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Measuring, Modeling, and Assessing Culture in International Trade: A Systematic Literature Review

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ABSTRACT

This paper conducts a systematic literature review to examine how culture is measured, modeled, and assessed in international trade research. Drawing on 44 high-quality empirical studies identified through the PRISMA framework, it addresses three key research questions: (1) how cultural factors are incorporated into trade models, (2) how culture is quantified and analyzed using econometric techniques, and (3) whether the effects of culture on trade vary across contexts. The review distinguishes between proxy variables for culture, and direct culture measures. It also discusses innovations in measurement. Findings suggest that in international trade research, the non-linearity and context-dependent of cultural effects reveal the dynamic regulation of cultural effects by different regions, industries, and institutional settings. This paper aims to provide valuable insights in quantification of culture, and suggestions of research model building in the future.

Keywords: building, quantification, suggestions, variables, measurement

F10 – International Trade
Z10 – Cultural Economics
A12 – Literature Review in Economics

1. INTRODUCTION

Increasing scholarly attention has been devoted to understanding how culture influence international trade. Culture has progressively become recognized as an essential component in international economic activity. Culture is broadly defined as "a system of shared values, beliefs, norms, and practices within a group" (Hofstede, 2001). It has multidimensional nature and dynamic evolutionary characteristics (Schwartz, 1994). However it is precisely the complex dimensions and dynamics of culture that make its role in the international trade research challenging. Guiso, Sapienza, and Zingales (2009) explicitly pointed out that, because culture is difficult to capture by a single indicator, researchers need to face the dilemma of how to quantify culture when studying how it affects economic activities (e.g. international trade). Although there is a large amount of research focusing on how culture affects international trade, there is a lack of systematic review of quantification approaches and empirical results for culture. Addressing this research gap by systematically reviewing, comparing, and synthesizing the quantification methods of culture and their context-specific effects could thus provide valuable insights and suggestions of research model building in the future.

With these motivations, the author poses three research questions.

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A. How are cultural related factors incorporated into international trade models?

B. What are the major methods used to quantify culture in international trade research, and how to analyze using econometric model?

C. Does the effect of culture on international trade vary across contexts?

The remainder of this paper is structured as follows. Section 2 details the systematic literature review approach and the PRISMA screening process. Section 3 examines how cultural realted factors are incorporated into international trade models. Section 4 focuses on quantification methods of culture, evaluating the international trade model. Section 5 explores the specific effect of culture on international trade across different contexts. Section 6 concludes key findings, and suggests future research directions.

METHODOLOGY

2.1 Systematic Literature Review

In contrast to traditional narrative reviews, a systematic literature review (SLR) is characterised by the fact that it follows a rigorous methodology to minimise bias, ensure comprehensiveness and enhance replicability (Petticrew, 2003). SLR is a structured, transparent and reproducible methodology for identifying, evaluating and synthesising existing research within a specific field (Okoli, 2015; Lame, 2019), through a standardised methodology for conducting and reporting systematic evaluations that ensures that the selection, inclusion and exclusion of studies is clear and methodologically sound (Liberati et al., 2009; Petticrew, 2003).

This paper examines the measurement methods of cultural factors in international trade research and their application in trade models. The influence of culture on international trade has been widely recognized. However, the variety of measurement approaches, the dispersion of research pathways, and the interdisciplinary nature of the field, create challenges in assessing existing results and evidence on the topic.

Due to consider the following advantages of SLR:

1. Structured synthesis: SLR is able to provide a structured synthesis framework for multi-source evidence (Liberati et al., 2009). This means that researchers are able to integrate the various types of literature on the impact of culture on international trade, thereby identifying the central role of cultural factors in trade modelling.

2 Interdisciplinary applicability: SLR is highly valuable in interdisciplinary research because of its ability to integrate insights from multiple disciplines such as economics, business, sociology, and political science (Petticrew & Roberts, 2008). This suggests that SLR is an effective tool for understanding the complex and fluid relationship between culture and international trade.

3. Research Direction Insights: SLR maps the field of study and highlights directions for further research (Tranfield, Denyer, & Smart, 2003). By identifying research gaps, SLR can lay the foundation for future methodological advances in empirical research on the impact of culture on trade.

The author agree that SLR synthesizes and rigorously evaluate multi-source evidence from high-caliber studies, enabling critical appraisal of cultural measurement methods and facilitating the comparison of different research models, which makes it particularly valuable for the quantification of culture in international trade and for the optimisation of the methodology of empirical research.

