly observe the strategic profile of each and all CBM&As in our dataset. Still, we can infer it from the profile of the target firms, in particular from whether the latter are innovative (hold patents) or are active in a high-tech sector. In these two cases, the probability of the acquisition having asset-seeking purposes is higher (Graebner, 2004; Ranft & Lord, 2002; Ruckman, 2005), and with it the potential role played by inventors. In particular, we refer here to the role of inventors as R&D professionals, who may not be in or close to executive positions in charge of the choice of targets, but be competent enough to help evaluating or integrating the targets' knowledge resources. Such competence depends not only on their technical knowledge, but also on their position in the network of inventors (as described in section 2.1) and the information that goes with it.

We extend this line of reasoning to target firms whose sector of activity is the same as the acquirers', for which expect an increased probability of migrant inventors to play a role in post-acquisition activities.

H5: Migrant inventors' influence on the choice of CBM&A targets is the higher the more relevant technological knowledge and professional ties are, namely when targets are either innovative (H5a) or active in a high-tech sector (H5b) or in the same sector as the acquirer (H5c)

The various notions of distance we used in H2 may explain foreign investors' preference for CBM&As over other forms of entry/expansion (a point on which we will come back below) as well as their variability with respect to ownership shares (full vs partial). Sharing ownership of foreign operations with local partners may reduce exposure to unfamiliarity and relational hazards and the associated costs (Hennart & Larimo, 1998; Kogut & Singh, 1988; Malhotra & Gaur, 2014). On the other hand, shared ownership comes with higher costs of coordination with the foreign affiliate, due for example to the possibility of local partners engaging in opportunistic behavior. Where these costs are very high, acquirers could opt for full control. Zhao, Luo and Suh (2004) review evidence in both directions. Migrant inventors may alter this trade-off as they can help their companies to relate with the target's employees and the local business network. They can do so by leveraging, respectively, on the third and second of the social networks they belong to, namely the professional networks connecting them to other scientists and engineers and (for more senior individuals, closer to executive positions) their friendship and kinship networks, to the extent that they extend to business relationship. Several studies explore this relationship, based on different hypotheses (Foley & Kerr, 2013; Kogut & Singh, 1988; Malhotra & Gaur, 2014; Ragozzino, 2009; Zhao et al., 2004). One common hypothesis can be summarized as follows: conditional on a CBM&A to have taken place, migrant inventors may increase the probability that it consists in a full acquisition rather than a partial one.

Due to our interest in the role of migrants with respect to location choice, however, this hypothesis is of secondary importance. Instead, we recall that CBM&As are heterogeneous with respect to the acquirer's objective, in particular with respect to the acquirers' interest for the acquired targets' technological and relational assets and their integration. Such heterogeneity may be mirrored by the propensity of the acquirer to look at full control (full acquisition) as a prerequisite for completing the deal. By making less necessary to rely on local partners, migrant employees increase the probability of deal completion. We then expect to observe partial acquisition to occur in locations unrelated to the countries of origin of the acquirers' migrant inventors, while full acquisitions to be more concentrated in locations from where they come from.

H6 – All else equal, the influence exerted by migrant inventors on location choice is higher for full acquisitions, as opposed to partial ones

3. RESEARCH METHODOLOGY

In what follows we first present the baseline specification for our regression analysis (reduced form model, for testing hypothesis H1). After presenting our data, we examine in detail the explanatory variables and how we will use them to test hypotheses H2-H6

3.1 Reduced form model

We consider *i=1…N* potential CBM&A operations, involving an acquiring firm *j* from country *w* and a potential target *k* from country *z*, with only M<N deals actually taking place. We run a set of regressions based on the following reduced form:

$$CBM\&A_{i(j,k,w,z)} = \gamma * Migrant\ inventors_{(j,w,z)} + \beta_{w-z} * AT_{w-z} + \beta_z * AT_z + \beta_j * AT_j + \beta_k * AT_k + \beta_{j-k} * AT_{j-k} + \beta_{j-z} * AT_{j-z} + U_j + \delta_{s,k} + \delta_t + \varepsilon_i$$

where $CBM\&A_{i(j,k,w,z)}$ is a binary variable coded 1 if the operation *i* takes place (*j* acquires *k*) and 0 otherwise. $Migrant\ inventors_{(j,w,z)}$ is our key explanatory variable, namely the presence of *z*-nationals with a *w* address among the inventors listed on firm *j*'s patents. Notice that, by equating migrants to foreign nationals, we do not consider most second-generation migrants as well as long-term first-generation migrants who have become nationals of the host country. We thus trade off recall (minimization of false negatives) for precision (minimization of false positives). By doing so, however, we can match migrant inventors to specific countries, which would be impossible had we adopted a name analysis approach, like Foley and Kerr's (2013).

As for our controls, they concern the distance and/or relationship between countries ($AT_{w\text{-}z}$) and the characteristics of target countries (AT_z). AT_k , AT_j and $AT_{j\text{-}k}$ refer, respectively, to the characteristics of the target and acquiring firms, and their relationships, while $AT_{j\text{-}z}$ indicates the acquiring firms' previous relationships with the target country. U_j represents non-observed systematic factors that influence the outcome CBM&A for acquirer j (acquirer's fixed effects) – with robustness analyses using deal fixed effects instead. Finally, $\delta_{s,k}$ are target's 4-digit SIC sector fixed effects, and δ_t represents time fixed effects. ε_i is a random error term.

Our reduced form equation is immediately useful for testing both hypothesis H1 and, with the introduction of interaction terms, hypotheses H2 to H6. Our dependent variable being a binary one, we estimate our model by means of conditional logistic regressions. This allows us to introduce the acquirer's fixed effects – which we could not do by using conventional logistic regressions, due to the incidental parameters problem (Allison, 2005, 2009).

3.2 Data sources and sampling

We link a large number of CBM&A operations occurred between 1997 and 2010 to data on inventors active in the acquiring firms, including the inventors' migratory status, based on three data sources (full details in the online appendix A.1):

1. The Bureau van Dijk Zephyr database.
2. The WIPO-PCT patent dataset, released by the World Intellectual Property Organization (WIPO), with information on the nationality of inventors listed on PCT patents (Miguelez & Fink, 2017).

3. The OECD Harmonised Applicant Names (HAN) database, February 2015, which provides a consolidation of patent applicants as listed on the Worldwide Patent Statistical Database. The consolidation results from disambiguation and matching of applicants' names to business register data from Amadeus/Orbis, also produced by Bureau van Dijk (Thoma, Torrisi, Gambardella, Guellec, Hall, & Harhoff, 2010).

The Zephyr database from Bureau van Dijk is one of the most comprehensive databases on M&As, Initial Public Offerings (IPOs), private equity and venture capital deals. It has been used in numerous empirical studies on FDIs and CBM&A (Cattaneo, Meoli, & Vismara, 2015; Grimpe & Hussinger, 2014; Stiebale, 2013). It includes over 226,210 M&A transactions from 1997 to 2010, and it gathers information from different sources, including news agencies and official company filings. Zephyr's post-2000 coverage is consistent and global (Reiter, 2013). Yet, records until 1998 are mostly limited to European deals (Bollaert & Delanghe, 2015). We discuss this potential source of bias in the robustness checks section, and propose different solutions.[i] We select all the international operations for which information is available on both the acquirer's and the target's names, including information of acquirer's and target's country location, as reported by Zephyr's sources of information. This translates into 58,254 deals, a sample we will refer to as the *choice set*.

