

Defying Gravity:

The Role of Intermediaries for Cross-Border Mergers and Acquisitions*

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ABSTRACT

This study examines the role of intermediaries for cross-border mergers and acquisitions (M&A) using the gravity approach. In practice, M&A advisers play many important roles in M&A deals, starting from searching for and selecting M&A candidates, doing due diligence, and calculating the business value of the target firm. We view these activities as information production, aimed at reducing information asymmetry between acquiring firms and target firms. The results from the gravity model show that a relatively high presence of M&A advisers is generally conducive to the volume of M&A deals, particularly for cross-border deals, and their impacts are significantly pronounced in origin countries. We also investigate the effect of M&A advisers on the intensive margin (i.e., the average value per deal) and the extensive margin (i.e., the number of deals). The positive effect of M&A advisers is particularly noticeable for the extensive margins. Further, we find substitutability between the use of M&A advisers and the extent of financial development for financial institutions and markets.

Keywords: FDI, cross-border M&A, financial development, gravity model

JEL Classification: F23 and G34.

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1. Introduction

Cross-border mergers and acquisitions (M&A) are key components of foreign direct investment (FDI). Their share is higher than that of Greenfield investments in developed countries (UNCTAD, 2019). Empirical studies on the determinants of cross-border M&As have shown that M&A flows across countries follow a gravity equation (Ahern et al., 2015; di Giovanni, 2005; Head and Ries, 2008; Hijzen et al., 2008; Huizinga and Voget, 2009; Mariscal, 2021; Wong, 2008).¹

In the gravity model for M&A, the M&A flow between two countries is proportional to the economic size of the two countries and inversely proportional to geographical distance. Geographical distance reflects various costs associated with M&A deals. In addition to the geographical distance, other *economic distances* are known to affect cross-border M&A patterns. For example, cross-country differences in financial market development (e.g., the level of investor protection, accounting standards, and regulation) affect the pattern of cross-border M&A, as reported in finance literature (e.g., Rossi and Volpin, 2004). These economic distances matter for M&A because they increase the transaction costs for firms involved in M&A. However, many of these economic distances can be circumvented, if not all, by proper communication between transacting parties. For example, the costs associated with searching for an appropriate target firm, bargaining, and information production (e.g., due diligence) are largely unrelated to physical distance and can be significantly reduced by a third party who specializes in these tasks.

In this study, we hypothesize that M&A advisers increase the number of M&A deals by reducing the transaction costs facing firms – including costs arising from information asymmetry. How do they achieve that? In practice, M&A advisers play many important roles in M&A deals, starting from searching for and selecting M&A candidates, doing due diligence,

¹ Similarly, FDI has also been explained by gravity models. See Brainard (1997), Markusen and Maskus (2002), Portes and Rey 2005, Bénassy-Quéré et al. (2005), Bergstrand and Egger (2007), Kleinert and Toubal (2010), Blonigen and Piger (2014), Román et al. (2016), and Hoshi and Kiyota (2019).

and calculating the business value of the target firm. We view these activities as information production, aimed at reducing information asymmetry between acquiring firms and target firms. Without M&A advisors, M&A markets would likely suffer from lemon's problem. Acquiring firms expecting low quality of target firms would offer low prices. At such low prices, good target firms abstain from participating in M&A markets, validating acquiring firms' concern that only low-quality firms become potential targets. This results in low volume of M&A, and in the worst case, the entire market may breakdown.

One may argue that the above-mentioned lemon's problem should not be a major concern in the US, because most M&A deals involve M&A advisers.² However, outside the US, things may be different. In fact, cross-border M&A deals are the case where the problem of information asymmetry is likely to be most severe, and yet, not every country has as many M&A advisers as the US firms can have access to. Without sufficient competition among M&A advisers, they might distort the M&A market. Furthermore, because M&A advisers work on both sides of the deal, i.e., for acquiring firms and for target firms, they may have different impacts on the deal completion depending on which side they work for. In sum, given the high level of uncertainty associated with cross-border M&A deals and potential heterogeneity among countries, we anticipate that M&A advisers can be a major determinant of these deals.

To empirically investigate how the presence of M&A advisers affects the pattern of cross-border M&A, we use gravity models and a large-scale database for 169 countries that contains over 800,000 deals including domestic and cross-border M&As. More precisely, we add the number of M&A advisers involved in actual M&A deals retrieved from the M&A database at the transaction level, controlling for the standard covariates of the gravity model. To deal with the potential endogeneity issue of M&A advisers, we also control for country-year fixed effects as well as country pair fixed effects. We estimate a gravity model using the pseudo-

² In the U.S. M&A market, Golubov et al. (2012) report that in 2007, investment banks advised over 85% of deals by transaction values.