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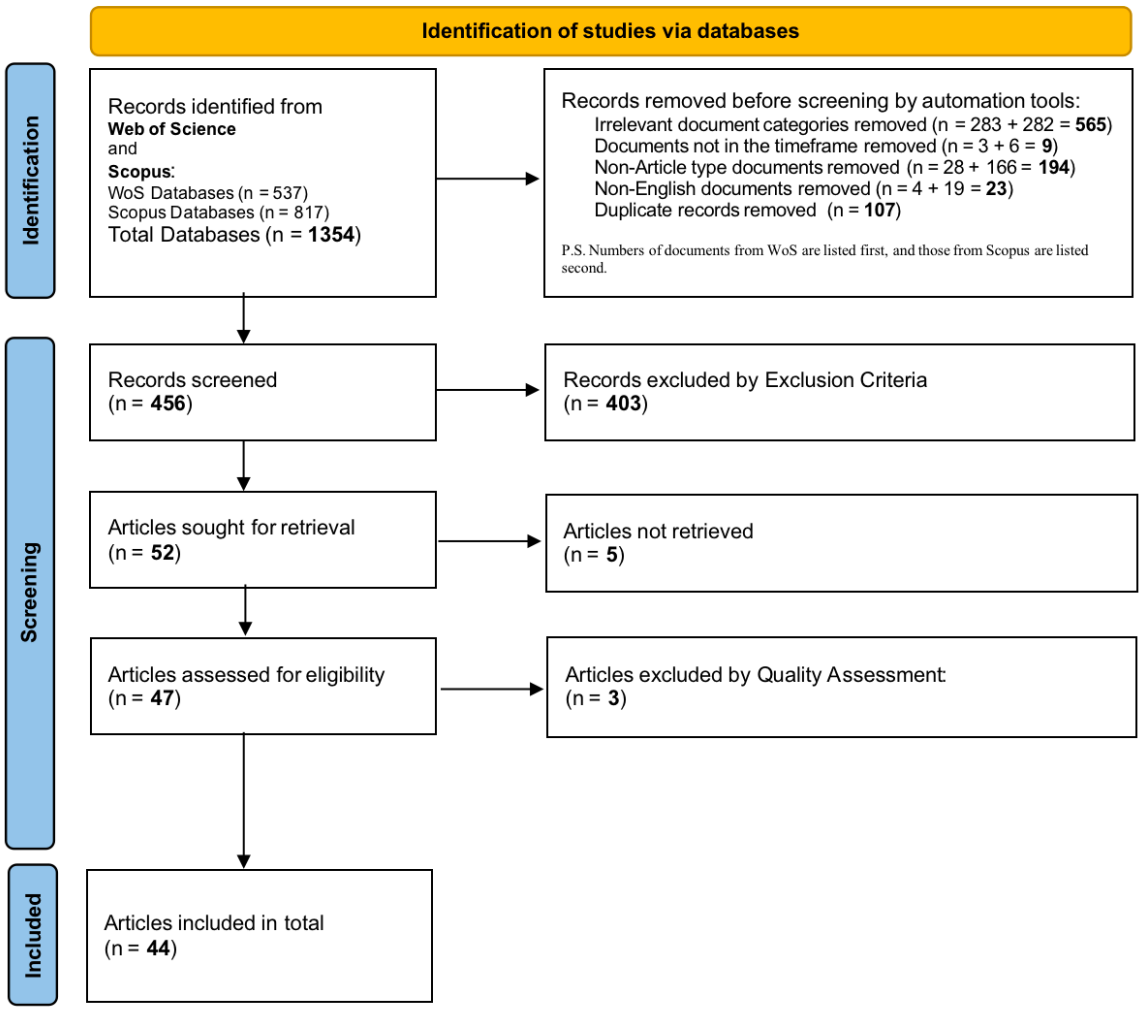
2.2 PRISMA Framework

The article screening process adopted in this paper, follows the Preferred Reporting Items for Systematic Reviews and Meta-analysis framework, commonly called PRISMA (Liberati et al., 2009). The PRISMA framework consists of 3 steps: identification, screening and inclusion as *Figure 1*.

Figure 1. PRISMA 2020 Flow Diagram for the Systematic Review

Source: Modified from PRISMA 2020 Flow Diagram, https://www.prisma-statement.org/prisma-2020-flow-diagram



2.2.1 Identification

The author has chosen two databases, Web of Science (WoS) and Scopus. Web of Science (WoS) is renowned for its rigorous curation of high-impact journals, ensuring both quality and scholarly influence (Mongeon & Paul-Hus, 2016). In contrast, Scopus offers broader interdisciplinary coverage, capturing insights from fields such as international business, sociology, and digital humanities (Falagas et al., 2008). Both databases are well used in systematic reviews, due to they align with

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PRISMA and ensure transparency and replicability in the article selection process (Gusenbauer & Haddaway, 2020).

In Web of Science (WoS), the search was conducted using Boolean search strings as ("trade*") AND ("cultural factors" OR "cultural distance" OR "cross-cultural" OR "intercultural" OR "cultural effect*" OR "cultural impact*") AND ("international" OR "global" OR "cross-border" OR "bilateral" OR "multilateral") NOT ("article review" OR "literature review" OR "meta-analysis" OR "case study" OR "qualitative research" OR "ethnographic research") , and was applied to the Topic field (titles, abstracts, and keywords), yielding 537 publications. In Scopus, the search was conducted using Boolean search strings as ("trade*") AND ("cultural factors" OR "cultural distance" OR "cross-cultural" OR "intercultural" OR "cultural effect*" OR "cultural impact*") AND ("international" OR "global" OR "cross-border" OR "bilateral" OR "multilateral") AND NOT ("article review" OR "literature review" OR "meta-analysis" OR "case study" OR "qualitative research" OR "ethnographic research") , and was applied to the Topic field (titles, abstracts, and keywords), yielding 817 publications. The Boolean search queries used in both databases included terms related to trade, culture, and international dimensions, while excluding review articles, qualitative studies, and case-based research to focus on empirical and quantitative studies. The outputs of the two databases were combined, yielding an initial total of 1354 publications without de-duplication. The documents were then machine-screened to select WoS Categories as Economics; Management; Business and Business Finance, and to limit Scopus Subject Categories to Social Sciences; Business, Management and Accounting; Economics, Econometrics and Finance. All documents were published by 31 December 2024. Non-Aritcle type publications were excluded and non-English writing publications were excluded. The remaining articles from the two databases were then combined to remove duplicates, yielding 456 articles to enter the screening step.

