Genetic Distance and Cross-border M&A Completion: Evidence from Chinese Firms

ABSTRACT. Using data drawn from Chinese firms from 1996 to 2019, we explored the effect of genetic distance on the completion of cross-border mergers and acquisitions (M&A). We found an inverted U-shaped relationship between genetic distance and cross-border M&A completion. Further research showed that this relationship is moderated by heterogeneity at the firm-, industry-, and country-levels. In particular, when the acquirer is a foreign-listed company and the host country institution is of good quality, genetic distance has a linear positive effect on acquisition completion. When the acquirer belongs to the high-tech industry and the two countries involved have not signed any bilateral investment treaties, the effect of genetic distance is not significant. Our study sheds light on the impact of genetic distance on cross-border M&A completion and enriches the related theoretical perspective. Our findings also have a certain practical value.

Keywords Genetic distance; Cross-border M&A; M&A completion

1. Introduction

For several decades, there has been a surge in the use of cross-border M&A by multinational corporations to expand internationally (IMAA, 2022). In particular, a growing number of multinationals from emerging markets (EMCs) have started to frequently use cross-border M&A to acquire strategic assets such as advanced technology, knowledge, and brands from international markets to overcome latecomer and competitive disadvantages (Zheng et al., 2022). Despite this prevalence, most announced transactions do not reach completion. On average, the abandonment rate of cross-border M&A initiated by EMNCs from 1981 to 2012 was 32.1%, with a significantly higher rate of 42.8% being recorded in China (He and Zhang, 2018). A failed cross-border M&A can involve significant costs for the acquiring firm, including those involved in searching for a suitable target, negotiating the deal, and financing the activities, and the opportunity cost linked to abandoning other potential targets (Bainbridge, 1990; Officer, 2003). Additionally, the deal's termination can harm the reputation and credibility of the acquirer (Luo, 2005). As a result, acquirers often make great efforts to ensure the success of a deal.

The international business (IB) literature has substantially advanced our knowledge of cross-border M&A completion by uncovering its key determinants; among which distance plays a vital role (Xie et al., 2017). The existing studies have found that institutional, cultural, and linguistic distances may affect cross-border M&A (Dikova et al., 2010; Li and Sai, 2020). However, these studies have yielded mixed results. Dikova et al. (2010) found that institutional and cultural distances reduce the likelihood of cross-border M&A completion, while Lawrence et al. (2021) demonstrated that transaction completion is largely unaffected by cross-border cultural and institutional differences. More importantly, this stream of literature has also received criticisms, such as "the illusion of stability" (Shenkar, 2001). Shenkar (2001) challenged the assumption of cultures being stable and argued that they change over time. Zaheer et al. (2012) also noted that other distance variables present this same problem. There is thus the need to find a more stable and deeply ingrained variable suited to explain the success or failure of cross-border M&A. One promising variable to consider is genes, which is a deeply ingrained factor that influences the preferences and behaviors of individuals from different countries involved in transnational activities (Qin et al., 2022).

Shenkar (2021) recently issued a call for the incorporation of interdisciplinary perspectives into IB studies and emphasized the importance of genetic distance. By definition, genetic distance is the summary measure of the very long-term divergence of the traits transmitted intergenerationally across populations (Spolaore and Wacziarg, 2009); these cover aspects such as physical appearance, IQ values, language, cultural values, customs, beliefs, thought patterns, behavioral norms, and social interactions (Spolaore and Wacziarg, 2009). Being based on "hard data" derived from DNA studies, genetic distance is more stable compared to others, and fundamentally shapes people's behaviors and decision-making preferences.

In searching for the factors that influence M&A completion, we chose to concentrate on genetic—rather than cultural—distance for the following reasons. First, genetic distance represents a more inclusive metric, as it encompasses differences not only in the institutional, cultural, and other social characteristics of populations but also in their biological attributes (Spolaore and Wacziarg, 2009), which cannot be captured by other recent measures of distance (Delis et al., 2017). Thus, genetic distance enabled us to predict the likelihood of cross-border M&A completion in a more comprehensive fashion. Although the genetic distance is positively correlated with its linguistic, cultural, and religious counterparts (Spolaore and Wacziarg, 2016), it is not synonymous with them. Second, as it arises from divergences that date back tens of thousands of years, genetic distance has a more enduring foundation than those cultural and institutional distances, which are more susceptible to change. This feature enabled us to overcome the stability issue of distance (Shenkar, 2001). In addition, as it is assumed to be exogenous, genetic distance is often used as an instrumental variable of cultural distance, which is affected by economic exchanges and cultural blending (Xu et al., 2021).

The recent incorporation of genetic distance in IB studies has caused the emergence of two divergent perspectives. On the one hand, some researchers have found that genetic distance is detrimental, as it increases distrust and hinders the transfer of technology, thereby decreasing trade flows (Bove and Gokmen, 2017) and business dealings (Davies,

2014) between nations. On the other hand, several scholars have demonstrated that genetic distance may have a positive effect by increasing the genetic diversity of a team (Ashraf and Galor, 2013). The novel perspectives taken and innovative solutions developed by populations with diverse genetic backgrounds can help improve corporate financial and innovation performance (Delis et al., 2017; Xu et al., 2021).

However, despite recent advancements, some research questions remain unaddressed. Previous studies have overlooked the role played by genetic distance in cross-border M&A, thus leaving a critical gap in the literature. Specifically, our understanding of whether and how genetic distance affects cross-border M&A completion remains limited. Additionally, the existing studies have tended to analyze the positive or negative effects of genetic distance based on linear assumptions, thus failing to account for nonlinear relationships, which have led to inconsistent or conflicting findings.

In light of the aforementioned research gaps, our study was aimed at investigating the determinants of cross-border M&A completion from the perspective of genetic distance. By examining both the positive and negative effects of genetic distance, we formulated the hypothesis that its impact on cross-border M&A completion follows an inverted-U pattern. To test this hypothesis, we utilized cross-border M&A data drawn from Chinese enterprises from 1996 to 2019. Furthermore, we examined the moderating effect of six key factors at the firm-, industry-, and country-levels.

The contributions of our study are as follows. First, it answers Shenkar's (2021) call for the application of genetic distance to IB studies, thus enriching the country distance stream in the IB literature. Shenkar (2021) pointed out that, although hard data drawn from DNA is often used to criticize cultural studies of IB, its application in the field remains limited. We tested the effect of genetic distance in the context of cross-border M&A, and obtained robust results, thus providing empirical support for the non-negligible role played by genetic distance in IB. At the same time, our study represents an extension of that conducted by Xu et al. (2021), who ignored the role played by genetic distance in cross-border M&A.

Second, our study may shed new light on the determinants of cross-border M&A completion. Previous studies had focused on variables such as cultural and institutional distances, ignoring the genetic differences between the parties involved in the transaction. Ours is the first study to link cross-border M&A completion with genetic distance, and to demonstrate the existence of a U-shaped relationship between the two; this provides a new perspective suited to better predict the likelihood of M&A completion. This finding is unique because it suggests that the net effect of genetic distance is neither purely negative (Ang and Kumar, 2014; Spolaore and Wacziarg, 2009, 2016) nor unswervingly positive (Delis et al., 2017; Xu et al., 2021), but that both effects exist simultaneously.

Third, we responded to two criticisms of distance (Shenkar, 2001; Ambos and Hakanson, 2014; Zaheer et al., 2012). On one hand, we avoid the stability issues by choosing genetic distance, which stems from deep-rooted differences developed over a time span of tens of thousands of years, and is more stable than its cultural counterpart. On the other hand, we offer a way to avoid 'the illusion of linearity' (Shenkar, 2001) that surrounds genetic distance. The existing literature mainly analyzes genetic distance from a single, isolated perspective—whether negative or positive. Our study, however, integrates the two seemingly competing views by yielding an inverted U-shaped relationship.

