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ORIGINAL PAPER

Social ties and home bias in mergers and acquisitions

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Abstract
This paper explores whether social ties, proxied by Facebook friendship links, can explain why the number and value of mergers and acquisitions (M&As) are greater within countries than between countries. We find that social ties are positively correlated with the number and value of M&As. We also demonstrate that the home bias in M&As is greatly reduced once we control for the differences in social ties between and within countries. We further find that social ties particularly facilitate M&As when the level of corruption is high, press freedom is limited in the target country, and there are more cultural differences between the acquirer and target countries.

Keywords Mergers and acquisitions (M&As) · Social ties · Border effect · Facebook · foreign direct investment (FDI) · European Union (EU)

JEL Classification F15 · F21 · F23

1 Introduction

The value of cross-border mergers and acquisitions (M&As) was multiplied by 10 between 1995 and 2019. Cross-border M&As also grew in relative terms, rising its share in foreign direct investment (FDI) from 31% in 1995 to 44% in 2019.[1] The

[1] Calculations are made using a five-year moving window for cross-border M&As and FDI inflow values. Data are from UNCTAD, World Investment Reports (various issues). Available at: https://unctad.org/publications.

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increase in the absolute and relative size of cross-border M&As have prompted scholars to explore their determinants (di Giovanni, 2005; Neary, 2007; Head & Ries, 2008; Hijzen et al., 2008; Alviarez et al., 2020) and investigate why some firms choose this internationalization strategy over others (Nocke & Yeaple, 2007; Neary, 2009).

Despite its increase, the value of M&As across borders is still lower than that within borders. Figure 1 illustrates that during the 1995–2019 period, on average, the value of domestic M&As was approximately three times larger than that of cross-border M&As. To measure whether this difference was explained by firms' preference to acquire or merge with local firms over foreign firms, Carril-Caccia et al. (2022) estimated a gravity equation for M&A flows and determined that the number and value of within-country M&As was five times larger than between-country M&As.

The goal of this paper is to explore whether social ties are positively related with M&As. Furthermore, we investigate whether social ties can explain a country's preference to conduct M&As within their own borders. We proxy social ties with the number of friendship links between Facebook users across and within countries. We expect this variable to be strongly positively correlated with other forms of social ties and, hence, represent a good proxy for the intensity of the social linkages between two countries or regions. For brevity, in the rest of the paper, we will refer to Facebook friendship links as social ties.

Combining data on the number and value of M&As with social ties between and within countries for the 2015-2019 period, we find that social ties have a strong positive correlation with the number and value of M&As. Specifically, a 10% increase in social ties raises the number and value of M&As by 5%. We further demonstrate that the home bias in M&As greatly reduces, and even disappears in some estimations, once we control for differences in social ties between and within countries.

To further support our results, we exploit the fact that a firm is more likely to invest in related industries than in unrelated activities, and industries are unevenly distributed geographically in a country. We build a new social ties index that takes into account these two elements. This new index should be more powerful in explaining the industry-level M&As than the standard, population-based, social ties index. When we introduce the industry-level and the standard social ties indexes in the regression equation, we find that the former is positive and statistically significant whereas the latter is statistically insignificant. However, this result should be taken with caution.

There are two caveats to the narrative that social ties facilitate M&As. First, there might be a reverse causality problem in which M&As explain social ties rather than friendship ties explaining M&As. Following similar arguments as those used in Bailey et al. (2021), we argue that the number of Facebook friendship links attributable to M&A negotiations is very small relative to the total number of friendship links. Therefore, the quantitative impact of the reverse causality should be very small.

Second, the correlation between social ties and M&As might stem from an omitted variable that is positively correlated with both social ties and M&As. For example, having similar preferences can explain two countries having many Facebook

friendship links and M&As. To address this concern, we analyze whether the positive relationship between social ties and M&As remains when we use more granular fixed effects. First, we regionally disaggregate our M&A flow and social ties data and re-estimate our empirical specifications with acquirer region × target country × year and acquirer country × target region × year fixed effects. These granular fixed effects control for all omitted variables specific to an acquirer country-target country-year triad. Second, using data on managers' city of birth, we build an acquirer firm-destination region specific social ties index. This enables us to control for acquirer region-destination region specific fixed effects. In both analyses, we still find a significant positive correlation between social ties and M&As.

Next, we explore the mechanisms by which social ties facilitate M&As. First, social ties allow a firm to overcome the transaction costs involved in acquiring or merging with another firm. These obstacles are larger when the institutional quality of the target country is low. Thus, social ties should be particularly important in facilitating M&A operations in those countries. We proxy institutional quality with the level of corruption and discover that social ties have a stronger positive effect on the number and value of M&As when the corruption level is high in the target country.

Second, social ties provide a firm with information about a target-country's events and government policies that might determine the value of an asset. This information source will be particularly relevant in target countries in which press freedom is limited. In line with this argument, we find that social ties have a stronger positive effect on the number and value of M&As when press freedom is limited in the target country.

Third, Head and Ries (2008) argued that cultural distance increases headquarters' costs of monitoring subsidiary managers. Additionally, M&As prompt to organizational changes that could be more difficult to implement when cultural distances are great. Social ties can reduce the cultural distance between the acquirer and target countries and therefore attenuate organizational change and monitoring costs. We classify country pairs as low-distance or high-distance pairs using Hofstede's (1980) cultural dimensions. We determine that social ties have a stronger positive effect on the number and value of M&As the greater the cultural distance between the acquirer and target countries.

Our paper contributes to the literature analyzing home bias in M&As. Mayer et al. (2010) analyzed the determinants of French firm investment during the 1992–2002 period and determined that domestic investment was 2.6 times higher than foreign investment. Umber et al. (2014) examined the border effect on cross-border M&As among European Union's (EU) 15 countries during the 1991–2007 period and found that on average, the value of M&As within a specific EU country was six times larger than that between EU countries. Using a sample of 95 countries for the 1995-2015 period, Carril-Caccia et al. (2022) showed that the number and value of within-country M&As was five times larger than between-country M&As. We contribute to this literature by illustrating that the home bias in M&As is greatly reduced, and in many specifications disappears, when one controls for differences in social ties within and between countries. Our paper is closely related to the work of Bailey et al. (2021), who revealed that social ties positively impact trade flows. They

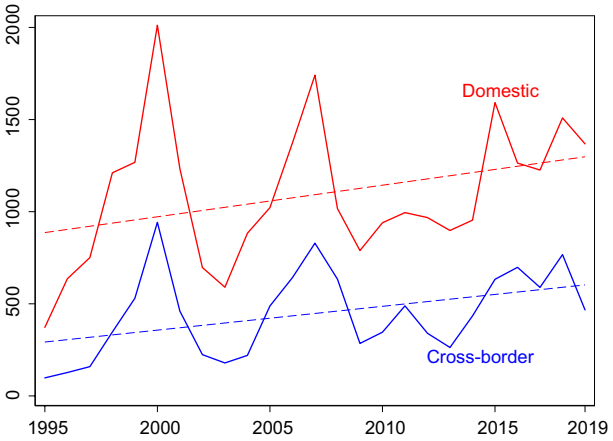

Fig. 1 Value of domestic and cross-border M&As, 1995–2019 (billions of US dollars). Note: Authors' own elaboration based on the Eikon Thomson Reuters database

also found that the home bias in trade decreases significantly once differences in social ties within and between countries are considered.

Our work is also linked to literature that has highlighted the positive effect of social ties on FDI. Previous research has concluded that immigrants facilitate firms' access to foreign markets by reducing the transaction costs related to cultural and institutional differences and easing access to foreign market information (Docquier & Lodigiani, 2010; De Simone & Manchin, 2012; Gao et al., 2013; Kugler & Rapoport, 2007; Burchardi et al., 2018). In a similar vein, Lien et al. (2012) showed that the establishment of the Confucius Institutes fostered Chinese FDI into developing countries. These institutes not only fostered FDI by increasing the number of non-native Chinese speakers, but also by providing market access information to Chinese investors. From a different perspective, Paniagua et al. (2017) showed that firms' participation in online social networks could promote their internationalization, enhancing their capabilities abroad by favoring their transfer of reputation and identity and reducing the liability of their foreignness. Additionally, social networks can serve as a tool for acquiring knowledge from the host country or transferring it to subsidiaries abroad. We contribute to this literature by using a measure of social ties based on actual Facebook friendship links, as opposed to other measures such as migration which cannot ensure whether a relationship exists between the migrant and an individual in his or her homeland. Furthermore, we show that social ties facilitate M&As by smoothing the transaction costs to acquire and merge with other firms, providing additional information about events and policies that might determine the value of the target asset, and reducing the cultural distance between the acquirer and target countries.