2.2.2 Screening

The following criteria have been defined in relation to the research questions of this paper. Articles that met any of the criteria were excluded by reading the title and abstract. A total of 403 articles were excluded and 52 articles were preserved.

Exclusion Criteria:

1. Articles with research topics other than international trade, including but not limited to investment, immigration, politics, diplomacy, tourism, pedagogy and religion, archaeology, film and the internet, etc.

2. Articles for which the research focus is not on countries, including but not limited to firms, international organisations, individuals (e.g. consumers, producers, or negotiating teams), etc.

3. Articles with research methods that are not quantitative or mixed, including but not limited to qualitative research, literature reviews, grounded theory, ethnography, case studies, etc.

Further checking the access of full-text excluded five articles for which full-text was not available. A total of 47 articles were recorded for entry to the full-text reading.

2.2.3 Inclusion

This paper adopts the quality assessment framework which designed by the author to evaluate the remaining 47 articles. This assessment form has 7 scoring dimensions. Each criterion is scored on a 0-2 scale, with the total score ranging from 0 to 14. Articles scoring 0-5 are classified as low quality and excluded from further analysis. Those scoring 6-10 are deemed moderate quality, while studies

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scoring 11-14 are regarded as high quality and prioritized for inclusion. Detailed quality assessment dimensions and scoring criteria are shown in *Table 1*. After reading the full texts and scoring them according to the quality assessment form, three articles with scores lower than 5 were given exclusion. 9 of the articles scored within the range of 6 to 10, may be included based on their contextual relevance. And 35 articles scored between 11 and 14 were given priority to be analysed. A total of 44 articles have been included. The number of 44 may be limited, but the credibility of a systematic literature review does not depend on the number of articles included. SLR provides a structured understanding of a particular field or question, and is able to draw high quality conclusions even when the literature number is small (Tranfield, Denyer, & Smart, 2003).

Table 1.Quality Assessment Scale for Articles Related to the Author's Research Topic

Dimension	**Score 0**	**Score 1**	**Score 2**
Focus on International Trade	The study does not focus on international trade.	The study involves international trade, but it is not the primary focus.	The study explicitly focuses on international trade.
National-level Study	The study is conducted at the individual, firm, or other non-national levels.	The study includes national-level analysis but does not primarily focus on the country as a unit of analysis.	The study is primarily conducted at the national level, with countries as the key unit of analysis.
Use of Quantitative Methods	The study relies solely on qualitative methods without any quantitative analysis.	The study employs a mixed-methods approach but with a limited use of quantitative techniques.	The study primarily uses quantitative methods, including statistical or econometric analysis.
Inclusion of Culture-related Factors (e.g., language, religion, colonial history, education, institutions, etc.)	No culture-related factors are included in the model.	Culture-related factors are included but only as minor explanatory variables.	Culture-related factors are explicitly incorporated as key explanatory variables in the model.
Quantification of Culture (e.g., Hofstede indices, cultural distance, etc.)	Culture is not quantified in the study.	Preliminary concept of culture of quantification but not directly integrated into the econometric model.	Culture is quantified and directly used as a variable in the econometric model.
Data Reliability and Sample Size	The data source is unclear.	Data source is transparent but sample is limited (e.g. particular region, short-term dataset).	Data comes from authoritative sources and covers multiple countries or long-term data.
Clarity of Conclusion on Cultural Impact on Trade	The study provides an unclear or inconclusive assessment of culture's impact on trade.	The study discusses the cultural impact but lacks depth in its analysis.	The study presents a clear and strong discussion on the cultural impact on trade, regardless of

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			whether the effect is significant or its direction.