The rest of this paper is structured as follows. Section 2 introduces a review of the literature and presents our hypothesis. Section 3 provides an explanation of the definitions and sources of the main variables and a discussion of the empirical approach. Section 4 presents the empirical results, and Section 5 the conclusion.

2. Theory and hypothesis

2.1. The existing research on genetic distance

Zaheer et al. (2012) noted that "Essentially, international management is the management of distance". Genetic distance is a relatively new dimension that has only recently garnered attention among international business scholars. According to the "Out of Africa hypothesis", the mass migration of Homo sapiens from East Africa to different settlements across the globe is the cause of the genetic differences found among modern populations (Ashraf and Galor, 2013). As a deeply rooted distinguishing trait developed over tens of thousands of years, genetic distance has been proven to have a significant impact on economic activity, outweighing other factors such as cultural, institutional, and geographic distances.

Most previous research has treated genetic distance as a cost or an obstacle. For example, in their pioneering work, Spolaore and Wacziarg (2009) showed that inter-population genetic distance hinders the spread of economic development. Other studies suggest that genetic distance impedes the spread of financial innovation (Ang and Kumar, 2014) and direct investment among countries (Guiso et al., 2009). Heid and Lu (2022) have recently suggested that a 1% increase in genetic distance results in a 0.9% reduction in the likelihood of signing a regional trade. The underlying reason for these findings is that genetic distance reduces trust, impedes the exchange of ideas, and limits opportunities for learning, imitation, and adoption.

Conversely, a growing number of studies are beginning to recognize the positive role of genetic distance. This line of inquiry suggests that genetic distance can give rise to diversity, which is the source of its positive effects. Delis et al. (2017) found that genetic diversity among board members helps to develop different perspectives, skills, and abilities, leading to diverse interpretations and problem-solving approaches. As a result, board directors from countries with various levels of genetic diversity have been seen to improve corporate performance. Similarly, Xu et al. (2021) showed a positive correlation between genetic distance and multinational R&D performance, as genetic distance can bring complementary knowledge and skills, thus increasing organizational flexibility and adaptability.

Despite these advances, the existing literature has not turned its attention to the effects of genetic distance on cross-border M&A completion. Moreover, these studies have tended to consider the effects of genetic distance under the assumption of linearity.

2.2. Genetic distance and cross-border M&A completion

We focused on cross-border M&A completion; specifically, the public takeover process, from announcement to resolution. (Boone and Mulherin, 2007). During this process, although the host country's regulators, stakeholders, and the public may influence the completion or abandonment of a transaction (Li et al., 2019; Hawn, 2021), the acquirer is the most significant determinant. As, at this stage, a single acquiring company is involved in the negotiations, its bargaining power is greater than that of the target company. Moreover, if an acquisition falls through, the opportunity cost and potential damage borne by the target company are usually greater (Asquith, 1983). Therefore, following Lim and Lee (2016, 2017), we assumed that, after its public announcement, the acquiring company is more likely than the target one to determine the outcome of a transaction. In other words, at the public takeover stage, it is the acquiring company's top managers who largely decide whether a transaction will be completed or abandoned.

As noted by March and Shapira (1987), in risk decision-making, managers tend to view expected return as a positive outcome that increases the likelihood of selecting a risky alternative, and perceived risk as a negative outcome that reduces the such likelihood. As cross-border M&A is an irreversible investment characterized by extensive complexity and uncertainty, it can be regarded as a classic risk decision (Lim and Lee, 2016). When deciding on whether or not to complete an acquisition, managers evaluate its expected benefits and potential risks, which are influenced by country differences such as genetic distance. Whereas genetic distance can increase the expected return of the transaction, it can also lead to significant potential risks. The former motivates managers to complete cross-border M&A, while the latter may lead to M&A abandonment.

In essence, our basic logic is that genetic distance affects the return expected and risk perceived by managers to a cross-border M&A; this, in turn, affects the likelihood of success or failure of a cross-border M&A deal.

2.2.1. The positive side of genetic distance

From a positive perspective, genetic distance can increase the potential benefits of a cross-border M&A. First, genetically different team members can take different perspectives, thus bringing in new ideas, and the complementary characteristics of individuals can also facilitate the synthesis of such ideas (Delis, 2017). Thus, team integration can produce higher-high-quality solutions. Hong and Page (2004) asserted that teams that include multiple problem solvers can outperform those comprising highly competent problem solvers. Also, genetic differences bring diverse skills and knowledge; resources that, combined, can enable the development of new or better products (Zaheer et al., 2011). Robinson and Dechant (1997) pointed out that companies with new hires of different ethnicities tend to have a better understanding of the market and to develop new products. Empirically, Xu et al. (2021) showed that enterprises' cross-border R&D performance improves with the increase in genetic distance.

Second, research on the genetic diversity of board members also provides some evidence. With their empirical study, Delis et al. (2017) found that, for a 1% increase in the standard deviation of the genetic heterogeneity of board directors, the risk-adjusted return increases by 20.8%, and Tobin's q increases by approximately 6.9%. As a concept closely related to genetic distance, ethnic diversity is thought to have the potential to improve the information provided by the board to managers, because such diversity is likely to produce unique information sets, and ethnically diverse directors may bring different perspectives and non-traditional approaches to problem-solving (Carter, 2010). Hence, the acquirer can benefit from board director diversity linked to genetic distance.

Third, the genetic distance increases the flexibility of the merged entity. Genetic diversity breeds companies with unique resources, capabilities, and organizational practices. The integration of firms embedded in different genetic environments reconstructs the organization's genes, which breaks down the organizational rigidity of the acquiring firm and increases organizational flexibility (Barkema and Vermeulen, 1998). As a result, firms are better able to respond to any changes in the external environment, which is conducive to the shaping of competitive advantages and improvements in enterprise performance (Ahern et al., 2015; Teece et al., 1997).

In addition, different genetic backgrounds can lead to systematic differences between countries regarding, among others, social, cultural, and institutional aspects (Guedes et al., 2019; Spolaore and Wacziarg, 2009), which are considered to provide arbitrage opportunities for multinational companies (Ambos and Hakanson, 2014). Doing business in foreign markets to gain arbitrage is the main reason motivating companies to enter the international market (Kogut,1985). In arbitrage, the acquirer may arrange different functional activities in different or distant genetic backgrounds to gain a competitive advantage (Jackson and Deeg, 2008).

In brief, genetic distance provides heterogeneous resources, improves corporate governance and organizational flexibility, and contains arbitrage opportunities, which increases the expected earnings of the M&A managers. Therefore, managers are motivated to complete the transaction.

2.2.2. The downside of genetic distance

From a negative perspective, the genetic distance increases the perceived risk linked to a cross-border M&A. On the one hand, during the public takeover phase, the acquirer's managers tend to obtain as much detailed information about the target company as possible to negotiate and make better decisions (Dow et al., 2016). However, in different genetic environments, obtaining such information in a relatively short time may be challenging. One of the reasons for this is that genetic distance reduces the level of trust. Guiso et al. (2009) found that the genetic distance between countries increases by one standard deviation and bilateral trust decreases by 6%. Qin et al. (2022) reached similar conclusions. A lack of trust leads to the distortion of the objective assessment of each other's trustworthiness (Ang and Kumar, 2014), reducing the willingness of the target company and its stakeholders to provide reliable information (Very and Schweiger, 2001).

Moreover, genetic distance generally causes people to exhibit great differences in appearance, language, values, behaviors, and business practices, which is considered to exacerbate communication barriers and hinder the acquirer's access to adequate information (Spolaore and Wacziarg, 2009). In addition, when managers try to complete an acquisition through negotiation, the lack of trust and the hindrance to communication caused by genetic distance may cause controversy, and even lead to misunderstandings in some unexpected places (Li and Sai, 2020). In this case, it is difficult for managers to reach an agreement, eventually leading to the abandonment of a cross-border M&A.

