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Title

Distance constructs in M&A and International Business: A review and future research agenda

Abstract

Distance constructs have become increasingly integral to research within International Business (IB) and Mergers & Acquisitions (M&A) fields, facilitating analysis of outcomes across diverse organizational and geographic contexts. This systematic literature review examines the application of distance measures in these domains. Through a comprehensive search yielding 420 quantitative and 100 qualitative studies, this review aims to: (1) trace the historical development and conceptual foundations of prominent distance constructs; (2) critically evaluate measurement approaches and operationalization techniques employed in their construction, offering recommendations for future methodological rigor; (3) propose a framework to guide researchers in selecting appropriate

distance measures based on research objectives; and (4) synthesize existing critiques of these measurements and assess current research practices. This review contributes to the IB and M&A literature by providing a consolidated understanding of distance constructs, thereby informing and advancing future research directions.

Keywords

M&A, International Business, Distance, CBA, JV, Internationalization

Introduction

After World War II, trade witnessed a significant surge in foreign direct investment (FDI) globally, prompting scholars to investigate the factors influencing global business activity. In the context of international business, 'distance' refers to the multifaceted differences between countries or regions that can impede cross-border collaboration and investment. Early research highlighted the role of cultural differences as potential impediments to international ventures; Hofstede's work underscored the impact of national culture (Hofstede, 1980), while (Kogut and Singh, 1988) explicitly positioned cultural distance as a liability. Subsequently, researchers explored the influence of geographic distance (Grosse and Trevino, 1996), institutional factors—encompassing both formal regulations and informal norms—(Li and Scullion, 2006), and other dimensions such as economic disparities and dynamics.

While existing literature reviews have addressed broader themes within international business (e.g., (Rugman, Verbeke and Nguyen, 2011)), the nuanced understanding of distance constructs — encompassing intra-country, inter-country, and intra-firm variations—remains a subject of ongoing refinement. (Harzing and Pudelko, 2016) emphasized the need for improved methodological approaches to utilizing distance measures, while (López-Duarte, Vidal-Suárez and González-Díaz,

2016) provided critical insights into cultural distance research(Hutzschenreuter, Kleindienst and Lange, 2016) offered a comprehensive overview of the distance construct in international business but also identified significant limitations, including measurement ambiguity and an overreliance on cultural distance. This review builds upon these existing analyses by providing a focused examination of distance measures within the context of IB and M&A. Currently, no existing review offers a comprehensive examination of various distance measures from their evolution perspective and provides recommendations accordingly.

To address this gap, this systematic literature review seeks to:

- Trace the historical development and conceptual foundations of prominent distance constructs;
- Critically evaluate measurement approaches and operationalisation techniques employed in their construction, offering recommendations for enhanced methodological rigor;
- Propose a framework to guide researchers in selecting appropriate distance measures based on specific research objectives;
- Synthesize existing critiques of these measurements and assess current research practices.

The subsequent sections detail the methodology employed, present descriptive findings regarding prevalent distance variables, introduce novel measurement approaches, offer a two-dimensional framework for distance selection, and conclude with a proposed agenda for future research.

Review Methodology

Following recommendations by (Paul et al., 2021), this systematic literature review adopts a domain-based, structured approach to advance the understanding of distance constructs within the

fields of M&A and IB. A detailed overview of the methodological steps undertaken is presented below.

Step 1: Search Strategy

To identify relevant literature, a comprehensive search was conducted using a pre-defined query on the Elsevier Scopus database. Scopus was selected due to its broad coverage of management, social sciences, economics, finance and other scientific research. The search did not restrict for years. Search query, adapted from (Ahsan, Popli and Kumar, 2024), incorporated keywords related to M&A, IB, financial performance, deal characteristics, and distance constructs (see Appendix for the full search string). The initial search yielded $N = 1072$ articles.