Source: Made by the Author

RESULTS ANALYSIS

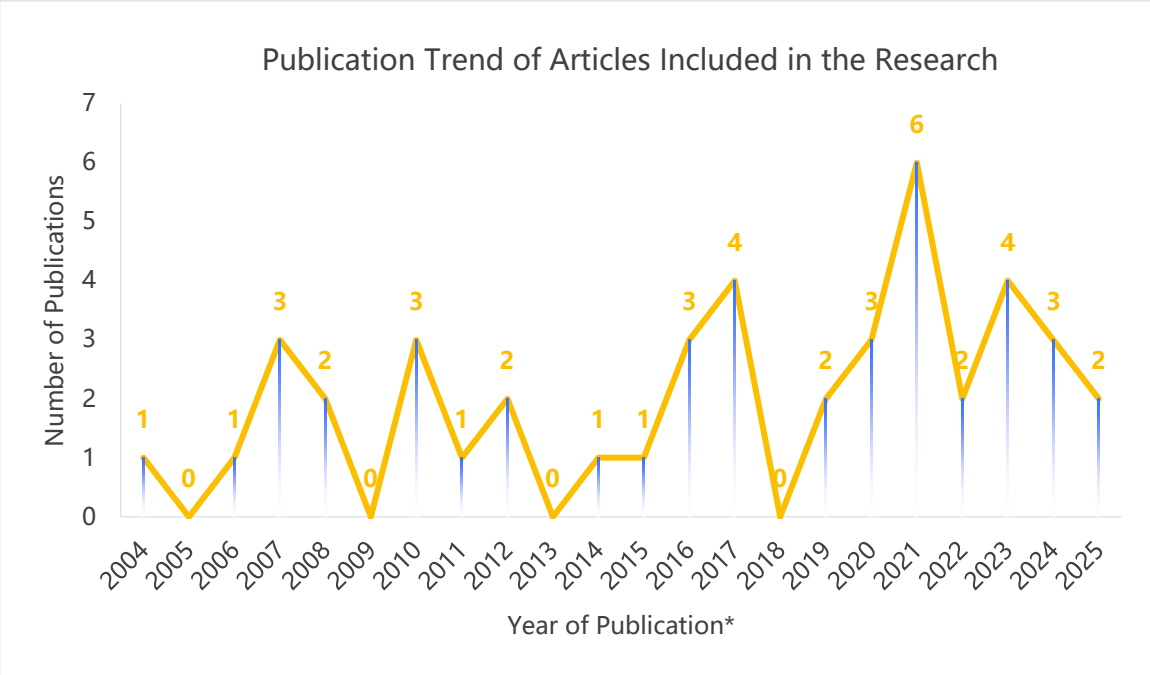
3.1 Descriptive Data Analysis

3.1.1 Year of publication

As *Figure 2*. the year distribution of the selected 44 articles reflects that, in general, a growing scholarly interest in the role of culture in international trade. Between 2004 and 2015, publications were relatively sporadic, with some years having no articles at all. However, from 2016 onwards, the number of publications has shown a notable upward trend. The years 2017, 2021, and 2023 saw a higher concentration of publications, and the year 2021 reached at peak with 6 articles. This trend suggests that quantifying culture's impact have been increasingly recognized as significant components in international trade research.

Figure 2. Publication Trend of Articles Included in the Research

Source: Made by the Author



Note*: As of the time the first draft of this paper was completed, 31 December 2024, the publication year of some articles appears as 2025 because the article was available online in 2024 and the publication date was set to 2025.

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3.1.2 Source of Publication

The 44 articles were published in a total of 39 different sources. Of those, *Sustainability* ranked as the most frequent journal, with 3 articles, demonstrating the growing interest in the intersection of culture, trade and sustainable development. In addition, *Emerging Markets Finance and Trade*, *Applied Economics Letters* and *Open Economies Review* each published two articles. The remaining sources published one article each. The wide distribution of publication sources highlights the interdisciplinary nature of the study of the culture role in international trade.

3.1.3 Author of Publication

Tadesse, B. and White, R. are the authors with the highest number of article contributions, contributing to 5 articles. The 5 articles they were involved in overlapped completely and there was no third co-author. This implies that they might be long-term research partners with a dedicated interest and in-depth research in areas related to culture and trade. Cyrus, T. L., De Groot, H. L. and Zhou, Z. were each involved in two publications: De Groot, H. L. and Zhou, Z.'s articles were co-authored with other scholars; Cyrus, T. L.'s article was written independently. The rest of the scholars were involved in only one publication. This means that the relevant research areas, although gaining attention, are still in an expansionary stage and their research systems may not yet be standardised.

3.2 Proxy Variables for Culture in International Trade Models

In empirical studies of international trade, culture and its effects, because of its open-ended, dynamic, flexible and complex nature (Hofstede, 1980), make it challenging to formulate testable hypotheses to obtain empirical evidence. Therefore, many studies tend to use proxies that indirectly reflect the impact of culture. These variables are not synonymous with "culture" itself, but rather reflect cultural heterogeneity by capturing differences between countries at the structural, historical or institutional level. The use of proxy variables for culture is prevalent in the articles included in this review.

It displays that how such cultural proxy variables are mainly categorized and implemented, focusing on four key groups: Language, Religion, Historical ties, and Others.

·Language

Language is the most frequently used cultural proxy in international trade models. It is often considered a fundamental dimension of culture, and even a key medium for communicating culture (Guiso, Sapienza, & Zingales, 2009). In the included literatures, language variables appear in two forms: (1) Common language, (2) Digitised the language gap.

