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Abstract

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JEL codes: O18, R00, R11

Keywords: Mergers and acquisitions, Netherlands, geographical proximity, home bias, industrial relatedness

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ABSTRACT

In economic geography, geographical proximity has been identified as a key driver of M&A activity. In this context, little attention has yet been drawn to the effect of industrial relatedness, which refers to the similarity and complementarity of business activities. We examine 1,855 domestic M&A deals announced between 2002 and 2008 in the Netherlands, and we assess the extent to which geographical proximity and industrial relatedness affect M&A partnering. Our study shows that geographical

proximity drives domestic M&A deals, even at very detailed spatial scales like the municipality level. We also found evidence that companies that share the same or complementary industries are more likely to engage in an M&A deal. Logistic regressions show that the effect of industrial relatedness is stronger than the effect of geographical proximity and that the effect of geographical proximity is stronger in unrelated than related target selection.

KEY WORDS

mergers and acquisitions, Netherlands, geographical proximity, home bias, industrial relatedness

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1 INTRODUCTION

Geographical proximity drives many economic processes, despite globalization (Morgan 2004; McCann 2008). Studies have demonstrated that geographical proximity stimulates inter-organizational interactions, such as scientific collaborations (e.g. Katz 2005), investments (e.g. Coval and Moskowitz 1999; Fritsch and Schilder 2008) or trade (e.g. Wolf 2000; Hillberry 2003). The proximity literature (e.g. Rallet and Torre, 1999; Boschma, 2005; Knoben and Oerlemans 2006) claims that other kinds of proximity may also drive economic interactions. In this context, the role of cognitive proximity and industrial relatedness has gained special attention in recent years, especially in relation to regional growth and regional diversification (see e.g. Frenken et al. 2007; Neffke et al. 2011).

There have been studies demonstrating that geographical proximity is an important driver of M&A's within countries (e.g. Böckerman and Lehto 2006; Grote and Umber 2006). In addition, studies have shown that relatedness between industries is an important determinant of M&A activity (e.g. Ahuja and Katila 2001; Hussinger 2010). In this paper, we combine these two drivers, and show their effect on what we call M&A partnering, the pairing of two companies prior to the announcement of a deal.

The objective of this paper is twofold. First, we aim at investigating the role of geographical proximity for M&A activity. M&A's are frequently examined in geography (see e.g. Green and Meyer 1997; Capron 1999; Chapman 2003; Rodríguez-Pose and Zademach 2003; Böckerman and Lehto 2006; Paci et al. 2013). Their concentration in space suggests that geographical proximity influences M&A partnering.

Studies that explicitly investigate M&A partnering in relation to geographical proximity are, however, scarce and focus mainly on international deals (e.g. Schildt and Laamanen 2006; Ragozzino 2009; Di Guardo et al. 2013) or U.S. deals (Eun and Mukherjee 2006; Grote and Umber 2006; Chakrabarti and Mitchell 2013). Exceptions are studies for Finland (Böckermann and Letho 2006), Germany (Rodríguez-Pose and Zademach 2003) and Italy (Boschma et al. 2014). In this study, we investigate M&A deals within the Netherlands and within regions at various spatial scales, such as provinces and municipalities. To our knowledge, no systematic attempt has yet been made to apply the proximity framework to M&A activity at sub-national levels.

Second, we aim to show to what extent geographically close (instead of distant) companies pair on an individual level. We refer to this as the company's home bias. Although some studies (e.g. Laulajainen 1988) have investigated spatial considerations during the target selection process, and although there is evidence that geographical distance limits M&A, we have little understanding of the extent of the home bias on an individual level. In that respect, we build on the study of Grote and Umber (2006) who calculated a home bias for U.S. deals.

We examine 1,855 domestic M&A deal announcements in the Netherlands between 2002 and 2008, which comprises the most recent merger wave. These real partnerings are compared with a control group of non-partnerings, which consists of about 1.6 million fictitious deals, i.e. combinations of bidders and targets on the M&A market that could have been involved in an M&A deal but did not. Of every bidder and target, we

know the exact headquarter location as well as all the company's business activities, indicated by NACE codes.

In Section 2, we elucidate on the underlying causes of the home bias and the industrial relatedness bias. In Section 3, we show how the data is collected and sampled, how the dependent variable (M&A partnering) and how the independent variables (geographical proximity, industrial relatedness and controls) are operationalized. We also elaborate on our methodology, which includes the construction of the home bias measure and the use of rare event logistic regression models. Section 4 presents some descriptives. In Section 5, we provide and discuss the results. In the final section, we conclude and discuss the theoretical implications of this research.

2 M&A PARTNERING AND THE ROLE OF GEOGRAPHICAL PROXIMITY AND INDUSTRIAL RELATEDNESS

Home bias - Acquirers that prefer geographically proximate targets are home biased. For this, the literature provides four explanations: (a) information asymmetries, (b) familiarity, (c) strategy and (d) localization effects. Information asymmetries refer to unevenly distributed information, which limit (or enable) company's choices. Actors in geographical proximity have more and better information than non-local actors (Böckerman and Lehto 2006), and therefore a different search context. In M&A partnering, information is crucial not only for the identification of potential partners but also for the success of the due diligence process (Chakrabarti and Mitchell 2013). If the

risk of adverse selection, i.e. the selection of a "bad" target, is mitigated and managers are aware of that, partnering may be more likely (Schildt and Laamanen 2006).