Poisson maximum likelihood (PPML) method, and find that the number of M&A advisers has a positive impact on M&A inflows and outflows. This result is consistent with the view of M&A advisers acting as information intermediaries to facilitate M&A deals, i.e., helping firms overcome information or various barriers when dealing with remote trading partners.

Further, we investigate the effect of M&A advisers on the intensive margin (i.e., the average value per deal) and the extensive margin (i.e., the number of deals). The positive effect of M&A advisers is particularly noticeable for the extensive margins. When we estimate the gravity model with M&A advisers focusing on the intensive margin, M&A flows still obey the gravity equation (albeit with the reduced effects of other explanatory variables). When focusing on the extensive margin, the standard gravity variables turn out to be less significant, while the impact of M&A advisers remains positive and significant. In fact, the number of M&A advisers is the single most important explanatory variable for the extensive margin.

Finally, we examine the heterogeneity of the roles of M&A advisers in three dimensions. First, we examine if and how the impacts of advisers differ between domestic and cross-border deals. Second, we study the dependence of their impacts on the level of financial development. Finally, we study the difference in their impacts on inward and outward M&A flows. The effects of M&A advisers are more pronounced for cross-border deals than for domestic deals. Furthermore, we find that the effects of M&A advisers are asymmetric: M&A advisers working for bidder firms substitute for the level of financial development in source countries (i.e., for outward M&A), while those working for target firms complement the level of financial development in destination countries (i.e., for inward M&A).

This study contributes to the literature on the determinants of cross-border M&As. Many factors that affect M&A patterns have been suggested, including cultural values (Ahern et al., 2015), taxation (Arulampalam et al., 2019; Huizinga and Voget, 2009; Todtenhaupt et al., 2020), political uncertainty (Bonaime et al., 2018; Cao et al., 2019), European integration (Coerdacier et al., 2009), trade costs (Hijzen et al., 2008), financial market development (di

Giovanni, 2005), accounting standards and investor protection (Erel et al., 2012; Rossi and Volpin, 2004), and labor market regulation (Dessaint et al., 2017). None of these studies examine the role of intermediaries in facilitating M&As. Ferreira et al. (2010) have studied the role of institutional investors in facilitating cross-border M&A and reported that foreign institutional ownership is positively related to the intensity of cross-border M&A. We complement their work by showing that M&A advisers may substitute the role played by foreign institutional investors.

This study also contributes to the literature on M&A advisers. Despite their importance in the M&A market, the role of M&A advisers *as a determinant of cross-border M&As* has not been the focus of existing research. Most studies in the literature focus on US domestic deals and examine how the characteristics of bidder advisers (e.g., reputation, experience, and expertise) affect the announcement returns of bidder firms (Bao and Edmans, 2011; Chemmanur et al., 2019; Golubov et al., 2012; Kale et al., 2003; Raghavendra Rau, 2000; Servaes and Zenner, 1996; Wang et al., 2022; Yawson and Zhang, 2021). Instead of studying M&A advisers' effect on particular qualities of deals, we take a step back and examine whether their presence affects the number of deals. We also examine their roles not only on the bidder side but also on the target side. Our results are consistent with Bodnaruk et al. (2009), who have found that firms in which bidder advisers hold stakes are more likely to become targets.³ As for cross-border M&As, Francis et al. (2014b) have found the positive effect of learning from past cross-border M&As on the likelihood of deal completion, and it is pronounced in culturally remote markets. Our results suggest a particular mechanism behind their result: M&A advisers promote cross-border M&As by facilitating this learning process.

The remainder of this paper is organized as follows. Section 2 elaborates on the gravity equation for bilateral M&A and the independent variables used in this equation. Section 3

³ Also consistent with our results, Francis et al. (2014a) have found that bidder firms use advisers in deals in which they face a high level of risk.

describes the data used to estimate the gravity model. Section 4 presents the estimation results from PPML, and Section 5 presents the conclusions drawn from the study.