In studies, common language always has been adopt as the dummy variable to indicate whether or not a given pairing of countries shares at least one common language. This method captures the simplest, most direct form of linguistic proximity. Many empirical evidence consistently shows that sharing a common language facilitates the international trade (Cyrus, 2015; Kim et al., 2019; Lankhuizen & de Groot, 2016). Among so many kinds of language worldwide, Chinese and English are two of them that are often listed for separate research. For example, Kea et al. (2019) found that the Chinese language dummy significantly increased Cambodia's rice export likelihood to Chinese-speaking countries, while Wang and Chen (2025) showed that shared language Chinese enhanced trade between China and ASEAN nations. Similarly, White and Tadesse (2008) highlighted the positive role of English in boosting U.S. cultural exports. In addition, White and Tadesse (2010) further confirmed the significance of shared language English in trade, demonstrating that it significantly promotes trade between the U.S. and its immigrant source countries. These findings

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consistently emphasize the role of common language in reducing trade barriers and fostering trade activities. Nonetheless, not all studies find a significant impact. Yeganeh (2011), analyzing Canada's trade with 53 countries, included a common language dummy that showed no statistically significant effect. He attributed this result to the dominance of other factors such as geographic proximity and institutional compatibility, suggesting that the role of language may diminish in highly integrated or standardized trade environments.

It is worth noting that two articles brought in language-related variables different from the common language dummy variable. Melitz and Toubal (2014) developed a composite language proximity index incorporating three dimensions: common official language (binary indicator), shared native language (≥9% population threshold), and linguistic commonality through colonial/global lingua francas. Their three different dimensions were assigned different weights, and were combined into one index by means of a weighted average. Their empirical analysis using gravity models demonstrated that this composite index significantly predicts bilateral trade flows, with a 1% increase in language proximity associated with approximately 0.37% growth in trade volume (Melitz & Toubal, 2014). Jang, Kim, and Baek (2023) proposed a more nuanced approach to language called Language Similarity, by employing the Jaccard similarity index, reflecting up to three official languages in each country based on the CEPII. This measure captures the degree of overlap in the spoken languages between country pairs. The study results showed that the higher the linguistic similarity, the lower the cultural friction and the more favourable the international trade in services related to film and television. Mostafiz, Akter, and Rahman (2024) introduced another advanced proxy—Linguistic Distance (LD)—to capture cultural divergence between trade partners. Drawing from the Levenshtein distance, by quantifies the phonological and syntactic dissimilarity between major world languages, they incorporated LD into a gravity model assessing Bangladesh's bilateral trade patterns. Their results revealed that linguistic distance negatively and significantly affected bilateral trade volumes. It reinforced the idea that deeper linguistic gaps hinder trust, communication, and contract enforcement in the trade.

·Religion

Religion is another commonly used cultural proxy in international trade models. It is frequently perceived as a foundational cultural institution that mirrors deeply entrenched value orientations (Yeganeh, 2011). In the included literatures, religion-related variables appear in two main forms: (1) Common religion or Religion, (2) Digitised measures of religious similarity.

An approach to operationalising religion is through a dummy variable, called common religion or religion, that indicates whether two countries share the same dominant religion. Kim et al. (2019) utilised Ghemawat's CAGE framework and found that common religion significantly promoted trade in baseline models. However, this effect diminished when accounting for cultural distance, suggesting that its influence may operate indirectly through broader cultural affinity (Kim et al., 2019). Park and Park (2021), in their analysis of regional trade agreements (RTAs), demonstrated that common religious had a positive and significant impact on trade in traditional specifications. However, this effect became insignificant after controlling for institutional and cultural distance variables, implying that religion's role may be subsumed by higher-order institutional factors. De Groot et al. (2004) utilised a gravity model and reported that common religious exhibited a robust correlation with bilateral trade flows, even after accounting for institutional quality. The findings collectively suggest that shared religious beliefs may facilitate trade, although the standalone significance of this relationship depends on whether cultural and institutional variables are included in the empirical framework.

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Beyond the use of the dummy variable, several studies have adopted more nuanced measures of religious similarity to capture subtle cultural proximities. Wang and Chen's (2025) study used the Religious similarity index (Horsewood & Voicu, 2012), thereby calculating probability distributions of shared faiths between trading partners. The results found that this amplified the trade liberalisation effects in China-ASEAN commerce. Cyrus (2015) referred to religious similarity measures based on La Porta et al. (1999), and followed the probability-based theory developed by Guiso et al. (2009) to explore cultural proximity effects within EU markets. Fensore et al. (2022) employed a probabilistic religious matching approach yet found only indirect trade facilitation, with ancestral distance emerging as the dominant cultural predictor. Harms and Shuvalova (2020) innovated by introducing multiplicative scoring of Catholic/Protestant/Muslim population overlaps, revealing particularly strong service trade stimulation versus goods trade. Collectively, these studies demonstrate that religious similarity consistently affect international trade, although the quantifying methods differ across studies.

· Colonial historical ties

For two countries with colonial historical ties, the colonial history is often used as cultural proxy variables in international trade models. It reflected enduring similarities in shared norms, and cultural references rooted in common historical experience (Cyrus, 2015; Abafita & Tadesse, 2021). In the reviewed literature, colonial historical ties are primarily operationalised in two forms: (1) Shared colonial history (whether both countries had been colonized by the same country), (2) Direct colonial relationship (whether one country was previously colonized by the other country).