The remainder of the paper proceeds as follows. The next section presents the different sets of data used in our study, explains how information on Facebook friendship links is used to build a bilateral social ties index, and presents examples of how this index varies between countries and regions. Section 3 presents the regression

analyses used to estimate the impact of social ties on the number and value of bilateral M&As using country, industry, regional, and firm-level data. Section 4 explores the mechanisms by which social ties facilitate M&As. The last section concludes.

2 Data

Our dataset combines three pieces of information: (i) social ties between regions and countries; (ii) M&A operations at the acquirer firm-target firm level; and (iii) gravity variables.

2.1 Social ties

We use data on Facebook friendship links as a proxy for social ties between regions and countries. This dataset was created by Bailey et al. (2021) and made available to us for this project. To build this dataset, Bailey et al. (2021) took an anonymized snapshot of all active Facebook users in March 2019, which totaled 2.4 billion individuals. They were geo-localized at the city level based on their profile information and connection data. Each user's friendship links were obtained from his or her account.

Based on this raw data, Bailey et al. (2021) calculated a social connectedness index, which we denote as social ties, defined as follows:

$$Social\ Ties_{ij} = \frac{Facebook\ friendships_{ij}}{Facebook\ users_i \times Facebook\ users_j} \quad (1)$$

where $Facebook\ friendships_{ij}$ is the number of Facebook friendship connections between countries i and j, and *Facebook users* is the number of Facebook users in each country. $Social\ Ties_{ij}$ is calculated as a ratio and captures the probability that a Facebook user in i has a friendship connection with another Facebook user in j. Although the social connectedness index measures the intensity rather than the absolute number of social ties, for the sake of brevity, as previously mentioned, we will denote it as social ties.

As an illustration of this data, Fig. 2 depicts Spain's social ties. Lighter colors denote fewer social ties and darker colors more social ties. Spain has, on average, more social ties with countries that are geographically proximate.[2] Additionally, Spain has strong social ties with countries that also speak Spanish, such as those located in Latin America and Equatorial Guinea. Migration is also important for explaining social ties. For example, Spain has strong social ties with Romania and Bulgaria in Europe, with Morocco and Senegal in Africa, and with Ecuador and Venezuela in South America. The number of people that migrated from these countries to Spain represents a sizable share of these countries' populations, increasing the probability that a Facebook user in these countries might have a friendship or

[2] Bailey et al. (2018) showed that the elasticity of the number of social ties to distance ranged from about − 2.0 over distances less than 200 miles to about − 1.2 for distances larger than 200 miles.

family tie with a Facebook user in Spain. Interestingly, Spain also has strong social ties with Switzerland, the destination of many Spanish workers during the 1960s.

As an illustration of regional-level social ties data, Figure 3 illustrates social ties in Basque Country, a region of Spain. To facilitate the reading, we only depict the social ties with the NUTS-2 regions of the two countries adjacent to Spain: France and Portugal.[3] Geographical distance is important for determining social ties between Basque Country and other Spanish NUTS-2 regions. Basque Country has very strong social links with nearby regions (e.g., Cantabria, La Rioja, and Navarre) while the intensity of the links attenuates as the distance increases. In any case, on average, social ties are much stronger with Spanish NUTS-2 regions than with French and Portuguese regions.

2.2 M&A operations

The number of projects and the value of domestic and cross-border M&As was retrieved from Eikon Thomson Reuters. As explained in the previous subsection, Facebook data are from 2019. To stay close to that year, we selected M&A transactions from the 2015-2019 period. Our database covers 71,223 domestic and 22,188 international transactions in 143 countries.[4] In line with the definition of FDI, we excluded all transactions that represented less than 10% of target firm ownership. To ensure that we were correctly classifying M&A operations as domestic or cross-border, we dropped all transactions in which the nationality of the ultimate investor or investee was unknown.[5]

Because our database was based on firm-level data and identified the nationality of the ultimate owner of a firm, we reduced the potential bias usually present in FDI statistics attributable to the use of tax havens as transit countries. One caveat of our database is that the value was missing for 70% of M&A transactions. This omission is common in small and publicly undisclosed transactions. To keep those transactions in our dataset, we assumed that all M&As without a reported value were 1 million US dollar (USD) transactions. This data imputation was motivated by Thomson Reuters's data collection strategy, which collects within-border and cross-border M&As that are equal to or surpass the value of 1 million US dollars.[6]

Unfortunately, the M&A dataset did not identify the region within a country in which the investor and target firm were located. To overcome this limitation, we created a subsample that included the M&A transactions between the five EU countries with the largest number of bilateral M&A transactions during the period of analysis:

[3] NUTS is the nomenclature used by the EU to classify territorial units. At the two-digit level, it comprises 244 regions, of which 19 belong to Spain, 26 to France, and 7 to Portugal. We exclude the Azores, the Canary Islands, Madeira, and French overseas territories from the map.

[4] Table 6 in the Appendix lists all of the countries included in the sample.

[5] We removed an observation from the sample if the nationalities of the direct investor and investee were the same but the nationalities of the ultimate investor and investee differed. Likewise, we also dropped an observation if the direct investor and investee had different nationalities but the ultimate investor and investee had the same nationality.

[6] As explained later, removing observations where value was imputed does not alter our conclusions.

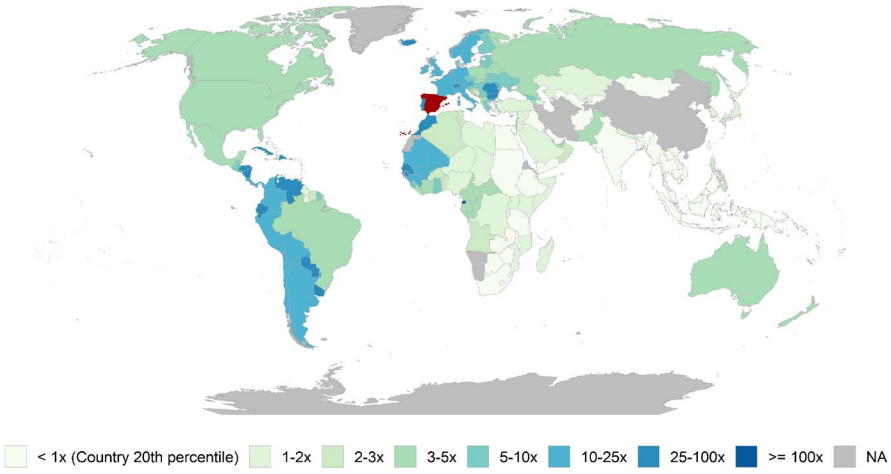

Fig. 2 Spain's social ties. Note: The figure shows a heatmap of Spain's social ties with other countries. The colors highlight connections to Spain, which are given in red. The lightest color corresponds to the 10th percentile of social ties between country-pairs globally; darker colors correspond to closer connections. Source: The figure was created using an R-script provided by Bailey et al. (2021)

France, Germany, Italy, Spain, and the United Kingdom (UK). We downloaded the name and region of all firms operating in those countries that were included in the Orbis database. We then matched the M&A dataset with Orbis using the firm's name and its nationality as links. Because a firm's name could be written in various ways, we used STATA software's "matchit" module to measure the similarity between all firm-name combinations (Raffo, 2020).[7] After matching, we obtained the NUTS-2 and NUTS-3 codes for 21.4% of the M&A operations including the origins and destinations in the selected EU countries.

2.3 Gravity variables

We estimate a gravity model to analyze the links between M&As and social ties. First, some dyadic country-level "gravity variables", such as common land border (i.e., contiguity), common language, legal system, religious affinity, and colonial ties were obtained from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) database (Head et al., 2010). Second, to identify whether a pair of countries had signed a trade agreement, we used Mario Larch's Regional Trade Agreements database from Egger and Larch (2008). Third, based on the information from the United Nations Conference on Trade and Development's (UNCTAD's) Investment Agreements Navigator, we constructed a variable that indicated if two countries had signed a bilateral investment treaty. Fourth, from the International Monetary Fund's International Financial Statistics, we retrieved

[7] We selected the match with the maximum score, as long as the similarity score between the two names was equal to or greater than 0.9, with equal names having a score of 1.