Step 2: Journal Selection & Duplicate Removal

To ensure methodological rigor and focus on high-quality research, only articles published in journals with an 'A' or higher ranking (as defined by Australian Business Deans' Council) were included. Subsequently, all retrieved articles underwent a rigorous process of duplicate removal to eliminate redundancies. This resulted in a refined dataset of $N = 520$ articles.

Step 3: Categorization & Data Extraction

The remaining articles were categorized into quantitative and non-quantitative studies ($N=420$ and $N=100$, respectively). For each article, data extraction focused on key aspects of distance constructs, including type, conceptualization, theoretical underpinnings, measurement approaches, and operationalization techniques. This process facilitated a detailed analysis of the evolution and application of these constructs across diverse research contexts.

Step 4: Synthesis & Selection of Key Articles

To synthesize the findings, articles were selected based on citation frequency, novelty of measurement approaches, and presence of critical evaluations or suggestions for future research.

Tables 2-5 (Appendix) provide a breakdown of article counts by journal category.

As illustrated in Figure 1 (Appendix), the utilization of distance variables exhibited a notable increase since 1980s.

----- Insert Figure 1 about here -----

Figure 2 shows the

Synthesis and Discussion

A systematic review of the selected articles involved careful extraction of specific information pertaining to distance constructs. This included documenting the focal distance variable under investigation, the conceptualization and theoretical foundations supporting its use, measurement approaches and data sources employed, and explicit claims regarding improvements or limitations in conceptualization, measurement, or data source selection.

The analysis revealed a recurring set of distance terminologies: cultural, geographic, institutional, psychic, economic, market, linguistic, power, political, regulatory, technological, administrative, cognitive, religious, and normative. Recognizing overlaps and similarities among these diverse types, the literature was subsequently clustered to facilitate discussion. These clusters are as follows: Social and perception-based (encompassing Cultural, Psychic, Religious, and Normative distance); Spatial (including Geographic and related measures like travel time and border proximity); Formal (comprising Institutional, Political, Regulatory, and Administrative

dimensions); Financial (incorporating Economic, Market, and Technological factors); and Communication (represented by Linguistic distance).

It is acknowledged that these clusters are constructed to streamline the subsequent discussion of distance variables; inherent overlaps likely persist across categories. The following sections will examine the evolution of these distance constructs as reflected in their conceptualizations, measurements, data sources, and critically evaluate associated criticisms.

Conceptualizations:

Social and perception-based

Cultural distance holds a dominant position within both the Mergers & Acquisitions (M&A) and International Business (IB) literature. Its prevalence is evidenced by its frequent use, diverse conceptualizations, varied measurement approaches, and numerous subtypes. Building upon foundational work such as (Hofstede, 1980) and (Kogut and Singh, 1988), the transaction cost perspective posits that cultural differences are often perceived as barriers, leading managers to favor cooperative ventures over more resource-intensive options. These differences can contribute to information asymmetry, agency conflicts (Barkema, Bell and Pennings, 1996; Walters, 1996), and subsequent conceptualizations like the “liability of foreignness.” This liability is frequently integrated with concepts such as institutional distance and organizational isomorphism to explain disadvantages faced by foreign firms, including increased costs of capital and reduced liquidity (Bell, Filatotchev and Rasheed, 2012). Social and perception-based distances, notably psychic distance, are not simply dissimilarities but rather perceptions shaped by managerial cognitions and experiences (Johanson and Vahlne, 2009), influencing relationship development timelines, hindering capability learning (Prashantham and Floyd, 2012), and complicating market

understanding for exporting firms (Prime, Obadia and Vida, 2009). Shared religious beliefs can mitigate these distances by reducing perceived cultural differences (Richardson, 2014). Conversely, (Magnani, Zucchella and Floriani, 2018) suggest that firms may strategically select distant markets, seemingly disregarding distance considerations to achieve specific objectives.