Many studies in the reviewed literature adopted colonial variables. And in those articles where the colonial variable is used, it is usually in the form of the first variable, which examines whether two countries have been colonised by the same country. Common colonizer background was found to significantly enhance trade in EU contexts in Cyrus's (2015) study. Fensore et al. (2022) also used common colonizer as a control in a genetic distance model and found a robust positive impact on trade, reinforcing the idea that colonial legacy strengthens institutional continuity. Harms and Shuvalova (2020) observed that colony positively affected trade in transport and cultural services, although its impact was weaker than that of religious similarity. Lankhuizen and de Groot (2016) confirmed the robustness of colony in a nonlinear cultural distance model, suggesting that colonial historical ties influence trade significantly.

There are also two articles that refer to the direct colonial relationship. Abafita and Tadesse (2021), in their study of global coffee trade, not only included shared colonial history, but also included direct colonial relationship. Their results showed that common colonizer was only marginally significant in some models, reflecting —— colonial homogenization trap —— countries that share a common colonizer have similar industrial structures, resulting in insufficient trade complementarity. In contrast, the colonial links between colonizer and colonized country had a strong and significant positive effect on bilateral trade, due to the trade infrastructure and stable trade channels established by the colonists continue to reduce transaction costs. Another article that mentioned the direct colonial relationship was a study by Kea et al. (2019). Kea et al. (2019) examined whether the trade importing country had been a French colony, thus finding in the context of the trade partner had been a French colony, being beneficial to the export of Cambodian rice. However, although this article used direct colonial relationships to set dummy variable, in terms of the results, the essence remained to study the shared colonial experience of trading partner countries and Cambodia.

Generally, shared colonial experience plays a more prominent and independent role than direct colonial relationships in existing trade research. The direct colonial ties rarely examined in isolation.

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Notably, all reviewed articles employed binary dummy variables to represent colonial historical ties. More nuanced measures such as colonial duration, time since independence, or composite indices of colonial institutional influence have not yet been seen in these included articles.

· Other

Beyond the commonly used cultural proxies such as language, religion, and Colonial historical ties, some researchers have introduced alternative variables to capture cultural factors that shape international trade. They similarly offered valuable insights. By capturing dimensions of cultural proximity that are not readily observable through traditional proxies, these measures provide a more nuanced understanding of culture's role in shaping international trade patterns. In the reviewed literature, such "other" cultural proxies include cultural preference, institutionalized cultural exchanges, and region-specific cultural clustering.

Kokko and Tingvall (2014) used voting data from the Eurovision Song Contest to construct a cultural preference score between European countries. The researchers believed that when countries regularly give each other high votes in this music competition, it shows they share similar cultural tastes and values, and existed cultural closeness. Their results showed a positive and significant relationship between cultural voting alignment and bilateral trade intensity. Li et al. (2021) used the number of Confucius Institutes—sourced from the official Hanban database—as a proxy for China's cultural outreach. These institutes serve as platforms for language and value dissemination, helping to reduce cultural barriers. The authors also introduced a cultural circle dummy, defined by shared Confucian traditions and historical links, to identify countries with deep-rooted cultural proximity to China. Both variables showed significant positive effects on China's exports, suggesting that cultural familiarity fosters trade under the Belt and Road Initiative. Similarly, Zhou and Zhou (2022) grouped China, Japan, and Korea into a Confucian cultural cluster, drawing on civilizational and philosophical commonalities rather than empirical indices. Both studies found that cultural alignment, whether through institutional presence or shared heritage, significantly enhanced bilateral trade in cultural goods.

In sum, although these variables are less standardized than language or religion, they help extend the conceptual boundary of culture in trade research and offer a more context-specific approach to study cultural effects.

3.3 Culture Quantification and Econometric Design in International Trade Models

The methods of quantifying culture itself and the design of its econometric models are the unavoidable topic in international trade research. Based on the included articles, focusing on the direct quantification of culture itself (non-proxy variables), the authors develop the systematic review with the way in which the cultural variables are constructed, the data sources adopted, the variables' roles in research models, and their empirical impact on international trade.

· Hofstede-Based Cultural Measures

A considerable number of empirical studies in international trade adopt Hofstede's cultural dimensions as the primary basis for measuring cross-national cultural differences, based on either four or six dimensions depending on data availability (e.g., Fu & Lee, 2008; Kristjánsdóttir et al., 2017; Mostafiz, Akter, & Rahman, 2024). Most of these studies construct cultural distance variables using the Kogut and Singh index (1988). For example, For example, Pippinato et al. (2020) construct a cultural distance index based on four Hofstede dimensions—Power Distance, Individualism, Masculinity, and Uncertainty Avoidance—using the Kogut and Singh index (1988). The cultural

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distance variable is incorporated into gravity models estimated using OLS, Heckman selection, and PPML methods. While the OLS and Heckman models suggest a weakly positive effect, the PPML results—deemed more robust by the authors—indicate a negative but statistically insignificant relationship between cultural distance and honey trade flows. However, its modelling approach is still informative. Mostafiz et al. (2024) employ the full six-dimensional Kogut and Singh index to explain Bangladesh's bilateral trade, using a PPML gravity model. Their findings confirm a significant negative effect of cultural distance on trade flows, even with stronger impacts on exports. Wang, Yang, and Yasar (2020) further extend the standard approach by embedding the Kogut and Singh index into a multilevel linear model (MLM). Their analysis reveals that cultural distance more severely reduces bilateral trade in experience goods than in search goods, and this negative effect is mitigated when the importing country has a higher level of uncertainty avoidance, offering a novel interactional interpretation of cultural mechanisms.