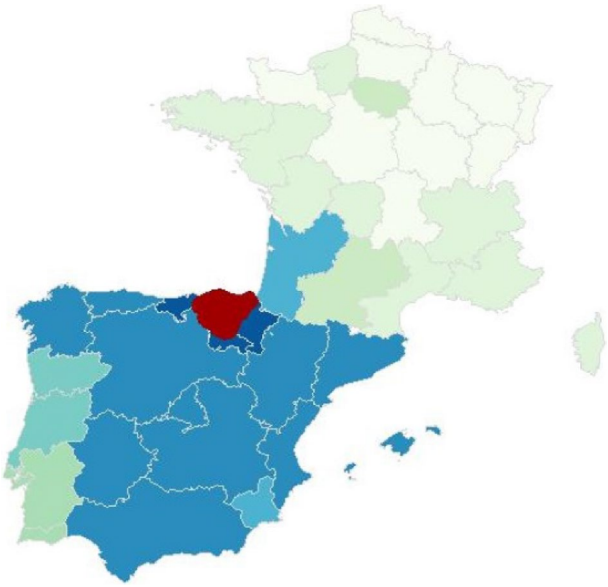

Fig. 3 Basque Country's social ties. Note: The figure depicts a heatmap of Basque Country's social ties. The colors highlight the connections to the focal country, which are given in red. The lightest color corresponds to the 10th percentile of social ties between region-pairs globally; darker colors correspond to closer connections. Source: The figure was created using an R-script provided by Bailey et al. (2021)

countries' nominal exchange rates. Based on the bilateral exchange rate, we then constructed an index that took the value of 100 in the base year of 2015. Fifth, we obtained the stock of international migrants for 2010 from the United Nations Department of Economic and Social Affairs Population division. Because the value of the stock of domestic migrants was not available for most countries, we employed the World Bank's Development Indicator data for each country's population in 2010. From each country's total population we then subtracted the number of migrants.

Bilateral geographic distances among countries and regions were measured using Julian Hinz's gravity distances.[8] We used the harmonic mean distance for 2000, the latest year available for bilateral distances at country and regional level (NUTS-2 and NUTS-3). According to Hinz (2017), using this measure of geographical distance in gravity models improves the existing measures along multiple lines: (1) The use of nightlight satellite imagery for the calculation of the weights provides very fine detail on the location and intensity of economic activity in a region, reducing the possibility of measurement error in human-collected population figures; (2) It moves away from a population-weighted towards a GDP-based measure, which is more consistent with the theoretical gravity framework; (3) Arithmetic distances

[8] Available at: https://julianhinz.com/data-code/gravity_distances/.

overstate the weight of short distances, leading to an overestimation of the border effect. This is amended by the use of harmonic distances.[9]

We employed the 2008 European Value Survey (EVS, 2011a) to measure migration at the regional NUTS-2 level. The EVS provided information about the region in which the respondent lived at age 14 and at the time the EVS questionnaire was conducted.[10] Based on this information, we constructed a NUTS-2 regional bilateral variable that proxied the stock of migrants. The value of migration within a region was calculated as the weighted number of respondents that lived in the same region at age 14 and at the time of the interview. Then, a respondent was classified as migrant if the region in which he or she lived at age 14 was different from the one in which he or she lived at the time of the interview.[11] Descriptive statistics of the variables are presented in Table 7 in the Appendix.

3 The effect of social ties on M&As

In this section, we use regression analysis to examine the effect of social ties on M&As. First, we introduce the regression equation. Second, we estimate it using M&A and social ties data at the country level. Third, to further support our narrative on the positive relationship between M&As and social ties and address the problem of potentially omitted variables, we re-estimate the specification using industry, regional, and firm-level data.

3.1 Regression equation

We use a gravity-type equation to estimate the determinants of bilateral M&As (di Giovanni, 2005; Head & Ries, 2008; Hijzen et al., 2008). It is defined as follows:

$$MA_{ijt} = exp[\beta_1 \ln st_{ij} + \beta_2 border_{ij} + \alpha' X_{ij} + \mu' Z_{ijt} + \gamma_{it} + \omega_{jt} + \epsilon_{ijt}] \quad (2)$$

where MA_{ijt} is the number of M&As that country i performs in country j in year t. An analogous model is estimated for the value of M&As. st_{ij} are social ties, as defined in Equation (1). $border_{ij}$ is an indicator variable that turns one when i and j are the same country. This variable captures the preference of firms to acquire and merge with domestic rather than foreign firms, once we control for the other variables that affect M&As. X_{ij} is a matrix of time-invariant bilateral determinants of M&As such as distance, having a common land border (contiguity), sharing a language and legal system, and having religious affinity and a former colonial relationship. Z_{ijt} is a matrix of time-variant bilateral determinants of M&As, namely, a

[9] Our results are robust to using the CEPII geographic distances. Although the results of these robustness tests are not included in the paper, they can be requested from the authors.

[10] There were 8,156 respondents for the five countries included in our analysis: France (1,501), Germany (2,075), Italy (1,519), Spain (1,500), and the UK (1,561).

[11] Only 0.04% of the respondents were between 16 and 17 years of age. The respondents' average age was 49. To ensure representativeness, the number of within and between regional migrants was calculated using the weights provided by the EVS. This weight adjusted for socio-structural characteristics and corrected for regional disproportionality (EVS, 2011b).

preferential trade agreement, a bilateral investment treaty, and a bilateral exchange rate.

We make all indicator and index variables (i.e., language, contiguity, religion, legal system, shared colonial past, preferential trade agreement, investment treaty, and bilateral exchange rate) take the value of one, or 100, when the origin and destination countries are the same. Therefore, the exponent of β_2 measures the number of M&As in the domestic market relative to that in a foreign country, which is at the same distance, has the same social ties, speaks the same language, shares a land border, legal system, religion, and currency, has a common colonial past, and belongs to the same preferential trade and investment agreements as the domestic market.

Equation (2) also includes an acquirer country × year fixed effect (γ_{it}) and a target country × year fixed effect (ω_{jt}). They control for all acquirer and target country-level variables that vary in time, such as GDP, institutional quality, and market capitalization. These fixed effects also absorb the origin and target countries' multilateral resistances that control for the fact that bilateral barriers to M&As depend on how attractive the origin and target countries are relative to other countries (Head & Ries, 2008). ϵ_{ijt} is a disturbance term.

As argued by Bailey et al. (2021), in some countries, such as the United States, Facebook foreign friendship links are representative of the entire country's population's foreign friendship links. However, in less developed countries, where access to Internet is more limited or costly, Facebook foreign friendship links might only be representative of the well-off population's friendship links. Because the well-off population has, on average, more foreign friends, this might overstate developing countries' social connectedness with other countries. The introduction of acquirer country × year and target country × year fixed effects in Eq. (2) addresses this problem and ensures that estimates are not biased due to differences in Facebook data representativeness between countries.

Since M&A operations are sparse, there are many cases in which the number of M&As that an acquirer country performs in a target country in a year is zero. To keep the zero values in the sample and address ordinary least squares (OLS) estimates' heteroskedasticity bias, we estimate Eq. (2) using a Poisson pseudo-maximum likelihood estimator (Santos-Silva & Tenreyro, 2010).[12] We cluster the standard errors at the acquirer country × target country level.

3.2 Country-level estimates

Table 1 presents the results of estimating Equation (2) using country-level M&A and social ties data. We collapsed the M&A transaction-level data at the country level and computed the number and value of bilateral M&A operations per year. Columns 1 to 3 present the results when the dependent variable is the number of M&As, whereas columns 4 to 6 show the results when the dependent variable is the value of M&As.

[12] We use Stata's ppmlhdfe command (Correia et al., 2019).

Table 1 Country-level analysis of social ties and home bias in M&As

	Number			Value		
	(1)	(2)	(3)	(4)	(5)	(6)
Border	1.251[a] (0.164)	− 0.082 (0.175)	− 0.050 (0.173)	0.870[b] (0.438)	− 0.620 (0.542)	− 0.587 (0.550)
Social ties (log)		0.524[a] (0.033)	0.389[a] (0.045)		0.539[a] (0.100)	0.329[a] (0.103)
Distance (log)	− 0.657[a] (0.048)	− 0.341[a] (0.050)	− 0.340[a] (0.053)	− 0.742[a] (0.110)	− 0.438[a] (0.123)	− 0.441[a] (0.125)
Contiguity	− 0.210[c] (0.120)	− 0.155	− 0.192	− 0.656[b] (0.295)	− 0.665[b] (0.300)	− 0.698[b] (0.302)
Language	1.083[a] (0.091)	0.643[a] (0.096)	0.651[a] (0.096)	0.810[a] (0.210)	0.460[b] (0.222)	0.450[b] (0.219)
Legal system	0.151[c] (0.078)	0.095 (0.075)	0.116 (0.075)	− 0.079 (0.158)	− 0.110 (0.161)	− 0.090 (0.166)
Religion	0.953[a] (0.138)	0.832[a] (0.129)	0.775[a] (0.122)	1.129[a] (0.423)	1.012[b] (0.396)	0.915[b] (0.392)
Colony	0.496[a] (0.120)	0.208[c] (0.117)	0.133 (0.119)	0.514[b] (0.229)	0.311 (0.235)	0.269 (0.225)
Trade agreement	0.170[c] (0.101)	0.103 (0.090)	0.063 (0.090)	− 0.126 (0.210)	− 0.111 (0.200)	− 0.157 (0.194)
Investment treaty	− 0.748[a] (0.102)	− 0.631[a] (0.099)	− 0.578[a] (0.101)	− 0.985[a] (0.270)	− 0.862[a] (0.269)	− 0.788[b] (0.277)
Exchange rate	− 0.017[c] (0.009)	− 0.012 (0.008)	− 0.012 (0.007)	− 0.009 (0.008)	− 0.006 (0.007)	− 0.007 (0.007)
Migrants (log)			0.103[a] (0.022)			0.155[a] (0.047)
Observations	54,498	54,498	53,466	54,498	54,498	53,466
Pseudo-R^2	0.961	0.964	0.964	0.946	0.948	0.949