Despite its widespread use, the conceptualization of cultural distance has faced considerable criticism. (Shenkar, 2012a) proposed “cultural friction” as a more nuanced construct reflecting actual interaction dynamics. Existing formulations of cultural distance have been challenged for creating misleading impressions of symmetry, stability, linearity, causality, and discordance – factors that do not accurately represent the complexities of cross-cultural business interactions (Shenkar, 2012b). (Zaheer, Schomaker and Nachum, 2012) highlight the tendency to treat distance constructs as scalars lacking directionality, implying equal challenges and benefits for all parties. Furthermore, they argue that distance can be endogenous to the perceiver, meaning firms’ experiences of it are subjective and variable. (Harzing and Pudelko, 2016) advocate for more sophisticated measurement approaches, while (López-Duarte, Vidal-Suárez and González-Díaz, 2016) emphasize the need to account for intra-country cultural diversity and incorporate a broader range of theoretical perspectives. (Cuypers et al., 2018) point to limitations in existing measurements, including symmetric assessments, high correlations among Hofstede’s dimensions, and an inability to track cultural change using standard datasets. The concept of psychic distance has also been critiqued for potentially leading decision-makers to overlook critical differences due to perceived psychological similarity (O’Grady and Lane, 1996).

Notwithstanding these criticisms, cultural distance remains the most prevalent distance construct in M&A and IB research.

Spatial distances

Multi-national corporations face micro-level operational difficulties in generating value when they are geographically dispersed (Li and Scullion, 2006). Geographic distance is one of the key factors affecting the choice of target states for state-owned enterprises due to their perception as political entities with state backing, making their location choices subject to interstate political relations and nationalistic sentiments (Shi, Hoskisson and Zhang, 2016). Geographic distance directly influences governance decisions in cross-border acquisitions, specifically, firms tend to acquire higher stakes in geographically proximate targets compared to more distant ones (Ragozzino, 2009). Geographic distances are also constraining in terms of entrepreneurs' choice of new ventures (Ellis, 2011) and they affect MNE resource allocation decisions (Dellestrand and Kappen, 2012). At the individual level, it is argued that the geographic distance between corporate directors and the company headquarters influences information acquisition and, consequently, board decisions (Alam et al., 2014). In case of family firms, geographical distance affects acquisition choices contingent on ownership structure and aspirations (Calabrò et al., 2024) There have been several minor criticisms of Spatial distances on the measurement side, but not on the conceptual side.

Formal distances

According to (North, 1990), societal institutions are “humanly devised constraints that shape human interaction”; informal constraints, such as conventions, codes of conduct and norms of behaviour, and formal constraints, such as political and judicial regulations (e.g., common law), economic rules (e.g., contracts) and third-party enforcement, reduce the uncertainty in human and organisational interaction. Weak institutions and inadequate infrastructure in base-of-the-pyramid

markets, limits the transferability of capabilities developed in home countries (Van den waeyenberg and Hens, 2012). Institutional distance can also increase liability of foreignness (Bell, Filatotchev and Rasheed, 2012). (Trapeczyński and Banalieva, 2016) show how negative and positive institutional distances affect the performance of the firm in the host country. Choice of ownership type (wholly owned subsidiaries or joint venture) is affected by institutional variables such as political risk, cultural and linguistic distance, agglomeration, location (Demirbag, Glaister and Tatoglu, 2007). Formal and informal institutional contexts affect subsidiary location decisions, performance of rival firms following horizontal M&As (Haddad and Verriest, 2025; Kalanoski et al., 2025). At individual levels, country-level institutional profiles encompassing cognitive, normative, and regulative aspects, influence managers' traditional gender role attitudes (Parboteeah, Hoegl and Cullen, 2008).