When it comes to spatial behavior, managers also possess a cognitive bias towards their own local environment. This is what Huberman (2001) called familiarity. The neighborhood effect states that people tend to overvalue their own region (e.g. MacAllister et al. 2001). While familiarity can be regarded as an irrational or unconscious factor, bidders may also choose a proximate target rationally. In these cases, target search and identification explicitly involve a spatial element (Laulajainen 1988). Strategic reasons to select a proximate target may be easing price competition (Levy and Reitzes 1992), the possibility to share common assets after the acquisition, and the capacity to monitor and lower implementation costs (Böckerman and Lehto 2006).

The effect of localization refers to the spatial distribution of potential targets that satisfy the favored industrial profile. If certain industries are clustered, a bidder that selects a target within the same cluster and from the same industry is automatically home biased. Although prospective buyers might strategically opt for distant targets in order to penetrate new geographical markets or to enter regions with lower production costs, we expect an overall home bias.

Based on this line of reasoning, we hypothesize that in domestic M&A deal announcements, bidders tend to select targets that are geographically closer than the average target. The existence of this bias can be tested by comparing the geographical distance between the bidder to the actual target and the average distance to a set of

hypothetical targets. In our analysis, we also test at what spatial scales within a country, this home bias drives M&A deals.

Industrial relatedness bias - Next to geographical proximity, we argue that also industrial relatedness drives M&A partnering. The main reason to acquire a company from the same or a similar industry is the possibility to realize synergy effects. In fact, M&A research has extensively addressed the role of synergies that stems from related resources, such as similar products, technologies, distribution channels, and routines, among others (e.g. Chatterjee 1986; Sirower 1997; Seth et al. 2000; Homberg et al. 2009). If these resources are shared or efficiently combined, related, or horizontal, acquisitions can benefit from economies of scope and scale. The corporate diversification literature (Penrose 1959) and the resource-based view of the firm (Wernerfelt 1984) make similar suggestions. Additionally, companies are reluctant to establish radically new resource combinations due to path dependencies (Nelson and Winter 1982). If companies can benefit from acquiring supplementary or complementary industries, partnering likelihood is expected to increase.

Additionally, information asymmetries may facilitate M&A partnering (Shen and Reuer 2005; Schildt and Laamanen 2006; Capron and Shen 2007). If both firms are active within the same industry, their managers are more likely to know each other and to exchange information, which would affect the target identification phase (Chatterjee et al. 1992). During the due diligence phase, bidders have an advantage when assessing industrially related targets because its value can be more easily determined. This should in turn increase the likelihood to acquire. Whereas Mitchell and Shaver (2003) found

that only bidders with a large product line scope tend to purchase overlapping product lines, it appears that technological relatedness has a significant impact on partnering (e.g. Ahuja and Katila 2001; Schildt and Laamanen 2006; Hussinger 2010).

Therefore, we expect that in domestic M&A deal announcements, bidders will select targets that are industrially more related than the average target. This effect can be tested by comparing industrial relatedness between the bidder and its actual target and between the bidder and the average industrial relatedness to a set of hypothetical targets.

3 DATA AND METHODOLOGY

Data - Our analyses are predominantly based on data retrieved from the ZEPHYR database by Bureau van Dijk. Since 2000, this database registers M&A deals all over the world with information on type and date of the deal, industry and location of the companies, their number of subsidiaries and their listed-unlisted status, among others. In contrast to the more commonly used Thomson ONE Banker database, ZEPHYR provides postcodes for many of the Dutch bidders and targets, which can be linked to longitude and latitude coordinates. A Dutch postcode shares on average 17 different addresses. Such detailed information enables us to measure geographical proximity rather precise. The postcodes refer to the headquarters of the companies, the place where M&A decisions are taken. For additional information and data checks, another database by Bureau van Dijk, REACH, has been consulted. Missing data were manually collected on the Internet.

Partnering - The dependent variable PARTNERING simply indicates whether between two companies a deal was announced or not. M&A partnering is the outcome of complex search and decision processes by both the potential bidder and the potential target. Conceptually, for the sake of simplicity, we take a bidder perspective and assume that the bidder selects the target (not vice versa). While real partnerings are given by ZEPHYR, the peer group of non-partnerings needs to be constructed (see methodology of Grote and Umber 2006; Hussinger 2010; Chakrabarti and Mitchell 2013). We assume that in non-partnerings only bidders of announced domestic deals can serve as bidders and that any target (and any target whose industry corresponds to the bidder's real target's industry, in order to control for localization effects) that was involved in a domestic deal announcement at about the same time can serve as a potential target. This is theoretically and empirically meaningful because bidder and target significantly differ from each other (Kenny et al. 2006). We miss companies though of which the owner was willing to sell but did not. As cross-border deals are often based on different motives, we excluded all bidders that selected a foreign target and all targets that were involved in a deal announcement with a foreign bidder, respectively.

