When trade meets tradition: unpacking cultural differences and their impact on China's international trade.

YU, B., ZHONG, X., GHIMIRE, B. and SAPKOTA, N.

2025

International Review of Financial Analysis 106 (2025) 104488

Contents lists available at ScienceDirect

International Review of Financial Analysis

journal homepage: www.elsevier.com/locate/irfa

When trade meets tradition: Unpacking cultural differences and their impact on China's international trade☆

Bin Yu [a], Xingyu Zhong [a], Binam Ghimire [b], Niranjan Sapkota [c,*]

[a] School of Economics, Zhejiang University of Technology, Hangzhou, China
[b] Aberdeen Business School, Robert Gordon University, Aberdeen, United Kingdom
[c] School of Accounting and Finance, University of Vaasa, Vaasa, Finland

ARTICLE INFO

JEL classification:
C1
C5
F1
F14
P5

Keywords:
China
Consumer preferences
Consumer psychology
Cultural distance
Gravity model
Poisson pseudo maximum likelihood
Trade

ABSTRACT

Amidst renewed trade tensions and heightened uncertainty in global financial markets, this paper examines the impact of cultural differences on China's international trade. Departing from majority of prior studies treating cultural disparities as static, we employ dynamic models to capture cultural differences over 2001–2021 with its 44 key trading partners. We incorporate Hofstede's six cultural dimensions and apply both linear and non-linear models. Our findings show a consistent negative effect of cultural distance on China's trade. The non-linear analysis uncovers a S-shaped curve relationship, highlighting the subtle influence of cultural differences confirmed by robustness tests in export and import trades. We argue that the impact of trade tensions can be lessened by aligning with the evolving nature of consumer preferences and psychological factors.

1. Introduction

On 10th April 2025, the United States (U.S.) imposed its highest tariffs to date on Chinese goods (145%) surpassing those applied to any other trading partner. While U.S. imports significantly more from China than China does from the U.S., the total value of imports from China, as per data from the United States International Trade Commission, remains lower than the combined imports from Canada and Mexico (www.usitc.gov). According to the Office of the United States Trade Representation, in 2024, Mexico alone exported 505.9 billion U.S. dollars (USD) worth of goods to the U.S., which was 67 billion higher than the total export figures of China (www.ustr.gov). Yet, neither Canada nor Mexico appears on President Trump's tariff list of 8th April. Geographic distance alone does not seem to explain the disparity either, as countries, such as Australia and New Zealand, which are more distant away than China, had 10% tariff until 9th April, similar to culturally aligned nations like the United Kingdom (UK). Subsequently, Trump on 9th April announced uniform trade tariff to all countries except China. While China too increased its tariffs on U.S. exports by a significant 125% on 11th April, this rise may be seen by many as a reciprocal move, given that it followed the U.S. tariff hike. Continuous trade tensions between China and the U.S. that has existed for several decades raise a crucial question: are these steep tariffs driven solely by trade imbalances, or other deeper factors, also play a pivotal role in shaping China's foreign trade policy? While tariff-induced price increases remain a major factor influencing purchasing decisions, this research explores how cultural dimensions, such as consumer preferences and underlying psychological factors, may offer strategic pathways for China to improve its trade with its major partners, and potentially contribute to improved trade relationships.

In recent decades, China has made remarkable progress in its foreign trade, becoming the world's top trading nation. China has now established itself as the largest exporter globally, with a growth rate

☆ This article evolved from a 40,000-word research project conducted at the School of Economics, Zhejiang University of Technology, Hangzhou, China. We are thankful to the Center for Language Education Cooperation, Ministry of Education of the People's Republic of China for the grant [grant number: 21YH048CX5]. We appreciate the insightful comments received from the participants of research seminars at Aberdeen Business School, UK, and at School of Economics, Zhejiang University of Technology, China where this paper was presented. We are especially grateful to Professor Georgios Sermpinis and Dr. B. K. Adhikari of University of Glasgow and University of Texas at San Antonio, respectively, for their valuable feedback.

* Corresponding author.
E-mail address: niranjan.sapkota@uwasa.fi (N. Sapkota).

https://doi.org/10.1016/j.irfa.2025.104488
Received 24 April 2025; Received in revised form 17 July 2025; Accepted 30 July 2025
Available online 12 August 2025

significantly higher than its competitors. As per The World Bank data, while G7 countries recorded a combined export growth rate of 1.7% per annum in the last decade, China's export grew by 5% in the same period, reaching $3.6 trillion in 2022. In terms of imports, at $2.7 trillion in 2022, it ranks second in the world after the U.S.. However, there have also been noticeable declines in Chinese foreign trade. For instance, there was a 1% and 5% contraction in China's foreign trade in 2019 and 2023, compared to the figures recorded in 2018 and 2022, respectively (Data source: www.customs.gov.cn) China's economy is highly foreign trade driven as can be evidenced by the ratio of foreign trade to GDP (Gross Domestic Product), which in the last decade has remained above 35% per annum on average (Data source: www.stats.gov.cn). Given Chinese economy's reliance on foreign trade, a contraction on trade can pose significant challenges to the overall economic landscape.