Research on formal distances has been criticized as well. While the institutional incompatibilities may trigger active agency issues, (Saka-Helmhout and Geppert, 2011) argue that institutional incompatibilities alone do not automatically trigger change and that there are other factors as well. (Van Hoorn and Maseland, 2016) Criticise the mere use of institutional distance, and call for the use of institutional profiles, which are the characteristics of an institution rather than only distance. Scholars have also called for the usage of informal institutional distance (Berrone et al., 2022). (Ahsan, Popli and Kumar, 2024) highlight the disproportionate focus on host nation institutions, static portrayals of institutions, inconsistencies in findings, underexplored relation with the deal structuring phase, and several other issues in institutional distance-related research.

Finacial distances

Economic, market and technological distances are discussed to some extent in M&A and IB literature. Economic distances affect hazard rates for foreign direct investments, likelihood of change in corporate visual identity, preferences for specialty products consumption (Li and Katsumata, 2020; Liou, Rao-Nicholson and Sarpong, 2018; Tsang and Yip, 2007). Market distance is many times seen as an interchangeable use of geography or spatial distance, mainly discussed in the context of integration with the environment and make or buy decisions (Belich and Dubinsky, 1995; Peng, Zhou and York, 2006). Technological distance has been associated mostly with firms' research and development, and innovation. It is associated with strategic alliances, mobility of inventors, choice of cooperation during M&As, R&D alliance formations and product innovation design (Joshi and Lahiri, 2015; Mayrhofer, 2004; McCarthy and Aalbers, 2016; Rosenkopf and Almeida, 2003; Shao et al., 2024).

Linguistic distance

Linguistic distance is derived from the idea that there exists differences in languages which are a primary mode of communication among individuals. These linguistic flows affect communicative benefits, learning costs (Ginsburgh, Ortuño-Ortín and Weber, 2007), in turn affecting social ties among managers, firms' resource allocation, advantage or disadvantages for immigrant workers, partner selection in alliances, ownership structure in cross border acquisitions, acquisition performance, technological similarity and several other factors (Cuypers, Ertug and Hennart, 2015; Ellis, 2011; Isphording and Otten, 2014; Joshi and Lahiri, 2015; Kedia and Reddy, 2016; Ly, Esperança and Davcik, 2018).

The preceding analysis suggests a useful framework (Figure 2) for categorizing conceptualizations of distance constructs. This framework classifies approaches based on the nature of distance –

characterized as either high or low – and the overarching strategic objective – whether internal or external. The resulting quadrants offer distinct interpretations regarding managerial approach and potential outcomes.

When distance is high and the strategic objective is internal, research often emphasizes efficiency gains, enhanced control, and risk mitigation stemming from similarities or reduced friction. This perspective highlights leveraging inherent closeness to facilitate integration, minimize transaction costs, and optimize governance within a relatively predictable environment. Conversely, when distance is high and the strategic objective is external, scholarly attention focuses on risk-taking and opportunity identification in the face of potential familiarity barriers. Such scenarios may be particularly relevant for organizations like state-owned enterprises where maintaining distance can be strategically advantageous.

Finally, a low-distance, externally-focused approach prioritizes innovation and leverages unique attributes by embracing friction. This quadrant reflects situations where differences – whether institutional, cultural, or otherwise – are considered the norm or catalyst for value creation through knowledge recombination, adaptation to evolving norms/technologies/rules, and exploration of foreign environments.

Measurements and Data sources:

Table 2 shows the distance types and some of the measurements that are available. Some of the latest improvements and persisting limitations on several distance types are discussed below.

- Cultural distance: The persisting limitations include the difficulty in measuring ‘added cultural distance’, no weights during aggregations of dimensions, and lack of subjectivity in Hofstede’s scores. Some recent studies show trends in improving the measurements.

(Shi, Williams and Rong, 2025) disaggregate cross-national distance into nine sub-dimensions using the Wharton-defined measurement. (Nguyen, Larimo and Dow, 2024) introduces cultural friction as an alternative to the traditional cultural distance approach for modeling the impact of cultural differences. This new metric incorporates firm-specific factors, termed 'degree of cultural interaction,' which moderates the impact of cultural distance, thereby enhancing the operationalization of cultural differences by accounting for firm-level variations.