On the other hand, the genetic distance increases the potential risk involved in the future integration process. Cross-border M&A poses significant challenges, especially in the post-acquisition phase (Zheng et al., 2022). Many cross-border acquisitions fail to integrate, and national distance is considered to be an important reason for this (Ahern et al., 2015). The integration challenges posed by genetic distance are manifold. As mentioned earlier, genetic distance can result in a lack of trust, which reduces the level of cooperation between people (Hamilton, 1975) and increases the cost involved in resource integration. Previous empirical research has also found that genetic distance weakens the diffusion effect of technology (Spolaore and Wacziarg, 2009; Ang and Kumar, 2014).

Furthermore, genetic distance can create serious problems. According to genetic similarity theory, people with different genes tend to form a natural antipathy and to set up mutually hostile environments (Rushton et al., 1984), which makes the process of cross-border M&A integration more complex and highly emotional (Bhal et al., 2009). For example, the genetic distance may cause strong psychological reactions and even the resignation of key employees of the target firm (Pottie-Sherman and Wilkes, 2017; Elsass and Veiga, 1994). Last, although genetic distance makes heterogeneous technology and knowledge resources available, a high genetic distance makes it difficult for the acquirers to accurately evaluate the knowledge assets of their target enterprises (Dikova and Sahib, 2013), Under this condition, managers are more likely to make inefficient decisions in the integration process. As emerging market enterprises tend to select developed country targets with advanced technology (Luo and Tung, 2007), these negative effects also intensify with the increase of genetic distance.

The above two points of view show how the relationship between genetic distance and the completion of cross-border M&A is more complex than a simple linear one. As both of these views are, to some extent, supported by empirical evidence, we proposed a curvilinear relationship suited to integrate them. In this relationship, the positive or negative effects of genetic distance on the completion of cross-border M&A are not infinite. When genetic distance is in a low range, any increase in it improves the expected returns of top managers. At the same time, the risks associated with genetic distance are generally controllable. In this context, the decision-makers tend to pursue the benefits of genetic distance and are thus more likely to decide to complete the transaction. However, with the increase of genetic distance, the risk level perceived by decision-makers increases at a disproportionately high rate, while excessively heterogeneous resources also challenge the managers' capabilities. In this case, rather than seizing opportunities in overseas markets, managers are more concerned about risk, especially when considering the irreversible characteristics of cross-border M&A (Sha et al., 2020). Therefore, managers are more likely to take a cautious approach, which is likely to lead to the abandonment of the merger.

In conclusion, we proposed that a relatively low level of genetic distance is more likely to lead to the completion of a cross-border acquisition. This is true until genetic distance reaches a threshold after which it will cause decision-makers to abandon the transaction. Thus, we proposed the following hypothesis:

Hypothesis. Genetic distance and cross-border M&A completion are in an inverted U-shaped relationship, whereby genetic distance is positively related to M&A completion only up to a certain point, after which the relationship becomes negative.

3. Research design

3.1. Data

Our research sample was made up of cross-border M&A initiated by Chinese firms between 1996 and 2019. The data were obtained from the Thomson Financial Security Data Corporation (SDC) database, which held the details of each deal, including its announcement and completion dates, transaction status, acquired equity, payment method, and basic information on both parties—such as their industries and listing status. From the SDC database, we drew all cross-border M&A events about Chinese firms engaged in M&A in the sample period and obtained a total of 5,612 records. We then screened the samples according to the following criteria. First, we excluded any M&A events with 'rumor' status, unknown final status, and those in which the acquirers had been non-corporate. Second, we deleted any transactions in which the target companies were located in Hong Kong, Macau, Taiwan, the Cayman Islands, the Virgin Islands, Bermuda, etc. Third, we excluded those with missing values. We were finally left with a sample of 3,329 observations. In addition, we filled the control variables with a small number of missing data with the mean values. Table 1 reports the locational distribution, genetic distance, and completion rates of the cross-border M&A in our sample.

Table 1
Sample description

Host country	Number of M&A announcements	Genetic distance	M&A completion rate
America	647	1.199	0.688

Australia	371	1.119	0.612
German	220	1.261	0.745
Singapore	199	0.195	0.638
Canada	191	1.113	0.670
England	179	1.136	0.760
Japan	120	0.522	0.733
Italy	113	1.207	0.708
France	111	1.145	0.766
Korea	100	0.483	0.670
Netherlands	68	1.269	0.676
Malaysia	58	0.503	0.586
Russia	55	1.199	0.600
Brazil	54	1.286	0.704
Other countries	843	1.168	0.676

3.2. Variables

3.2.1. Dependent variables

The dependent variable is the *completion of cross-border M&A* (*Compl*), a dummy variable the value of which is determined by the final status of the M&A transaction in the SDC database. Specifically, it was assigned a value of 1 if the status of the cross-border acquisition was marked as 'completed', and a value of 0 otherwise.

3.2.2. Independent variable

The independent variable is the *genetic distance (GD)*, which has been measured in many ways. The early measurements are generally based on morphological distances, in a direct application of Mahalanobis's (1936) D^2 statistic to gene frequency data (Sanghvi,1953; Balakrishnan and Sanghvi,1968). In these methods, the genetic distance is measured by the distance between the corresponding points of two populations in space. However, the absolute values of these measurements do not hold any specific biological meaning (Nei,1978). By contrast, the *Fst* and *Nei* measures of genetic distance are advantageous because such methods measure the number of codon replacements per gene after the two populations have separated (Nei, 1978). Thus, their absolute values have clear biological significance—i.e., they can accurately capture the time elapsed since the last common ancestors of two populations (Nei, 1978).

Therefore, *Fst* and *Nei* as the measurements of genetic distance are the most commonly adopted by scholars. Although the *Fst* and *Nei* distances are highly correlated—with a correlation coefficient of 93.9% (Spolaore and Wacziarg, 2009)—the former is more widely used because it is a more precise indicator of genetic distance in the context of the few new mutations occurring during the study period, which coincides with the period of modern human evolution (Cavalli-Sforza et al.,1994; Ang and Kumar, 2014). Therefore, we adopt the *Fst* measure of genetic distance. It is important to emphasize that the genes here refer to neutral alleles, which do not provide any selective advantage and are independent of environmental characteristics and are thus best suited to the reconstruction of evolutionary history.

As our focus is on the genetic distance at the national level, and Cavalli-Sforza et al. (1994) only provide population-level data, we use the measurement method provided by Spolaore and Wacziarg (2009). In this approach, genetic distance data between ethnic groups (Cavalli-Sforza et al., 1994) and national ethnic data (Alesina et al., 2003) are matched and country-level genetic distance data are obtained in a weighted manner. The specific calculation formula is as follows:

$$Fst_{AB} = \sum_{i=1}^{I}\sum_{j=1}^{J}(P_{Ai} \times P_{Bj} \times d_{ij})$$

Where Fst_{AB} represents the genetic distance between country A and country B. Country A contains ethnic groups $i = 1 \ldots I$ and country B contains groups $j = 1 \ldots J$. P_{Ai} is the share of ethnic group i in country A and P_{Bj} is that of ethnic group j in country B. d_{ij} is the genetic distance between ethnic groups i and j. In addition, for the sake of analysis, we divided the data obtained from Spolaore and Wacziarg (2009) by 100.

3.2.3. Control Variables

In line with the existing research (Zhang et al., 2011; Li et al., 2019; Li and Sai, 2020; Lawrence et al., 2021), we include three levels of control variables that have been identified in the literature to explain cross-border M&A completion—i.e., firm-, transaction-, and country-level factors.

At the firm level, the *Soe* (state-owned enterprise) dummy variable refers to the ownership attribute of the acquirer. As such, it is set to 1 if the acquirer firm was state-owned and to 0 otherwise. Compared with *non-Soe* ones, *Soe* firms may face issues of opaqueness during cross-border M&A (Li et al., 2019). The dummy variable *Exper* indicates whether a firm had experience in cross-border M&A (1) or not (0). Previous studies have shown that, in the process of public acquisition, prior acquisition experience may help to complete transactions in new locations (Very et al., 2001). We use the *Tgov* dummy variable to indicate whether the government is involved as the seller (1) or not (0). This distinction is based on the argument that a host government may intervene against foreign firms in an acquisition deal. (Bertrand et al., 2016). The *Tlist* dummy variable is set to 1 when the target is a public company and to 0 otherwise. companies are generally considered harder to acquire because of their large size and the tougher regulations involved (Li and Sai, 2020).