There are several factors that may have positively influenced China's foreign trade, including economic reform and open-door policy that began as early as 1979, and the membership of various regional and international trade organisations, such as Asia-Pacific Economic Cooperation (APEC) in 1991, The World Trade Organisation (WTO) in 2001 and intergovernmental organisation, BRICS (Brazil, Russia, India, China, and South Africa.), in 2006, and other factors, like the distance (shorter) to a trading partner country (Anderson & Van Wincoop, 2003). Contrastingly, though trade itself has lesser effect on political relations, significant events or actions affecting political relations have led to adversely influence China's international trade (Whitten et al., 2020). Actions, such as tariff hikes (Fajgelbaum et al., 2024), anti-dumping duties (Felbermayr & Sandkamp, 2020; Lu et al., 2013), sanctions, diplomatic conflicts and trade wars (Guo et al., 2023), increased trade policy uncertainty (Crowley et al., 2018) have negative impact on China's international trade. However, the impact of "the uniqueness of Chinese culture" and the resulting cultural differences with other countries on China's international trade remains under-researched. For example, the admiration for "strong men" remains a defining characteristic of Chinese culture (Guan, 2023). This is evident in the online poll of 12,000 Weibo users, a Chinese microblogging and social media platform, conducted prior to the 2024 U.S. election in July 2024, where nearly 80% believed Trump would beat female candidate, Kamala Harris. Similarly, President elect Trump's November 2024 election victory has been celebrated and praised by many Chinese for his assertive leadership style, even in the face of contentious issues such as the "China virus" narrative (Nurullayev et al., 2024) and trade tariff increases, aligns with traditional Chinese values.[1] In light of such distinct Chinese cultural characteristics, which has been retained despite significant sociocultural changes in the current contemporary China (Faure & Fang, 2008), this paper makes several key contributions to enhance our understanding of whether minimising cultural differences fosters or impedes China's international trade, addressing gaps in the existing research.

First, we offer a focused analysis into the role of cultural differences in shaping and influencing China's international trade with its major 44 trading partners, which collectively accounts for over 90% of China's international trade. This approach of targeting major trading partners is motivated by the idea that managing cultural differences is more impactful within a smaller group (Hanson & Lackman, 1998) of high-volume trading partners than with numerous countries trading lesser amount with China. By concentrating on fewer but large trading countries, we provide crucial insights into the dynamics of cultural differences and trade relationships with significant partners.

[1] According to Franka Lu in WorldCrunch (Source: worldcrunch.com; November 30, 2024), Trump's popularity in China reflects an enduring cultural trait: reverence for strong, authoritative leaders, coupled with admiration for his bold personality and perceived business acumen.

Second, we contribute by identifying a monotonically decreasing, S-shaped relationship between cultural distance and China's total foreign trade. While examining the influence of culture is important due to the distinct nature of Chinese culture, shaped by values and traditions stemming from thousands of years of history, including diverse forms of learning such as Confucianism (Hucker, 1975), like lower probability of speculations (Ge et al., 2023), our findings reveal that cultural differences exert a non-linear negative impact on trade. Robustness tests further confirm this, showing a horizontal S-shaped effect on exports and a "flipped" S-shaped effect on imports.

Third, major contribution of this study is that it links the shape of the relationship to consumer preferences and the psychological impact of buying foreign products. This effect highlights how cultural differences influence trade by simultaneously altering consumer psychological uncertainty and trade costs. Specifically, the paper demonstrates that under the combined influence of consumer psychology uncertainty benefits and trade cost disadvantages, cultural differences impose a non-linear negative effect on China's total foreign trade.

Fourth, we contribute by rigorously examining both the linear and non-linear relationships through the incorporation of quadratic and cubic terms of cultural distance into our model. Additionally, we contribute methodologically by employing (Hofstede et al., 2010) cultural distance data, aligning with existing popular literature that has utilised this dataset and therefore facilitating result comparisons with our sample dataset of major trading partners.

The remainder of the paper is organised as follows: Section 2 reviews the relevant literature, Section 3 outlines the materials and methods used, Section 4 presents the empirical results and analysis, and Section 5 concludes the paper.

2. Literature review

Webster's Dictionary (www.merriam-webster.com) defines culture as "customary beliefs, social forms, and material traits of a racial, religious, or social group". When comparing cultures across nations, some like Australia and the United Kingdom (UK), reveal similarities, despite substantial spatial distance. In contrast, countries like the U.S. and Mexico, though sharing geographic proximities, exhibit major cultural distinctions. The culture of nations when quantified can be compared and the difference is commonly known as Cultural Distance (CD) in the literature. While the negative impact of geographical distance on foreign trade has garnered substantial empirical support in the literature (Disdier & Head, 2008), the relationship with CD remains inconclusive and an ongoing area of research. This section, therefore, reviews existing literature, exploring both supporting and opposing perspectives on the relationship between cultural distance and international trade, alongside some recent relevant studies involving China.

Early literature examining the relationship emphasised the importance of minimising the psychic distance between trading countries. The psychic distance represents factors, such as the differences in language, education, business practices, culture, and industrial development (Beckerman, 1956; Hörnell et al., 1973; Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). The role of psychic distance has been emphasised in various studies and also for Small and Medium-sized Enterprises (SMEs) engaged in export business (Paul et al., 2017). However, it was only after the pivotal publications of cultural dimension data by Hofstede in 1980 and World Values Surveys (WVS) data by Inglehart and his team in 1981, academic literature got some momentum to empirically examine the relationship involving CD for a large number of countries. Currently, there are several studies that have used Hofstede's and WVS data to assess the impact of CD on international trade, while some other studies have focused on linguistic distance data either by constructing it or through sources, such as Chiswick and Miller (1997), Mayer and Zignago (2011), and the website of the Central Intelligence Agency (CIA).