- Geographic distance: Measurement of this distance is straightforward, generally used as per theoretical needs (for ex., geographic distance between a firm's headquarters and its subsidiaries) and tailored for specific studies. (Cui, Tian and Yu, 2025) create a juxtaposition between geographic and political distance arguing that political distance modifies that traditional distance between geographic proximity and regionalization. (Calabrò et al., 2024) the natural logarithm of the geodesic distance between the countries' headquarters, which includes internal distances for acquisitions between companies from the same country and accounts for country size. These improvements allow more nuances to be captured.
- Institutional distance: (Nayyar and Luiz, 2024) use the conceptualization of institutional complementarity and substitution by introducing the novel idea of "institutional thresholds," which examine how the position of a host country on the institutional profile distribution affects these effects. (Osuji, Torres de Oliveira and Tupper, 2024) have improved the measurement of "formal institutional distance" by using a composite measure of seven variables: regulatory quality, rule of law, political rights, civil liberties, political

affinity, GDP per capita, and target country classification, derived through principal component analysis.

- **Psychic distance:** (Kollmann, Müllner and Puck, 2025) use a formative index that collapses five dimensions (industrial development, education, democracy, language, and religion), thus addressing criticism of narrow distance conceptualizations. Combining perceived exchange rate risk, transportation distance, and customs clearance risk, psychic distance has been operationalized (Ma, Chai and Jia, 2022).
- **Economic distance:** Economic distance is measured as the difference in the level of economic development between a home country and a host country (Tsang and Yip, 2007), total market size in GDP figures (Brock, Johnson and Zhou, 2011) or disparity in economic development between a firm's home country and that of its partner (Wang et al., 2025). Economic distance measurements generally center around the GDP or FDI data without much improvements.
- **Linguistic distance:** (Kedia and Reddy, 2016) introduces a new measure of linguistic distance by borrowing from research in adjacent disciplines, and posits this measure combined with lingua franca proficiency is both a more objective and pragmatic measure relative to other often-used language distance measures. (Cuypers, Ertug and Hennart, 2015) use a composite scale, which includes syntactic distance, incidence of the acquirer's language in the target's country, and incidence of the target's language in the acquirer's country where the limitations regarding linguistic distance include the assumption of symmetry in linguistic distance between acquirer and target countries, and the measurement of language distance at the national level rather than at the individual level.

Conclusion

This review has sought to provide a comprehensive assessment of distance constructs M&A and IB literature. The analysis traced the historical development and conceptual foundations of prominent distance variables, critically evaluated measurement approaches and operationalization techniques employed in their construction—offering recommendations for enhanced methodological rigor—and proposed a framework designed to guide researchers in selecting appropriate distance measures based on specific research objectives. Furthermore, existing critiques of these measurements were synthesized, and current research practices assessed.

The resulting framework, grounded in conceptualizations, offers valuable insights for both scholars and practitioners. Scholars may leverage this tool to inform the selection of appropriate distance measures for their own studies, critically evaluate existing literature by assessing its positioning within the framework, and identify areas where research gaps remain. Similarly, managers can utilize this framework to scrutinize strategic decisions, considering the specific types of distance involved and aligning them with overarching objectives.

Limitations and Future Study

The scope of this review was intentionally limited to top-tier journals and frequently utilized measures; consequently, the exclusion of other sources may restrict a complete understanding of the breadth of distance constructs. The inherent diversity in conceptualization, measurement, and proposed improvements across different distance variables presents a significant challenge when attempting to integrate multiple constructs within a single study. Furthermore, the disproportionate attention afforded to certain constructs by scholars in M&A and IB fields has influenced the scope

and focus of this review. Addressing these limitations through expanded research avenues would significantly enhance future investigations into distance constructs.