Previous studies based the allocation of potential targets to bidders on different temporal scopes. While Hussinger (2010) selected random targets from the same year as the acquisition, Chakrabarti and Mitchell (2013) took targets during a five-year window around the deal announcement date. As our models did not occur to be time-sensitive, we follow Grote and Umber (2006), who used a time window of 18 months before and after the date of deal announcement. The use of this time window seems to be realistic

due to the tediousness of M&A decisions and the fact that this resulted in a sufficient amount of observations (and hence allowed for accurate subsampling). In conjunction with the required time lapse, we selected the targets of all deals that were announced between July 2, 2000 and July 1, 2010. These targets can be allocated to all bidders that bid on a target in the full years 2002-2008.

Geographical distance - We use distance in kilometers as a continuous measurement of geographical proximity. DISTANCE is calculated by the Great Circle Distance Formula (Pearson 2011) and based on the geographical coordinates of the companies' headquarters. These, in turn, are based on a list that displays the coordinates of most Dutch postcodes or on a manual query for cases in which the postcode or the coordinates were not available.

The Netherlands is divided into 12 provinces, 40 COROP regions and 418 municipalities. COROP regions always consist of several municipalities and are always within the same province, and provinces always consist of several COROP regions. As an alternative measurement of geographical proximity, we use binary variables that indicate whether the headquarters of both bidder and target are located in the same province, but different COROP regions (INTRA_PROVINCE), within the same COROP region but different municipalities (INTRA_COROP), or within the same municipality (INTRA_MUNICIPALITY). The mutually exclusive construction avoids biases by subordinate spatial levels.

Industrial relatedness - The standard method of measuring industrial relatedness is to indicate whether two activity codes belong to the same level within the hierarchy of an industrial classification system (Frenken et al. 2007). Other more sophisticated measures of industry relatedness exist, like product-relatedness (see e.g. Neffke et al. 2011), but we have no product data for the Netherlands to measure the degree of product-relatedness across industries. Instead, we use the primary NACE code, which indicates the section, division, group and class of the company's core business. There are 21 sections (e.g. "Information and Communication"), 88 divisions (e.g. "Publishing activities"), 272 groups (e.g. "Publishing of books, periodicals and other publishing activities") and 615 classes (e.g. "Publishing of newspapers"). As for many companies information on the class is not available, we consider groups as the most detailed level. Mutually exclusive binary variables indicate whether the primary activities of bidder and target do belong to the same section, but different divisions (INTRA_SECTION), to the same division but different groups (INTRA_DIVISION), or to the same group (INTRA_GROUP).

Control variables - Other relational factors, such as prior alliances (e.g. Schildt and Laamanen 2006), size difference (e.g. Hussinger 2010) or social relations (e.g. Cai and Sevilir 2009) may also facilitate M&A partnering. However, our data only allows controlling for relational variables that refer to the listed vs. unlisted status of companies, and their number of subsidiaries and business activities. Consequently, we test whether partnering is more likely if both companies have no subsidiaries (BOTH_SINGLE-LOCATIONAL) or at least one subsidiary (BOTH_MULTI-LOCATIONAL), and if

both companies have only one business activity (BOTH_SPECIALIZED) or at least two business activities (BOTH_DIVERSIFIED). Including these variables improves the robustness of the estimations. The listed. vs. unlisted status was not used in the analysis as it did not seem to play a role in M&A partnering (see Table 5).

Data sampling - Table 1 shows the sampling procedure. For the whole period between July 2, 2000 and July 1, 2010, ZEPHYR displayed 4,540 deals coded as merger or acquisition. A detailed investigation of those deals showed that many deals were not M&As as defined in this work. We define M&As as business transactions in which the acquirer buys, by cash, stock or both, at least 50% of the assets and liabilities of the target (Maynard 2009). We also included mergers, which are a form of corporate restructuring in which acquirer and target are integrated by establishing a new legal and economic entity while the two old companies legally disappear. Consequently, we excluded in total 342 stake increases (i.e. the acquirer already acquired a minority or majority stake before 2000), restructurings (coded in ZEPHYR as stake increase from 100% to 100%), acquisitions of minority stakes (<50%), acquisitions of unknown stakes and mergers with unknown stakes. Furthermore, we excluded 1,031 deals in which either bidder or target was a non-company. This is if the bidder's name was unknown, if the bidder was a private person or family, if the bidder was public (e.g. municipalities), if the bidder was a joint venture of several entities, if the name of the bidder or target was unspecified, if the target was a governmental organization, and if the target only consisted of certain assets, activities, branches or divisions of a company. We also excluded deals in which the bidder or target was not located in the Netherlands,

although coded as such by ZEPHYR. In total, 3,167 deals remained. Out of the population of 3,167 deals, we had to exclude some more deals, due to missing or inaccurate information on the geographical location or NACE group. Both are required for constructing the measures of geographical proximity and industrial relatedness. We conducted an internet search on 198 bidders and 403 targets of which the postcode was not known, or only the postcode of the post office box. We found the postcodes of 183 bidders and 304 targets, while we excluded 99 deals for which the target and bidder postcode could not be identified. We excluded some other 440 deals for which the validity of postcodes was questionable. It appeared that in some deals, bidder and target headquarters had exactly the same postcode. A match of these cases with data from the REACH database showed that in most of these cases, the bidder shared exactly the same address as the target. As these postcodes may reflect the location after, instead of before, the deal we excluded such observations. Finally, we excluded 70 deals for which the NACE group of the bidder or target was unknown. This sampling procedure led to a total sample of 1,855 real partnerings.