Boisso and Ferrantino (1997) constructed linguistic similarity data and estimated the relationship over a sample of 7943 bilateral export flows for each year from 1960–1985. They found linguistic distance negatively affecting trade. In another study involving linguistic distance, Hutchinson (2005) examines the influence of the English language and trade relationships between different nations and the United States. The author found that there will be less trade between the United States and a country the further that country's language is from English. Melitz (2008) investigated whether ease of communication facilitates trade through translation or the ability to communicate directly. The impact of direct communication, where the author included all languages spoken by at least 4% of the population of the trading countries, was three times higher than indirect communication via translation. In a meta-analysis, Egger and Lassmann (2012) showed that on average, common language increased trade flows by 44%. Literature has continued to make use of linguistic distance while exploring international trade relationships (see, for example, Contractor et al., 2016; Fidrmuc & Fidrmuc, 2016; Hanousek & Kočenda, 2014; Sun et al., 2024) and the importance of language has been established by majority past literature. However, a common language or similar language is not a precise representation of culture. For example, countries, such as Spain and Mexico, Australia and New Zealand, and India and Pakistan — all have common languages (Spanish, English, and Hindi for each country pair, respectively) but the cultural aspects, including traditions, cuisine, and societal norms, exhibit notable differences between them. The relationship with culture, which is broader than language, remains unanswered.

Rauch and Trindade (2002) study the role of ethnic Chinese networks on international trade. Following Rauch (1999), the authors separate tradable commodities into those that have reference prices and others that do not, where reference price refers to prices of goods that do not have a brand or label and therefore are homogeneous; and opposite will be differentiated goods. The authors found increased bilateral trade for differentiated goods than for homogeneous goods, possibly signalling the fact that there is more demand for labelled, may be prestigious, goods among Chinese immigrants. Moreover, several studies have delved into the impact of immigrants (Hajro et al., 2021; Hernandez, 2014; Shukla & Cantwell, 2018; Tung & Chung, 2010) and ancestry on trade (Fensore et al., 2022) consistently revealing an overall positive correlation, albeit with variations based on the analysed factors. For example, the overall trade, tends to exhibit a more robust association with low-skilled immigrants compared to their high-skilled counterparts (Lin & Yang, 2017). However, these comprehensive investigations have largely overlooked the essential connection with CD.

In their analysis of data from 92 countries in 1999, Linders et al. (2005) noted the anticipated negative effects of institutional quality and institutional distance on bilateral trade flows. However, contrary to expectations, the impact of cultural distance was found to be positive. Against this unexpected result, the authors tentatively suggested that firms might find it more advantageous to trade with culturally distant countries over investing and engaging in the local production operations in the host country, but this explanation is questionable. Additionally, the authors themselves could not provide evidence for their own explanations as they did not have the sales figures of their sample firms' foreign production facilities.

Tadesse and White (2010a) constructed cultural distance data using WVS between U.S. states and their 75 trading partner countries during the year 2000. They found greater cultural distance between the U.S. and trading partners reduces aggregate export by 0.29%. The impact observed was substantial, amounting to 0.49% on exports of cultural products compared to 0.27% on exports of non-cultural products. In a subsequent study, the authors (Tadesse & White, 2010b) computed cultural distance between nine OECD (Organisation for Economic Co-operation and Development) reference countries and 58 trading partners for the period 1996–2001. The negative effect of cultural distance continued in this new sample, further strengthening their previous findings. However, Tadesse et al. (2017) could not find similar evidence for China although the source of the CD data in all three studies was WVS (Inglehart, 2004). Employing yearly data from 1995 to 2011, the authors analysed if cultural differences across societies impact China's external trade flows. The findings revealed that the aggregate exports and imports of China show minimal sensitivity to the cultural gap between China and its 88 trading partners. They concluded that China's trade is not affected by CD.

Studies have also examined how religious commonalities influence international trade, assessing the impact across multiple countries and within individual nations. Helble (2007) examines how religion shapes global trade, finding distinct trade impacts among the five major world religions namely Buddhism, Christianity, Hinduism, Judaism, and Islam. Analysing empirically trade flows between 151 countries, the author finds that countries with a wide variety of religions tend to be more successful in trading with other countries. It concludes that a country's religious openness is positively correlated with its trade performance. Turco and Maggioni (2018) study Turkish firms and find that shared religious beliefs boost exports, particularly to Muslim-majority markets. This effect enhances trust in trade, facilitates market entry, and lowers the costs of expanding into new markets. Similarly, Thomas (1999) shows that culturally homogeneous groups tend to outperform heterogeneous ones in the short term, due to better alignment in norms and expectations. However, Watson et al. (1993) find that over time, the performance gap between homogeneous and heterogeneous groups narrows, and diverse groups may even outperform on specific task measures. These findings, although relate to group dynamics, implies that while cultural homogeneity and religious similarity can offer initial advantages in trade and cooperation, diverse partnerships may also become more effective as relationships mature.

Employing the measure of cultural distance based on the national culture scores by Hofstede et al. (2010) and the World Bank Worldwide Governance Indicators, Liu et al. (2020) studied the impact of cultural and institutional distances between China and 99 trading partners, from 2002 to 2016. They applied difference in differences (DID) regression to subsamples of 38 Belt and Road (B&R) countries and the non-B&R countries before and after the B&R initiative of China in 2013. They found that China's bilateral trade is more sensitive to cultural and institutional distances between China and its trading partners along the B&R than all countries. They provided evidence that variations in bilateral trade flows between China and its trading partners are explained more by cultural distance than institutional distance. The authors, however, could not find significant effects of CD on trade flows when only the subsample of European countries was considered. The authors, in a subsequent study (Liu et al., 2021), changed the source of CD data to WVS and investigated the relationship between CD on export of China and the US on a sample of 97 trading partners from 2004 to 2016. Methodologically, they improve by applying the PPML model to solve the problems of biased and inconsistent coefficient estimators of linear equations. They found that a unit increase in CD (measured in standard deviation) reduces the exports of China and the US to the trading partners by 5.71% and 4.26%, respectively. But when they decomposed the CD into traditional vs. secular-rational values (TSR) distance and self-expression values (SSE) and survival vs. self-expression values (SSE) distance, they found a significant difference. The results indicated that China's exports are negatively affected by CD measured along TSR but it has no influence on the US export. In the case of (SSE) distance, it had a negative impact on US exports, while it had no influence on China's exports. Liu et al. (2021) provided some tentative explanations for this puzzle by linking with the comparative advantages of China and the USA in labour-intensive and capital-intensive products, respectively.