Appendix

Figure 1

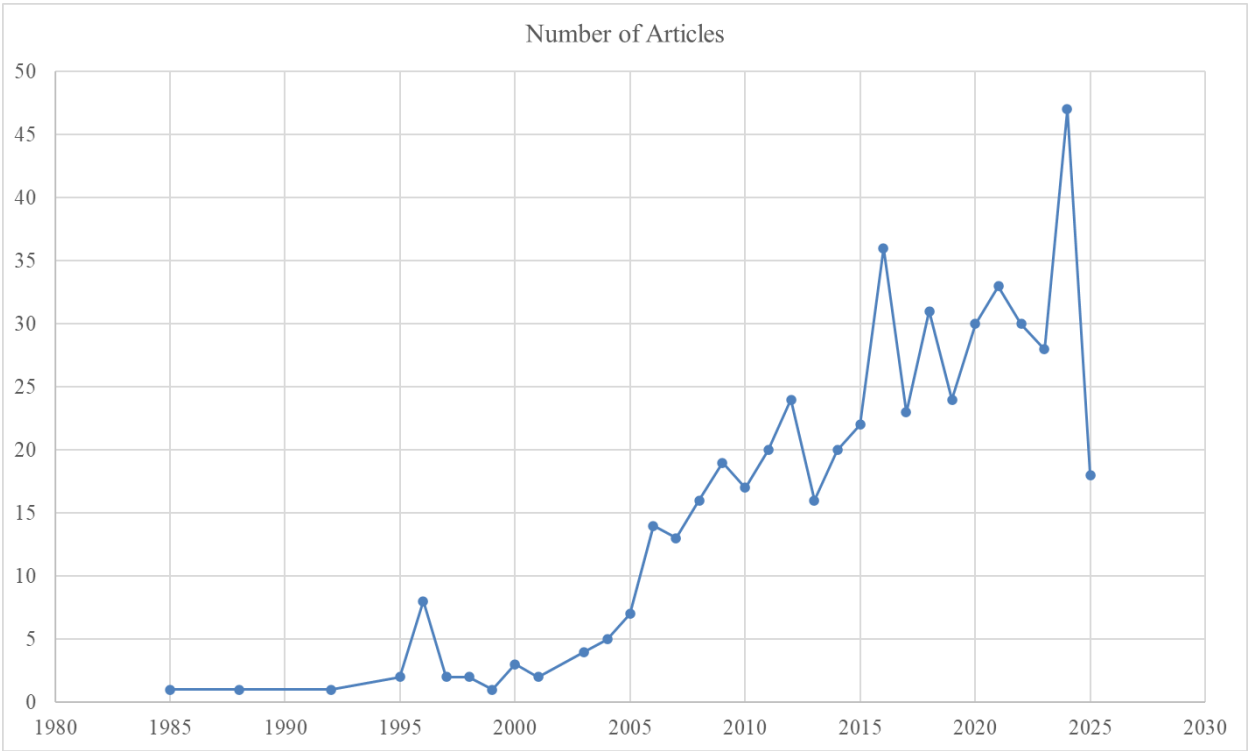


Figure 2

		Strategic objective	
		Internal	External
Nature of distance	High	• Efficiency • Familiarity • Control • Risk minimization	• Opportunity seeking • Risk taking • Diversification
	Low		• Innovation • Novelty through friction

Table 1:

Step 1 Search strings	Based on (Ahsan, Popli and Kumar, 2024), the query was used to search for research articles on the Elsevier Scopus database. N= 1072	"m&a" OR "merger*" OR "acquisition*" OR "international business" OR "abnormal returns" OR "acquirer returns" OR "bidder returns" OR "cash deal" OR "cross-border " OR "CBA" OR "CBMA" OR "M&A" OR "merger/mergers" OR "M&A performance" OR "post-merger" OR "stock payment" OR "target returns" AND "distance"
Step 2 Carve out articles field-wise	Only journals which have ranking of 'A' or above have been used. All articles were cleaned up for duplicates in the same order.	N=520
Step 3	I then carefully divide the articles into Quantitative and non-quantitative identify various distance variables used in each article to check for distance type, conceptualizations, theoretical underpinnings, measurements and operationalization, etc.	Quantitative N=420 Non-Quantitative N=100
Step 4	I try to pick and discuss the most cited articles, novel measures, criticisms and suggestions.	