The WIPO-PCT dataset contains all patent applications filed at national and international patent offices that underwent a PCT examination procedure.[ii] A large part of such applications contains not only the country of residence, but also the nationality of inventors, thus representing an unrivalled data source for migration research (Miguelez & Fink, 2017). We assign the migrant status to any inventor whose nationality differs from his/her country of residence at the time of the invention (priority date of the patent). Albeit some statistical sources use different definitions, ours is in full accordance with the definition of "migrant worker" in article 2.1 of the United Nations Convention on Migrants' Rights of 1990.

Based on these sources, we build a sample of acquirer-target pairs and related controls as follows. First, we track in Zephyr all CBM&A deals in which the acquiring companies have filed at least one PCT patent application, in the five years before the acquisition date. In order to match the company names from Zephyr with those of patent applicants in OECD HAN we apply several string-based matching techniques. For a Zephyr acquirer in country *w* to be included in our sample, it needs to hold at least one PCT application in the same country (the country code for *w* must appear both in the PCT patent applicant's address and in the acquirer's Zephyr address). This helps removing all the cases in which firms have branches or headquarters in countries where they do not undertake any meaningful inventive activity. In this way, we obtain what we will refer to as the *deal sample*, which contains 10,441 CBM&A deals (originated from 3,372 acquiring firms).[iii]

Based on the deal sample, we produce a *control sample* by randomly matching each target to a set of non-chosen alternatives, also from the *choice set*, based on two of the target firm's characteristics, namely its 2-digit SIC code and the year of the deal – plus the condition of *not* belonging to the same country of the focal target. We then retain at random one control for each country, where at least one control is available. The deal and the control sample jointly form our *regression sample*. After removing deals for which we could not find a control and those for which not all the explanatory variables are available, we remain with 8,629 deals, which correspond to 3,364 acquirers choosing their targets, on average, from across 86.82 different countries, each of which generates a control. Therefore we conduct regressions on 3,364*86.82≈ 292,061 observations. Each observation consists of either an acquirer-target pair or an acquirer-control pair, with the dependent variable $CBM\&A_i$ taking value 1 for the former and 0 for the latter (further details in appendix A.2, especially figure A.2.1; for similar sampling schemes, see: Frey & Hussinger, 2006; Hall, 1988; Hussinger, 2010; Stellner, 2015).

The intuition behind this approach is as follows. When deciding for a CBM&A operation, acquirers choose from within a choice set of cross-border targets. The choice set spans across several countries, which we identify by focusing on the target that was actually chosen and on similarly attractive alternative targets, in different countries. We then explain the observed choice on the basis of some further characteristics of the firms or the countries in the *choice set*, including distance and its possible mitigation by migrant inventors working for the acquirer.[iv]

Table 1 provides summary information on the geographical distribution of deals in our sample. It lists the top 30 CBM&A corridors in our sample (left-hand columns) and the individual countries involved (right-hand columns). As expected, high-income countries host the largest number of both acquirers and targets. More than 80 percent of the deals in our sample occur between such countries, in particular between the US, Canada, the UK, France and Germany. The US account for 28 percent of the deals in the sample, and Europe as a whole for 53 percent (half of which are intra-European deals) – with emerging economies lagging somewhat behind.

Table 1 HERE

3.3 Explanatory variables

The presence of migrant inventors on patents by the 3,364 acquirers in our sample is very uneven. Out of 6,159 acquirer-year cases (number of acquirers times number of deals taking place in different years), only 2,282 host migrant inventors (37 percent). Among them, the average share of immigrants is 18.4 percent, which goes down to 6.8 percent if one considers zeroes. Acquirers in Switzerland (23 percent), New Zealand (12 percent) and the US (11 percent) exhibit the largest average share of immigrants, in line with the average share of migrant inventors in these countries reported by Miguelez and Fink (2017).[v]

Bearing in mind such unevenness, we measure *Migrant inventors* $_{(j,w,z)}$ by means of two alternative variables. Both are based on all inventors reported on the PCT applications filed by acquirer *j* up to five years before the observed deal; that is, from *t-5* to *t-1*, with the deal taking place at time *t*. First, we create a dummy variable (*≥1 migrant inventor*) valued 1 if acquirer *j* (located in country *w*) employs at least one inventor with address in *w*, but nationality of country *z* (the country of target/control *k*), and 0 otherwise. Second, we account for *j*'s reliance on migrant inventors at the intensive margin by computing the share of inventors from country *z* out of the total number of inventors employed by *j* in country *w* (*% migrant inventors*). We interpret any positive estimated coefficients of these variables as confirming H1.

With respect to $AT_{w\text{-}z}$ controls, we consider two inverted measures of distance between *w* and *z*, namely two dummy variables valued 1 if the two countries have former colonial ties (*Same colonial past*) and if they have at least one common official language (*Common language*). We similarly consider an inverted measure of physical distance, such as a dummy variable valued 1 if the two countries share a common border (*Common border*); and a direct measure such as the great circle distance between the most populated cities of *w* and *z* (*Distance (1000 km.)*). We expect all (inverted) distance measures to be (positively) negatively correlated with the dependent variable.

When it comes to testing hypotheses *H2a*, *H2b* and *H2c*, we interact *≥1 migrant inventor* with the three dummies (*Same colonial past*, *Common language*, *Common border*) so to create high and low distance acquirer-target (control) groups and compare the estimated coefficients. Similarly, we test *H2d* by transforming *Distance (1000 km)* into a dummy taking value 1 for distances over 5000 km, and interacting it with *≥1 migrant inventor.*[vi]

As for *H3*, we test it by interacting *≥1 migrant inventor* with a dummy taking value 1 if the target country *z* scores well or very well in terms of institutional quality, according to KunčIč (2014) country index.[vii]

Our $AT_{w\text{-}z}$ controls also include various measures of economic integration between countries (Buckley, Forsans, & Munjal, 2012; Erel et al., 2012). In particular we consider, for each year *t*, the aggregate flows of trade between *w* and *z*, as retrieved from UN COMTRADE records (*Max (EXP, IMP) [billion $]*), as well as the overall investment flows between the two countries, proxied by the number of total

CBM&A operations from *w* to *z* (*CBMA yearly flows*). In addition, we include the stock of college educated migrants from *z* living in *w*, in year 2000 (Artuc et al., 2015).

With respect to the attractiveness of the target country (AT_z), we include measures of market size (*GDP target, in billion $*) as well as market potential *(5-year average GDP growth*), based on the World Bank's World Development Indicators database. As for the target/control's characteristics (AT_k), we include two dummy variables to indicate, respectively, whether *k* is an *Innovative Target* (it takes value 1 if *k* has filed at least one PCT application before the year of the deal, any time between *t-5* and *t-1*) and whether it is active in a high-tech sector (*HighTech Target*), based on the SIC classification reported by Zephyr.[viii] Both dummies are further exploited to test hypotheses *H5a* and *H5b*, through interaction with *≥1 migrant inventor*. We also control for whether *k* owns several production sites (dummy *Multi-plant target*, with value 1) or just one.

As for controls $AT_{j\text{-}k}$, (relationships between acquirers and target/control firms) we include a dummy valued 1 if the acquirer and target companies have the same industry 4-digit SIC code (*Relatedness*). This dummy is also interacted with *≥1 migrant inventor*, so to test hypothesis *H5c*.