<Table 1>

Control for localization effect - We argued earlier that there are four explanations for home bias, of which localization effect is one. We control for this effect by an assumption regarding the uneven distribution of different industries in space. Instead of assuming that partnering can occur between all kinds of companies, we assume that bidders can only select companies of the same industry as the company that was finally targeted. Grote and Umber (2006) made a similar assumption. This implies that bidders

decide on the industry of the target firm before the target identification process starts, or vice versa, that targets can only match with bidders of the same industry as the actual buyer. Technically speaking, we used a sub-sample of industry-matched non-partnerings.

Construction of individual home bias measures - We investigated and tested the distribution of an absolute (ABS_HB_b) and relative home bias measure (REL_HB_b), which is allocated to every bidder *b*. ABS_HB_b expresses the absolute distance which the bidder's real target is closer to the bidder than the average target. Basically, we compare the distance between bidder *b* and its real target *rt* and the mean of the distance between *b* and all its potential targets *pt*:

$$ABS\_HB_b = \frac{\sum_{b,ht=1}^{n} distance_{b,pt}}{n} - distance_{b,rt}. \quad (2)$$

However, this measure does not take into account the different ranges of possible distances for every bidder. Therefore, it is corrected by the minimum and maximum possible distance to every potential target:

$$REL\_HB_b = \frac{Abs\ HB_b}{distance_{b,pt_{max}}} * 100 =$$

$$\frac{Abs\ HB_b}{\frac{\sum_{b,ht=1}^{n} distance_{b,pt}}{n} - distance_{b,pt_{min}}} * 100\ if\ ABS_{HB_b} \geq 0, \quad (3)$$

$$REL\_HB_b = \frac{Abs\ HB_b}{distance_{b,pt_{max}}} * 100 =$$

$$\frac{Abs\ HB_b}{distance_{b,ht_{max}} - \frac{\sum_{b,ht=1}^{n} distance_{b,pt}}{n}} * 100\ if\ ABS\_HB_b < 0. \qquad (4)$$

As the number of potential targets can be very small and may bias the results, we define a threshold of a minimum number of potential targets and test whether the number of potential targets has an influence on the home bias. We decided that the home bias can only be estimated for bidders that have at least five potential targets (or at least three potential targets for the industry-matched deals), excluding the real target. A higher threshold would lead to a loss of many deals and therefore produce unrepresentative results. A correlation analysis showed some significant, but very weak, relationships between the number of potential targets and ABS_HB_b and REL_HB_b, respectively (maximum absolute value of Kendall's tau = -0.098, $p<0.01$). This means the home bias measure is slightly biased by the number of potential targets.

M&A partnering as rare events - We applied logistic regression models, but with some adaptation, because of the discrepancy between the low number of partnerings and the inflated number of non-partnerings. Otherwise, the likelihood of rare events would be underestimated and wrong standard errors given (King and Zeng 2001a). Another problem is that an estimation of the full model with 1.6 million non-events and only 1,855 events gave a very bad goodness of overall fit and strong overdispersion.

In order to cope with this, we created a subsample by means of endogenous stratification, which is used in econometrics (Manski and Lerman 1977) and epidemiology (Breslow and Day 1980). Endogenous stratification simply splits observations into a set of events and a set of non-events. We then randomly, i.e. independently from all other variables, select from the 0's and select all available 1's. In that way, we do not lose consistency or efficiency compared to the full sample (King and Zeng 2001a; King and Zeng 2001b). Regarding the number of non-partnerings, we followed King and Zeng's (2001a) suggestion to proceed sequentially. We constructed several samples ranging from a partnering/non-partnering proportion of 0.5 to 0.1. A sample of 9,900 non-partnerings and 1,855 partnerings appeared to be the best choice, as it did not show strong over- or underdispersion.

4 DESCRIPTION OF DEALS, BIDDERS AND TARGETS

On a global scale, M&A deals are spatially concentrated. Table 2 shows that 69% of all domestic deals took place within only ten countries, and 88% of all bidders were located in one of these ten countries during the first decade of the twenty-first century. Measured by the number of announced deals, the Netherlands was the ninth largest M&A market in the world. And whereas the average proportion of domestic deals was about 75% worldwide, it was 67% in the Netherlands. This reflects the international orientation of Dutch corporations.

<Table 2>

Our sample includes 1,855 real deal announcements in the Netherlands in the years 2002 to 2008. Those deals were undertaken by 1,391 companies, of which some were multiple bidders: 29 bidders selected five or more targets, 52 bidders three or four and 148 bidders two. Out of these 1,855 deals, 447 failed to get completed. Table 3 depicts the number of partnerings and non-partnerings by regional scale (equal to sample sizes) and by year. The numbers suggest a merger wave with a peak in 2005 and 2006, which corresponds with the world-wide trend.

<Table 3>

Table 4 gives descriptives of the bidder and target characteristics. It stands out that bidders are more often financial companies than targets, which is in line with the argument that many deals are pure financial deals. Another distinguishing feature is that 9.3% of all bidders are listed while this is true for only 0.3% of the targets. Furthermore, targets have fewer subsidiaries and are less diversified than bidders.