At the transaction level, the *Relev* dummy variable indicates whether the acquirer and the target shared the same SIC industry code (1) or not (0). Cross-border M&A within the same industry is characterized by lower information asymmetry, which is thus conducive to deal completion (Li and Sai, 2020). The *Sought* variable is set as the percentage of ownership sought by the acquirer. Seeking a bigger stake can lead to target companies and host governments setting up higher hurdles (Li et al., 2019). The *Cash* dummy variable indicates whether the transaction involved a single cash payment (1) or not (0). Cash payments increase the acquirer's financial burden and acquisition risk, thus reducing the likelihood of acquisition completion (Zhou et al., 2016). The *Friend* dummy is set to 1 if the transaction was described as *Friendly* and to 0 otherwise, and the *Advis* one to reflect the number of consultants hired by the acquirer. Lawrence et al. (2021) found that these two variables have a positive impact on M&A completion.

At the national level, we include the institutional and cultural distances and contiguity. Institutional distance (*ID*) captures the differences in the regulative and normative aspects of the institutional environments between the two countries. Dikova et al. (2010) showed that cross-border M&A completion is correlated with institutional distance. Following He and Zhang (2018), we measure the institutional distance between the host country and China in terms of the absolute difference in institutional quality, which we calculated as the average of the six *Worldwide Governance Indicators*. These six dimensions include voice and accountability, political stability, government effectiveness, control of corruption, regulatory quality, and rule of law. Cultural distance (*CD*) is defined as the difference between national cultures. Dikova et al. (2010) found that cultural distance reduces transaction completion likelihood and that different cultural dimensions have different influences. Based on Hofstede's six cultural dimensions—i.e., individualism, power distance, masculinity, uncertainty avoidance, long-term orientation, and indulgence—we calculated cultural distance following the approach developed by Kogut and Singh (1988). The formula is as follows: $CD_j = \sum_{k=1}^{6}\{(D_{ij} - D_{iCN})^2 / V_i\}/6$. Where D_{ij} represents the value taken by cultural dimension *i* in country *j*; V_i represents the variance index of dimension *i*; and *CN* denotes China. The *Contig* dummy variable represents contiguity, reflecting the geographical proximity of the host country and China. Following Lawrence et al. (2021), *Contig* was set to 1 if the host country shared a border with China, and to 0 otherwise.

Table 2

Definition of variables. and data sources

Variables	Description	Data sources
Compl	A dummy variable set to 1 if the transaction status was marked as *Completed*, and to 0 otherwise.	SDC database
GD	The *Fst* measure of the genetic distance between the two countries.	Spolaore and Wacziarg (2009).
Soe	A dummy variable set to 1 if the acquirer was a state-owned enterprise, and to 0 otherwise.	SDC database
Exper	A dummy variable set to 1 if the acquirer had prior cross-border M&A experience, and to 0 otherwise.	SDC database
Tgov	A dummy variable set to 1 if the government was involved as the selling side, and to 0 otherwise.	SDC database
Tlist	A dummy variable set to 1 if the target was a company, and to 0 otherwise.	SDC database
Relev	A dummy variable set to 1 if the acquirer and target shared a common SIC industry code, and to 0 otherwise.	SDC database
Sought	The proportion of equity sought by the acquirer.	SDC database
Cash	A dummy variable set to 1 if the transaction involved a single cash payment, and to 0 otherwise.	SDC database
Friend	A dummy variable set to 1 if the transaction attitude was marked as *Friendly*, and to 0 otherwise.	SDC database
Advis	The number of different types of consultants retained by the acquirer.	SDC database

ID	The absolute difference in institutional quality is calculated as the average of the six *Worldwide Governance Indicators*.	World Bank
CD	Indicates the differences in Hofstede's cultural dimensions between the host country and China, calculated based on the method proposed by Kogut and Singh (1988).	http://geerthofstede.com/
Contig	A dummy variable was set to 1 if the host country shared a border with China, and to 0 otherwise.	Map of China

3.3. Model specifications

As our dependent variable is dichotomous, we used logistic regression and introduced genetic distance and its squared term. The regression model was set as follows:

$$Pr(Compl = 1) = \Lambda(\alpha + \beta_1 GD + \beta_2 GD^2 + \lambda_i \sum Control_i)$$

where $\Lambda(Z)= e^Z / (1+e^Z)$; e is the exponential function; a is the constant term; β_1 is the coefficient of genetic distance; β_2 is the coefficient of the square term of the genetic distance; $Control_i$ represents each control variable, and λ_i refers to the coefficient of each control variable. In addition, following Li and Sai (2020), we include time and industry effects in our regression model. Importantly, based on existing studies (Frijns et al., 2016; Ashraf et al., 2022), we compute two-way clustered robust standard errors at the firm (acquirer) and country (host) levels in the regressions.

4. Results

4.1. Descriptive statistics

Table 3 reports the descriptive statistics and correlation coefficient matrices of our variables. Our statistics show that the average completion rate of our sample Chinese cross-border M&A is 68.1%, lower than the global average of 76% calculated by Li and Sai (2020). We found the mean of the genetic distance to be 1.061 and its standard deviation to be 0.415. We also present the means and standard deviations for the other variables used in the analysis. In terms of correlation, we found the correlation coefficient between transaction completion and genetic distance to be 0.028. In particular, in line with previous studies (Spolaore and Wacziarg, 2016), we found a strong correlation between genetic distance and cultural distance, with a correlation coefficient of 0.575. We also calculated the VIF for each variable and found these values to be all lower than the accepted rule-of-thumb threshold of 10 (Neter et al., 1985), indicating the absence of any multicollinearity problem in our analysis.

Table 3

Descriptive statistics and correlations.

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
1 *Compl*	1													
2 *GD*	0.028	1												
3 *Soe*	-0.004	0.094	1											
4 *Exper*	0.025	0.054	0.163	1										
5 *Tgov*	-0.032	0.016	0.185	0.053	1									
6 *Tlist*	-0.098	-0.049	0.064	0.046	-0.048	1								
7 *Relev*	0.039	0.007	0.097	0.082	0.037	-0.051	1							
8 *Sought*	0.115	0.070	-0.081	-0.067	-0.013	-0.361	0.031	1						
9 *Cash*	-0.042	-0.061	0.022	-0.036	-0.014	0.182	-0.010	-0.267	1					
10 *Friend*	0.065	0.030	-0.083	-0.061	-0.042	-0.117	-0.018	0.164	0.006	1				
11 *Advis*	0.082	0.028	0.135	0.100	0.051	0.088	0.010	0.078	0.053	-0.004	1			
12 *ID*	0.040	-0.034	-0.057	-0.088	-0.097	0.185	-0.048	0.052	0.046	0.040	0.038	1		
13 *CD*	-0.024	0.575	0.044	0.025	-0.023	0.110	-0.006	-0.011	0.040	0.002	-0.017	0.197	1	
14 *Contig*	-0.056	-0.050	0.059	0.067	0.076	-0.036	0.029	-0.071	-0.011	-0.036	-0.022	-0.458	-0.194	1
Mean	0.681	1.061	0.276	0.284	0.064	0.184	0.324	66.42	0.538	0.94	0.275	3.076	0.053	1.541
St. Dev	0.466	0.415	0.447	0.451	0.245	0.388	0.429	34.13	0.499	0.238	0.616	1.27	0.223	0.639

4.2. Main results

Table 4 shows the results of the logistic regressions, in which two-way clustered robust standard errors at the firm and country levels are used. Column 1 is a basic model that merely includes the control variables. The results for the control variables show that, when the acquirer has previous M&A experience, both parties operate in the same industry, the equity sought is high, the attitude towards M&A is friendly, and the acquirer hires consultants, the likelihood of acquisition being completed will significantly increase. Conversely, sell-side government-owned involvement, target company, and national contiguity significantly reduce the probability of cross-border acquisition completion. These results are consistent with previous studies (Very et al., 2001; Bertrand et al., 2016; Li and Sai, 2020; Lawrence et al., 2021). In particular, cultural distance tends to hinder

M&A completion, which is consistent with the study of Dikova et al. (2010).