Finally, our model includes several acquirer-specific covariates (AT_j). First, in order to account for acquirer *j*'s size, we compute the total number of its inventors, as reported on PCT applications filed over the five years before the deal (*# inventors*). Second, we account for *j*'s previous level of internationalization by means of three different proxies, namely:

- the overall share of migrant inventors out of all inventors employed by *j* in country w (*% foreign inventors*) – from PCT data;
- the share of the *j*'s PCT patents worldwide signed by inventors residing outside country w (*% foreign inventorship*)
- *j*'s propensity to engage in CBM&As, as measured by the number of CBM&A deals over the total number M&A deals (*% CBM&A*) – as from Zephyr's records.

We also control for *j*'s pre-existing R&D activities in the target/control's countries by means of two dummy variables, namely:

- *Former inventive activity at destination*, which takes value 1 if *j* filed any PCT patent application listing one or more *z*-resident inventors before deal time *t*.[ix]
- *Inventive subsidiaries at destination*, which takes value 1 if *j* has any subsidiary engaged in inventive activities in the country of the potential target before deal time *t*. We obtain the necessary information by consolidating PCT patent applicants' names across different countries, according to information on groups provided by the OECD HAN dataset, which suggests that acquirer *j* may have patent applications assigned to its different facilities worldwide.

Finally, we consider the potential role of *j*'s inventors working previously in *w*, who may have moved to *z* (*Scouts to target country*). This is computed as a dummy taking value 1 if, at any time between *t-10* and *t-3*, *j* employed at least one inventor working in *w*, who we also find to be active in *z* in between t-5 and *t-1*, either for *j* itself or another company. To build this variable we rely on disambiguated data on inventors listed on USPTO patents, as from PatentsView, a new resource recently released by the US Patent Office (http://www.patentsview.org).[x]

Table 2 reports summary statistics for the dependent and independent variables in our regressions. In particular, it shows that deals represent only about 3 percent of the observations, with the remaining 97 percent being controls (mean of *CBM&A*). It also shows that 5 percent of the acquirers have at least one migrant inventor from the targets'/controls' countries (mean of *≥1 migrant inventor*). The average share of such migrants over the acquirer's total number of inventors (*% migrant inventors*) is even smaller (0.15 percent). Such low figures go along with large standard deviations, especially for the latter variable, which indicates high heterogeneity in hiring foreign talent across firms – and lends credit to our firm-level approach.

In addition, such highly asymmetric distribution of the dependent variables justifies our choice of performing logistic regressions instead of linear probability models (LPM). In particular, we use conditional logistic regression methods so to include fixed effects (Allison, 2005, 2009).[xi]

Table 2 HERE

Table 3 reports the correlation matrix. Most explanatory variables show the expected (and significant) correlation with the dependent one. Some of them are also correlated one to another, but only to a moderate extent, so collinearity is not a major concern. The main exception is the 0.60 correlation value for the two variables indicating international trade and capital flows (respectively: *Max (EXP, IMP) [billion $]* and *CBMA yearly flows*).

Table 3 HERE

4. RESULTS

4.1 CBM&A location choice: baseline results

Table 4 reports our baseline results, including tests for hypothesis H1. As in all the following tables, we report the estimated coefficients, from which we will calculate and discuss odds ratios, when necessary. Column 1 reports some preliminary results, based only on controls for host-home country linkages ($AT_{w\text{-}z}$) and target country variables (AT_z).

Most of the variables are significant and present the expected sign. The main exceptions are the *5-year average GDP growth* of target/control countries and the bilateral trade figures (*Max (EXP, IMP) [billion $]*), both of which are unexpectedly negative and significant. In the second case, however, the sign changes when *CBMA yearly flows* is not included, which suggests a problem of collinearity, as discussed above. In the first case, the result may be explained by a composition effect, the vast majority of CBM&As in our sample going to advanced economies, which register lower growth rates than the emerging ones also included in the sample.

Column 2 introduces firm-level variables, namely the characteristics of the potential target/control and the acquiring firm (AT_k and AT_j), as well as their relationships (AT_{j-k}). With respect to AT_k only *Innovative target* is significant. Neither the acquirer's firm size (*# inventors*) nor its degree of internationalization (*% foreign inventors, % foreign inventorship*, and *% int'l M&A*) are significant. The presence of acquirers' fixed effects may explain both results. On the contrary, the different acquirers' links with the target country are largely positive and significant (*Scouts to target country, Former inventive activity at destination*, and *Inventive subsidiaries at destination*). Finally, as expected, the probability to observe a deal increases substantially for *Relatedness* equal 1.

Column 3 introduces our main explanatory variable, *≥1 migrant inventor*, which is positive and highly significant, as per hypothesis H1. In particular, the estimated coefficient is associated to an odds ratio of 1.29 [exp(0.256)], that is a 29% increase in the relative probability of choosing a target in country *z* over one located elsewhere, due to the presence of at least migrant inventors from *z*, ceteris paribus.

As such, these figures do not tell us yet why migrant inventors matter. However, they are informative of their relative importance compared to other ties of previous acquirers to targets' countries. For comparison purposes, we can calculate the odds ratios for the three other dummies pointing at pre-existing, R&D-related links between the acquirer and country *z* (*Scouts to target country, Former inventive activity at destination*, and *Inventive subsidiaries at destination*). We notice they are as high or not much higher, respectively 1.35, 1.86, and 1.23.

Column 4 replaces the focal dummy variable with a continuous one (*% migrant inventors*), which measures the share of migrants among the acquirer's inventor workforce. The odds ratio we obtain from the estimated coefficient suggests that a 1% increase in the acquirer's share of migrant inventors from a given country leads to a 1.1% increase in the relative probability for the acquirer to locate its investment in that country over another one. We also run this regression with standardized coefficients (not reported), and find that an increase of one standard deviation of *% migrant inventors* increases by

2.2 percent the probability to observe a CBM&A deal. Combined with previous results, this suggests a non-linear effect of migrant inventors on CBM&A, with one or a few migrants having strong influence, and additional ones being possibly redundant. This is somehow expected, since, as discussed in section 2.1, inventors are not merely representatives of highly skilled workers, but a special category of them, with unique abilities when it comes to engaging in innovation efforts. Therefore, it could be that picking a few, well-connected individuals may suffice to spot potential targets in their home countries and/or to lower the expected costs for integration of their knowledge bases. This issue deserves further investigation and data collection. For this reason, in the remainder of the analysis, we retain only the dummy *≥1 migrant inventor*.

Table 4 HERE

4.2 Migrant inventors, distance and institutional quality

We test hypothesis *H2* by interacting our focal explanatory variable (*≥1 migrant inventor*) with several acquirer-target/control country characteristics ($AT_{w\text{-}z}$) – namely *Same colonial past*, *Common language*, *Common border*, and *Distance* (after dichotomizing it, for distances higher vs lower than 5000km). More precisely, based on the regression in column 3 of table 4, we estimate separate coefficients for the focal variable, for country pairs with or without the relevant characteristics. Columns 1 to 4 in table 5 report the results for a different interaction (we omit the remaining coefficients to save space, but they are available on request). We notice that the estimated coefficients are always higher for groups with high vs low distance, that is when the acquirer's and the target/control's countries do not share a colonial past, have no common language or physical border, and are located far apart in the physical space.