The dependent variable is the number of M&As in columns 1 to 3 and the value of M&As in columns 4 to 6. All regressions include acquirer country × year and target country × year fixed effects. Standard errors clustered at the acquirer country × target country level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

Column 1 presents the results when Eq. (2) is estimated without social ties. The border coefficient is positive and statistically significant. Its value indicates that a country performs 3.5 times as many M&A operations inside than outside of its borders (exp(1.251)). Distance is negatively correlated with the number of M&As, whereas sharing a language, legal system, religion, colonial past, or trade agreement are positively correlated with the number of M&As. Sharing a land border and variations in the exchange rate have a negative effect on the number of M&As. Surprisingly, having signed a bilateral investment treaty also has a negative and statistically significant effect on the number of M&As.[13]

Column 2 presents the results when social ties are added to the specification. The social ties coefficient is positive and statistically significant. According to the coefficient reported in column 2, a 10% increase in social ties is correlated with a 5.2% rise in the number of M&As. The border coefficient is statistically insignificant. This result indicates that the preference of firms to acquire or merge with domestic firms disappears once we control for differences in social ties within and between countries. It is also noteworthy the sizable reduction in the distance coefficient. This result shows that the large negative effect of distance on the number of M&As in column 1 is partially explained by the negative correlation between distance and social ties.[14]

In Sect. 2, we argued that social ties were positively correlated with migration. Column 3 adds this variable to the specification to rule out that social ties are capturing the positive correlation between bilateral migration and the number of M&As (Burchardi et al., 2018). The number of bilateral migrants has a significant positive effect on the number of M&As. We do not observe any significant change in the border coefficient. The point value of the social ties coefficient decreases, but remains positive and statistically significant. Specifically, a 10% increase in social ties is correlated with a 3.9% rise in the number of M&As.

Columns 4 to 6 present the determinants of the value of bilateral M&As. When social ties are omitted, we find a strong home bias in the value of M&As. The value of M&As among domestic firms is almost 2.4 times larger than between domestic and foreign firms (exp .870). Coefficients for the remaining variables are similar to those reported in column 1 except for legal system and trade agreement, which become statistically insignificant. There is a strong positive correlation between social ties and the value of M&As. According to the coefficient reported in column 5, a 10% increase in social ties is correlated with a 5.4% increase in the value of M&As. This elasticity is larger than the elasticity of bilateral trade to social ties

[13] Mixed results for this variable are common in the literature. For instance, regarding greenfield investments, Paniagua and Sapena (2014) found that bilateral investment treaties fostered investment only into emerging countries and Paniagua et al. (2015) concluded that the effect depend on the intensity of investment flows between countries. Colen et al. (2016) and Tobin and Rose-Ackerman (2011) discovered that the effect depended on the specific sector receiving the investment and the host country's institutional quality. Moreover, our estimates on bilateral trade and investment treaties should be considered with caution because we do not address any potential endogeneity between FDI and bilateral agreements (Baier & Bergstrand, 2009; Bergstrand & Egger, 2013).

[14] Bailey et al. (2020) showed that a 10% increase in bilateral distance was associated with a 10–15% decline in social ties.

reported by Bailey et al. (2021): 0.28.[15] This result is in line with the argument that FDI faces larger information asymmetries than international trade and, thus, social ties should matter more for the former than for the latter (Javorcik et al., 2011; Tong, 2005). Column 6 shows that the number of bilateral migrants is positively correlated with the value of M&As. The social ties coefficient, although smaller, remains positive and statistically significant.[16]

We analyzed whether results were robust to a potential non-linear relationship between M&As and distance. We substitute the log (distance) variable in Eq. (2) by 100 dummy variables representing percentiles of the distance distribution. Table 8 in the Appendix presents the results. The fit of the model improves marginally when the log of distance is substituted by the 100 distance percentiles. Social ties remain positive and statistically significant and, for most estimations, its point value is similar in size to that reported in Table 1. We also observe a large reduction in the border coefficient once we control for social ties. However, in contrast with previous results, the border effect does not disappear for the number of M&As.

We also explored whether results were robust to introducing the value of bilateral exports, linearly and in percentiles, in the regression equation.[17] Social ties still have a significant positive effect on the number and value of M&As. We also analyzed whether excluding the observations where the value of M&As was missing (and it was replaced by one million USD) alters our conclusions on the relationship between social ties and the value of M&As. We found that results are robust to excluding these observations.[18]

Summing up, our estimations show that social ties have a strong positive correlation with the number and value of bilateral M&As. Furthermore, we find that social ties lead to the disappearance of the home bias for the number and value of M&As.

There are two main caveats to the narrative that social ties facilitate the number and value of M&As. First, M&A negotiations, if they are friendly, may lead to Facebook friendship links between the individuals participating in the negotiations. However, this reverse flow seems weak, because the number of individuals involved in M&A negotiations is very small relative to the whole population.

Second, omitted variables, which are positively correlated with social ties and M&As, may explain the correlation between these variables. For example, if two countries love skiing, they may have more bilateral friendship links owing

[15] Table 1-column 7.

[16] We also estimated columns 2 and 5 excluding social ties and including migration. Regarding the number of M&As, there was a reduction of the border effect relative to column 1, but the reduction was much lower than the one rendered by the inclusion of social ties. This confirmed that the large reduction in the border effect in the number of M&As was explained by social ties. Regarding the value of M&As, the border coefficient already becomes statistically insignificant only including the bilateral migrants variable in the specification. Nevertheless, this latter result is not robust to estimating the model with distance percentiles. For example, in a specification with 100 distance percentiles and the bilateral migration variable the border coefficient remains positive and statistically significant, and only disappears when the social ties variable is included in the specification. To conserve space, estimates are available upon request.

[17] Trade data was obtained from Borchert et al. (2021).

[18] To conserve space, these robustness analyses are available upon request.

to ski aficionados meeting at winter resorts. Additionally, following Linder's (1961) hypothesis, these countries will be relatively specialized in ski-related goods and services, raising the number and value of M&As between them. To give further support to our narrative on the positive relationship between social ties and M&As, and attenuate the threat of omitted variable bias, in the next subsections, we exploit the industrial, geographical, and firm-level disaggregation of our M&A data.

3.3 Industry-level estimates

In this section we analyze whether the positive correlation between social ties and M&As remains when we use industry-level M&A data and a new industry-weighted social ties index. The industry-level social ties index takes into account that (i) a firm is more likely to invest in related industries than in unrelated activities and (ii) industries are unevenly distributed geographically in a country. Hence, a social ties index that accounts for these features should be more suitable to explain M&As between industries that the standard, population-weighted, social ties index.

Regarding the first element, it is more likely that a firm will merge or acquire another firm if the latter operates in an industry which is an important supplier or customer of the former. To capture the backward, or supplier, linkage between industry s and s', we calculate the following index:

$$B_{s,s'} = \frac{I_{s,s'}}{\sum_{s' \in S} I_{s,s'}} \tag{3}$$

where $I_{s,s'}$ are the purchases of industry s' products by industry s and $\sum_{s' \in S} I_{s,s'}$ are the purchases of intermediate products by industry s from all industries (S).

Likewise, the forward, or customer, linkage between industry s and s' is captured by the following index:

$$F_{s,s'} = \frac{W_{s,s'}}{\sum_{s' \in S} W_{s,s'}} \tag{4}$$

where $W_{s,s'}$ are the sales from industry s to industry s' and $\sum_{s' \in S} W_{s,s'}$ are sales from industry s to all industries.

The between-industries linkage is calculated as the average of the backward and forward linkages:

$$IO^{s,s'} = \frac{B_{s,s'} + F_{s,s'}}{2} \tag{5}$$

We obtained the across-industries purchases and sales data from the national input-output tables included in the World Input-Output Database for 2014 (Timmer et al., 2012). We calculated the between-industry linkages for each of the countries included in the database.

Regarding the second element of the industry-level social ties index, we proxy the weight of a region in an industry by the share of a country's total firms operating in that industry located in the region. We retrieved this information from Eurostat's

Structural Business Statistics, which uses a NACE Rev. 2, 2-digit disaggregation for industries and a NUTS 2-digit disaggregation for regions.