Sun et al. (2024), used Hofstede's six cultural dimension data and 535 WTO trade dispute cases from 1995 to 2017. They found that

country with a unit farther cultural distance to its trade partner has an average 0.18% higher probability of filing a trade complaint.

In addition to the significance of cultural differences, some studies suggest that China possesses unique financial market characteristics that distinguish it from many other countries. For example, stock market's momentum returns in China exclusively follow down markets, which is different from the financial market characteristics of its major trading partner, the U.S., where they follow up markets. Furthermore, the lack of momentum returns after market gains in China cannot be explained by the usual market behaviour seen in the U.S. (Cheema & Nartea, 2017). Chinese market uniqueness has also been identified in other studies, including in the study by Liu et al. (2012), which found that, unlike firms in most countries that performed poorly during the last financial crisis, Chinese firms relying on bank finance performed better during the crisis.

Majority literature on international trade have ignored the buyers, the main facilitator of both the export and import trade, in particular studies do not emphasise consumer preference and psychological impacts of purchasing foreign products. In reality, however, when consumers tend to choose products, larger cultural differences between two countries can diminish recognition and affinity between them ultimately creating a psychological trade barrier. This is related to consumer psychology uncertainty. The uncertainty relates to the doubts and hesitations that consumers may experience when considering the purchase of products from a foreign market, especially when there is a significant cultural distance between the consumer's home country and the market of origin for the products. This uncertainty can stem from a lack of familiarity with the foreign market's products, business practices, or consumer rights protections. Consequently, domestic consumers may prefer not to buy foreign products (Fensore et al., 2022). However, certain cultural differences might also pique consumers' curiosity (Shulgin et al., 2017), leading them to purchase foreign products. Thus, the impact of consumer psychology uncertainty caused by cultural differences on international trade remains unknown, and it largely depends on which psychology, one – discourages consumers from purchasing, another – attracts consumers to purchase, dominates among consumers in different countries when they consume foreign products.

In summary, the relationship between CD and international trade remains a debated topic in scholarly discussions. While some studies utilising linguistic distance data have demonstrated the anticipated negative relationship with trade, language, as explained above, is not a substitute for culture. In terms of measuring CD, majority literature considers it as time invariant, relying on static CD data. However, such assumptions can lead to mistaken interpretations. We also reviewed that China has some uniqueness in terms of its financial markets, which further enhances the scope of this study. Additionally, the existing literature do not link consumer psychology for purchase of foreign goods while explaining the relationship between cultural differences and trade. Methodologically, diverse approaches have been employed by the current body of literature, and recent research highlights a shift towards examining the non-linearity of the relationship. Despite these efforts, the findings across the literature are far from reaching a consensus on the precise nature of the link between CD and trade.

3. Data and methodologies

To ensure that the selected sample has a strong representativeness, we studied export and import volume of all trading partner countries of China. Out of more than 200 countries with whom China was found trading at the end of 2021, this paper focuses on its 44 major trading partners. The significance of studying the relationship with major trading partners is also well supported in prior research (see for example, Bissoondoyal-Bheenick et al. (2022)). Table A.1 in the Appendix provides the name list of all 43 countries and Hong Kong SAR included in our sample, as together they represent majority (above 90%) of China's total foreign trade.

Fig. 1 displays China's export and import values by country from 2001 to 2021. In the export chart, the U.S. consistently stands out as China's largest export destination, with a sharp increase after 2020. Hong Kong, Germany, Japan, and Korea are also significant export partners, though their values remain lower than the U.S.. The majority of other trading partners, including emerging economies like Vietnam and India, show gradual upward trends but stay clustered at the lower end. Overall, the chart reveals a general growth in China's export values across most countries over time, reflecting the country's increasing role as a global trade leader.

In the import chart, Republic of Korea and Japan emerge as the largest sources of China's imports, particularly between 2010 and 2018. The U.S., Australia, Germany, and Brazil also contribute substantial import values, highlighting China's reliance on industrial and resource-heavy economies. Unlike exports, the import chart exhibits more fluctuations, with noticeable dips around 2015 and 2020 for some key partners. While trade values for smaller partners remain low, the overall trend suggests steady growth in China's imports, driven by its expanding demand for goods and resources to support economic development.