Wald tests on differences between coefficients(at the bottom of each column) reject the null hypothesis of the two estimated coefficients to be equal, which confirms our hypothesis *H2a-d*. This suggests that migrant inventors of acquiring firms play a more important role the larger the distance between countries, as expected.

In order to test hypothesis *H3*, we again estimate separate coefficients for the focal variable, interacting it with *Low* vs *High Quality Institutions* (column 5 of Table 5).[xii] Again, the Wald test on differences between coefficients rejects the null hypothesis of the two estimated coefficients to be equal, which supports our hypothesis *H3*.

Table 5 HERE

4.3 Ownership strategy and targets' characteristics

Column 1 of table 6 tests hypothesis *H4* by estimating separate coefficients for our focal variable, *≥1 migrant inventor*, for different types of deal. In particular, we compare the deals that mark the acquirer's entry in the target company (*First acquisition*) to those in which the acquirer merely increases a pre-existing participation (*Participation growth*). Results show that the estimated coefficient for the migration variable is larger for *First acquisition* than for *Participation growth.* A Wald test confirms that the difference is significant, thus supporting hypothesis *H4*.

In columns 2 to 4, we test hypotheses *H5a-c* by interacting the main explanatory variable and three characteristics of the target firms, namely: whether they are innovative or not (*Innovative target* equal 1 or 0; column 2), whether they operate in a high-technology sector (*HighTech Target* equal 1 or 0; column 3), and whether they are active in the same 4-digit SIC code of the acquirer or not (*Relatedness* equal 1 or 0; column 4). Wald tests reject all null hypotheses of equality of coefficients. Again, by comparing the interaction coefficients we find that migrant inventors increase the probability of the deal to take place only for high-tech or related targets, and more for innovative rather than non-innovative targets; that is, when the specific professional ties of R&D workers, such as inventors, may be particularly valuable, as stated by hypotheses *H5a-c*.

Finally, column 5 in table 6 tests hypothesis *H6*, by distinguishing the deals in which the acquirer purchases the totality of the target's shares from all other deals (*100% ownership* vs *Partial ownership*), with the former indicating acquisitions that for sure do not imply any partnership within the target's country. The estimated coefficient for the migration variable is larger for *100% ownership* than for *Partial ownership*, and a Wald test confirms that the difference is significant, which supports hypothesis *H6*.

Table 6 HERE

4.4 Robustness checks

Our results may be affected by estimation bias due to reverse causality or omitted variables, which deserve discussion. First, acquirers may choose their target firms on the basis of non-observed systematic factors that also influence their inventor recruitment policies, such as similarity of cultural or economic traits between countries that our regressors do not capture. Second, the acquirers' employment policies and investment location decisions may be determined simultaneously, and be driven by technological shocks in the target's country affecting both migration and the CBM&A location. If this is the case, hiring migrants from the country of the potential target is not relevant for reducing problems of asymmetric information, because it may occur after taking the decision to invest in their country of origin (although hiring migrants can still be necessary to make the investment effective). Third, multinational companies may transfer local employees from the target's country to their home operations after deciding to invest abroad (but before operating the investment).

Treating endogeneity with instruments proves a nearly impossible task, as it is very difficult to find any useful variable that would be correlated with the acquiring company's employment policies, but not with its investment location strategy. We share this problem with the rest of the literature on the topic (see for example Bhattacharya & Groznik, 2008; and Foley & Kerr, 2013). We then follow the literature and simply try to discuss how likely it is that we have a bias problem. We do so by either modifying the sampling scheme or by adding new controls to our regressions. In several cases, we follow an anonymous referee's suggestions, which we gratefully acknowledge.

In order to save space, we relegate all the relevant tables to the online Appendix (Appendix A.3). For the same reason, we choose a compact presentation strategy, and simply report the estimated coefficients, standard errors and Wald tests for the focal explanatory variables (by hypothesis to be tested), with the coefficients for controls unreported but available on request.

In table A.3.1 we test whether our results depend exclusively from data for the US, which is at the same time the country involved in the largest number of deals in the acquirer position and the one hosting the largest number of migrant inventors, especially from China, India, the UK, and Germany (Miguelez & Fink, 2017). In the first line of the table (corresponding to hypothesis H1) the estimated coefficient for *≥1 migrant inventor* slightly decreases as compared to our baseline regression, but it remains positive, large, and strongly significant. The interaction term with *Low-quality institutions* (sixth line of table A.3.1) becomes not significant, which prevents us from validating hypothesis H3. Intuitively, we explain this change in our results with the disappearance from the sample of the highly populated US-China and US-India corridors, where both China and India have low quality institutions.

In table A.3.2, we tackle the potential bias of Zephyr toward European deals before 2000, as mentioned in section 3, by removing all previous deals. Results remain unaltered. In table A.3.3 we perform an even more restrictive robustness check by removing all deals in which the acquirer was based in a European country. Again our results do not change much, except for Wald statistics concerning hypotheses *H3, H4, H5a* and *H6*, which turn out not be significant (still, the coefficients for the interactions have the expected relative values).

Next, we verify the extent at which large corporations drive our results. In the baseline model we measure firm size with the number of inventors. In table A.3.4, following the literature, we acknowledge the limitations of this variable, and re-run all models using sales instead. Results remain unchanged – though Wald tests become inconclusive for hypothesis *H4*. In table A.3.5 we replicate our regressions after removing all deals performed by the largest acquiring firms, namely those falling in the top 20% of sales size. Again, results are generally maintained, except for Wald tests for hypothesis *H4*.

Table A.3.6 takes a step further in probing the effects of the acquirers' size. It splits our focal variable in separate dummies according to four quantiles of the acquirer's size distribution (measured by sales and by number of inventors) plus a more classical measure of firm size (also based on inventors: >10 inventors, 10-50 inventors, 50-250 inventors, >250 inventors), and runs again the model presented in column 3 of table 4. The rationale of this exercise descends from the discussion in section 2.1: while it is generally reasonable to assume that some migrant inventors may be senior enough to exert influence on their companies' decision makers, it is more likely that the influence will be felt more strongly in smaller firms, where we expect shorter managerial chains. As shown in table A.3.6., overall, our focal coefficients are indeed smaller the larger is the acquirer firm (with the exception of the group with the smallest firms, for which the coefficient is not significant). The differences in the estimated coefficients across sizes are not always significant, but still they suggest that the migrant inventors' effects are stronger in small and medium-small firms, compared to the largest ones.

Next, we test for the possible omission of one important control in our baseline estimation, namely the acquirer's previous experience with M&A operations in the country of the target/control firm. In table A.3.7, we insert a dummy variable taking value 1 if the acquirer has acquired at least one firm in the target's country up to 5 years before the focal deal (*CBM&A experience*). The estimated coefficient for the variable is, as expected, positive and significant, but it leaves unaltered all of our results.

We also address potential omissions of important variables exploiting other fixed effects' structures. Table A.3.8 introduces deal fixed effects, and removes acquirer fixed effects (conditional logit regressions do not converge when including both type of fixed effects). The results for our focal variables do not change much. We also experimented with target firm fixed effects. Unfortunately, for the large majority of the cases, the outcome variable is always zero within each target fixed effects group (as control targets are drawn from the *choice set*), thus making the conditional logit model again impossible to be estimated properly.