Following Bailey et al. (2021), we combine the industry-linkage and the regional weight elements to build a new industry-specific country of origin × country of destination social ties index (sci_{ij}^{s}) as follows:

$$sci_{ij}^{s} = \sum_{r_i \in R(i)} Share_{s,r_i} \times \left[\sum_{s' \in S} IO_i^{s,s'} \times \left(\sum_{r_j \in R(j)} Share_{s',r_j} \times SCI_{r_i,r_j} \right) \right] \tag{6}$$

where $R(i)$ and $R(j)$ are the set of regions in the acquirer country i and target country j, respectively, and S is the set of industries. $Share_{s,r_i}$ denotes the weight of region i in the acquirer country's industry s and $Share_{s',r_j}$ is the weight of region j in the target country's industry s'. $IO_i^{s,s'}$ is the average backward and forward linkage between industry s and s' in country i. We select the origin country to measure the between industry linkage because we assume that the investment decision is driven by the industrial relationships prevailing in the acquirer firm's country. SCI_{r_i,r_j} denotes the (population-weighted or standard) social ties index between acquirer country's region i and target country's region j.

To ensure that we only capture investments motivated by industrial linkages, we remove conglomerate investments. These latter refer to operations where a firm acquires or merges with another firm operating in an unrelated industry with the goal of diversifying its activities. We set a minimum threshold of 0.2 ($IO_i^{s,s'} \geq 0.2$) to include a linkage in the calculation of the industry-level social ties index.[19] Due to data-availability limitations, our analysis was carried out for 28 countries and 38 sectors.

Equipped with the new industry-level social ties index, we estimate the following equation:

$$MA_{isjt} = exp[\beta_1 \ln sci_{ij}^{s} + \beta_2 border_{ij} + \alpha' X_{ij} + \mu' Z_{ijt} + \gamma_{ist} + \omega_{jst} + \epsilon_{isjt}] \tag{7}$$

where MA_{isjt} are the number (value) of M&As that industry s located in country i performs in country j at year t. Equation (7) has three main differences with the baseline specification (Equation (2)). First, M&As are industry-specific. Second, it incorporates an industry and region weighted social ties index. Third, it introduces $origin \times sector \times year$ and $destination \times sector \times year$ fixed effects, which control for the average propensity of each country to invest and receive an investment in each sector in a specific year.

Results are reported in Table 2. Column 1 shows the border effect for the number of M&As before including social ties. In column 2 we incorporate the standard, population-weighted, social ties index and in column 3 the industry-level social ties index. Both social ties coefficients are positive and significant and their inclusion leads to statistically insignificant border effect coefficients.

[19] We view the 20% threshold as hitting the "sweet spot" between excluding conglomerate M&A operations and ensuring a sample size with enough degrees of freedom.

In column 4 we include both social ties variables. We find that the industry-level social ties index remains positive and significant whereas the standard, population-weighted, social ties coefficient becomes statistically insignificant. In column 5 we introduce country-pair specific fixed effects. The industry-specific social ties coefficient remains positive and significant.

Columns 6 to 10 present the results when the dependent variable is the value of M&As. The industry-level social ties index is also positive and significant. Contrary to the number of M&As, the border effect coefficient is statistically insignificant in all estimations. It is likely that border effect is being absorbed by the remaining control variables (distance, contiguity, language or colony), which all have large coefficients. It is also surprising the negative coefficient associated with language.

These results support the argument that social ties facilitate the number and value of M&As. When the more relevant industry-level social ties index is estimated with the less relevant standard social ties index, the former remains positive and statistically significant, whereas the latter takes the opposite sign. However, we should take the results with caution for two reasons. First, there is a very high correlation between the industry-specific and the standard social ties indexes: 0.84, which may lead to multicollinearity problems in the estimations reported in columns 4 and 9. Second, the results are sensitive to the industry-linkage threshold used to remove conglomerate M&As. For example, when we use 10% and 30% thresholds to exclude conglomerate investments, the industry-specific social ties' coefficient becomes insignificant in some estimations when it is estimated with the standard social ties coefficient (columns 4 and 9) or when country-pair fixed effects are introduced (columns 5 and 10).

3.4 Region-level estimates

The social ties data is available at a highly disaggregated geographical level. This allows us to verify the robustness of our baseline results, re-estimating the regression equation with data on social relations at a regional level and introducing highly granular geographic fixed effects.

As explained in Sect. 2, we build a subsample of bilateral M&A operations between 2015 and 2019 for the regions belonging to five EU countries: France, Germany, Italy, Spain, and the UK. We selected countries from the EU because they comprise a large number of regions. Specifically, our dataset includes 139 regions at the NUTS-2 level and 503 at the NUTS-3 level. The selected countries are the top-five origin and destinations for intra-EU M&As.[20]

We use two specifications to analyze the effect of social ties on M&As at the regional level. First, to estimate the home bias in M&As using regional data, we used an specification similar to Eq. (2):

[20] During the 2015-2019 period, M&A operations among these top-five countries represented 75.4% and 79.5% of the total number and total value of intra-EU transactions, respectively.

Table 2 Industry-based social ties

	Number					Value				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Border	0.970[a] (0.359)	0.416 (0.428)	0.287 (0.430)	0.318 (0.434)		− 0.907 (1.442)	− 0.917 (1.536)	− 2.353 (1.783)	− 0.930 (1.787)	
Social ties (log)		0.406[a] (0.135)		− 0.198 (0.255)			0.009 (0.385)		− 5.794[a] (1.278)	
Social ties industry (log)			0.476[a] (0.123)	0.641[a] (0.233)	0.578[a] (0.268)			1.404[b] (0.572)	5.924[a] (1.199)	4.636[a] (1.488)
Distance (log)	− 0.791[a] (0.166)	− 0.704[a] (0.167)	− 0.672[a] (0.166)	− 0.672[a] (0.166)		− 3.477[a] (0.477)	− 3.473[a] (0.499)	− 3.033[a] (0.516)	− 3.547[a] (0.557)	
Contiguity	− 0.047 (0.169)	− 0.024 (0.164)	− 0.013 (0.164)	− 0.012 (0.164)		− 2.446[a] (0.717)	− 2.447[a] (0.718)	− 2.480[a] (0.742)	− 2.051[a] (0.741)	
Language	0.574[a] (0.160)	0.464[a] (0.160)	0.469[a] (0.158)	0.487[a] (0.162)		− 3.237[b] (1.331)	− 3.243[b] (1.354)	− 3.806[a] (1.192)	− 1.431 (0.959)	
Legal system	− 0.107 (0.128)	− 0.173 (0.130)	− 0.195 (0.130)	− 0.192 (0.130)		− 0.449 (0.638)	− 0.448 (0.641)	− 0.245 (0.596)	− 0.526 (0.573)	
Religion	0.560[a] (0.206)	0.681[a] (0.213)	0.747[a] (0.215)	0.754[a] (0.214)		− 1.135 (0.932)	− 1.135 (0.937)	− 0.814 (0.943)	0.508 (1.227)	
Colony	0.003 (0.193)	0.227 (0.226)	0.251 (0.222)	0.228 (0.222)		3.402[a] (1.073)	3.406[a] (1.085)	3.855[a] (1.086)	1.913 (1.173)	
Investment treaty	− 0.498[b] (0.206)	− 0.510[a] (0.189)	− 0.518[a] (0.190)	− 0.514[a] (0.191)	− 0.207 (0.631)	− 1.488[b] (0.747)	− 1.491[c] (0.781)	− 2.252[b] (1.027)	− 1.509[b] (0.729)	− 1.730 (1.161)
Exchange rate	0.123 (0.083)	0.102 (0.083)	0.071 (0.084)	0.062 (0.086)	0.090 (0.103)	− 0.321 (0.318)	− 0.321 (0.321)	− 0.401 (0.324)	− 0.694[c] (0.383)	− 0.753[c] (0.450)
Migrants (log)	0.200[a] (0.052)	− 0.019 (0.095)	− 0.052 (0.088)	− 0.032 (0.095)		0.607[a] (0.230)	0.604[b] (0.248)	0.001 (0.362)	0.340 (0.355)	
Observations	8,147	8,147	8,147	8,147	5,584	8,147	8,147	8,147	8,147	5,584
Pseudo-R^2	0.701	0.702	0.702	0.702	0.692	0.992	0.992	0.992	0.993	0.997

The dependent variable is the number of M&As in columns 1 to 5, and the value of M&As in columns 6 to 10. All regressions include acquirer country × sector × year and target country × sector × year fixed effects. Columns 5 and 10 also include acquirer country × target country fixed effects. Standard errors clustered at the acquirer country × target country level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

$$MA_{kimjt} = exp[\beta_1 \ln st_{kimj} + \beta_2 border_{kimj} + \beta_3 \ln dist_{kimj} + \beta_4 contiguity_{kimj} + \beta_5 \ln migrants_{kimjt} + \gamma_{kit} + \omega_{mjt} + \epsilon_{kimjt}] \quad (8)$$

where MA_{kimjt} measures the number of M&As that region k of country i performs in region m of country j in year t. The equation only includes social ties, border, distance, contiguity, and migrants as independent variables. As explained below, the reason for including only these variables in the specification is the structure of the fixed effects used in the second specification. Note that social ties, distance, contiguity, and migrants are now measured at the acquirer region × target region level and that $border_{kimj}$ turns one if region k and region m belong to the same country. We also substitute the origin country × year and target country × year fixed effects in Equation (2) by acquirer region × year (γ_{kit}) and target region × year (ω_{mjt}) fixed effects, respectively.