2. Gravity model for cross-border M&A

Following Head and Ries (2008), we apply a gravity model to explain bilateral M&A. The volume of bilateral M&A is proportional to the market size of the origin and destination countries. Conversely, the farther the overseas subsidiary, the higher the costs of monitoring the managers to exert effort incurred by the headquarters of a multinational enterprise. Therefore, M&A volume is expected to be inversely proportional to the bilateral geographical distance between the headquarters and subsidiary. The gravity model for explaining the bilateral deal volumes of M&As from the origin (acquirer) country i to destination (target) country j in year t , V_{ijt} , is expressed as follows:

$$V_{ijt} = \exp\left(\mathbf{O}'_{it} \alpha + \mathbf{T}'_{jt} \beta + \mathbf{D}_{ij}\theta\right) \varepsilon_{ijt} \quad (1)$$

where \mathbf{O}'_{it} is the vector of time-variant origin-country-year-specific factors, \mathbf{T}'_{jt} is the vector of time-variant destination-country-year-specific factors, \mathbf{D}_{ij} is the vector of the origin-destination country-pair characteristics, and ε_{ijt} is the disturbance term.

Concerning the time-varying origin- and destination-country-year-specific factors, in addition to the market size proxied by gross domestic product (GDP) (GDP_{it}, GDP_{jt}), the following traits that affect M&A decisions are included in the model. First, we add the financial development index in the origin and destination countries (FD_{it}, FD_{jt}) provided by the international monetary fund (IMF), considering that M&A decisions may be affected by the difference in the extent of financial development for financial institutions and markets. The

volume of M&As should be higher in financially developed destination countries, where well-established systems and markets contribute to forming fair-deal values, than in financially underdeveloped countries. Further, financially developed countries should accelerate outward M&A by facilitating financing. Furthermore, the costs of starting a business in the host country influence investment decisions. To measure this cost, we use the sum of the number of days required to start a business and the number of procedures to start a business ($Entry_{it}, Entry_{jt}$) provided by World Development Indicators as a proxy for business costs.

A key novelty of our research is the inclusion of M&A advisers (Adv_{it-1}, Adv_{jt-1}) as a predetermined factor. M&A advisers play many important roles in M&A deals, starting from searching for and selecting M&A candidates, doing due diligence, and calculating the business value of the target firm. Typically, professional business service providers, such as investment banks, law firms, and consulting firms, act as M&A advisers. These firms are known to charge high advisory fees; however, on the net, we anticipate that the cost of M&A deals is reduced in countries where such advisers are abundant (and behave relatively competitively), relative to countries where they are non-existent or behave less competitively. Therefore, we predict that a higher presence of M&A advisers leads to an increase in M&A.

We include a standard list of variables to control for changes in the country-pair relationship that may affect the cross-border M&A activity between two countries. Let D_{ij} denote a vector that consists of an origin–destination country pair with time-invariant characteristics. For the time-invariant country-pair characteristics, the geographical distance between the origin country i and destination country j ($Dist_{ij}$) is used based on the assumption that the higher the distance, the higher the impediments to monitoring overseas subsidiaries. Further, contiguity is considered by introducing a dummy for sharing a common border ($Contig_{ij}$). To control for the difference between intra-national and cross-border M&As, we add a dummy for cross-border deals ($CBRD_{ij}$). In international trade literature, a common view is that the geographical impediments between the countries are mitigated by cultural ties.

Similarly, sharing a common language ($Lang_{ij}$), religion ($Relig_{ij}$), and legal origin ($Legal_{ij}$) should have a positive impact on M&As by reducing the transaction costs of contracts. Thus, the equation to be estimated is as follows:

$$\begin{aligned}
V_{ijt} = & \exp(\alpha_1 \ln GDP_{it} + \beta_1 \ln GDP_{jt} + \alpha_2 \ln FD_{it} + \beta_2 \ln FD_{jt} + \alpha_3 \ln Entry_{it} + \\
& \beta_3 \ln Entry_{jt} + \alpha_4 \ln Adv_{it-1} + \beta_4 \ln Adv_{jt-1} + \theta_1 \ln Dist_{ij} + \theta_2 CBRD_{ij} + \theta_3 Contig_{ij} + \\
& \theta_4 Lang_{ij} + \theta_5 Legal_{ij} + \theta_6 Relig_{ij} + \gamma_i + \delta_j + \tau_t) \varepsilon_{ijt} \quad (2)
\end{aligned}$$

where γ_i and δ_j are time-invariant country-fixed effects, and τ_t is a year-fixed effect. We estimate gravity model (2) for M&A flows by applying the PPML estimation method.⁴

3. Data sources

Our bilateral M&A volume data are a compilation of over 800,000 transactions available from 1997 to 2019 with a deal value retrieved from *Zephyr*, the database of M&A transactions provided by Bureau van Dijk (BvD). The bilateral data cover 169 countries/regions, including cross-border M&As and domestic M&As.