<Table 4>

Descriptives of the relational variables are given in Table 5, depicting differences between the partnerings and the peer group of non-partnerings. M&A deals occur at shorter average geographical distance, as compared to non-partnering. Still, the majority of M&A takes place between provinces. Furthermore, M&A deals occur between more closely related industries than non-partnering. This difference is especially striking at the most detailed intra-group level.

<Table 5>

5 RESULTS

Domestic and regional home bias - Table 6 shows that Dutch bidders are home biased when it comes to domestic M&As: the average absolute home bias of 25.5 km is significantly positive. A significant home bias also exists in regional M&A deals, i.e. partnerings in which bidder and target are located within the same province, COROP region or municipality. Here, the average home biases are 10.2 km, 5.2 km and 1.0 km, respectively. Striking is that even the home bias on a municipality level is significantly positive. This value turns insignificant though when we test industry-matched partnerings, which means that the localization effect is the main reason why, on a municipality level, companies are more likely to partner in geographical proximity.

The standardization of the values by the minimum and maximum distance to all potential targets enables a comparison of the role of geographical proximity on different spatial scales. As non-overlapping 95%-confidence intervals of the relative values reveal, the regional home biases on the level of COROP regions and provinces were significantly higher than the average domestic home bias. Next to the home bias in kilometers and as a relative value, we show how many bidders are actually home biased. On the national scale, these are more than two-thirds of all bidders.

<Table 6>

Logistic regressions - We estimated logistic regression models which included the geographical proximity, industrial relatedness and control variables. As explained earlier, our dependent variable is whether two companies were partnering (1) or non-

partnering (0). The correlation matrix can be found in the Appendix (Table A1). Instead of DISTANCE, we estimated the effect of its logarithmic term LnDISTANCE, which led to a slightly better overall fit of the model.

As shown in Table 7, we found a logarithmic relationship between distance and partnering likelihood. The effect of LnDISTANCE is about the same in the full model (Model D) and the model without industrial relatedness predictors (Model C). All three categorical geographical proximity variables turned out to be positive and significant and the likelihood of M&A partnering was highest within the same municipality. As shown in the appendix (Table A2), companies within the same municipality have a 4% to 168% higher chance to partner. Interesting is also that LnDISTANCE remained significant when estimated jointly with the three spatial dummies. This means that pure distance in km (in logarithmic terms) and co-location at various spatial scales do have a distinct effect on M&A partnering.

<Table 7>

In the complete model in Table 7, we also found a clear, strong relationship between industrial relatedness and M&A partnering. All industrial relatedness dummies were positive and significant. As shown in Table A2, the likelihood of partnering was about 71 to 104 times higher within the same group (i.e. at the most detailed industrial level).

In Table 8, we explored further the interaction between geographical proximity and industrial relatedness. Interestingly, we found that geographical proximity plays a somewhat different role in the search for related and unrelated targets. Relatedness is

here being defined on a 3 digit NACE code level. A comparison of the coefficients in both models suggests that companies seeking unrelated targets are searching closer to their home base than companies seeking related targets. This finding is in contrast to the study of Chakrabarti and Mitchell (2013) on domestic acquisitions by U.S. chemical manufacturers who found that acquirers are less likely to be engaged in (both related and unrelated) acquisitions as geographical distance increases, but this distance decay effect is stronger for related acquisitions.

<Table 8>

With respect to the control variables, we found that partnering is significantly more likely if both companies have multiple sites and activities. Furthermore, the models illustrate that partnering is a rare event. If partnering occurs randomly, its probability would be 1,855/1,608,863 = 0.115%. The full model raised the average partnering probability to 0.549%, which is nearly five times larger than a random guess. Overall, likelihood-ratio tests showed that the full model should be preferred over the model without geographical proximity variables (D=6,540-6,078=462), over the model without industrial relatedness variables (D=9,331-6,078=3,253) and over the model with the control variables only (D=10,125-6,078=4,047).

In order to test the model's quality and generalizability, we exerted various tests. Tabachnick and Fidell (2007) suggest to cross-validate the model by splitting the data randomly into a selection of 80% and run the model on this training sample and its counterpart with the remaining 20% of the data. We could not find significant

differences in the values of the R^2s and *b*s and attest the model generalizing well. Furthermore, we searched for cases that might have exerted an undue influence on the model, i.e. outliers that bias the model, and outliers for which the model fits poorly. A commonly used statistic to estimate the overall influence of single cases on the model is Cook's distance. Cook and Weisberg (1982) suggest that this statistic should not exceed 1. Indeed, there were no influential cases or outsiders, as the largest value was 0.10. In order to examine the fit between data and model, we examined the values of standardized and studentized residuals. Field (2009) suggests watching out for residuals with an absolute value larger than 1.96, 2.58 and 3.29, whose fractions should not exceed 5%, 1% and 0%, respectively. These limits were kept for standardized residuals and deviance, but not for studentized residuals, suggesting that for some cases the model might fit poorly.