We also estimate a second specification that introduces more detailed geographical fixed effects:

$$MA_{kimjt} = exp[\beta_1 \ln st_{kimj} + \beta_2 \ln dist_{kimj} + \beta_3 contiguity_{kimj} + \beta_4 \ln migrants_{kimjt} + \gamma_{kijt} + \omega_{imjt} + \epsilon_{kimjt}] \quad (9)$$

where γ_{kijt} is an acquirer region × target country × year fixed effect and ω_{imjt} is an acquirer country × target region × year fixed effect. Note that these fixed effects preclude the estimation of all variables, such as border, which vary at the acquirer country × target country level. These highly granular fixed effects control for all omitted variables that are specific to the acquirer region-target country-year and acquirer country-target region-year triads.

Columns 1 to 3 of Table 3 present the estimations when the dependent variable is the number of M&As, while columns 4 to 6 show the results when the dependent variable is the value of M&As. First, we estimate Eq. (8) without the social ties and migration variables. We also encounter a strong home bias in M&As when using regional data (column 1). Distance is negatively correlated with the number of M&As. Contiguity has a positive sign but is statistically insignificant. Column 2 shows that there is a strong positive correlation between social ties and the number of M&As. According to the coefficient reported in column 2, a 10% increase in social ties raises the number of M&As by 8.7%. The border effect weakens, but remains positive and statistically significant. Migration has a negative correlation with the number of M&As. Distance and contiguity are statistically insignificant. Column 3 presents the results of estimating Eq. (9). The social ties coefficient remains positive and statistically significant, confirming social ties' positive correlation with the number of M&As.

We also find a strong home bias for the value of M&As (column 4). Column 5 shows that social ties are strongly positively correlated with the value of M&As. Specifically, a 10% increase in social ties is correlated with a 9.1% increase in the value of M&As. The border, distance, contiguity, and migration coefficients are statistically insignificant. When we introduce very detailed geographical fixed effects (column 6), the social ties coefficient remains positive and statistically significant, confirming the strong correlation between social ties and the value of M&As.

Distance and migrants remain statistically insignificant, but contiguity has a significant negative effect on the value of M&As. Our results are robust to using a higher regional disaggregation (NUTS-3), as reported in Table 9 in the Appendix.

Although we cannot rule out that an omitted acquirer region-target region specific variable might bias our estimates, the results based on regional data support the narrative that social ties facilitate M&As. We address this limitation in the next subsection.

3.5 Firm-level estimates

In this subsection we exploit the fact that our M&A data is at the firm level. This allows us to build a firm-level social ties index and introduce it in a specification that controls for acquirer region-target region specific omitted variables. Since this analysis is performed at the regional level, we have used the sample of firms used in the previous subsection.

We retrieved information on the acquirer firms managers' geographic origin from the ORBIS database. First, we obtained the city where a manager was born. Second, since ORBIS does not provide the NUTS regional code of the city, we obtained this information using the city-NUTS correspondence provided by Eurostat.[21] We identified cities' NUTS region for 91% of managers. Third, for each M&A operation we constructed a new firm-level index of social ties. We calculated the social ties index between each of the acquirer firm manager's NUTS2 region and the acquired firm's NUTS2 region. We selected the highest social ties index among them.[22] For example, let's imagine that firm A located in the Basque Country region of Spain acquires firm B located in the Stuttgart region of Germany. Further imagine that firm A has two managers. The first was born in the Basque Country and the second in Stuttgart. The social ties index for the first manager is the one between Basque Country and Stuttgart, whereas for the second is the one between Stuttgart and Stuttgart. Since the latter social ties index is larger than the former, the firm-specific social ties index for this acquisition is the one between Stuttgart and Stuttgart. We follow this procedure because we expect a firm to take advantage of the strongest social tie available to it to smooth the barriers of a M&A operation. Finally, note that we build an acquirer firm's destination region-specific social ties index.[23]

Equipped with the new firm-specific social ties index, we estimate the following equation:

$$MA_{fkmt} = exp[\beta_1 \ln sci_{fm} + \gamma_{ft} + \omega_{kmt} + \epsilon_{fkmt}] \tag{10}$$

where MA_{fkmt} is the number (value) of M&As that acquirer firm f located in region k performs in region m in year t. sci_{fm} is the acquirer firm-destination region specific social ties index. Equation (10) introduces firm × year (γ_{ft}) and origin region × destination region × year (ω_{kmt}) fixed effects.

[21] https://ec.europa.eu/eurostat/web/nuts/local-administrative-units.

[22] As a robustness check, we also calculated a simple average of managers' social ties with the target region. Results were not altered.

[23] In the unlikely case in which the manager-based social ties index was lower than the one between the acquirer firm's NUTS2 region and the acquired firm's NUTS2 region, we selected the latter.

Table 3 Regional (NUTS-2) analysis of social ties and home-bias in M&As

	Number			Value		
	(1)	(2)	(3)	(4)	(5)	(6)
Border	1.925[a] (0.110)	0.506[a] (0.116)		2.399[a] (0.644)	0.199 (0.842)	
Social ties (log)		0.869[a] (0.049)	0.816[a] (0.141)		0.913[a] (0.224)	0.634[c] (0.327)
Distance (log)	− 0.965[a] (0.069)	− 0.010 (0.085)	− 0.080 (0.262)	− 0.252 (0.291)	0.357 (0.392)	− 0.782 (0.504)
Contiguity	0.092 (0.103)	− 0.179 (0.115)	− 0.210 (0.149)	0.855 (0.664)	− 0.836 (0.664)	− 1.136[c] (0.593)
Migrants (log)		− 0.046[a] (0.014)	− 0.032[c] (0.017)		0.165 (0.117)	− 0.073 (0.075)
Observations	60,742	60,742	14,896	60,742	60,742	14,896
Acquirer Region x Year FE	Yes	Yes		Yes	Yes	
Target Region x Year FE	Yes	Yes		Yes	Yes	
RegionxCountry x Year FE			Yes			Yes
CountryxRegion x Year FE			Yes			Yes
Pseudo-R^2	0.564	0.596	0.486	0.807	0.823	0.908

The dependent variable is the number of M&As in columns 1 to 3, and the value of M&As in columns 4 to 6. The specifications in columns 1, 2, 4 and 5 include acquirer region × year and target region × year fixed effects; and the specifications in columns 3 and 6 acquirer region × target country × year and acquirer country × target region × year fixed effects. Standard errors clustered at the acquirer region × target region level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

Table 4 Firm-level analysis of social ties and home-bias in M&As

	Number		Value	
	(1)	(2)	(3)	(4)
Social ties (log)	0.297[a] (0.041)	0.336[b] (0.047)	0.280[c] (0.151)	0.204 (0.233)
Observations	21,081	5,166	21,081	5,166
Acquirer Firm FE	Yes		Yes	
Acquirer Region × Target Region × Year FE	Yes	Yes	Yes	Yes
Acquirer Firm × Year FE		Yes		Yes
Pseudo-R^2	0.208	0.214	0.858	0.921

The dependent variable is the number of M&As in columns 1 and 2, and the value of M&As in columns 3 and 4. All regressions include acquirer region × target region × year fixed effects. Additionally, columns 1 and 3 include acquirer firm fixed effects and columns 2 and 4 include acquirer firm × year fixed effects. Standard errors clustered at the acquirer firm × target region level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

Table 4 presents the estimations. In columns 1 and 2 the dependent variable is the number of M&As, while in columns 3 and 4 the dependent variable is the value of M&As. All regressions include acquirer region × target region × year fixed effects. Additionally, columns 1 and 3 include acquirer firm fixed effects and columns 2 and 4 include acquirer firm × year fixed effects.

Columns 1 and 2 show that the coefficient of the firm-level social ties is positive and statistically significant. This result indicates that, even when we control for other time-varying variables that are specific to the pair of regions that participate in the operation, social ties contribute to enhance the number of M&As. When the value of M&As is used as dependent variable, the coefficient of social ties in column 3 is positive and significant. However, when we replace acquirer firm fixed effects with acquirer firm × year fixed effects, the social ties coefficient although positive, is no longer significant (column 4). All in all, most of these results are in line with the argument that social ties contribute to facilitate the number and value of M&As.

To sum up, the industry, region, and firm-level analyses support the argument that social ties enhance M&As. In the next section, we explore why.