The disaggregated data allowed us to decompose bilateral M&A volume (MA) into two components: the extensive margin measured by the number of deals (N) and the intensive margin measured by the average volume per deal (MA/N):

$$MA_{ijt} = N_{ijt} \times \frac{MA_{ijt}}{N_{ijt}},$$

⁴ Since Silva and Tenreyro (2006), PPML has become a standard method of estimating the gravity model for bilateral trade flows because of its advantages of properly accounting for heteroskedasticity and zero observations. These considerations are particularly important for the study of cross-border M&A, where zero observations and potential heteroskedasticity are even more prevalent than trade. See Mariscal (2021) for the recent application of the PPML estimation of the gravity model in the context of cross-border M&A.

where subscripts i and j denote origin i and destination j , respectively. We estimate the gravity models specified in Eq. (2) for the volume (MA), intensive margin (MA/N), and extensive margin (N). This enabled us to study the impact of each explanatory variable on the margins.

Country-specific characteristics, such as GDP and entry costs, were obtained from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). Further, the country-pair characteristics, such as geographical distance, dummy variables for sharing a common border, and cultural ties, such as the common language, legal origin, and religion, were retrieved from the CEPII.

To consider the impact of country-level financial development, we employed the financial development index collected from the IMF. This broad measure of the index captured both institutional and market-based financial development. As a proxy variable for the advisers, we used the number of advisers aggregated by country based on the M&A deals data by *Zephyr*, which records the presence or absence of advisers for each deal. To avoid simultaneity, the one-year lagged number of advisers is used in the regression. Taking a one-period lag is consistent with the idea that these variables are proxies for past experience of using information services related to M&A deals. Table 1 presents the descriptive statistics of the variables. In our regression analysis, all continuous variables are logarithmic.⁵

⁵ As for the financial development index rescaled into 0-100 scores and the number of advisers, we add 0.0001 as a negligible value to these variables before taking the logarithm to deal with zero values.

Table 1. Descriptive statistics and variable definition

Variable	Definition	Mean	Std. dev.	Min	Max
MA	Volume of M&A	96.384	5337.679	0	1294752
MA/N	Average volume per M&A deal: intensive margin	4.466	105.759	0	22625
N	N of M&A deals: extensive margin	1.961	79.945	0	19614
lnY_o, lnY_d	log of GDP in origin (o) or destination (d) country	17.402	2.364	11.409	23.788
lnDist	log of distance btw capitals	8.731	0.813	2	10
CBRD	Dummy for cross-border deals	0.994	0.080	0	1
Contig	Dummy for sharing a common border	0.017	0.130	0	1
Lang	Dummy for sharing a common language	0.154	0.361	0	1
Legal	Dummy for sharing a common legal origin	0.390	0.488	0	1
Relig	Dummy for sharing a common religion	0.171	0.242	0	1
Entry_o, Entry_d	N of days & procedures required to start a business	39.716	50.200	2	711
FD_o, FD_d	Financial development index by IMF	32.422	23.689	3	100
Adv_o, Adv_d	N of M&A advisers	0.294	14.438	0	2323

4. Estimation results from the gravity model

4.1. Base results

Table 2 shows the results of the PPML estimation for Eq. (2). All estimations included year-fixed effects, although the results were suppressed. In addition, origin country fixed effects and destination country fixed effects are added to the estimations in columns [2], [4], [6], [8], [10], and [12] to absorb time-invariant country-specific factors. Columns [1]–[4] report the results for the volume of M&A deals. Columns [5]–[8] show the results for the intensive margin (the average volume per M&A deal), and columns [9]–[12] show the results for the extensive margin (the number of M&A deals).⁶

Columns [1] and [2] present the results of the baseline gravity model. Consistent with extant studies on the bilateral gravity model for FDI, the economic size of both countries has a

⁶ As PPML is a non-linear model, the sum of the coefficients of both margins is not equal to the coefficients for the volume. All the models include the market sizes of both the origin and destination country, and the geographical distance between them, as well as the cross-border dummy.