In the same vein, table A.3.9 introduces target-country fixed effects in all the models and re-runs all regressions. As it can be seen in the first line, the direct effect ceases to be significant and hypothesis H1 does not hold any more. Still, most of the other hypotheses, on the differential role of migrant inventors in relation to distance, remain valid. The main exceptions are hypotheses *H2b* and *H3*. Results are especially strong for hypotheses *H5a-c*. Yet, we are reluctant to make these results the main outcome of the paper, for several reasons. First, migration of PCT inventors is highly concentrated in a few countries. The US alone host more than 50% of all the PCT migrant inventors worldwide, 2001-2010. Concentration also exists for sending countries: China, India, Germany, UK, Canada, France and the US, are responsible for over 60% of all emigrant inventors worldwide, 2001-2010. Second, both our dependent and explanatory variables contain a large proportion of zeros. Clearly, adding target country FEs amounts to have almost a complete explanation of some of our results, leaving little variability to be exploited. Finally, in our regressions with target country FE, all the dummies for target country FEs become non-significant, with p-value around 0.998 and 1; this is coupled with non-significant F-tests of joint significance of these dummies (again, with p-values above 0.95). (Results provided on request). These odd outcomes are indication that our conditional logit model cannot be populated with too many FEs.

We also consider potential biases arising from the spatial clustering of certain industries in specific geographical areas, and by extension in few countries. Notice that our baseline approach matches each target to a set of non-chosen alternatives, based on two of the target firm's characteristics, namely its 2-digit SIC code and the year of the deal, plus the condition of *not* belonging to the same country of the focal target. However, if a given industry concentrates in specific clusters within certain acquirer's and target's country, and the 2-digit SIC code is not specific enough to gather similarly attractive controls, the control deals are less likely to occur simply because there are more firms of a given industry in the target country than in any other one.

We partially address this issue in three different ways. First, in table A.3.10 we replicate our regressions with a matching approach in which target firms are matched to controls on the finer basis of the 4-digit SIC sectoral classification (but allowing the time of the deal for the controls to vary ±2 years from the actual year of the deal, so to obtain a large enough sample). Results do not change in any noticeable way, with the main exception of the interaction terms referred to hypothesis H5c (*Relatedness vs No Relatedness*), for which the Wald test cannot anymore reject the null hypothesis of equality. This is expected, since with the new matching criteria targets and controls within each deal are technologically closer, and the estimated coefficient for *Relatedness* in the baseline regression becomes either non-significant or negative (results available on request).

Second, in table A.3.11 we rebuild our sample by matching controls to acquirers, instead of targets. That is, we produce a *control sample* by randomly matching each acquirer to a set of alternative acquirers that have not bought the focal target, based on two of the acquirer firm's characteristics, namely its 2-digit SIC code and ±2 years around the year of the deal. The controls can come from any country in the world (to avoid losing many observations, and also keep the possibility to test H2), including the focal acquirer's country itself. Unfortunately, this approach allows us testing only H1 and H2, which of course limits considerably the scope of our analysis. Results for H1 are presented in table A.3.11, columns 1 and 2 – with column 1 not including firm-level controls. The coefficient for the direct effect is considerably reduced, up to the point of losing significance. Of course, these results are not entirely satisfactory, as they question our baseline result. Still, H2 appears to hold (Table A.3.12). Some coefficients cease to be significant, but the relative values of the two coefficients within each interaction remain the same, and the differences are statistically significant according to the Wald tests presented at the bottom of both tables for two out of four cases

Finally, table A.3.11 adds the variable '*# patents in target country*' among the controls. The variable counts the number of PCT patents invented by residents of the target country – in a time window of 5 years – in which the acquirer is currently active in (technological classes are grouped into 35 fields following the WIPO classification by Schmoch, 2008). When the acquirer is active in two or more fields, the number of patents in the target country is weighted by the share of that field's patents in which the acquirer is active in – again, in a time window of 5 years. This aims to control for the acquirer's specialization relative to the specialization of the target country. As expected, the variable is positive and significant, but its inclusion does not affect our results and conclusions.

5. DISCUSSION AND CONCLUSIONS

In this paper we have analysed how migrant inventors may affect the destination of CBM&As by R&D-active firms. The analysis rests on a view of CBM&As as a type of FDI that is often directed at the acquisition of local knowledge assets, especially when undertaken by the firms we focus upon; and on a view of migrant inventors as a group of highly-educated, technology-oriented, boundary-spanning workers. Within such views, migrant inventors can provide both contextual information on the target firms and the means to integrate their knowledge basis, thanks to the multiple social networks they have access to.

We provide some baseline evidence, by which acquirers who employ migrant inventors from any given country of origin exhibit a higher probability to acquire targets in such country. We then find that the influence of migrant inventors is higher when it is more likely that the CBM&A operation obeys to a technology-oriented, asset-seeking strategy, and that migrant inventors provide specific competences and access to the relevant professional networks. This happens when the target firms are innovative or when they are active in high-technology sectors or yet in the same sector of the acquirers. Similarly, our results are stronger the more distant the acquirers' and targets' countries are, in the physical and social space, and the weaker the targets' countries institutions.

Our study contributes first and foremost to our literature of reference. First, we confirm, for the specific case of CBM&As, some early findings on US firms' expansion strategies (Foley & Kerr, 2013), as well as similar studies for emerging economies (Zaheer et al., 2009). We also provide micro-level evidence on a general finding of the more macro-oriented economic literature, namely that highly skilled migration is a complement rather than a substitute of both trade and FDIs (Kugler & Rapoport, 2007). This implies generating positive feedbacks for sending countries, thus limiting negative (brain drain) effects.

Second, we show the empirical potential of linking company and cross-border operation data to information on the migrant status of highly skilled employees (in this case inventors), which may open interesting ways of studying variation not just across companies but also across types of cross-border deals. With reference to the latter, despite focusing on CBM&As, we manage to find some variation by type of target and deal. As for whether our results will hold for other type of operations, such as greenfield investments, alliances or joint ventures, this depends on the operations' specific objectives. We expect that the closer these objectives are to integrating foreign targets' or partners' knowledge assets, or to accessing location-specific knowledge resources, such as for the case of technology-oriented CBM&As (Ahuja & Katila, 2001; Ranft & Lord, 2002; Ruckman, 2005), the more likely it is that our results will be confirmed.

Third, our results complement the literature on networks of inventors, in particular the most recent studies on the role of migrant inventors and their ethnic ties (Agrawal et al., 2008, 2011; Breschi, Lissoni, & Miguelez, 2017). By keeping with a vision of such networks as conduits of technical knowledge, this literature may have underestimated their potential as vehicles for other types of information, such as that on potential investment locations and targets. This is coherent with the our view of inventors as an heterogeneous social group, one that may not just host purely technical figures, but also managerial ones; and of inventors themselves as highly educated individuals, with family and friendship ties that may also turn out to be relevant for foreign investment decisions.

As for limitations, our empirical study suffers first and foremost of data constraints. As we identified foreign R&D workers by means of PCT patent data, it may be biased towards large and highly successful innovative firms, due to the high fixed cost associated to patenting-based appropriation strategies, especially when it comes to exploiting the PCT procedure. To the extent that we expect and find that migrant inventors play a larger role in smaller firms, where they may exert a more direct influence on the decision makers, this may suggest that our results could suffer of a negative bias.