6 CONCLUSIONS AND DISCUSSION

This paper shows that geographical proximity is an important driver of regional M&A partnering. We could show a significant effect of geographical proximity on Dutch domestic deals by individual home bias measures and by means of logistic regression, which allowed controlling for other factors. We found strong evidence that Dutch bidders tend to select targets that are geographically closer than the average target. This is in line with findings in studies on Finnish deals (Böckermann and Letho 2006) and US deals (Eun and Mukherjee, 2006; Grote and Umber, 2006; Chakrabarti and Mitchell, 2013). In their study on German M&As, Rodríguez-Pose and Zademach (2003; 2006) could find associations between geographical proximity and M&A activity only in

combination with agglomerations. We did not find such evidence in the Netherlands, as companies in non-urban provinces such as Zeeland or Friesland were even more home biased than companies in urban provinces like Utrecht, for instance.

Our analyses showed that geographical proximity even drives deals at various, quite detailed sub-national scales and thus suggest the existence of a regional home bias. The effect on deals within the same municipality could be explained by localization effects. This means that, given that bidders are restricted to a specific target industry, there is not much other choice than selecting a target that is closer than the average target because many industries are clustered. The results suggested that companies located in the same region have a higher chance to merge. Striking is that pure geographical distance has an additional effect. For example, within the same municipality, two companies that are 4 kilometers apart from each other are more likely to merge than two companies that are 7 kilometers apart from each other.

Furthermore, we found strong evidence that companies that share the same or similar industry are more likely to engage in an M&A deal. The effect of industrial relatedness is stronger than the effect of geographical proximity. By modeling the effects of industrial relatedness and geographical proximity jointly, we could show that the two effects are not reinforcing each other, but that they are independent. In that respect, our paper contributes to the proximity literature (Boschma 2005).

Of course, our study opens up a lot of research challenges. In the theoretical part, we described several factors that might account for the effect of geographical proximity and

industrial relatedness. It would, therefore, be interesting to examine the contribution of each of these different factors. Furthermore, our home bias measure calls for more research that examines its determinants. These can be company- or industry-specific, but also temporal or place-specific. As our explorations show, geographical proximity is more decisive in searching for unrelated than for related targets. Further research is needed to unravel the underlying reasons.

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APPENDIX

<Table A1>

<Table A2>

Table 1

Sampling criteria and procedure

Criteria		No. of deals
1	All domestic Dutch mergers and acquisitions that are announced or completed between 02.07.2000 and 01.07.2010	4,540
2	Deals that are no M&As as defined in this paper	-342
		=4,198
3	Bidder ≠ company (e.g. deals which are management buy-ins but not coded as such)	-365
4	Target ≠ company (e.g. spin-offs or carve-outs)	-683
Population (02.07.2000 - 01.07.2010)		**=3,167**
5	Bidder headquarter cannot be localized	-15
6	Target headquarter cannot be localized	-99
		=3,068
7	Bidder and target headquarter have the same street name and house number	-372
8	Bidder and target headquarter share the same postcode but no information about the street name and house number is available	-68
		=2,628
9	Bidder NACE code on a 3 digit level is not available	-55
10	Target NACE code on a 3 digit level is not available	-15
	Deals from 02.07.2000 - 01.07.2010 which provide all potential targets (target pool)	**=2,558**
	Deals from 01.01.2002 - 31.12.2008 which provide all potential bidders (bidder pool)	**=1,855**

Table 2

The 10 largest domestic M&A markets in the world, 2000-2010

Country	No. of domestic M&As	No. of bidders	Domestic M&As (%)
United States	52,772	63,979	82
United Kingdom	19,158	25,500	75
Russian Federation	9,097	9,831	93
Japan	7,645	8,627	89
France	6,809	10,139	67
Canada	6,500	10,120	64
Germany	6,270	9,744	64
Finland	6,114	7,281	84
The Netherlands	5,936	8,901	67
China	5,831	6,370	92
All countries (N=177)	181,567	242,051	75

Note: The numbers reflect all announced mergers and acquisitions as defined in ZEPHYR.

Table 3

Description of partnerings and non-partnerings

	No. of partnerings	No. of non-partnerings	No. of non-partnerings (industry-matched)
All domestic deals	1,855	1,607,008	33,212
Deals within the same province	654	210,995	4,988
Deals within the same COROP region	430	87,008	2,377
Deals within the same municipality	233	25,301	896
Deals in 2002	165	72,303	1,643
Deals in 2003	152	93,242	2,198
Deals in 2004	287	229,725	4,547
Deals in 2005	346	347,418	6,833
Deals in 2006	391	386,962	7,820
Deals in 2007	248	231,411	5,088
Deals in 2008	266	245,947	5,083

Note: Industry-matched non-partnerings are based on the assumption that the bidder could only select between targets that are active in the same industry as the bidder's real target.

Table 4

Description of bidders and targets

	Bidders	Targets
Wholesale and retail trade; repair of motor vehicles and motorcycles	18%	20%
Information and communication	17%	18%
Manufacturing	16%	16%
Financial and insurance activities	11%	5%
Active in one industry	70%	75%
Active in two or three industries	27%	23%
Active in more than three industries	3%	2%
No subsidiaries	39%	86%
One to ten subsidiaries	42%	12%
More than ten subsidiaries	19%	2%

Note: The proportions refer to the number of deals. N=1,855.