4 How do social ties increase M&As?

In the following discussion, we identify some of the mechanisms by which social ties foster M&As. First, social ties reduce the transaction costs involved in a M&A operation and mitigate contract enforcement frictions (Bailey et al., 2021). These costs are particularly important in target countries with a low level of institutional quality. There is a significant strand of literature that established a positive relationship between countries' institutional quality and their capacity to attract FDI (Bailey, 2018). Specifically, a high level of corruption is expected to have a negative effect on countries' capacity to attract FDI (Javorcik & Wei, 2009; Wei, 2000; Wu, 2006;

Zakharov, 2019). As summarized by Bailey (2018), corruption implies a higher cost of doing business and market and resources-allocation inefficiencies which ultimately lead to higher transaction costs. As indicated by Wei (2000), a high level of corruption is often associated with poor contract enforcement and burdensome bureaucracy. Thus, if social ties reduce transaction costs, they should have a stronger positive effect on M&As when the target country has a high level of corruption.

Based on the World Bank's Governance Indicators on corruption (Kaufmann et al., 2011), we construct a dummy variable that turns one if the host country has a level of corruption above the sample median for 2015. We interact this dummy with social ties. Column 1 of Table 5 shows that the Social ties × High-corruption coefficient is positive and statistically significant, indicating that social ties have a larger positive effect when the host country has a high level of corruption.[24] Specifically, while for countries with relatively low levels of corruption, a 10% growth in social ties increases the number of M&As by 4%, for high-corruption countries the impact rises to 5.9%. This represents a 48% increase. Column 4 indicates that social ties have a stronger effect on the value of M&As when the target country has a high level of corruption. Specifically, a 10% increase in social ties leads to a 3.4% rise in the value of M&As in low-corruption countries. The positive effect increases to 5.3% if the target country has a high level of corruption. This represents a 56% increase.

Second, Stiglitz (2002) and Alam and Ali Shah (2013) argued that freedom of press boosts countries capacity to attract M&As because it ensures transparency and eases the access to relevant information for firms. In the context of lack of press freedom, social ties can serve as a source of information about a host country's events and government policies that might determine the value of the target asset. Thus, social ties can help to reduce information asymmetries between firms from different countries (Bailey et al., 2021). We use the Freedom House Freedom of Press index, which classifies countries as not free, partially free, and free (Freedom House, 2016). Using 2015 data, we construct an indicator variable that turns one for host countries in which press freedom is limited (i.e., not free and partially free). We interact this indicator with social ties. The estimates are reported in Columns 2 and 5 of Table 5.[25] As expected, social ties have a larger effect on M&As when the target country has a limited press freedom. Specifically, the positive effect of social ties on the number and value of M&As is 47% and 115% higher, respectively, in limited-press-freedom countries than in free-press ones. This suggests that social ties are specially relevant for accessing information in countries where transparency is low.

Third, social ties facilitate the number and value of M&As by reducing cultural barriers (Boyacigiller, 1990). Previous empirical analyses have demonstrated that cultural differences result in lower FDI between countries (Ahern et al., 2015; Di Guardo et al., 2016; Liu et al., 2018). The larger the cultural differences, the more

[24] Because the specification includes target country × year fixed effects (Equation (2)) we do not need to include the high-corruption dummy variable in the specification. We instead interact the acquirer country × year fixed effect with the high-corruption dummy.

[25] As in the previous estimation, there is no need to introduce the limited-press-freedom dummy into the regression because it is already controlled by the target country × year fixed effect. We instead interact the acquirer country × year dummy variable with the limited-press-freedom dummy.

Table 5 Mechanisms

	Number			Value		
	(1)	(2)	(3)	(4)	(5)	(6)
Border	0.026 (0.170)	0.219 (0.164)	0.150 (0.192)	− 0.460 (0.604)	− 0.110 (0.585)	− 0.357 (0.629)
Social ties (log)	0.397[a] (0.043)	0.340[a] (0.041)	0.410[a] (0.061)	0.341[a] (0.109)	0.252[b] (0.105)	0.354[b] (0.143)
x High corruption	0.194[a] (0.027)			0.187[a] (0.062)		
x Limited freedom of press		0.159[a] (0.019)			0.291[a] (0.059)	
x High cultural difference			0.146[a] (0.042)			0.223[c] (0.133)
High cultural difference			− 1.617[a] (0.385)			− 2.421[b] (1.197)
Distance (log)	− 0.416[a] (0.049)	− 0.376[a] (0.047)	− 0.314[a] (0.056)	− 0.523[a] (0.128)	− 0.492[a] (0.124)	− 0.403[a] (0.139)
Contiguity	− 0.206[c] (0.106)	− 0.139 (0.102)	− 0.126 (0.118)	− 0.727[b] (0.306)	− 0.670[b] (0.286)	− 0.660[b] (0.310)
Language	0.654[a] (0.095)	0.566[a] (0.094)	0.532[a] (0.102)	0.487[b]	0.387[c] (0.198)	0.198 (0.243)
Legal system	0.120 (0.075)	0.176[b] (0.074)	0.071 (0.085)	− 0.071	− 0.039 (0.157)	− 0.098 (0.184)
Religion	0.605[a] (0.124)	0.556[a] (0.125)	0.646[a] (0.130)	0.734[c] (0.406)	0.418 (0.427)	0.553 (0.403)
Colony	0.061 (0.097)	0.042 (0.097)	0.156 (0.113)	0.066 (0.230)	0.056 (0.186)	0.193 (0.228)
Trade agreement	− 0.139[c] (0.084)	− 0.055 (0.084)	0.041 (0.084)	− 0.395[c] (0.202)	− 0.297[c] (0.172)	− 0.203 (0.190)
Investment treaty	− 0.416[a] (0.102)	− 0.377[a] (0.096)	− 0.666[a] (0.106)	− 0.533 (0.327)	− 0.373 (0.292)	− 0.928[a] (0.330)
Exchange rate	− 0.015[c] (0.008)	− 0.016[c] (0.009)	− 0.004 (0.003)	0.008 (0.008)	0.007 (0.006)	− 0.005 (0.006)
Migrants (log)	0.056[a] (0.021)	0.066[a] (0.021)	0.082[b] (0.032)	0.095[b] (0.041)	0.106[b] (0.041)	0.184[a] (0.065)
Observations	42,471	45,525	17,710	42,471	45,525	17,710
Pseudo-R^2	0.966	0.967	0.967	0.953	0.956	0.946

The dependent variable is the number of M&As in columns 1 to 3, and the value of the M&As in columns 4 to 6. All regressions include target country × year fixed effects. Additionally, the specifications in columns 1 and 4 include acquirer country × year × high-corruption fixed effects; the specifications in columns 2 and 5 acquirer country × year × limited-press-freedom fixed effects; and, the specifications in columns 3 and 6 acquirer country × year fixed effects. Standard errors clustered at the acquirer country × target country level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

a firm must adapt its management, productive activity, and products to the target country's idiosyncrasies. On the one hand, firms can use social networks to learn about host countries' cultures and consumer tastes (Paniagua et al., 2017). On the other hand, social ties can increase a society's awareness of other countries' cultures. Both factors are likely to reduce acquirer firms' liabilities related to foreignness and limit potential cultural clashes, thus increasing the likelihood of a successful M&A.

We employ a cultural difference index based on 2015 Hofstede's cultural dimensions data (Hofstede, 1980)[26] and construct a dummy variable that turns one when cultural differences between the acquirer and target countries are higher than the sample's median. In line with the previous literature, our estimates in column 3 and 6 corroborate the fact that a high level of cultural differences negatively affects the number and value of M&As. We also find that social ties are particularly relevant for the number and value of M&As between culturally-distant countries. Specifically, the positive effect of social ties on the number and value of M&As increases by 36% and 63%, respectively when the cultural distance between the acquirer and target countries is high.[27]

5 Conclusions

In this study, we showed that Facebook friendship links, a proxy for social ties, is strongly positively correlated with the number and value of M&As. Furthermore, we found that home bias in M&As greatly reduced, and in some cases disappeared, once we controlled for differences in social ties between and within countries. We confirmed the significantly positive effect of social ties on M&As and their capacity to reduce the home-bias using industrial, regional, and firm-level data. We find that the correlation between social ties and M&As is stronger when transactions costs are larger, the information about the target country is lower, and cultural barriers are greater.

Previous analyses concluded that Facebook friendship links are strongly positively correlated with trade flows. This paper finds that there is also strong positive correlation between Facebook friendship links and the number of value of M&As. An interesting topic for future analysis would be to understand why Facebook friendship links is such a strong proxy for social ties.[28]

Social relationships still are a limited instrument that governments use to attract FDI. Fostering a country's social ties with foreigners is likely to result in a greater inward FDI. As shown in this paper, this can be a useful tool for attracting foreign investment from culturally distant countries. While improving institutional quality is desirable for achieving economic development in general, and for attracting FDI specifically, international social ties can help countries' mitigate the negative implications of corruption and lack of press freedom on FDI.