positive impact on bilateral M&A. The geographical distance was significantly and negatively associated with the bilateral M&As. The cross-border dummy consistently showed negative coefficients for the volume and number of deals and positive coefficients for the intensive margin. This result indicates that the number of cross-border deals is smaller than that of domestic deals, whereas the average value per deal is relatively large for cross-border deals. This result confirms that cross-border deals are subject to higher transaction costs than domestic deals. The effect of standard gravity variables, such as economy size and geographical distance, on cross-border M&As was considerably robust, even when considering other covariates. As presented in Column [1], the results of entry costs in origin country show a negative sign as predicted. The negative impact of entry costs is particularly significant on extensive margins in Column [9]. However, the impact disappears after country fixed effects are considered in Column [2] and [10]. The dummy variables for common language and religion are positively associated with M&A volume, while common legal origin does not affect the M&A volume. This is as expected from trade literature: broadly defined “cultural proximity” reduces transaction costs associated with M&A. Furthermore, as shown in Columns [5] and [9], language commonality strongly contributes to the extensive margin, while the commonality of legal origin or religion has a positive effect on the intensive margin. The degree of financial development has a positive effect on the M&A volume, intensive margins, and extensive margins. Although the statistical significance for the volume and intensive margins is lost when the country fixed effect is introduced, the effect on the extensive margin is still significant even after controlling for the country fixed effects. For the magnitude of elasticity, the financial development in the origin country matters more than that in the destination country. This is consistent with the literature that found that source country financial market variables are important determinants of cross-border M&A (di Giovanni, 2005; Erel et al., 2012).

The number of M&A advisers showed a consistently positive impact, regardless of origin or destination, except for the intensive margin (Columns [7] and [8]). Moreover, its

impact is larger in the origin country than in the destination country and the impact is more pronounced for the extensive margin, which is a pattern similar to the indicator of financial development. These results suggest that the number of M&A advisers captures an important part of financial development, which is particularly relevant for cross-border M&As; further, the presence of M&A advisers reduces the cost of M&A more for acquirers than for targets, leading to an entry of acquirers as an extensive margin. One possible reason why the effect is concentrated on the acquisition side might be that acquiring firms, as continuing companies after deals, are more likely to have a longer-term relationship with advisers than acquired firms. We offer further discussion on this asymmetry in the concluding section. As a robustness check for the potential endogeneity of M&A advisers, the model that includes country-year fixed effects as well as country pair fixed effects is examined in the next section.