The tables below show the category-wise journals and article count.

Table 2:

Journal Name	Number of Articles	Journal Name	Number of Articles
Journal of International Business Studies	93	Review of Industrial Organization	2
International Business Review	61	Strategic Entrepreneurship Journal	2
Journal of World Business	29	Technological Forecasting and Social Change	2
Management International Review	24	Tourism Management	2
Journal of Business Research	21	Transportation Research Part A: Policy and Practice	2
Journal of Cleaner Production	20	Academy of Management Journal	1
Journal of International Management	19	American Business Review	1
International Marketing Review	14	Asia Pacific Journal of Tourism Research	1
Strategic Management Journal	11	British Accounting Review	1
Knowledge-Based Systems	10	Business History	1
Asia Pacific Journal of Management	9	Decision Sciences	1
Global Strategy Journal	9	Emerging Markets Review	1
Industrial Marketing Management	9	Engineering, Construction and Architectural Management	1
Research Policy	8	European Journal of Information Systems	1
Journal of International Marketing	7	European Journal of Marketing	1
International Journal of Human Resource Management	6	Financial Accountability and Management	1

International Journal of Production Research	6	Financial Management	1
Journal of Business Ethics	6	Gender, Work and Organization	1
Journal of Advanced Transportation	5	IEEE Transactions on Engineering Management	1
Journal of Knowledge Management	5	International Journal of Contemporary Hospitality Management	1
Journal of Management Studies	5	International Journal of Electronic Commerce	1
British Journal of Management	4	International Journal of Hospitality Management	1
Journal of Business Venturing	4	International Journal of Industrial Organization	1
Journal of Corporate Finance	4	International Journal of Intercultural Relations	1
Journal of Real Estate Finance and Economics	4	International Journal of Manpower	1
International Journal of Management Reviews	3	International Journal of Production Economics	1
Journal of Economic Behavior and Organization	3	International Journal of Project Management	1
Journal of Financial Economics	3	International Journal of Tourism Research	1
Journal of Management Information Systems	3	Journal of Construction Engineering and Management	1
Journal of Operations Management	3	Journal of Financial Research	1
Journal of Product Innovation Management	3	Journal of Financial Services Research	1
Labour Economics	3	Journal of Management	1
Strategic Organization	3	Journal of Management in Engineering	1
Technovation	3	Journal of Marketing	1
Tourism Geographies	3	Journal of Marketing Research	1
Accounting and Finance	2	Journal of Policy Analysis and Management	1
Australian Journal of Management	2	Journal of Retailing and Consumer Services	1
Corporate Governance: An International Review	2	Journal of Strategic Marketing	1
Current Issues in Tourism	2	Journal of Vacation Marketing	1
Decision Support Systems	2	Knowledge Management Research and Practice	1
Entrepreneurship and Regional Development	2	Marketing Letters	1
European Financial Management	2	Marketing Science	1
Global Journal of Flexible Systems Management	2	Organization Science	1
International Journal of Information Management	2	Organization Studies	1
Journal of Evolutionary Economics	2	Personnel Review	1
Journal of Financial and Quantitative Analysis	2	Production and Operations Management	1
Journal of Global Information Management	2	Quarterly Journal of Finance	1