Certain countries from the top list of the top 40 trading partners are excluded in this study. The exclusion of countries such as the United Arab Emirates, Saudi Arabia, Iran, Austria, Kazakhstan, and Norway from the list of China's top trading partners is driven by methodological considerations and the focus of this study. These countries often have highly specialised trade relationships with China, predominantly centred around single commodities such as oil, gas, or specific raw materials. Including such resource-dependent trade partners could skew the analysis by overemphasising volume-driven trade relationships that do not reflect the broader diversity of China's trade dynamics. Furthermore, the excluded countries' trade patterns align more closely with China's energy or strategic resource security strategies, which fall outside the primary scope of this study. This decision ensures that the analysis remains balanced and focused on more diversified trade relationships. Conversely, countries such as Nigeria, Finland, Hungary, Egypt, Greece, and Bangladesh are included to provide a more comprehensive representation of China's diverse trade relationships. These countries reflect growing or strategically important trade partnerships for China in emerging markets, manufacturing, and regional infrastructure development. For example, Nigeria plays a key role in China's engagement with Africa, while Greece and Egypt are pivotal to China's Belt and Road Initiative. Similarly, Bangladesh's integration into China's supply chains in textiles and manufacturing highlights its increasing relevance. By including these countries, the analysis captures a broader and more geographically balanced perspective, aligning with the study's objective to explore the multi-dimensional and evolving nature of China's global trade partnerships.

In terms of mathematical model, this paper gets its motivation from the gravity model of trade. Gravity theory, which has its origin from physics, also known as the Newton's law of gravitation, was first applied by Tinbergen (1962) into international trade. It provides the trade flows between the two countries, where trade is positively related with the GDP of the countries but inversely related to the distance between them.

While prior empirical studies have confirmed a decrease in bilateral trade with geographical distance (Disdier & Head, 2008), what is unknown is the relationship with cultural distance and if it can reduce trade tensions, the focal point of our investigation. Consequently, the geographical distance is replaced by cultural distance and the modified version of the theory is shown by Eq. (1).

$$\text{Trade}_{ij} = C\frac{\text{GDP}_i \times \text{GDP}_j}{\text{CD}_{ij}}, \tag{1}$$

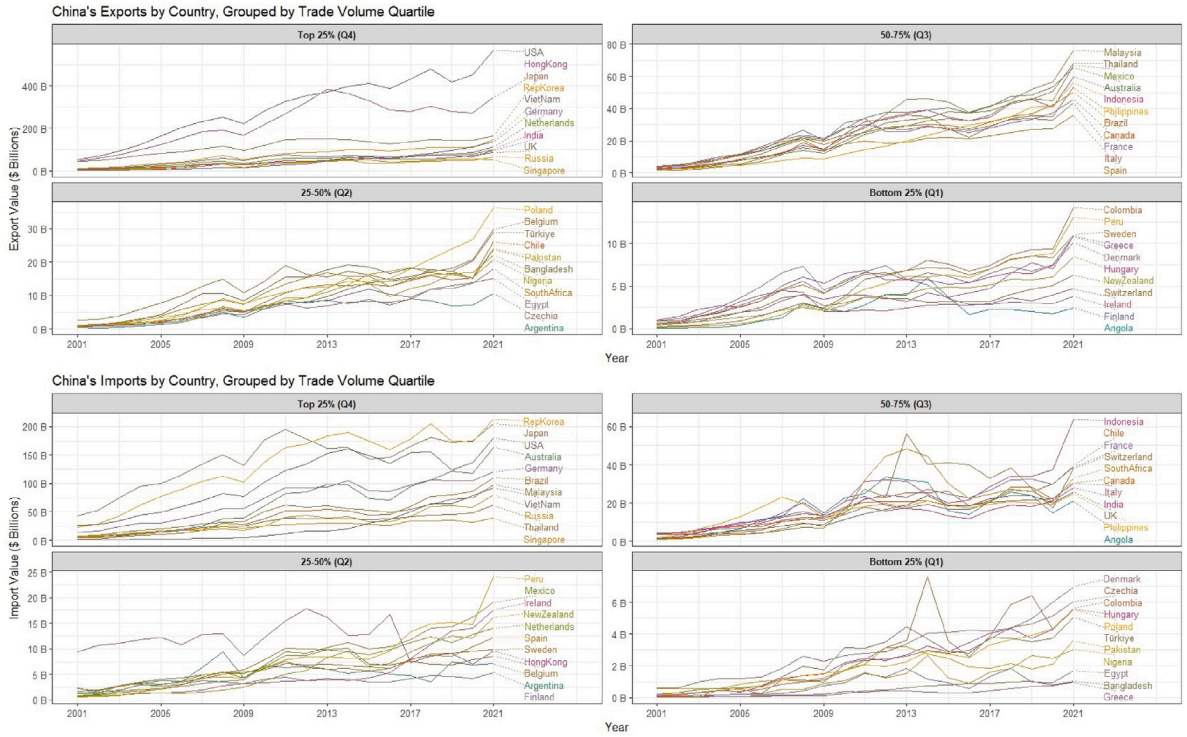

Fig. 1. China's top 44 global trade partners (2001–2021).

where Trade_{ij} represents the bilateral trade flows (export and import) between country i and j, C is a constant, GDP_i and GDP_j are the Gross Domestic Products for the two countries respectively, and CD_{ij} is the cultural distance.

To quantify CD, this paper, first, finds the score of cultural differences between China and its trading partners by making use of Hofstede's data (source: www.hofstede-insights.com). Hofstede (1984) quantified four national culture dimensions based on a survey among IBM employees, later expanding them to six (Hofstede et al., 2010).

Cultural similarities play a crucial role in trade relationships, yet they are often overlooked. A recent study by Wang and Liu (2024) introduce the residence-based approach to value-added exports, showing that a country's exports largely originate from activities within its jurisdiction, regardless of firm ownership. They find that the trade deficit between developed and developing G20 nations has declined, with developed economies retaining more value-added exports. However, they do not explore why this pattern emerges. Shared historical, institutional, and cultural traits among developed G20 nations (France, Germany, the United Kingdom, Australia, Canada, and the United States) may foster greater trade efficiency and intra-group cooperation, improving value retention. In contrast, developing G20 nations, like Mexico and Turkey, which exhibit more diverse cultural and economic structures, may struggle with value retention due to weaker institutional alignment, differing business norms, and cultural barriers in global trade. By incorporating Hofstede's cultural dimensions into the analysis, this study examines whether cultural proximity or distance influences the extent to which China and its trade partners retain or lose value in international trade.