Table 5

Description of relational variables: partnering versus non-partnering

	Partnerings	Non-partnerings
Geographical proximity		
Distance mean	60.85 km	86.12 km
Inter-province	64%	86%
Intra-province (but not within the same COROP region)	12%	8%
Intra-COROP region (not within the same municipality)	11%	4%
Intra-municipality	13%	2%
Industrial relatedness		
Inter-section (=conglomerate deals)	30%	89%
Intra-section (but not within the same division)	14%	8%
Intra-division (but not within the same group)	6%	1%
Intra-group (=horizontal deals)	52%	2%
Control variables		
Both unlisted	90.4%	90.6%
Bidder unlisted, target listed	0.3%	0.2%
Both listed	0.0%	0.0%
Bidder listed, target unlisted	9.3%	9.1%
Both multi-locational	10%	8.6%
Bidder multi-locational, target single-locational	51.3%	53.1%
Both single-locational	34.6%	33.0%
Bidder single-locational, target multi-locational	4.0%	5.2%
Both specialized	58.4%	55.2%
Bidder specialized, target diversified	11.5%	16.1%
Both diversified	13.3%	6.8%
Bidder diversified, target specialized	16.7%	21.9%
N	1,855	1,607,008

Table 6

Univariate statistics of home bias measures

Effect size	Company locations	All partnering			Industry-matched partnerings		
		Estimate	95% CI		Estimate	95% CI	
Mean of ABS_HB	Netherlands	25.5***	23.0	27.9	20.3***	17.9	22.4
	Same province	10.2***	8.9	11.5	5.7***	4.1	7.2
	Same COROP region	5.2***	4.5	6.0	1.9***	0.7	2.8
	Same municipality	1.0***	0.6	1.4	0.4	-0.4	1.2
Mean of REL_HB	Netherlands	33.7***	31.4	36.2	32.1***	28.8	35.1
	Same province	44.8***	40.7	49.0	39.0***	31.4	46.8
	Same COROP region	43.7***	38.5	48.7	23.8***	10.2	37.9
	Same municipality	38.7***	29.2	47.3	18.0	-10.1	44.6
% home biased bidders	Netherlands	71***	70	74	69***	67	71
	Same province	78***	72	82	71***	66	76
	Same COROP region	77***	73	81	60**	51	69
	Same municipality	72***	65	79	55	40	71

Notes:

The number of partnerings within the Netherlands is 1,855, within the same province 654, within the same COROP region 428 and within the same municipality 166. If considering industry-matched partnerings the number of parternings within the Netherlands is 1,664, within the same province 307, within the same COROP region 116 and within the same municipality 38. Note that the regional categories are not mutually exclusive.

The samples contain only partnerings in which the bidder could choose between at least 6 potential targets, or 4 potential targets if the partnerings are industry-matched (real target included).

The significance levels and confidence intervals are estimated by bootstrapping, based on 5,000 samples. The significance levels are *** p<0.01, ** p<0.05 and * p<0.1.

Table 7

M&A partnering models

Variables	Model A		Model B		Model C		Model D	
			Geographical proximity					
LnDISTANCE					-0.510***	(0.044)	-0.494***	(0.056)
INTRA_PROVINCE					0.210**	(0.095)	0.262**	(0.124)
INTRA_COROP					0.379***	(0.125)	0.381**	(0.163)
INTRA_MUNICIPALITY					0.536***	(0.186)	0.513**	(0.241)
			Industrial relatedness					
INTRA_SECTION			1.661***	(0.084)			1.645***	(0.089)
INTRA_DIVISION			2.555***	(0.137)			2.491***	(0.146)
INTRA_GROUP			4.463***	(0.093)			4.457***	(0.097)
			Control variables					
BOTH_SINGLE-LOCATIONAL	0.124**	(0.055)	0.057	(0.073)	0.124**	(0.058)	0.52	(0.076)
BOTH_MULTI-LOCATIONAL	0.237***	(0.088)	0.294**	(0.114)	0.269***	(0.092)	0.344***	(0.116)
BOTH_SPECIALIZED	0.315***	(0.057)	0.002	(0.073)	0.301***	(0.060)	-0.024	(0.076)
BOTH_DIVERSIFIED	0.969***	(0.088)	0.505***	(0.118)	1.001***	(0.092)	0.507***	(0.121)
Constant	-2.013***	(0.051)	-2.906***	(0.069)	-0.081	(0.198)	-1.030***	(0.251)
No. of partnerings	1,855		1,855		1,855		1,855	
No. of non-partnerings	9,900		9,900		9,900		9,900	
Omnibus test, χ^2 (df)	125 (4)***		3,711 (7)***		919 (8)***		4172 (11)***	
Hosmer and Lemeshow test, χ^2 (df)	1.32 (4)		4.01 (5)		14.00 (8)		9.24 (8)	
Dispersion Φ	0.33		0.80		1.75		1.16	
R_N^2	0.018		0.465		0.129		0.513	
- 2 Log likelihood	10,125		6,540		9,331		6,078	

Note: For the subsample of non-financial deals (excluding all deals with bidders in NACE section K "Financial and insurance activities"), the effect of geographical proximity was slightly weaker while the effect of industrial relatedness was considerably stronger. R_N^2 increased from 0.513 to 0.546.
The significance levels are *** p<0.01, ** p<0.05 and * p<0.1.