Table 2. Base results from the PPML

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
	V	V	V	V	IM	IM	IM	IM	EM	EM	EM	EM
lnAdv_o			0.151***	0.116***			0.00676	5.41E-05			0.229***	0.135***
			[0.0105]	[0.00885]			[0.0149]	[0.0143]			[0.0135]	[0.0103]
lnAdv_d			0.0510***	0.0476***			-0.0376**	-0.0418***			0.0547***	0.0581***
			[0.00886]	[0.00823]			[0.0163]	[0.0151]			[0.00945]	[0.00748]
lnY_o	0.585***	0.851***	0.393***	0.652***	0.317***	0.481**	0.336***	0.508**	0.436***	0.419***	0.246***	0.234**
	[0.0240]	[0.126]	[0.0251]	[0.129]	[0.0253]	[0.210]	[0.0284]	[0.210]	[0.0227]	[0.0983]	[0.0184]	[0.0951]
lnY_d	0.724***	0.832***	0.553***	0.791***	0.328***	0.169	0.349***	0.172	0.472***	0.324***	0.289***	0.239***
	[0.0255]	[0.115]	[0.0226]	[0.116]	[0.0305]	[0.203]	[0.0298]	[0.202]	[0.0218]	[0.0904]	[0.0202]	[0.0873]
lnDist	-0.219***	-0.472***	-0.0552	-0.312***	-0.353***	-0.429***	-0.364***	-0.453***	-0.120***	-0.668***	-0.0358	-0.487***
	[0.0358]	[0.0417]	[0.0350]	[0.0423]	[0.0539]	[0.0652]	[0.0567]	[0.0672]	[0.0313]	[0.0290]	[0.0250]	[0.0266]
CBRD	-3.392***	-2.605***	-2.518***	-1.960***	0.722***	0.961***	0.480*	0.718**	-5.121***	-3.254***	-3.421***	-2.393***
	[0.140]	[0.118]	[0.125]	[0.125]	[0.217]	[0.274]	[0.250]	[0.289]	[0.143]	[0.0929]	[0.118]	[0.0987]
Contig	0.282**	-0.11	0.248**	-0.117	-0.402**	-0.310*	-0.355**	-0.248	0.921***	-0.224**	0.483***	-0.301***
	[0.119]	[0.106]	[0.106]	[0.107]	[0.163]	[0.163]	[0.163]	[0.161]	[0.116]	[0.0878]	[0.0910]	[0.0831]
Lang	0.972***	0.833***	0.483***	0.483***	0.270**	0.137	0.320***	0.162	1.353***	1.469***	0.814***	1.091***
	[0.0761]	[0.0829]	[0.0774]	[0.0803]	[0.109]	[0.127]	[0.112]	[0.128]	[0.0619]	[0.0706]	[0.0560]	[0.0619]
Legal	0.0649	-0.0417	0.0519	-0.0285	0.274***	0.147*	0.277***	0.162*	-0.0667	-0.230***	-0.183***	-0.301***
	[0.0618]	[0.0675]	[0.0679]	[0.0693]	[0.0926]	[0.0861]	[0.0916]	[0.0863]	[0.0437]	[0.0468]	[0.0410]	[0.0423]
Relig	0.360***	1.743***	0.186**	1.301***	0.544***	0.544***	0.549***	0.559***	-0.473***	2.507***	-0.489***	2.078***
	[0.103]	[0.215]	[0.0929]	[0.202]	[0.124]	[0.169]	[0.123]	[0.171]	[0.105]	[0.134]	[0.0920]	[0.124]
lnEntry_o	-0.193***	-0.0177	-0.120***	0.0237	-0.00123	-0.0378	-0.0153	-0.035	-0.216***	-0.0805	-0.149***	-0.0273
	[0.0394]	[0.0826]	[0.0383]	[0.0798]	[0.0635]	[0.119]	[0.0629]	[0.119]	[0.0251]	[0.0556]	[0.0220]	[0.0494]
lnEntry_d	-0.0389	0.077	-0.00846	0.0588	-0.0812	-0.132	-0.0957	-0.127	0.157***	0.0342	0.178***	0.0141
	[0.0363]	[0.0788]	[0.0331]	[0.0763]	[0.0598]	[0.109]	[0.0607]	[0.109]	[0.0245]	[0.0518]	[0.0203]	[0.0459]
lnFD_o	1.282***	0.715*	0.874***	0.347	1.437***	-0.336	1.448***	-0.322	0.901***	1.424***	0.426***	0.984***
	[0.0959]	[0.420]	[0.0845]	[0.407]	[0.116]	[0.607]	[0.116]	[0.608]	[0.0695]	[0.275]	[0.0591]	[0.256]
lnFD_d	0.564***	-0.156	0.252***	-0.262	0.802***	-0.3	0.805***	-0.298	0.544***	0.430**	0.130***	0.336*
	[0.0798]	[0.340]	[0.0772]	[0.340]	[0.116]	[0.441]	[0.120]	[0.440]	[0.0541]	[0.216]	[0.0446]	[0.202]
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Constant	-23.51***	-25.45***	-14.65***	-19.98***	-16.69***	-3.964	-17.38***	-4.518	-17.38***	-12.63***	-7.480***	-6.466***
	[0.562]	[2.965]	[0.634]	[2.792]	[0.565]	[5.036]	[0.625]	[5.032]	[0.530]	[1.875]	[0.520]	[1.623]
Observations	416,760	358,788	416,760	358,788	416,760	358,788	416,760	358,788	416,760	358,788	416,760	358,788

Notes: Refer to the definitions in Table 1 for variable name abbreviations. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors clustered within country pairs are shown in parentheses.

4.2. Robustness check

One issue with our empirical approach is the endogeneity of the M&A advisers. To address the endogeneity issue, we added country–year-fixed effects that control for all observable country characteristics and unobservable time-variant country-specific factors. The introduction of the country–year-fixed effects is expected to eliminate the unobservable factors that may influence

the relationship between the M&A advisers and M&A flows. However, in this case, the impact of advisers could not be estimated because of the perfect collinearity with the country–year-fixed effects. We follow Heid et al. (2021) by estimating gravity models with cross-border transactions and intra-national transactions. The interaction term of the cross-border dummy and the number of M&A advisers are introduced to estimate the impact of M&A advisers on cross-border deals relative to intra-national deals, even when the country-year fixed effects are added to the model. As displayed in Table 3, the regressor of interest, the interaction term of the cross-border dummy and number of M&A advisers consistently showed a positive and statistically significant sign for both the origin country (In-Out deals) and the destination country (Out-In deals). This result holds for both intensive and extensive margins and indicates that the number of M&A advisers has a positive impact on cross-border deals relative to intra-national deals. Intermediaries play a more important role in cross-border deals than in domestic deals, suggesting greater information barriers for cross-border deals. Hence, the main results continue to hold.