Journal of Hospitality and Tourism Research	2	Real Estate Economics	1
Journal of Small Business Management	2	Scandinavian Journal of Hospitality and Tourism	1
Journal of the Operational Research Society	2	Strategy Science	1
Long Range Planning	2	Systems Research and Behavioral Science	1
Management Science	2	The International Journal of Logistics Management	1
National Tax Journal	2	Tourism Economics	1
Omega	2	Transportation Research Part E: Logistics and Transportation Review	1

Table 3

Distance type	Available measurement
cultural distance	Hofstede dimensions combined with PCA: This involves using PCA to aggregate multiple cultural dimensions from frameworks like Hofstede or GLOBE into variance-based scores, correcting earlier aggregation flaws by accounting for interdimensional correlations. Mahalanobis distance formula applied to Hofstede/GLOBE data: This measure explicitly addresses the issue of zero covariance across dimensions and intra-country variation through a weighted Euclidean approach based on variances.
geographic distance	Varies according to theoretical context Driving time (time since establishment in kilometers)**: This measures geographic distance by combining spatial and temporal elements using data from the Great Circle Distance database. Buffering distances between cities**: A gravity-based measure that accounts for regulatory and administrative environments, with driving time as a component of cost.
institutional distance	Formal: Mixture of surveys and Worldwide Governance Indicators Informal: Same as cultural distance
psychic distance	Directional asymmetry measure: Calculated as the absolute value of differences in psychic distance scores between two entities (e.g., Hong Kong vs. USA) with variance correction. Weighted Kogut & Singh Index: Incorporates standard deviations for each dimension and directional asymmetry to account for intra-country variations.

economic distance	Euclidean or Mahalanobis distance on a composite index of GDP per capita. PCA sub-factors: Combines multiple dimensions like GDP, inflation rates, and trade openness into weighted components for economic distance.
market distance	Regulatory quality from Worldwide Governance Indicators as a measure for formal institutional distance: This operationalizes market barriers by incorporating governance data rather than relying solely on physical location. Gravity model including regulatory quality factors: A composite measure of market accessibility combining geographic and institutional dimensions, with the most evolved version being the 9-dimensional measure using PCA sub-factors.
linguistic distance	Genealogical Language Distance (GLD): Based on Ethnologue data, measuring differences by language family trees and structural features. Combined English proficiency index: Using average TOEFL scores from home countries as a proxy for language capability (2016-2025). PCA-based institutional distance: Incorporates regulatory quality along with economic factors to calculate a composite language-related barrier (2018-2025).
power distance	Mahalanobis distance based on institutional dimensions
political distance	Mahalanobis Distance on Institutional Governance Indicators: Using data from Worldwide Governance Indicators (WGIs), particularly six dimensions including government effectiveness and control of corruption. PCA-based institutional complementarity index: Combining multiple governance indicators with cultural factors to measure the overall suitability for investment or collaboration (e.g., Berry et al., 2010 approach).

regulatory distance	Mahalanobis Distance incorporating six Worldwide Governance Indicator dimensions, accounting for interdimensional variances weighted factors from multiple governance indicators (e.g., government effectiveness, rule of law), combining them into a composite measure. standard deviations per dimension before aggregation, ensuring each aspect (e.g., regulatory quality) contributes proportionally based on its variance.
technological distance	Patent citations, codification of patents data, similarity in patents
administrative distance	Worldwide Governance Indicators (WGIs) collected by the World Bank
cognitive distance	CRTA, which is Pearson correlation index of the distribution across technological classes of the revealed technological advantages (RTA) of each firm relative to the other sample firms absolute value of the difference between the averages of three home country indicators: percentage of economically active population with at least tertiary education, number of computers per thousand persons, and number of internet hosts per thousand persons industry classification overlap, specifically using a cospecialization index based on three-digit GICS codes reflecting accumulated sectoral knowledge of investors and startups
religious distance	omposite index based on three items: distance between major religions, incidence of acquiring firm's major religions in target's country, incidence of target firm's major religions in acquiring firm's country Dow and Karunaratna's composite religious distance scale

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