Similar to some recent literature (Harms & Shuvalova, 2020; Jane, 2021; Kristjánsdóttir et al., 2017), this paper utilises all six cultural dimensions. They are power distance (PD), individualism and collectivism (IC), masculinity and feminism (MF), uncertainty avoidance (UA), long- and short-term orientation (LS), and indulgence and self-restraint (IR). Importance of these cultural dimensions has been emphasised in the literature. For example, Lee and Peterson (2000) suggest that country should have a culture that is low on power distance, weak in uncertainty avoidance, masculine in nature, individualistic, achievement oriented, and universalistic for global competitiveness. The scores for all six cultural dimension for all 44 trading partners are obtained from Hofstede Insights. Second, we follow the model developed by Kogut and Singh (1988) to compute CD. Majority of literature measuring cultural distance has applied this model in its original or modified version (review is available in Shenkar, 2001; Tihanyi et al., 2005).

The score for each country for each dimension is deducted from China's score on respective dimension, which gives the difference. Their model (page 422) is presented in Eq. (2).

$$\text{CD}_j = \frac{1}{4}\sum_{i=1}^{4}\frac{(I_{ij} - I_{iu})^2}{V_i}, \tag{2}$$

where, CD_j is the cultural difference of the jth country from the U.S. I_{ij} is the index for the ith cultural dimension and jth cultural country. V_i is the variance of the index of the ith dimension and u stands for the reference country, U.S.. As such, according to the model, the cultural distance between two countries is calculated as the average of the differences of Hofstede (1984)'s country scores adjusted by the variance of the corresponding dimension. We, however, expand the model by including two more cultural dimensions and adding a new variable into the equation. This improvisation is important first because the model by Kogut and Singh (1988) has faced criticism (see for example, Popli et al., 2016; Shenkar, 2001; Tung & Verbeke, 2010). Second, the model assumes that cultural distance is time invariant. However, as indicated in the improvised version below, cultural distance, reduces,

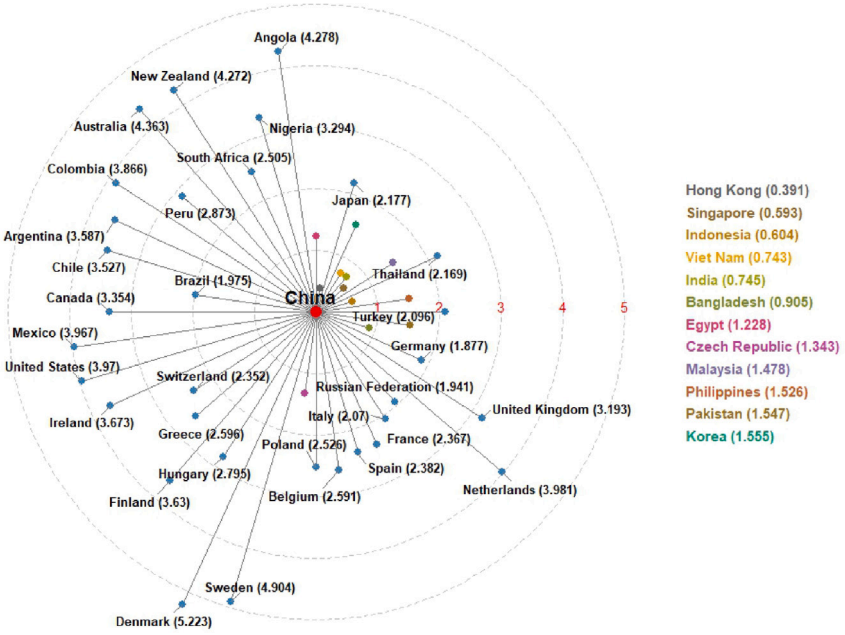

Fig. 2. Cultural distance between China and its 44 trading partners (2001–2021).
Note: Countries near to the centre are denoted with respective colour nodes. To compute the cultural distance, we extend the model by Kogut and Singh (1988) and apply:

$$\mathrm{CD}_{ij,t} = \frac{1}{6}\sum_{k=1}^{6}\frac{(I_{ik} - I_{jk})^2}{V_k} + \frac{1}{Y_{ij,t}}.$$

albeit slowly. The improvised model is given by Eq. (3).

$$\mathrm{CD}_{ij,t} = \frac{1}{6}\sum_{k=1}^{6}\frac{(I_{ik} - I_{jk})^2}{V_k} + \frac{1}{Y_{ij,t}}, \tag{3}$$

where, CD_{ijt} is the cultural distance between China i and the trading partner country j in year t, I_{ik} denotes the score of China i on the kth cultural dimension. I_{jk} denotes the score of the trading partner country j on the kth cultural dimension. V_k denotes the variance of the kth cultural dimension. $Y_{ij,t}$ is the new variable, not available in Kogut and Singh (1988), and the idea that cultural distance will change with time has been overlooked by several studies, including some recent papers (Harms & Shuvalova, 2020; Jane, 2021; Liu et al., 2020). We, however, introduce it into model because cultural distances between the trading countries changes over time (Cyrus, 2012). This logic is similar to the concept of "psychic distance", representing factors, such as differences in language, culture, political systems etc., is not constant, instead will, generally, reduce over time but rather slowly (Beckerman, 1956; Wiedersheim-Paul, 1972; Wiedersheim-Paul & Johanson, 1975). It may be noted that, following law of diminution, the reduction in the cultural distance will be much faster at the beginning but slower afterwards. To account for this, we adopt (Qi et al., 2012)'s approach and incorporate the reciprocal of the year of establishment of diplomatic relations $\left(\frac{1}{Y_{ij,t}}\right)$ into the formula, where $Y_{ij,t}$ represents time (age in years, t) of establishment of diplomatic relations of country (China, i) with the trading partner (country j). Given the denominator decreases with the passage of time, this adjustment ensures the required property for cultural distance explained above. Fig. 2 provides the graphical representation of cultural distance between China and its 44 trading partners.