Staying with inventor data, this limitation could be overcome by considering patents from national or regional offices, such as the United States Patent & Trademark Office or the European Patent Office. In this case, however, the migrant status of the inventors should be inferred by names and surnames, which can be done only for specific linguistic groups and may confound first- and second-generation migrants (for a discussion, see Breschi et al., 2017). Moving beyond inventor data, one can envisage to consider another category of highly skilled migrants, certainly closer to companies' decision-making, such as firm founders and managers. The latter's names, surnames, and in a few cases the country of birth or at least undergraduate education can be collected from public records (as in Kenney & Patton, 2015) or commercial ones (Singh, 2007). We have plans to undertake both research lines.

Second, our study does not consider in detail the internal structure of migrants' social networks, which limits the extent at which we can interpret the evidence we produced. For example, we noticed the absence of large effects at the intensive margin. However, we do not know to what extent this depends on the characteristics of individual inventors included in our database or on the general structure of inventors' networks and the position of migrant inventors therein. Some studies suggest that migrant inventors, while on average no more gifted than their native colleagues, often include a few highly productive individuals (Breschi, Lissoni, & Tarasconi, 2017; Hunt, 2015; No & Walsh, 2010). It may be that our evidence, based as it is on PCT patent data, is biased towards such individuals. Once again, one could overcome this limitation by considering all the inventors from several patent offices worldwide, disambiguate them, and build a global network of inventors. At present, formidable technical obstacles stand in this way. First, this would require disambiguating inventors across offices (an important step in this direction comes from Morrison, Riccaboni, & Pammolli, 2017). Second, as explained above, one should obviate to the absence of information on the nationality of inventors. One way forward may be possibly to focus on investments directed towards a limited number of countries of origin of migrants, those for which name analysis may work, and limit the analysis to the network position of inventors from such countries. This is also a research line we will undertake.

Third, we would also like to know more about migrant inventors' careers as well as their family or friendship ties. Case study and econometric evidence suggest that highly skilled returnee migrants may increase the innovativeness of the local staff or companies, and possibly generate externalities (Choudhury, 2016; Liu, Lu, Filatotchev, Buck, & Wright, 2010; Luo, Lovely, & Popp, 2017). However, the number of returnee inventors appears to be very limited, even when using larger datasets than ours (Alnuaimi, Opsahl, & George, 2012; Breschi, Lissoni, & Tarasconi, 2017). We read it as a hint that migrant inventors, when moving back as returnees, possibly progress to executive positions or engage in entrepreneurial ventures and patent data lose track of them. If this were the case, it would be worth exploring which ties they retain with their former employers, and whether this lessens or augments their importance in CBM&As. Large-scale, relevant information can be scraped from social media, which may also provide information on the schools and colleges attended by selected groups of migrants, from which some further social ties may be inferred. For an attempt in this direction, upon which we also plan to build, see Breschi, Lissoni and Miguelez (2018).

Last, we have characterised the investing companies' relationship to highly skilled migration in a rather simple way, with the companies reacting to the opportunities that migrant inventors offer them, but not actively creating them. This contrasts with the sheer size of highly skilled migrant staff in global, technology-intensive companies such as IBM, GE, Apple, Philips or Siemens, and the mobility of their high-level managers across foreign subsidiaries (Kerr et al., 2016). In this respect, firm heterogeneity ought to be measured not only in terms of workforce composition, but also with respect to the management practices put in place to exploit such composition, in relation to internationalisation strategies. Quite tentatively, we may say that this would require to move away from large-scale, quantitative analysis like ours, and consider specific case studies.

From a policy viewpoint, our results provide further reasons to support highly skilled immigration, besides its benefits in terms of innovation and alleviation of short-run skilled shortages (Skeldon, 2018). In particular, we suggest that highly skilled migration may be instrumental in supporting the internationalization efforts of firms in the host countries. This goes against recent trends towards more restrictive immigration policies in the US and elsewhere, which may touch the highly skilled, and have been opposed by many large companies (Drange, 2017; Romm, 2017). Whether our recommendation ought to be qualified as an incitation towards more selective (pro high-skilled) immigration policies or towards a general demise of migration barriers, it depends on evidence on whether other types of migration, especially the low-skilled, also have welfare-enhancing effects, and on complementarities between different groups of migrants (Card & Peri, 2016). As for firms' internationalization strategies, especially those concerning innovative activities, our results go clearly in the direction of recommending to tap in highly skilled migrant communities, either through recruitment or through collaboration with foreign scientists and engineers.

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Tables

Table 1. Largest CBM&A corridors

Top corridors			Top countries			
Acquirer's country	**Target's country**	**Nr of deals**	**By acquirer**	**Nr of deals**	**By target**	**Nr of deals**
United States	United Kingdom	518	United States	2,412	United States	1,578
United Kingdom	United States	363	United Kingdom	1,012	United Kingdom	1,053
United States	Canada	297	Germany	847	Germany	785
United States	Germany	267	France	661	France	535
Canada	United States	188	Sweden	435	Canada	427
Germany	United States	185	Netherlands	385	Netherlands	313
United States	France	171	Switzerland	346	Italy	268
France	United States	155	Canada	330	China	243
Germany	United Kingdom	99	Japan	298	Sweden	229
United States	Netherlands	90	Finland	291	Australia	226
United States	China	90	Belgium	220	Spain	214
Switzerland	United States	86	Italy	185	Switzerland	190
United Kingdom	France	81	Denmark	180	India	186
Japan	United States	80	Norway	147	Belgium	172
United Kingdom	Germany	78	Australia	119	Brazil	162
Sweden	United States	78	Austria	111	Denmark	159
United States	Australia	75	Spain	108	Finland	118
United States	Sweden	73	India	106	Poland	116
United States	Italy	64	Ireland	101	Norway	109
Germany	France	61	Israel	80	Czech Republic	105
United States	Brazil	60	Luxembourg	42	Japan	98
United States	Switzerland	60	Korea, Rep.	40	Austria	98
Netherlands	United States	60	New Zealand	39	Mexico	83
Switzerland	Germany	59	Brazil	31	Israel	80
United States	India	59	Iceland	29	Ireland	77
France	Germany	55	Bermuda	22	Korea, Rep.	69
United States	Israel	55	Poland	15	Russia	68
Finland	United States	53	South Africa	12	South Africa	66
Sweden	United Kingdom	53	China	10	Singapore	57
Germany	Switzerland	50	Slovenia	10	New Zealand	53

Source: Own elaborations and sampling from Zephyr database from Bureau van Dijk (1997-2010)

Table 2. Summary statistics.

	Mean	Std. Dev.	Min	Max	Source
CBM&A	0.03	0.17	0	1	BvD Zephyr
≥ 1 migrant inventor	0.05	0.22	0	1	WIPO-PCT
% migrant inventors	0.15	2.01	0	100	WIPO-PCT
Common language	0.16	0.37	0	1	CEPII (1)
Same colonial past	0.08	0.26	0	1	CEPII (1)
Common border	0.07	0.25	0	1	CEPII (1)
Distance (1000 km.)	6.30	4.59	0.06	19.77	CEPII (1)
Max (EXP, IMP) [billion $]	1.56	3.74	0	38.30	UN COMTRADE
CBMA yearly flows	9.21	23.79	0	227	BvD Zephyr
# college bilateral migrants (million people)	0.05	0.12	0	0.92	(2)
GDP target (billion $)	94.33	197.73	0.0013	1496.4	World Bank WDI
5-year average GDP growth	3.90	2.38	-13.81	30.31	World Bank WDI
Innovative target	0.01	0.11	0	1	WIPO-PCT
HighTech Target	0.55	0.50	0	1	BvD Zephyr
Multiplant target	0.15	0.36	0	1	BvD Zephyr
# inventors	198.71	767.26	1	7838	WIPO-PCT
% foreign inventors	7.04	15.09	0	100	WIPO-PCT
% foreign inventorship	32.19	37.70	0	100	WIPO-PCT
% CBM&A	88.29	20.97	8.33	100	BvD Zephyr
Scouts to target country	0.01	0.10	0	1	USPTO
Former inventive activity at destination	0.07	0.26	0	1	WIPO-PCT
Inventive subsidiaries at destination	0.01	0.11	0	1	OECD HAN
Relatedness	0.09	0.29	0	1	BvD Zephyr