Table 3. Results of the model with country–year- and pair-fixed effects

	[1]	[2]	[3]	[4]	[5]	[6]
	V	V	IM	IM	EM	EM
CBRD: 0×lnAdv_o	0.139*** [0.0328]		-0.0271** [0.0125]		0.122*** [0.0157]	
CBRD: 1×lnAdv_o	0.0259*** [0.00672]		-0.00899 [0.00774]		0.0371*** [0.00481]	
CBRD: 0×lnAdv_d		0.0964*** [0.0233]		-0.0204* [0.0119]		0.0848*** [0.0113]
CBRD: 1×lnAdv_d		0.0203*** [0.00743]		-0.00623 [0.0105]		0.0232*** [0.00380]
Constant	9.902*** [0.126]	10.11*** [0.0821]	4.554*** [0.0489]	4.562*** [0.0766]	5.959*** [0.0594]	6.154*** [0.0375]
Observations	101,802	101,802	101,802	101,802	101,802	101,802

Notes: Refer to the definitions in Table 1 for variable name abbreviations. Origin country-year, destination country-year fixed effects are included. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors clustered within country pairs are shown in parentheses.

4.3. Heterogeneous impacts

One interesting empirical issue is that the impact of M&A advisers may be heterogeneous according to country attributes. Table 4 displays the results of the model with interaction terms related to M&A advisers, including time-invariant country-fixed effects and year-fixed effects. First, to further investigate a possible interrelationship between the financial development index and the role of M&A advisers, we estimate the model by including the interaction term of the financial development index and the number of M&A advisers. Columns [1], [5], and [9] show that the coefficient of the interaction term was negative, indicating a substitutable relationship between the financial development index and the number of M&A advisers in the origin countries. Moreover, as shown in Columns [2], [6], and [10], a similar relationship was observed for the interaction terms of the origin \times destination. This indicates that cross-border M&A will be promoted in the country where there are many M&A advisers, even if the financial development of the counterpart country is lagging behind. The interrelationship between advisers in the acquirer side and the target side is also an interesting issue. Columns [3], [7], and [11] show the results from the model where the interaction term of both advisers in the acquirer and target is added. The negative and significant coefficients indicate substitutability between the two. This suggests that information service provided by M&A advisers is particularly needed when the counterpart countries lack such services.

Since our data cover both intra-national and cross-border deals, we studied the difference in the impacts of M&A advisers between the two types of deals. Columns [4], [8], and [12] demonstrate the results of the interaction terms related to the cross-border dummy variable to test the difference in the impact of M&A advisers between intra-national and cross-

border. The results show that the impact of M&A advisers was more pronounced in cross-border deals than in domestic deals. This suggests that the cost of collecting information was relatively high for cross-border deals; as a result, the positive impact of adviser support was relatively high.