Column 2 adds the explanatory variable genetic distance, and the results show that genetic distance has a significant and positive impact on the likelihood of completion ($\beta = 0.378$, $p < 0.01$). Column 3 further adds the squared term of genetic distance (GD^2). It shows that genetic distance ($\beta = 1.235$, $p < 0.01$) is positively related to completion, whereas genetic distance squared ($\beta = -0.346$, $p < 0.01$) is negatively related to it, which implies an inverted U-shaped relationship between genetic distance and cross-border M&A completion.

Table 4

Effect of genetic distance on the completion of cross-border M&A.

Variables	(1)	(2)	(3)
GD		0.378***	1.235***
		(0.137)	(0.240)
GD²			-0.346***
			(0.090)
Soe	-0.018	-0.043	-0.035
	(0.112)	(0.112)	(0.111)
Exper	0.292**	0.286**	0.279**
	(0.124)	(0.121)	(0.122)
Tgov	-0.312*	-0.318*	-0.289*
	(0.174)	(0.171)	(0.164)
Tlist	-0.502***	-0.472***	-0.485***
	(0.167)	(0.166)	(0.164)
Relev	0.361***	0.360***	0.354***
	(0.111)	(0.108)	(0.107)
Sought	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)
Cash	-0.080	-0.062	-0.048
	(0.170)	(0.174)	(0.176)
Friend	0.526***	0.513***	0.502***
	(0.160)	(0.159)	(0.161)
Advis	0.349**	0.339**	0.338**
	(0.166)	(0.163)	(0.165)
ID	0.078	0.106	0.030
	(0.096)	(0.084)	(0.081)
CD	-0.058	-0.130***	-0.159***
	(0.059)	(0.046)	(0.039)
Contig	-0.555***	-0.570***	-0.736***
	(0.208)	(0.176)	(0.175)
Year/industry dummy	Yes	Yes	Yes
Obs.	3318	3318	3318
Pseudo R^2	0.078	0.080	0.083
Log likelihood	-1914.751	-1910.260	-1904.012

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively. Standard errors presented in parentheses are clustered at the firm and country levels.

However, a quadratic term that is significantly negative is not sufficient to indicate an inverted U-shaped relationship between the variables. Thus, the inverted U-shaped relationship needed to be further confirmed according to the criteria proposed by Lind et al. (2010), and Table 5 reports the test results. It shows that the slopes of the lower (β = 1.15, $p < 0.01$) and upper boundaries (β = -0.835, $p < 0.01$) of the data range were found to be significant at the 1% level, indicating that both slopes are sufficiently steep. At the same time, the extreme point was found to be equal to 1.785, which is located well within the data range (from 0.123 to 2.993). In addition, the overall inverted U-shaped relationship was found to be significant at the 1% level ($p = 0.023$), thus excluding a monotonic or U relationship.

Table 5
Inverted U-shaped relationship test (Fieller method)

Testing Items	Results
Interval	[0.123; 2.993]
Lower bound Slope	1.150***
Upper bound Slope	-0.835***
Extreme point	1.785
95% Fieller interval for extreme point	[1.415, 2.611]
Overall test of an Inverted U shape	t=2.35; P>|t|=0.009

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively.

Figure 1 depicts the effect of genetic distance on the likelihood of cross-border M&A completion. As shown in Figure 1, in the lower range of genetic distance, genetic distance was found to be positively related to such likelihood. However, beyond a certain value (1.785), it was found to be negatively related to it. Therefore, we found sufficient evidence for the existence of an inverted U-shaped relationship between genetic distance and cross-border M&A completion. Thus, we found our hypothesis to be fully supported.

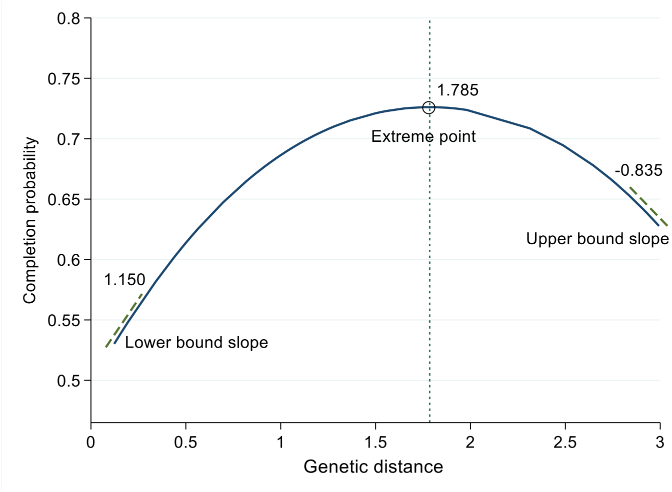

Fig. 1. The inverted U-shaped relationship between genetic distance and completion.

4.3. Endogeneity test

An endogenous problem could have affected the identification of the causal relationship between genetic distance and cross-border M&A completion. It has been shown that international investment related to economic globalization enhances migratory flows, which may influence genetic distance (Sanderson and Kentor, 2008). To alleviate this possible endogeneity problem, we used genetic distance in 1500 C.E. as an instrumental variable. Around 1500 C.E., widespread voyages of geographic discovery began and humans first established global connections, breaking the relative isolation that had hitherto existed between continents. The ensuing mass migration changed the genetic distance between populations, which evolved to form the genetic distance found between countries today. Therefore, the genetic distance in 1500 C.E. is closely related to the current one, which satisfies the condition of correlation. At the same time, contemporary international investment activities are unlikely to be related to the genetic distance found 500 years ago, thus satisfying the exogeneity condition of instrumental variables.

We performed a two-stage regression and the results are shown in Table 6. Column 1 of Table 6 shows that accounted for the endogeneity problem, the genetic distance was found to be significantly positive at the 1% level and the squared term of genetic distance to be significantly negative at the 1% level, which supports our hypothesis. The results of the AR and the Wald statistics were both significant at the 1% level, indicating that the instrumental variable was not unidentifiable or weak.

Table 6
Endogeneity test.

Variables	(1)	(2)	(3)
	Second stage	First stage	First stage
	Compl	*GD*	*GD^2*
GD	0.693***		
	(0.173)		
GD^2	-0.161***		
	(0.062)		
IVGD		0.359***	-0.410***
		(0.008)	(0.025)
$IVGD^2$		0.032***	0.444***
		(0.002)	(0.007)
Soe	-0.022	0.014**	0.040**
	(0.062)	(0.006)	(0.018)
Exper	0.170***	-0.005	-0.014
	(0.058)	(0.006)	(0.016)
Tgov	-0.179*	0.008	0.039
	(0.100)	(0.010)	(0.029)
Tlist	-0.294***	-0.010	-0.017
	(0.069)	(0.007)	(0.020)
Relev	0.214***	-0.008	-0.030*
	(0.064)	(0.006)	(0.018)
Sought	0.002***	-0.000	-0.000
	(0.001)	(0.000)	(0.000)
Cash	-0.026	0.005	0.016
	(0.051)	(0.005)	(0.015)
Friend	0.306***	0.007	0.031
	(0.100)	(0.010)	(0.030)
Advis	0.197***	-0.001	-0.013
	(0.043)	(0.004)	(0.012)
ID	0.034	-0.014***	-0.137***
	(0.047)	(0.005)	(0.013)
CD	-0.107***	0.068***	0.165***
	(0.026)	(0.002)	(0.007)
Contig	-0.426***	-0.004	-0.165***
	(0.123)	(0.012)	(0.036)
Year/industry dummy	Yes	Yes	Yes
Constant	-0.762	0.213***	0.334**
	(0.500)	(0.051)	(0.151)
Obs.	3318	3318	3318

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively, and standard errors are in parentheses.