(1) http://www.cepii.fr/CEPII/fr/bdd_modele/presentation.asp?id=6 (last accessed, September 26, 2016).
(2) Source: Frederic Docquier's website, http://perso.uclouvain.be/frederic.docquier/oxlight.htm (last access: March 1, 2017)

Table 3. Correlation matrix of the main variables used in the regressions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1																						
2	0.04	1																					
3	0.03	0.33	1																				
4	0.08	0.03	0.02	1																			
5	0.08	0.07	0.07	0.35	1																		
6	0.08	0.11	0.06	0.04	0.26	1																	
7	-0.06	-0.05	-0.02	0.03	0.15	-0.32	1																
8	0.13	0.17	0.09	0.01	0.17	0.45	-0.12	1															
9	0.22	0.16	0.10	0.33	0.32	0.22	-0.10	0.61	1														
10	0.07	0.14	0.10	0.17	0.24	0.22	0.07	0.60	0.48	1													
11	0.21	0.09	0.05	0.13	0.03	0.03	-0.01	0.32	0.32	0.10	1												
12	-0.05	-0.02	-0.01	-0.03	-0.01	-0.13	0.14	-0.06	-0.12	0.02	-0.11	1											
13	0.00	0.46	0.01	-0.03	-0.03	0.04	-0.02	0.02	-0.02	-0.02	0.00	0.01	1										
14	0.08	0.02	0.01	0.01	0.01	0.02	-0.04	0.02	0.03	0.00	0.08	-0.05	0.01	1									
15	0.00	0.06	0.01	0.01	0.04	0.01	0.01	0.04	0.04	0.04	0.01	-0.03	0.06	0.07	1								
16	0.11	0.00	0.01	0.01	0.02	0.01	-0.01	0.02	0.03	0.01	0.03	-0.01	-0.02	0.02	0.10	1							
17	0.00	0.01	0.00	0.00	-0.04	0.01	-0.08	-0.01	0.00	-0.02	0.00	-0.05	0.00	0.06	-0.02	0.00	1						
18	0.04	0.16	0.05	0.03	0.06	0.04	0.01	0.14	0.12	0.08	0.11	-0.02	0.11	0.02	0.04	0.00	0.00	1					
19	0.11	0.43	0.08	0.06	0.07	0.14	-0.10	0.16	0.19	0.06	0.25	-0.10	0.35	0.05	0.06	0.00	0.01	0.16	1				
20	0.09	0.14	0.04	0.06	0.04	0.05	-0.05	0.07	0.13	0.02	0.23	-0.06	0.11	0.04	0.02	0.00	0.00	0.05	0.38	1			
21	-0.01	0.14	0.16	-0.01	0.05	-0.02	0.06	0.04	0.04	0.10	-0.02	0.02	0.08	0.00	0.04	0.03	0.00	0.04	0.05	0.01	1		
22	0.00	-0.04	-0.01	0.02	0.01	-0.01	-0.07	-0.06	-0.04	-0.07	0.01	0.00	-0.02	0.00	0.00	-0.01	-0.01	-0.02	0.07	0.09	-0.06	1	
23	0.00	-0.10	0.00	-0.02	-0.04	0.01	-0.07	-0.07	-0.07	-0.12	0.03	0.00	-0.13	0.01	-0.03	0.00	0.01	-0.03	-0.03	-0.01	-0.04	0.08	1

Variables: (1) CBM&A, (2) ≥1 migrant inventor, (3) % migrant inventors, (4) Common language, (5) Same colonial past, (6) Common border, (7) Distance (1000 km.), (8) Max (EXP, IMP) [billion $], (9) CBMA yearly flows, (10) # college bilateral migrants (million people), (11) GDP target (billion $), (12) 5-year average GDP growth, (13) # inventors, (14) Innovative target, (15) HighTech Target, (16) Multiplant unit target, (17) Scouts to target country, (18) Former inventive activity at destination, (19) Inventive subsidiaries at destination, (20) % foreign inventors, (21) % foreign inventorship, (22) % CBM&A, and (23) Relatedness.

Table 4.CBM&A location choice – baseline results; conditional logistic estimations

	(1)	(2)	(3)	(4)
≥1 migrant inventor			0.256***	
			(0.0534)	
% migrant inventors				0.0110***
				(0.00321)
Same colonial past	0.186***	0.186***	0.183***	0.187***
	(0.0458)	(0.0467)	(0.0466)	(0.0466)
Common language	0.282***	0.228***	0.224***	0.224***
	(0.0387)	(0.0394)	(0.0394)	(0.0395)
Common border	0.288***	0.288***	0.286***	0.284***
	(0.0491)	(0.0499)	(0.0499)	(0.0499)
Distance (1000 km.)	-0.0708***	-0.0636***	-0.0631***	-0.0635***
	(0.00408)	(0.00414)	(0.00414)	(0.00414)
Max (EXP, IMP) [billion $]	-0.00791*	-0.00744*	-0.00796*	-0.00742*
	(0.00349)	(0.00358)	(0.00358)	(0.00358)
CBMA yearly flows	0.0105***	0.0101***	0.00999***	0.0100***
	(0.000433)	(0.000449)	(0.000449)	(0.000449)
# college bilateral migrants (million people)	0.639***	0.656***	0.621***	0.644***
	(0.120)	(0.124)	(0.125)	(0.124)
GDP target (billion $)	0.00184***	0.00156***	0.00157***	0.00157***
	(3.36e-05)	(3.71e-05)	(3.71e-05)	(3.71e-05)
5-year average GDP growth	-0.0627***	-0.0517***	-0.0519***	-0.0516***
	(0.00603)	(0.00617)	(0.00616)	(0.00617)
Innovative target		1.263***	1.263***	1.263***
		(0.0562)	(0.0562)	(0.0562)
HighTech Target		0.0596	0.0595	0.0596
		(0.0377)	(0.0377)	(0.0377)
Multiplant target		-0.0730*	-0.0739*	-0.0730*
		(0.0337)	(0.0337)	(0.0337)
# inventors		-2.74e-05	-4.30e-05	-2.63e-05
		(5.21e-05)	(5.24e-05)	(5.22e-05)
% foreign inventors		0.000496	5.25e-05	-0.000364
		(0.00217)	(0.00218)	(0.00219)
% foreign inventorship		-0.00135	-0.00112	-0.00134
		(0.00100)	(0.00101)	(0.00100)
% CBM&A		-0.000280	-0.000247	-0.000281
		(0.000883)	(0.000883)	(0.000883)
Scouts to target country		0.300***	0.277***	0.294***
		(0.0792)	(0.0794)	(0.0792)
Former inventive activity at destination		0.621***	0.583***	0.615***
		(0.0410)	(0.0419)	(0.0410)
Inventive subsidiaries at destination		0.210**	0.217***	0.210***
		(0.0639)	(0.0639)	(0.0638)
Relatedness		1.942***	1.941***	1.942***
		(0.0346)	(0.0346)	(0.0346)
Target industry, Year, & Acquirer FE	*YES*	*YES*	*YES*	*YES*
Observations	292,061	292,061	292,061	292,061
Number of acquirers	3,364	3,364	3,364	3,364
Log-likelihood	-29097	-27189	-27178	-27268
Pseudo-R2	0.147	0.203	0.203	0.201