Table 4. Results of interaction terms

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
	V	V	V	V	IM	IM	IM	IM	EM	EM	EM	EM
lnFD_o×lnAdv_o	-0.103*** [0.0163]				-0.115*** [0.0316]				-0.0878*** [0.0173]			
lnFD_d×lnAdv_d	0.00143 [0.0180]				-0.0926*** [0.0217]				-0.0208 [0.0159]			
lnFD_o×lnAdv_d		-0.0329** [0.0157]				-0.109*** [0.0301]				-0.0456*** [0.0140]		
lnFD_d×lnAdv_o		-0.0467*** [0.0135]				-0.108*** [0.0196]				-0.0264* [0.0142]		
lnAdv_o×lnAdv_d			-0.00201 [0.00127]				-0.0111*** [0.00211]				-0.00731*** [0.00112]	
CBRD×lnAdv_o				0.0606*** [0.0225]				0.125*** [0.0341]				0.125*** [0.0196]
CBRD×lnAdv_d				0.0715*** [0.0159]				0.0975*** [0.0276]				0.0605*** [0.0144]
CBRD	-2.005*** [0.126]	-2.023*** [0.123]	-2.069*** [0.141]	-2.742*** [0.180]	0.853*** [0.287]	0.818*** [0.287]	0.302 [0.281]	0.551* [0.321]	-2.445*** [0.101]	-2.447*** [0.100]	-2.723*** [0.106]	-3.342*** [0.107]
lnFD_o	0.242 [0.432]	0.408 [0.433]	0.385 [0.417]	0.541 [0.429]	-1.216** [0.607]	-1.190* [0.643]	-0.351 [0.601]	-0.242 [0.609]	0.993*** [0.274]	0.972*** [0.269]	1.153*** [0.266]	1.330*** [0.287]
lnFD_d	-0.0488 [0.367]	-0.274 [0.355]	-0.24 [0.341]	-0.162 [0.356]	-1.073** [0.469]	-1.101** [0.442]	-0.311 [0.439]	-0.225 [0.438]	0.436* [0.230]	0.388* [0.212]	0.381* [0.214]	0.395* [0.228]
lnAdv_o	0.544*** [0.0677]	0.303*** [0.0540]	0.100*** [0.0132]	0.0455* [0.0209]	0.487*** [0.128]	0.444*** [0.0804]	-0.0828*** [0.0191]	-0.122*** [0.0308]	0.489*** [0.0779]	0.236*** [0.0586]	0.0802*** [0.0142]	0.0137 [0.0205]
lnAdv_d	0.0418 [0.0729]	0.189*** [0.0677]	0.0481*** [0.00802]	-0.0187 [0.0143]	0.359*** [0.0902]	0.442*** [0.127]	-0.0497*** [0.0107]	-0.129*** [0.0235]	0.145** [0.0683]	0.248*** [0.0630]	0.0602*** [0.00661]	0.00909 [0.0135]
Constant	-20.28*** [2.802]	-20.21*** [2.813]	-20.81*** [2.814]	-23.78*** [2.747]	2.854 [4.988]	3.395 [5.425]	-4.131 [5.055]	-5.623 [5.090]	-7.035*** [1.681]	-6.693*** [1.653]	-9.671*** [1.760]	-12.57*** [1.778]
Observations	358,788	358,788	358,788	358,788	358,788	358,788	358,788	358,788	358,788	358,788	358,788	358,788

Notes: Refer to the definitions in Table 1 for variable name abbreviations. The other covariates used in the models in Table 2 are all included while the results are suppressed. Origin country-, destination country-, and year-fixed effects are included. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors clustered within country pairs are shown in parentheses.

5. Conclusion

Growing cross-border M&A is becoming a major player in FDI, particularly in developed countries. There is an active policy debate on how to build a friendly environment for inward FDI without relying on tax incentives. Previous research on M&A advisers has mostly focused on the role of bidder advisers and their impact on bidder announcement returns. This study examined the role of advisers, for both the acquirer and target sides, as a determinant of bilateral M&A flows. Our results suggest that the increase in M&A may be due to the presence of intermediaries who are in charge of searching for appropriate targets, negotiations, and advisory work.

The estimation results from the PPML reveal that a high presence of advisers is positively associated with M&A volume, in particular, through the extensive margin. This result is consistent with the view that M&A advisers are the information channels that facilitate M&A deals. To shed light on how intermediaries promote M&As, we further investigate how the intermediary effect interacts with a financial market development index and a cross-border dummy variable. We find evidence that M&A advisers are more important for cross-border deals than domestic deals, indicating higher information barriers for cross-border deals. Additionally, for a two-way M&A flow, the intermediation service substitutes for the positive effect of overall financial market development on M&A volume. Even if financial markets and institutions are not developed, the presence of advisers plays a role in increasing M&A. To spur M&As, we should consider either improving financial development in general, or expanding M&A intermediation services in particular.

Finally, one robust finding is that the impact of M&A advisers is much stronger on the acquirer side than on the target side, especially for the extensive margin. We conclude by offering two hypotheses to explain this asymmetry. First, it is perhaps easier for M&A advisers to build a long-term relationship with acquiring firms than with target firms because the completion of deals changes the status of target firms (e.g., from public to private, from

independent to a subsidiary, or they may simply disappear). This might create a better incentive for M&A advisers to improve the quality of deals on the acquirer's side, increasing M&As. Second, M&A advisers may be used as defense mechanisms for potential target firms. Firms on the acquirer side would naturally seek better deals for them (i.e., high-quality target firms for low prices). In contrast, firms on the other side of M&A markets may have more diverse incentives; some may want to sell themselves at relatively high prices, while others may want to prevent deals. This might lead to a weak effect of M&A advisers on the target side, on average. We believe that further investigation of this asymmetry would be useful for a better understanding of the M&A markets.

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