4.4. Robustness test

To test for robustness, we used three strategies the results of which are shown in Table 7. First, we changed the measurement of genetic distance. Such measurement is relatively complicated and scholars provide different methods. In addition to *Fst* value mentioned above, *Nei* value is also commonly used. To reduce the estimation bias brought by the variable measurement, we used the *Nei* value as an alternative measurement. The results are shown in column 1 of Table 7. The coefficient of genetic distance was found to be significantly positive at the 1% level, and its squared term was significantly negative at the 1% level, which is highly consistent with the above results. Second, we changed the sample. Due to its particularity, we excluded cross-border M&A events in the financial industry. The results are presented in column 2. The coefficients of genetic distance and its squared term were found to be consistent with our expectations and highly significant. Third, to reduce model selection bias, we used the Probit model for regression, and the results, which are shown in Column 3, still support our hypothesis. Moreover, to confirm the inverted U-shaped relationship between genetic distance and cross-border M&A completion in the above three models, we again carried out tests according to the criteria provided by Lind et al. (2010), and the results were still found to be valid.

Table 7

Robustness tests.

Variables	(1) Alternative measurement of the explanatory variable	(2) Exclude financial sector	(3) Probit regression
GD	0.721***	1.312***	0.743***
	(0.162)	(0.252)	(0.146)
GD^2	-0.135***	-0.351***	-0.209***
	(0.046)	(0.098)	(0.054)
Soe	-0.041	-0.052	-0.017
	(0.111)	(0.135)	(0.067)
Exper	0.274**	0.274**	0.170**
	(0.122)	(0.137)	(0.072)
Tgov	-0.291*	-0.155	-0.174*
	(0.164)	(0.190)	(0.098)
Tlist	-0.492***	-0.334*	-0.301***
	(0.163)	(0.187)	(0.098)
Relev	0.355***	0.455***	0.211***
	(0.107)	(0.115)	(0.064)
Sought	0.004***	0.004***	0.002***
	(0.001)	(0.002)	(0.001)
Cash	-0.050	-0.020	-0.028
	(0.176)	(0.200)	(0.102)
Friend	0.500***	0.543***	0.307***
	(0.161)	(0.162)	(0.095)
Advis	0.340**	0.322	0.199**
	(0.165)	(0.203)	(0.087)
ID	0.023	0.103	0.018
	(0.082)	(0.086)	(0.048)
CD	-0.153***	-0.177***	-0.098***
	(0.038)	(0.041)	(0.023)
Contig	-0.717***	-0.645***	-0.447***

	(0.161)	(0.149)	(0.104)
Year/industry dummy	Yes	Yes	Yes
Constant	-1.179**	-1.415**	-0.741**
	(0.502)	(0.656)	(0.303)
Obs.	3318	2618	3318
Pseudo R^2	0.0832	0.0838	0.0837
Log likelihood	-1904.356	-1547.554	-1903.235

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively. Standard errors presented in parentheses are clustered at the firm and country levels.

5. Further analysis

So far, our evidence indicated that the relationship between genetic distance and cross-border M&A completion takes an inverted U-shaped relationship. However, this is not always the case. Therefore, we selected firm-, industry- and country-level factors to conduct heterogeneity tests aimed at clarifying the heterogeneous effects of genetic distance in different contexts.

5.1. Firm-level heterogeneity

The diverse types of firm ownership are an important feature of emerging markets, and numerous studies have shown that state-owned and non-state-owned acquirers present significant differences in many respects (Cuervo-Cazurra, et al., 2023). Therefore, the impact of genetic distance on the completion of cross-border M&A may vary with firm ownership type. The results—presented in columns 1 and 2 of Table 8—show that the inverted U-shaped relationship is significant for both state-owned and non-state-owned acquirers. Nevertheless, the effect of genetic distance was found to differ among them, as depicted in Figure 2. On the one hand, the apex point of the inverted U-shaped curve was found to be shifted to the right for SOE acquirers, indicating that such companies can benefit from a wider range of values of genetic distance. On the other hand, the curves for SOE acquirers on both sides of the apex point were found to be steeper, indicating that the positive and negative effects of genetic distance on M&A completion are stronger for such acquirers. A possible explanation is that state-owned acquirers generally are larger and have lower financing constraints, which, to some extent, reduces the level of perceived risk caused by genetic distance. Moreover, to reap the complementary benefits of genetic distance, SOE acquirers may complete the transaction through higher premiums or political connections. Therefore, the positive effect of genetic distance is stronger to the left of the apex point. At the same time, SOE acquirers are deeply rooted in the institutional environments of their home countries and have greater organizational rigidity (Cuervo-Cazurra et al., 2014), and it is especially difficult for them to adjust their strategies and structures quickly in the presence of high genetic distances, which increases the risk about future integration. Thus, the negative effects of genetic distance are amplified to the right of the apex point.

According to whether our sample acquirers were abroad, we performed a grouping regression, and the results are shown in columns 3 to 5 of Table 8. Column 3 shows that, for acquirers abroad, the coefficient of the squared term of genetic distance was found not to be significant, indicating that the inverted U-shaped relationship does not apply. Column 4 presents the results of our further analysis of the linear relationship, whereby we found that, for companies abroad, genetic distance has a positive and linear influence on the likelihood of cross-border M&A completion. In contrast, for acquirers not abroad, column 5 shows an inverted U-shaped relationship between genetic distance and the likelihood of cross-border M&A completion. A possible reason is that being abroad can reduce the information asymmetry of acquirers and reduce the risk perception levels of decision-makers. Therefore, the negative effect of genetic distance on the likelihood of cross-border M&A completion is offset. However, acquirers not abroad do not have such advantages, so the relationship between genetic distance and the likelihood of cross-border M&A completion remains inverted U-shaped.

Table 8
Heterogeneity analysis of firm-level factors.

	(1)	(2)	(3)	(4)	(5)
Variables	SOE	Non-SOE	Overseas listing	Overseas listing	Non-overseas listing
GD	2.093***	1.147***	1.273**	0.639*	1.140***
	(0.415)	(0.373)	(0.518)	(0.340)	(0.314)
GD²	-0.542***	-0.382**	-0.257		-0.341***
	(0.133)	(0.155)	(0.213)		(0.118)
Soe			-0.087	-0.104	-0.088
			(0.376)	(0.380)	(0.128)

Exper	0.666**	0.095	0.437*	0.447*	0.309**
	(0.291)	(0.132)	(0.244)	(0.246)	(0.133)
Tgov	-0.465*	-0.051	0.263	0.276	-0.470**
	(0.254)	(0.258)	(0.547)	(0.544)	(0.193)
Tlist	-1.130***	-0.236	-0.213	-0.179	-0.643***
	(0.236)	(0.203)	(0.448)	(0.446)	(0.169)
Relev	0.622***	0.245**	1.029**	1.044**	0.204**
	(0.235)	(0.122)	(0.409)	(0.407)	(0.104)
Sought	-0.002	0.006***	0.007	0.007	0.004**
	(0.002)	(0.001)	(0.005)	(0.005)	(0.002)
Cash	0.113	-0.072	0.329	0.348	-0.190
	(0.232)	(0.181)	(0.248)	(0.252)	(0.223)
Friend	0.386	0.630**	1.247**	1.258**	0.423***
	(0.273)	(0.306)	(0.559)	(0.554)	(0.161)
Advis	0.332	0.394***	0.365	0.327	0.352*
	(0.303)	(0.114)	(0.260)	(0.255)	(0.189)
ID	0.113	-0.060	0.373	0.421	0.027
	(0.174)	(0.096)	(0.255)	(0.264)	(0.094)
CD	-0.180**	-0.152***	-0.112	-0.083	-0.155***
	(0.089)	(0.050)	(0.100)	(0.100)	(0.049)
Contig	-0.382	-1.066***	-0.304	-0.177	-0.666***
	(0.307)	(0.232)	(0.459)	(0.451)	(0.216)
Year/industry dummy	Yes	Yes	Yes	Yes	Yes
Constant	-1.239	-1.710***	-5.051***	-4.885***	-0.539
	(1.022)	(0.630)	(1.016)	(1.021)	(0.869)
Obs.	889	2393	540	540	2701
Pseudo R^2	0.147	0.090	0.191	0.190	0.0867
Log likelihood	-474.933	-1362.526	-285.049	-285.487	-1533.603

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively. Standard errors presented in parentheses are clustered at the firm and country levels.