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

Table 5. Migrant inventors' role: distance and institutional quality. Conditional logit estimates

	(1)	(2)	(3)	(4)	(5)
≥1 mig inv * Same colonial past	0.0318				
	(0.0740)				
≥1 mig inv * No same colon. past	0.430***				
	(0.0630)				
≥1 mig inv * Common language		0.0280			
		(0.0967)			
≥1 mig inv * No comm. language		0.327***			
		(0.0578)			
≥1 mig inv * Common border			-0.104		
			(0.0889)		
≥1 mig inv * No common border			0.388***		
			(0.0578)		
≥1 mig inv * Distance <5000km				0.0625	
				(0.0716)	
≥1 mig inv * Distance ≥5000km				0.474***	
				(0.0655)	
≥1 mig inv * High-quality instit.					0.221***
					(0.0555)
≥1 mig inv * Low-quality instit.					0.458***
					(0.117)
Controls as in Table 4	YES	YES	YES	YES	YES
Target industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Acquirer FE	YES	YES	YES	YES	YES
Wald test	21.75	8.42	27.46	23.46	3.88
Prob.	0.0000	0.0037	0.0000	0.0000	0.0488
Observations	292,061	292,061	292,061	292,061	283,735
Number of acquirers	3,364	3,364	3,364	3,364	3,355
Log-likelihood	-27183	-27181	-27180	-27292	-26984
Pseudo-R2	0.203	0.203	0.203	0.200	0.202

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

Table 6. Migrant inventors, entry mode and targets' characteristics

	(1)	(2)	(3)	(4)	(5)
≥1 mig inv * First acquisition	0.287***				
	(0.0556)				
≥1 mig inv * Participation growth	0.0497				
	(0.123)				
≥1 mig inv * Innovative target		1.956***			
		(0.148)			
≥1 mig inv * Non-Innovative target		0.165**			
		(0.0545)			
≥1 mig inv * HighTech target			0.402***		
			(0.0603)		
≥1 mig inv * Non-HighTech target			-0.0492		
			(0.0842)		
≥1 mig inv * Relatedness				1.331***	
				(0.0960)	
≥1 mig inv * No relatedness				0.0719	
				(0.0562)	
≥1 mig inv * 100% ownership					0.309***
					(0.0563)
≥1 mig inv * Partial ownership					-0.00823
					(0.110)
Controls as in Table 4	YES	YES	YES	YES	YES
Target industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Acquirer FE	YES	YES	YES	YES	YES
Wald test	3.55	148.32	23.86	160.05	7.74
Prob.	0.0595	0.0000	0.0000	0.0000	0.0054
Observations	292,061	292,061	292,061	292,061	292,061
Number of acquirers	3,364	3,364	3,364	3,364	3,364
Log-likelihood	-27176	-27325	-27167	-28563	-27174
Pseudo-R2	0.203	0.199	0.204	0.163	0.203

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

NOTES

[i] Zephyr contains all deals whose value is at least GBP 1 million, which is a relatively low value as compared to other M&A datasets, such as Thomson Reuters' SDC (Bollaert & Delanghe, 2015). For a deal to be included, however, it has to involve a stake of at least 2% of the target company's shares, and to allow the acquirer to end up with a share of 50% or more. Quite importantly, Zephyr acquirers' names are based on Bureau van Dijk's ORBIS database, which in turn is the same database used to harmonize and homogenize applicants' names from PCT patents, which increases the positive outcomes in our patent matching exercises (see below). No deal is included until confirmed, which implies that no information is available for failed negotiations.

[ii] The PCT is an international treaty administered by WIPO offering a faster route for applying for patents in different patent jurisdictions (http://www.wipo.int/pct/en/; last access: May 27, 2018)

[iii] We were able to link patent data from the PCT to the acquirer name for 15,182 deals out of the 58,254 CBM&A ones mentioned above. However, in only 10,441 cases the acquirer has patents in a time window of five years just before the date of the deal.

[iv] An alternative approach would have been to estimate a two-stage Heckman model, where the first step regresses the probability for a firm to undertake a CBM&A as a function of having foreign inventors (plus controls); and the second step regresses the firm's choice of targets, conditional on it being an acquirer (i.e. conditional on the firm having undertaken a CBM&A). Unfortunately we are unable to apply this method directly to our dataset, given that we match PCT patent applicants with the entries in Zephyr only for acquirers (and targets) involved in CBM&As, and not for firms that never undertook such operations. Matching to Zephyr all the firms listed as PCT patent applicants is by now prohibitively costly and time-consuming, and therefore we leave it for future research.

[v] Differences are also apparent across the 4-digit SIC sectors in which these acquirers operate, with Semiconductors and related services (code 3674), Commercial, physical and biological research (8731), Computer programming services (7371), and Pharmaceutical preparations (2834) being the most popular among migrant inventors.

[vi] 5000 km is approximately the distance between East and West coast of the US, or between the farthest apart European capitals (Helsinki and Lisbon). When plotting an histogram of the distance of CBM&A deals in our sample two peaks appear, one at very low distances (<1500km) and another right beyond 5000km. Figures available on request

[vii] Kunčič (2014) produces a time-invariant institutional quality index by compiling more than 30 already existent institutional indicators, and classifying this information into three homogeneous groups of legal, political and economic institutions. He further generates five clusters of countries with increasingly high institutional quality. We take clusters 4 and 5 to assign them the label of target countries with high-quality institutions.

[viii] The definition of 'high-tech' sectors is described in Hart and Acs (2011) and Hadlock, Hecker, and Gannon (1991), which in turn it is based on the Bureau of Labor Statistics' (BLS) reference to R&D employment as a share of total employment as the key criterion. Our final list of high-tech sectors is very similar to that used by Hart and Acs (2011). Differently from them, we also include to this list SIC 874, 'Management and public relations', which met the BLS definition.

[ix] Alternatively, we experimented with the percentage of *j*'s inventors residents in *z* out of the total number of *j*'s inventors worldwide, with virtually no changes in our results (available upon request). We keep the dummy measure in the results presented here for comparison purposes with our focal variable – also a dummy.

[x] To do so, we first retrieved all UPSTO patents owned by our sample of acquirers, and all patents by the related inventors (irrespective of the assignees), as well as the priority dates of the patents and the inventors' addresses. Notice that Patentviews include only granted patents, so its data cannot be immediately compared to PCT data, which refer to applications.

[xi] Conditional logistic analysis differs from logistic regression in that the data are grouped and the likelihood is calculated relative to each group; which means that conditional likelihood is used (Chamberlain, 2010). We experimented with logistic regression methods for rare events (King & Zeng, 2001), but results – available on request – do not change much.

[xii] Note that the index of institutional quality ("high-quality institutions" vs "low-quality institutions") is not included in the main model, contrary to other country-level characteristics, in order to avoid losing too many observations, as this index presents a number of missing values. However, adding target-country institutional quality as an additional regressor does not alter our results and conclusions (results available on request).