Table 8

M&A partnering models for unrelated and related companies

Variables	Unrelated		Related	
	Geographical proximity			
DISTANCE	-0.006***	(0.001)	-0.002*	(0.001)
INTRA_PROVINCE	0.41***	(0.124)	0.55***	(0.120)
INTRA_COROP	0.83***	(0.144)	1.13***	(0.135)
INTRA_MUNICIPALITY	1.96***	(0.155)	1.15***	(0.141)
	Control variables			
BOTH_SINGLE-LOCATIONAL	0.05	(0.080)	0.37***	(0.074)
BOTH_MULTI-LOCATIONAL	0.36***	(0.119)	0.18	(0.128)
BOTH_SPECIALIZED	-0.15*	(0.078)	0.97***	(0.087)
BOTH_DIVERSIFIED	0.79***	(0.118)	0.14	(0.120)
Constant	-2.20***	(0.110)	-3.19***	(0.112)
No. of partnerings	893		962	
No. of non-partnerings	9,718		10,469	
Omnibus test, χ^2 (df)	478 (8)***		463 (8)***	
Hosmer and Lemeshow test, χ^2 (df)	12.26 (8)		14.02 (8)*	
Dispersion Φ	1.53		1.75	
R_N^2	0.100		0.091	
- 2 Log likelihood	5,651		6,139	

Notes:

The sample of unrelated companies is part of the sample that is used in the other estimations. The sample of related companies is extended by additional, randomly selected, non-partnerings in order to obtain the same proportion between the number of partnerings and non-partnerings in both samples.

In these models we use DISTANCE instead of LnDISTANCE because of high correlations between LnDISTANCE and INTRA_MUNICIPALITY (R^2=-0.82 in E, R^2=-0.73 in F).

The significance levels are *** p<0.01, ** p<0.05 and * p<0.1.

Table A1

Correlation matrix

		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Ln_DISTANCE	**-0.193**	**-0.306**	**-0.627**	**-0.023**	**-0.055**	**-0.157**	-0.007	0.000	**-0.019**	-0.014
(2)	INTRA_PROVINCE		**-0.068**	**-0.055**	-0.002	0.011	0.032	0.008	-0.017	-0.001	0.017
(3)	INTRA_COROP			**-0.041**	0.002	**0.024**	**0.071**	0.002	-0.010	0.005	-0.004
(4)	INTRA_MUNICIPALITY				**0.035**	**0.029**	**0.130**	0.013	0.000	**0.018**	-0.003
(5)	INTRA_SECTION					**-0.046**	**-0.104**	0.003	0.008	**-0.030**	0.035
(6)	INTRA_DIVISION						**-0.048**	0.013	0.005	0.015	-0.009
(7)	INTRA_GROUP							**0.019**	0.000	0.048	0.082
(8)	BOTH_SINGLE-LOCATIONAL								**-0.216**	**0.063**	**-0.030**
(9)	BOTH_MULTI-LOCATIONAL									**-0.022**	0.005
(10)	BOTH_SPECIALIZED										-0.329
(11)	BOTH_DIVERSIFIED										

Notes:

Bold values indicate correlation coefficients significant on a 5%-level.

As most variables are binary most coefficients are φ. If one variable is continuous and one categorical the point-biserial correlation coefficient r_{pb} is used, which has the same value as Pearson's product-moment correlation coefficient.

Significance levels are two-tailed. N = 11,755.

Table A2

M&A partnering models (odds ratios)

Variables	Model A		Model B		Model C		Model D	
				Geographical proximity				
LnDISTANCE					0.60	(0.55 – 0.66)	0.61	(0.54 – 0.68)
INTRA_PROVINCE					1.23	(1.02 – 1.49)	1.30	(1.02 – 1.66)
INTRA_COROP					1.46	(1.14 – 1.86)	1.46	(1.06 – 2.01)
INTRA_MUNICIPALITY					1.71	(1.19 – 2.46)	1.67	(1.04 – 2.68)
				Industrial relatedness				
INTRA_SECTION			5.27	(4.46 – 6.21)			5.18	(4.35 – 6.16)
INTRA_DIVISION			12.87	(9.85 – 16.81)			12.07	(9.07 – 16.06)
INTRA_GROUP			86.73	(72.24 – 104.11)			86.23	(71.36 – 104.19)
				Control variables				
BOTH_SINGLE-LOCATIONAL	1.13	(1.02 – 1.26)	1.06	(0.92 – 1.22)	1.13	(1.01 – 1.27)	1.05	(0.91 – 1.22)
BOTH_MULTI-LOCATIONAL	1.27	(1.07 – 1.51)	1.34	(1.07 – 1.68)	1.31	(1.09 – 1.57)	1.41	(1.12 – 1.77)
BOTH_SPECIALIZED	1.37	(1.22 – 1.53)	1.00	(0.87 – 1.16)	1.35	(1.20 – 1.52)	0.98	(0.84 – 1.13)
BOTH_DIVERSIFIED	2.64	(2.22 – 3.13)	1.66	(1.31 – 2.09)	2.72	(2.27 – 3.26)	1.66	(1.31 – 2.11)

Notes:

Odds ratios indicate partnering likelihood if the value of the independent variable increases by 1, all other variables being equal.

The values in brackets denote the 95%-confidence interval of the odds ratios. If the upper and lower values are both smaller or bigger than 1 the effect is significant on a 5%-level.