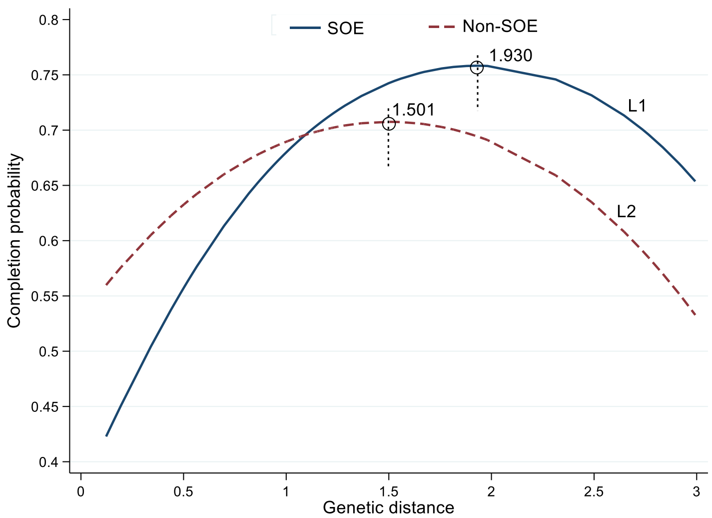

Fig. 2. Heterogeneous effects of state-owned and non-state-owned acquirers.

5.2. Industry-level heterogeneity

The impact of genetic distance on the likelihood of cross-border M&A completion may vary by industry. In line with the 2007 US Foreign Investment and National Security Act, we defined the following industries as sensitive: strategic natural resources (such as coal, oil, and natural gas), defense, finance, and telecommunications. On this basis, we carried out a grouping regression according to whether the target enterprises belonged to a sensitive industry. The results are presented in Table 9. Columns 1 and 2 show that the inverted U-shaped relationship between genetic distance and the likelihood of cross-border M&A completion was found to be significant for both sensitive and non-sensitive industries. However, the effects of genetic distance were found to differ between the two types of industries. As shown in Figure 3, the effect of genetic distance reaches its apex point earlier for sensitive industries. This indicates that, when the enterprises involved in M&As belong to such industries, the range wherein genetic distance has a positive effect on the likelihood of M&A completion is narrower. At the same time, the curve to the right of the apex point was found to be steeper for sensitive industries, indicating that the negative effect of genetic distance on the likelihood of M&A completion increases sharply passed the apex point. One possible explanation is that sensitive industries are the focus of stricter host country regulatory scrutiny, which increases the legitimacy pressure on acquirers and makes the expected return of acquisitions more uncertain. As a result, the positive effect of genetic distance on the likelihood of cross-border M&A completion in sensitive industries is weakened, while the negative effect is strengthened.

We also conducted a grouping regression according to whether the acquirers belonged to high-tech industries, and the results are presented in columns 3 to 5 of Table 9. Columns 3 and 4 show that for high-tech industry acquirers, both the inverted U-shaped and linear relationships between genetic distance and the likelihood of acquisition completion were found not to be significant. A likely reason is that cross-border M&As in high-tech industries tend to be aimed at seeking creative assets such as technology and knowledge. However, the genetic distance both increases the potential for synergy and impedes knowledge sharing, causing any positive and negative effects to cancel each other out. Column 5 shows that the inverted U-shaped relationship between genetic distance and the likelihood of acquisition completion was found to remain significant for acquirers in non-high-tech industries.

Table 9
Heterogeneity Analysis of industry-level factors.

Variables	Target industry		Acquirer industry		
	Sensitive	Non-sensitive	High-tech		Non-high-tech
	(1)	(2)	(3)	(4)	(5)
GD	1.075**	1.427***	1.511	0.100	1.356***
	(0.433)	(0.256)	(1.001)	(0.327)	(0.241)
GD^2	-0.357**	-0.385***	-0.752		-0.359***
	(0.159)	(0.097)	(0.553)		(0.087)
Soe	0.216	-0.101	-0.093	-0.079	-0.033
	(0.232)	(0.146)	(0.303)	(0.291)	(0.121)
Exper	0.075	0.325**	-0.127	-0.107	0.391***
	(0.204)	(0.147)	(0.190)	(0.191)	(0.126)
Tgov	0.033	-0.503**	0.431	0.393	-0.374**
	(0.402)	(0.201)	(0.487)	(0.496)	(0.174)
Tlist	-0.814***	-0.333*	0.031	0.055	-0.580***
	(0.245)	(0.184)	(0.299)	(0.305)	(0.176)
Relev	0.215	0.340**	0.449**	0.474**	0.301**
	(0.173)	(0.147)	(0.226)	(0.228)	(0.125)
Sought	0.005*	0.004***	0.007**	0.008**	0.003*
	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)
Cash	0.143	-0.130	-0.116	-0.122	-0.002
	(0.215)	(0.205)	(0.356)	(0.349)	(0.157)
Friend	0.659***	0.450***	1.184**	1.221***	0.373**
	(0.249)	(0.174)	(0.491)	(0.467)	(0.170)
Advis	0.163	0.439*	0.498**	0.496**	0.300*
	(0.169)	(0.250)	(0.199)	(0.206)	(0.177)
ID	-0.019	0.009	0.078	0.135	0.009
	(0.156)	(0.087)	(0.149)	(0.164)	(0.089)
CD	-0.175**	-0.151***	0.001	0.033	-0.204***
	(0.069)	(0.058)	(0.095)	(0.093)	(0.044)
Contig	-0.766**	-0.793***	-0.405	-0.194	-0.805***
	(0.311)	(0.213)	(0.431)	(0.419)	(0.239)
Constant	-1.466	-0.937	-1.729	-1.385	-0.972*
	(1.141)	(0.588)	(2.408)	(2.461)	(0.523)
Year/industry dummy	Yes	Yes	Yes	Yes	Yes
Obs.	1022	2265	799	799	2481
Pseudo R^2	0.121	0.099	0.118	0.114	0.087
Log likelihood	-555.690	-1285.449	-439.163	-441.086	-1421.786

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively. Standard errors presented in parentheses are clustered at the firm and country levels.

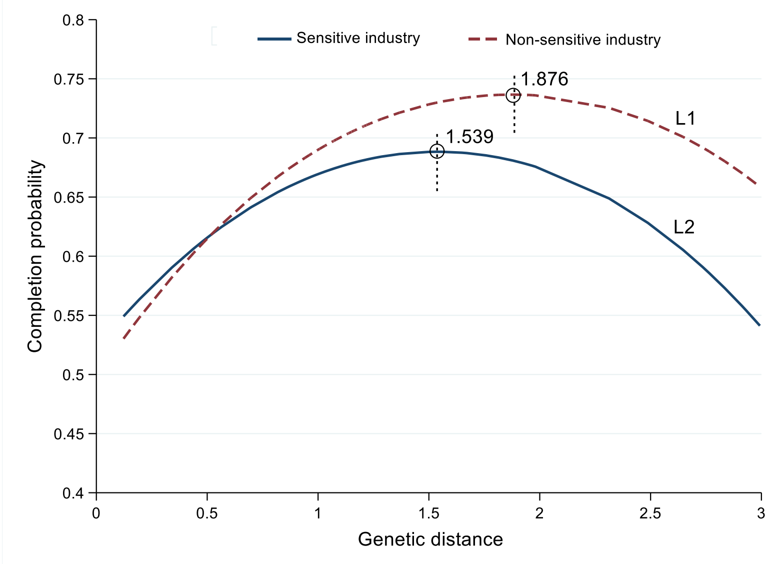

Fig. 3. Heterogeneous effects of sensitive and non-sensitive industry.