Next, we linearise Eq. (1) and include CD computed by Eq. (3) as the core independent variable and other control variables into the model to test the relationship between trade and CD. Additionally, we follow Silva and Tenreyro (2006) and make use of the more commonly applied Poisson Pseudo Maximum Likelihood (PPML) model, which avoids the need to take the logarithm of trade and therefore estimates turns out to be unbiased and consistent. The gravity model incorporating PPML is given by Eq. (4).

$$\begin{aligned}\mathrm{Trade}_{ij,t} = \exp\Big(&\beta_1 + \beta_2 \mathrm{CD}_{ij,t} + \beta_3 \ln \mathrm{GDP}_{it} + \beta_4 \ln \mathrm{GDP}_{jt} + \beta_5 \ln D_{ij} \\ &+ \beta_6 \ln \mathrm{ED}_{ij,t} + \beta_7 \mathrm{EF}_{j,t} + \beta_8 \mathrm{NE} + \beta_9 \mathrm{AP} + \beta_{10} \mathrm{FTA} + \epsilon_{ijt}\Big),\end{aligned} \tag{4}$$

In Eq. (4), $Trade$ is the total exports and import of China in USD. CD represents cultural distance as per Eq. (3). GDP_{it} and GDP_{jt} are the GDP of China and GDP of trading partner in our sample for year t, respectively. The ratio of GDP per capita between China and the trading partner countries is given by the economic difference variable, ED. The economic freedom index of trading partner country is represented by EF. Additionally, there are three dummy variables, namely, NE, AP and FTA. NE is a dichotomous variable it indicates whether China has territorial or sea border shared with the partner country or not. It is given the value of 1 for countries with common border (land or sea) and 0 otherwise. In case of AP and FTA, since China is a member of both APEC and Free Trade Agreement (FTA), dummy values of 1 is given to member countries of APEC and FTA, and if they are not the members, then value of 0 is assigned.

In terms of sources of data, Trade data for China and all its 44 trading partners is obtained from The United Nations Comtrade Database. GDP and ED are obtained from the World Bank. EF data is from the Heritage Foundation. NE data is from the CEPII database. AP and FTA data is obtained from the official website of the APEC and the Ministry of Commerce of China. Table 1 provides the details of dependent, independent and control variables including brief definitions and various sources of data.

While considering the complexity of international trade, a non-linear influence relationship between cultural differences and China's foreign trade cannot be ignored. This paper, therefore, further extends

Table 1
Variable definitions and sources of data.

Variables	Definition	Data source
Dependent variable		
Trade	China's total exports and imports in USD	UN Comtrade database (https://comtradeplus.un.org)
Independent variables		
Cultural distance	Quantitative measure of cultural differences between China and its trading partners	Hofstede Insights (https://www.hofstede-insights.com)
Control variables		
China GDP	Real Gross Domestic Product of China	The World Bank (https://worldbank.org)
Partners GDP	Real Gross Domestic Product of China's trading partners	The World Bank (https://worldbank.org)
Geo-Distance	Distance between Beijing and the capital city of trading partners	CEPII database (https://cepii.fr)
Economic distance	Difference between the per capita GDP of China and the trading partners	The World Bank (https://worldbank.org)
Economic freedom	Index value of economic freedom	Heritage Foundation (https://heritage.org)
Border — NE	Indicates whether China shares territorial or sea borders with the trading partner country	CEPII database (https://cepii.fr)
Member — APEC	Indicates whether the trading partner is a member of APEC or not	Asia Pacific Economic Council (https://apec.org)
Member — FTA	Indicates whether the trading partner is a member of an FTA or not	Ministry of Commerce of China (https://fta.mofcom.gov.cn)

Note: Cultural distance is computed as per Eq. (3). The last three items are dummy variables.

Table 2
Means, standard deviations, correlations.

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade (1)	549.80	902.80	1									
Cultural distance (2)	2.62	1.29	−0.11	1								
China GDP (3)	4.06	0.83	0.30	0.00	1							
Partner GDP (4)	1.86	1.01	0.58	0.05	0.29	1						
Geo-Distance (5)	8.83	0.64	−0.32	0.59	0.00	−0.02	1					
Economic distance (6)	−1.07	1.40	−0.12	−0.38	0.36	−0.30	−0.10	1				
Economic freedom (7)	66.89	10.83	0.29	0.26	0.10	0.22	−0.03	−0.68	1			
Border — NE (8)	0.23	0.42	0.31	−0.57	0.00	0.03	−0.71	0.33	−0.20	1		
Member — APEC (9)	0.39	0.49	0.41	−0.15	0.00	0.07	−0.30	0.00	0.27	0.46	1	
Member — FTA (10)	0.19	0.39	0.19	−0.26	0.31	−0.14	−0.26	0.21	0.24	0.35	0.47	1

Note: The sample for this paper has 44 trading partners for 21 years (2001–2021). SD stands for standard deviation. Number of observations = 924.