[26] It is calculated as $\frac{\sum_{i=1}^{4}(C_{ci}-C_{cj})^2/Var_c}{4}$, where C stands for one of the four cultural dimensions c in the source and host countries i and j, respectively, and Var is the c dimension variance. The cultural dimensions are power distance, individualism, masculinity, and uncertainty avoidance.

[27] The results shown in Table 5 are robust to replacing the high corruption, limited freedom of press, and cultural difference dummies by the variables itself. To conserve space, estimates are available upon request.

[28] We thank a reviewer for raising this question.

Appendix

See Tables 6, 7, 8, 9.

Table 6 Country sample

Albania	Dominican Republic	Luxembourg	Seychelles
Algeria	Ecuador	Macedonia	Singapore
Angola	Egypt	Madagascar	Slovak Republic
Argentina	El Salvador	Malawi	Slovenia
Armenia	Estonia	Malaysia	South Africa
Australia	Ethiopia	Maldives	Spain
Austria	Finland	Mali	Sri Lanka
Azerbaijan	France	Malta	St. Lucia
Bahamas	Gabon	Mauritius	Suriname
Bahrain	Georgia	Mexico	Swaziland
Bangladesh	Germany	Moldova	Sweden
Barbados	Ghana	Mongolia	Switzerland
Belarus	Greece	Morocco	Taiwan
Belgium	Guatemala	Mozambique	Tanzania
Benin	Guinea	Myanmar	Thailand
Bolivia	Guyana	Namibia	Togo
Bosnia and Herzegovina	Hungary	Nepal	Trinidad and Tobago
Botswana	Iceland	Netherlands	Tunisia
Brazil	India	New Zealand	Turkey
Brunei Darussalam	Indonesia	Nicaragua	Uganda
Bulgaria	Iraq	Niger	Ukraine
Burkina Faso	Ireland	Nigeria	United Arab Emirates
Cabo Verde	Israel	Norway	United Kingdom
Cambodia	Italy	Oman	United States
Cameroon	Jamaica	Pakistan	Uruguay
Canada	Japan	Panama	Uzbekistan
Central African Republic	Jordan	Papua New Guinea	Venezuela
Chad	Kazakhstan	Paraguay	Vietnam
Chile	Kenya	Peru	Zambia
Colombia	Korea, Rep.	Philippines	
Congo, Rep.	Kuwait	Poland	
Costa Rica	Kyrgyz Republic	Portugal	
Cote d'Ivoire	Lao PDR	Qatar	
Croatia	Latvia	Russian Federation	
Cyprus	Lebanon	Rwanda	
Czech Republic	Lesotho	Samoa	
Denmark	Libya	Saudi Arabia	
Djibouti	Lithuania	Senegal	

Table 7 Descriptive statistics

Country-level descriptive statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
Number of M&A projects	54,498	1.69	61.33	0	7,035
Total value of M&A	54,498	163.71	8,912.11	0	1,073,864
Border	54,498	0.01	0.09	0	1
Social ties (log)	54,498	7.91	1.71	4.30	20.72
Distance (log)	54,498	8.59	0.93	1.55	9.89
Contiguity	54,498	0.03	0.17	0	1
Language	54,498	0.12	0.32	0	1
Legal system	54,498	0.36	0.48	0	1
Colony	54,498	0.03	0.16	0	1
Religion	54,498	0.18	0.26	0	1
Trade agreement	54,498	0.38	0.49	0	1
Investment treaty	54,498	0.14	0.35	0	1
Exchange rate	54,498	103.06	33.11	16.72	597.94
Migrants (log)	53,466	3.35	4.00	0.00	20.93
NUTS-2 descriptive statistics					
Number of M&A projects	60,742	0.05	0.55	0	58
Total value of M&A	60,742	0.70	37.56	0	6,448
Border	60,742	0.23	0.42	0	1
Social ties (log)	60,742	6.51	1.69	3.56	15.23
Distance (log)	60,742	6.56	0.82	1.35	8.20
Contiguity	60,742	0.04	0.20	0	1
Migrants (log)	60,742	0.35	1.38	0.00	10.74
NUTS-3 descriptive statistics					
Number of M&A projects	332,071	0.01	0.19	0	58
Total value of M&A	332,071	0.13	15.33	0	6,448
Border	332,071	0.25	0.43	0	1
Social ties (log)	332,071	6.60	1.73	2.56	16.98
Distance (log)	332,071	6.47	0.87	0.53	8.23
Contiguity	332,071	0.01	0.11	0	1

Authors' own elaboration. Social ties, distance and migrant stock are presented in logarithms. The total value of M&A projects is expressed in millions of US dollars

Table 8 Robustness. 100 distance percentiles. Country-level analysis of social ties and home bias in M&As

	Number			Value		
	(1)	(2)	(3)	(4)	(5)	(6)
Border	1.753[a] (0.146)	0.514[a] (0.163)	0.590[a] (0.164)	2.028[a] (0.421)	0.182 (0.486)	0.299 (0.504)
Social ties (log)		0.473[a] (0.028)	0.356[a] (0.034)		0.598[a] (0.078)	0.484[a] (0.083)
Contiguity	− 0.173 (0.114)	− 0.212[b] (0.100)	− 0.211[b] (0.099)	− 0.179 (0.279)	− 0.452 (0.303)	− 0.438 (0.303)
Language	0.848[a] (0.087)	0.471[a] (0.081)	0.490[a] (0.083)	0.440[b] (0.208)	0.101 (0.225)	0.092 (0.231)
Legal system	0.208[a] (0.060)	0.174[a] (0.056)	0.192[a] (0.059)	− 0.091 (0.166)	− 0.126 (0.175)	− 0.102 (0.180)
Religion	0.748[a] (0.110)	0.514[a] (0.107)	0.428[a] (0.108)	0.335 (0.349)	0.053 (0.346)	− 0.048 (0.351)
Colony	0.271[a] (0.077)	0.003 (0.081)	− 0.071 (0.079)	0.561[a] (0.202)	0.235 (0.202)	0.192 (0.203)
Trade agreement	0.290[a] (0.063)	0.287[a] (0.058)	0.243[a] (0.061)	0.315[b] (0.153)	0.347[b] (0.155)	0.276[c] (0.160)
Investment treaty	− 0.571[a] (0.089)	− 0.456[a] (0.081)	− 0.421[a] (0.081)	− 0.693[a] (0.213)	− 0.570[b] (0.223)	− 0.568[b] (0.228)
Exchange rate	− 0.008 (0.006)	− 0.005 (0.005)	− 0.005 (0.005)	− 0.004 (0.005)	− 0.005 (0.006)	− 0.007 (0.007)
Migrants (log)			0.094[a] (0.015)			0.088[a] (0.028)
Observations	54,498	54,498	53,466	54,498	54,498	53,466
Pseudo-R^2	0.966	0.968	0.968	0.957	0.958	0.959

The dependent variable is the number of M&As in columns 1 to 3 and the value of M&As in columns 4 to 6. All regressions include acquirer country × year, target country × year, and 100 distance percentiles fixed effects. Standard errors clustered at the acquirer country × target country level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

Table 9 Regional (NUTS-3) analysis of social ties and home-bias in M&As

	Number			Value		
	(1)	(2)	(3)	(4)	(5)	(6)
Border	2.155[a] (0.092)	0.507[a] (0.101)		2.666[a] (0.715)	0.629 (0.981)	
Social ties (log)		0.872[a] (0.038)	0.954[a] (0.045)		0.852[a] (0.166)	1.015[a] (0.135)
Distance (log)	− 0.709[a] (0.042)	0.071 (0.052)	0.164[a] (0.059)	0.038 (0.295)	0.396 (0.311)	0.205 (0.197)
Contiguity	0.815[a] (0.088)	− 0.154 (0.100)	− 0.127 (0.108)	2.507[a] (0.860)	1.030 (1.049)	0.105 (0.566)
Observations	332,071	332,071	76,023	332,071	332,071	76,023
Acquirer Region x Year FE	Yes	Yes		Yes	Yes	
Target Region x Year FE	Yes	Yes		Yes	Yes	
RegionxCountry x Year FE			Yes			Yes
CountryxRegion x Year FE			Yes			Yes
Pseudo-R^2	0.460	0.490	0.423	0.805	0.813	0.913

The dependent variable is the number of M&As in columns 1 to 3 and the value of M&As in columns 4 to 6. The specifications in columns 1, 2, 4 and 5 include acquirer region × year and target region × year fixed effects; and the specifications in columns 3 and 6 acquirer region × target country × year and acquirer country × target region × year fixed effects. Standard errors clustered at the acquirer region × target region level are in parentheses; a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively

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Declarations

Conflict of interest The authors declare no conflict of interest.

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