5.3. Country-level heterogeneity

In this section, we focus on the heterogeneity effect of bilateral relations and host country institutional quality. We first obtained data on bilateral investment treaties (BIT) from the UNCTAD website. Then, we carried out a group regression according to whether or not the two countries had signed a BIT, and the results are reported in Table 10. Column 1 shows that when the two countries had signed a BIT, an inverted U-shaped relationship was found between genetic distance and the likelihood of cross-border M&A completion. Conversely, Table 2 shows that, when the two countries had not signed a BIT, the inverted U-shaped relationship between genetic distance and the likelihood of acquisition completion was not significant. Further, the results of the linear relationship test—presented in column 3—show that genetic distance tends to inhibit cross-border M&A completion, albeit not significantly. A possible explanation is that, in the absence of a BIT between the two countries, transnational investment is marred by greater uncertainty (Desbordes and Vicard, 2009), and the negative impact of genetic distance is therefore amplified.

In addition, we divided our sample into two groups based on the average host country's institutional quality. On this basis, we conducted a grouping test. The results, presented in column 4 of Table 10, show that, when host country institutional quality is high, the inverted U-shaped relationship between genetic distance and the likelihood of cross-border M&A completion is not significant. Furthermore, column 5 shows that the coefficient of genetic distance was found to be significantly positive (β=1.022, $p < 0.01$), indicating a linear positive relationship between genetic distance and the likelihood of cross-border acquisition completion. One possible explanation is that high target country institutional quality enables the acquirer to better understand the environment and mitigates uncertainty (Li and Sai, 2020), which helps to address the issues caused by genetic distance. However, when the host country's institutional quality is low, there is still an inverted U-shaped relationship between genetic distance and the likelihood of cross-border M&A completion.

Table 10

Heterogeneity analysis of country-level factors.

Variables	BIT	Non-BIT		Higher quality		Lower quality
	(1)	(2)	(3)	(4)	(5)	(6)
GD	1.219***	0.702	-0.344	2.633**	1.022***	1.020***
	(0.265)	(2.447)	(0.319)	(1.097)	(0.268)	(0.370)
GD²	-0.335***	-0.267		-1.041		-0.276**
	(0.115)	(0.597)		(0.704)		(0.120)
Soe	-0.093	0.010	0.003	0.108	0.118	-0.251
	(0.138)	(0.146)	(0.146)	(0.153)	(0.152)	(0.165)
Exper	0.363***	0.192	0.190	0.237*	0.244*	0.304*
	(0.139)	(0.146)	(0.147)	(0.132)	(0.131)	(0.171)
Tgov	-0.268	-0.459	-0.471	-0.177	-0.181	-0.450
	(0.170)	(0.400)	(0.404)	(0.207)	(0.206)	(0.288)
Tlist	-0.622***	-0.229	-0.238	-0.481**	-0.467**	-0.572**
	(0.172)	(0.461)	(0.455)	(0.209)	(0.207)	(0.273)
Relev	0.369***	0.342	0.344	0.566***	0.573***	0.145
	(0.118)	(0.220)	(0.222)	(0.118)	(0.119)	(0.128)
Sought	0.003	0.006***	0.006***	0.003*	0.003*	0.005**
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Cash	0.055	-0.320	-0.323	0.094	0.105	-0.206
	(0.150)	(0.311)	(0.308)	(0.185)	(0.180)	(0.203)
Friend	0.667***	0.284	0.284	0.304	0.309	0.614***
	(0.215)	(0.244)	(0.242)	(0.240)	(0.240)	(0.188)
Advis	0.289	0.474***	0.480***	0.368	0.364	0.342**
	(0.178)	(0.153)	(0.154)	(0.234)	(0.232)	(0.160)
ID	0.085	-0.173	-0.185	0.339	0.186	0.048
	(0.102)	(0.322)	(0.323)	(0.381)	(0.405)	(0.151)
CD	-0.134**	-0.251**	-0.237**	-0.227**	-0.181*	-0.166***
	(0.057)	(0.121)	(0.119)	(0.092)	(0.093)	(0.051)
Contig	-0.693***	-1.623**	-1.613**			-0.700***
	(0.208)	(0.756)	(0.795)			(0.188)
Year/industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.545	-0.242	0.597	-2.873***	-2.238**	1.446
	(0.773)	(2.236)	(1.146)	(1.041)	(0.975)	(1.289)
Obs.	2319	949	949	1590	1590	1685

Pseudo R^2	0.095	0.109	0.108	0.103	0.102	0.107
Log likelihood	-1315.604	-534.506	-534.633	-889.833	-890.283	-951.473

Note: *, **, and *** represent the 10 %, 5 %, and 1 % significance levels, respectively. Standard errors presented in parentheses are clustered at the firm and country levels.

6. Conclusion and discussion

Scholars have turned their attention to how national distance affects cross-border M&As (Lawrence et al., 2021; Ahern et al., 2015). Genetic distance is a biological concept that has been introduced into IB research in recent years. Diverging from previous studies, we introduced genetic distance into the context of cross-border M&As and were the first to study the relationship between such distance and the likelihood of cross-border M&A completion. We found that genetic distance affects the likelihood of cross-border M&A completion following an inverted U-shaped curve. Specifically, low levels of genetic distance are positively related to the likelihood of cross-border acquisition completion, while high levels of such distance may lead to the abandonment of cross-border acquisitions.

We also found that the relationship between genetic distance and the likelihood of cross-border M&A completion is affected by many factors, which is helpful to understand the related mechanism. Specifically, although the effect of genetic distance on transaction completion still follows an inverted U-shaped curve for both state-owned and non-state-owned acquirers, for the former, the positive effect is stronger and the negative effect is weaker. Also, genetic distance has a stronger inverted U-shaped effect on cross-border M&A completion when targets in sensitive industries are acquired, showing a weaker positive effect and a stronger negative one. When the acquirer is abroad and the host country's institutional quality is good, genetic distance has a linear and positive influence on the likelihood of acquisition completion. When the buyer belongs to a high-tech industry and the two countries have not signed a BIT, the influence of genetic distance is not significant.

The conclusions of our research provide insights for both enterprises and governments. First, acquirers should pay attention to the potential impact of genetic distance on cross-border M&A completion. When choosing the target locations for their cross-border M&A, enterprises are advised to give priority to host countries characterized by genetic distance from the home country that fall within an appropriate range. In special cases, when acquiring companies need to enter host countries with high genetic distance, they are advised to aim for those that are engaged in bilateral relationships with their own home countries or that feature good institutional environments, and to avoid sensitive industries such as energy resources, defense, telecommunications, etc. Second, non-SOE acquirers should build up their resources and capabilities to widen the range within genetic distance has a positive impact. Third, acquirers can establish contact with the international market by being abroad to reduce any information asymmetry and trust barriers caused by genetic distance. Fourth, governments should engage in strong domestic institutional reform and improve their national institutional environments. At the same time, governments should actively pursue extensive bilateral exchanges with other countries and sign high-quality BITs, which would help to reduce any negative impact of genetic distance.

Our paper has some limitations. First, our findings are based on a specific problem—namely, cross-border M&A completion. To further enrich the literature on genetic distance and cross-border M&A, future studies could explore other issues such as the influence of genetic distance on acquisition initiation, integration decisions, and acquisition performance. Second, our study responds to Shenkar's (2021) call for the application of genetic distance to the IB field from the perspective of cross-border M&A. However, the genetic distance may also have an impact on other types of transnational transactions, such as greenfield investments, joint ventures, etc. Future studies could fill these gaps and further expand the IB research horizon.

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