While the Kogut and Singh index (1988) remains dominant, several studies propose alternative or modified constructions based on Hofstede's dimensions. For instance, Kristjánsdóttir et al. (2017) develop a standardized composite index by summing five normalized Hofstede dimensions into a single score ranging from 0 to 500. This index is used as a continuous explanatory variable in gravity models estimated by OLS and PPML, showing a significantly positive effect on trade volume. Park and Park (2021) introduce a log-transformed distance formula that aggregates standardized absolute gaps across four Hofstede dimensions; this variable is incorporated into a pooled probit model examining the likelihood of regional trade agreement formation, with results indicating a significant negative effect of cultural distance. Harms and Shuvalova (2020) use Mahalanobis distance based on six Hofstede dimensions to construct a cultural distance variable, which negatively and significantly affects bilateral service trade in a PPML gravity model. These studies demonstrate the researchers' ability to adapt Hofstede-based cultural variables to better fit specific theoretical contexts and econometric designs.

· WVS/EVS-Based Cultural Measures

Some studies also quantify cultural distance using data from the World Values Survey (WVS) or European Values Survey (EVS), with most adopting Euclidean Distance formulas to calculate the distance between countries based on value dimensions. Tadesse and White (2017) use Inglehart's TSR and SSE dimensions from WVS (1995–2010), computing their Euclidean distance and embedding the variable into a multi-level gravity model of trade costs; cultural distance is positively and significantly associated with higher trade costs. Cyrus (2012) constructed cultural distance using four WVS-based variables-trust, respect, control, and obedience-then calculates their Euclidean difference. OLS and IV-GMM results showed cultural distance significantly and negatively affects trade before controlling for variables such as language, religion, etc.; cultural distance lost significance when these control variables were added, suggesting that cultural proxies may be substituting for some of the cultural distance effect. Liu, Lu, & Wang (2021) constructed a cultural distance index based on Inglehart and Welzel's TSR and SSE dimensions, and incorporated it into a PPML gravity model using disaggregated export data. Results showed that cultural distance significantly hindered exports from both China and the U.S., mainly through preference and transaction cost channels, with the effect varying by dimension. White & Tadesse (2008) employed Inglehart-based cultural distance in a Tobit model analyzing U.S. state-level exports of cultural products to 75 countries. Its results indicated a significant negative effect of cultural distance on both the extensive and intensive margins of exports, while immigrant stocks partially mitigated these effects. Tadesse & White (2010) used Euclidean distance derived from Inglehart's two cultural dimensions and included it as a main explanatory variable in a Tobit model of U.S. state exports. The finding suggested that cultural distance

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significantly reduced exports, especially of cultural goods, while the interaction with immigrant stocks showed a moderating effect.

In contrast, Shulgin et al. (2017) proposed a novel ensemble metric—MELNN—based on individual-level responses to 82 value items from the WVS. This ensemble integrated five distance metrics: Euclidean distance, normalized Euclidean distance, L-distance, normalized L-distance, and Mahalanobis distance. By constructing a "values network" through MELNN scores, the authors derived country-level cultural distances based on the density of "neighbors in values" across national populations. These Symmetrical Cultural Distance (SCD) indicators were used in gravity models of trade and showed significant negative effects on bilateral trade volumes. Compared to traditional two-dimensional WVS measures, the MELNN-based approach captured richer micro-level variation and nonlinear structures, offering a notable innovation for cultural distance measurement in trade research.

3.3.3 Other Cultural Distance Measures

Beyond Hofstede and WVS-based approaches, several studies have adopted alternative cultural frameworks and data sources to quantify cultural distance. Brewer and Sherriff (2007) utilized the GLOBE study's 18 cultural dimensions to construct a cultural distance index using the Kogut and Singh method, focusing on Australia's export destinations. Their OLS analysis found no significant impact of GLOBE-based cultural distance on trade, displaying the limited explanatory power of culture in certain contexts. Imm Ng, Anne Lee, and Soutar (2007) used Schwartz's value scores (1994) to calculate cultural distance across 23 countries, with Australia as the reference. The Schwartz-based index significantly predicted bilateral trade volumes, suggesting that value-oriented frameworks may outperform structural ones in explaining cultural barriers. Yeganeh (2011) further customized a Schwartz-based index using weighted and standardized differences across three dimensions—Egalitarianism, Harmony, and Conservatism—although the effect became insignificant after controlling for language, pointing to the dominant role of linguistic proximity.

Other studies have moved beyond abstract cultural frameworks and constructed distance measures based on more data. Fensore et al. (2022) innovatively measured "ancestral distance" through population-weighted FST values from genetic data, finding that deep-rooted ancestry differences significantly hinder both the formation and intensity of trade, particularly in North–South and differentiated product flows. Query and Thompson (2024) employed national survey data (GSS and ISSP) to compute eight domain-specific cultural distances, using both Euclidean and Mahalanobis metrics. Their disaggregated analysis revealed that trust and business-related value distances consistently reduced trade flows, while religion- and worldview-based distances sometimes showed the opposite effect.

Compared to Hofstede and WVS-based studies, this stream of literature highlights a shift from generalized macro-indices toward domain-specific, theoretically grounded, and often empirically richer measures of culture—pushing the boundaries of how cultural distance can be understood and operationalized in international trade.

3.4 Culture Effects under Varying Trade Contexts

The effect of culture on international trade is not universal, but rather contextual (Liu, Lu, & Wang, 2021; Zhou & Zhou, 2022), with the direction and intensity of the effect moderated by multiple factors. This complexity requires researchers to move away from a single cultural determinism and focus on cultural effects in specific international trade contexts.

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Several studies have challenged the linear assumption that "the closer the culture, the stronger the trade". Zhou and Zhou (2022) studied the trade of cultural products in China, Japan and South Korea, and found the variable of cultural distance was only positively significant in some of the models, which suggests that there may be a non-linear mechanism for the effect of culture on trade. Lankhuizen and de Groot (2016) modeled a quadratic relationship and found a statistically significant inverted U-shape, suggesting that moderate cultural distance may actually foster trade, while extreme similarity or difference reduces it. Imm Ng, Anne Lee, and Soutar (2007) found that only Schwartz-based distance significantly predicted bilateral trade, whereas Hofstede-based distance was not significant. They further questioned the linearity assumption and found that the effect of cultural distance is not only non-linear, but also highly sensitive to the cultural framework used, underscoring the need to reconsider the "more similar is always better" assumption in international trade studies.

Cultural effects on trade vary significantly across geographic, industries, and institutional contexts. At the region or country level, Liu, Lu, and Wang (2021) found that the same cultural dimension exerted divergent effects in East Asia and Europe. Zhou and Zhou (2022) reported that cultural similarity enhanced trade for China but not for Japan or Korea, highlighting national specificity. Industry- and product-level heterogeneity has also been observed. Harms and Shuvalova (2020) found that cultural distance significantly reduced exports of culture-sensitive services but had no impact on standardized sectors like transportation. Similarly, Mostafiz et al. (2024) demonstrated that manufactured goods, such as apparel, were more vulnerable to cultural barriers than minerals and other homogeneous primary products, as the former require deeper cultural alignment with consumer preferences. Policy and institutional environments can also shape how cultural distance translates into trade outcomes. Li et al. (2021) demonstrated that China's Confucius Institutes mitigated the negative impact of cultural distance on trade with Belt and Road countries, particularly in non-Chinese cultural contexts. Kokko and Tingvall (2014) found that EU institutional integration neutralised the trade-inhibiting effect of cultural distance among newer member states, whereas older members remained sensitive to cultural differences. These studies highlight how policies and institutions, such as supranational governance, could recalibrate the economic consequences of cultural gaps.

Therefore, future empirical research should consider more context-specific approaches to capture the complexity and flexibility of culture, moving beyond simple assumptions towards a more robust exploration of cultural effects in international trade.

CONCLUSION AND DISSCUSION

This study provides a comprehensive overview of the measurement of culture in international trade and the impact of contextualisation through a systematic literature review and the PRISMA framework. By critically analysing the included articles, it is not hard to get the consensus that culture is a key component in international trade research.

Its empirical research mainly relies on two types of quantitative methods in order to add the role of culture into the research model as the variable(s): the selection of cultural proxies variable and the quantification of culture itself. Language, religion, and colonial historical ties are common and popular cultural proxy variables that effectively capture the structural and institutional dimensions of culture. They are usually found in the form of dummy variables, but there are a few studies that measure them through interesting and informed methods, instead of only 0 or 1. In addition to this, some researchers have made innovative use of some other cultural proxy variables such as cultural

preference, institutionalised cultural exchanges, and region-specific cultural clustering. As for direct quantification methods, especially those built upon Hofstede's cultural dimensions and World Values Survey data, dominate empirical studies. The Kogut and Singh index (1988) is the popular approach when utilizing Hofstede's dimensions. However, some other scholars have actively proposed alternatives, such as Mahalanobis distance or self-created cultural distance formula, reflecting a growing methodological diversification. Among the measures based on the World Values Survey (WVS), researchers usually adopt the Euclidean distance through multidimensional value dimensions to calculate cultural differences. However, it's notable as well that the MELNN indicator proposed by Shulgin et al. (2017), which breaks through the limitations of the traditional two-dimensional framework by integrating the multi-distance metric with the "value network" analysis, providing a new path to study the impact of micro-cultural differences on international trade.

By summarizing the empirical research results, it is clear to state that the cultural effect on international trade depends on the specific context. A linear or universal simple assumption cannot adequately reflect the complexity of the culture-trade relationship. Cultural effects might manifest variations across different geographical regions, industries or products, and institutional environments.

Based on these findings, several directions or suggestions for future research in this filed have emerged. For further research, it would be better to embrace non-linear modeling, clearly identifying when cultural differences transition from facilitating to inhibiting trade. Second, given the methodological diversity revealed, researchers should systematically compare multiple cultural measurement frameworks within identical empirical settings to verify their predictive accuracy and robustness. Third, future research could deepen contextual analysis by examining how cultural effects differ across regions, industries, products, and institutional conditions, thus advancing theoretical clarity and informing international trade policies from cultural perspective.

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