Eq. (4) by adding the quadratic and cubic cultural distance as explanatory variables. This is shown by Eqs. (5)–(7), where $CD^2_{ij,t}$ and $CD^3_{ij,t}$ represent the quadratic and cubic relationships, respectively.

$$\mathrm{Trade}_{ij,t} = \exp\Big(\beta_1 + \beta_2 \mathrm{CD}_{ij,t} + \beta_3 \mathrm{CD}^2_{ij,t} + \beta_4 \mathrm{CD}^3_{ij,t} + \beta_5 \ln \mathrm{GDP}_{it} + \beta_6 \ln \mathrm{GDP}_{jt} + \beta_7 \ln D_{ij} + \beta_8 \ln \mathrm{ED}_{ij,t} + \beta_9 \mathrm{EF}_{j,t} + \beta_{10} \mathrm{NE} + \beta_{11} \mathrm{AP} + \beta_{12} \mathrm{FTA} + \epsilon_{ijt}\Big), \tag{5}$$

$$\mathrm{Export}_{ij,t} = \exp\Big(\beta_1 + \beta_2 \mathrm{CD}_{ij,t} + \beta_3 \mathrm{CD}^2_{ij,t} + \beta_4 \mathrm{CD}^3_{ij,t} + \beta_5 \ln \mathrm{GDP}_{it} + \beta_6 \ln \mathrm{GDP}_{jt} + \beta_7 \ln D_{ij} + \beta_8 \ln \mathrm{ED}_{ij,t} + \beta_9 \mathrm{EF}_{j,t} + \beta_{10} \mathrm{NE} + \beta_{11} \mathrm{AP} + \beta_{12} \mathrm{FTA} + \epsilon_{ijt}\Big), \tag{6}$$

$$\mathrm{Import}_{ij,t} = \exp\Big(\beta_1 + \beta_2 \mathrm{CD}_{ij,t} + \beta_3 \mathrm{CD}^2_{ij,t} + \beta_4 \mathrm{CD}^3_{ij,t} + \beta_5 \ln \mathrm{GDP}_{it} + \beta_6 \ln \mathrm{GDP}_{jt} + \beta_7 \ln D_{ij} + \beta_8 \ln \mathrm{ED}_{ij,t} + \beta_9 \mathrm{EF}_{j,t} + \beta_{10} \mathrm{NE} + \beta_{11} \mathrm{AP} + \beta_{12} \mathrm{FTA} + \epsilon_{ijt}\Big), \tag{7}$$

Prior to applying the models mentioned above, we looked into the descriptive statistics and correlation among variables mainly to check for the outliers and to avoid statistical issues, such as multicollinearity. The descriptive statistics and the correlation results are presented in Table 2.

Notably, the absolute values of the correlation coefficients for the explanatory and control variables are mostly below 0.70, indicating no evidence of a very high correlation. The only exception is the correlation between the geographical distance and sea land proximity variable, which is 0.711. Additionally, we conducted a Variance Inflation factor (VIF) test for each variable using the VIF formula of 1 divided by the tolerance i.e., 1- coefficient of determination $\left(\frac{1}{1-R_i^2}\right)$. It is found that the maximum VIF observed among the variables is 5.06, well below the critical threshold of 10. These findings confirm the absence of multicollinearity among the variables.

4. Results and discussions

4.1. Benchmark model test

In this section, we first report the estimation results of the Pooled Ordinary Least Squares (POLS) regression of Eq. (4) as a simple benchmark model test. The test results are shown in column (1) of Table 3. Next, we conducted a stepwise regression using the PPML method. In the estimations, we apply fixed effects for time, i.e., year, and also for continent. Because our 44 trading partners come from all continents except Antarctica, we have six continents in our cross-section fixed effect model. The results are shown in columns (2)–(5) of Table 3.

As evident from the results in Table 3, the estimation outputs reveal a significant negative impact of CD on China's overall foreign trade. This is supported by both the Pooled Ordinary Least Squares estimation (POLS, column 1) and PPML tests (PPML, columns 2–5). The core estimation comprises the relationship between foreign trade and cultural distance, along with control variables representing (Tinbergen, 1962)'s trade gravity model, namely GDP and economic distance.

Table 3
Impact of cultural distance on China's Foreign Trade with its trading partners using Pooled Ordinary Least Squares (POLS, column 1) and Pseudo Maximum Likelihood Model (PPML, columns 2–5).

Variables	1 POLS	2 PPML	3 PPML	4 PPML	5 PPML
Cultural distance	−0.110***	−0.199***	−0.300***	−0.285***	−0.234***
	(−4.70)	(−5.25)	(−8.92)	(−9.92)	(−7.89)
China GDP	0.691***	0.641***	0.917***	0.618***	0.614***
	(−18.05)	(−7.43)	(−12.46)	(−8.09)	(−8.30)
Partners' GDP	0.619***	0.598***	0.507***	0.608***	0.621***
	(−26.59)	(−25.71)	(−22.46)	(−30.86)	(−28.35)
Geo-Distance	−0.264***	−0.837***	−0.516***	−0.596***	−0.331***
	(−6.94)	(−12.54)	(−9.24)	(−11.00)	(−5.13)
Economic distance	−0.060**		−0.361***	−0.006	−0.059
	(−2.05)		(−12.05)	(−0.15)	(−1.44)
Economic freedom	0.007			0.038***	0.030***
	(−1.61)			(−8.72)	(−6.91)
Border	0.337***				0.426***
	(−5.07)				(−4.58)
Member — APEC	0.772***				0.357***
	(−16.53)				(−5.34)
Member — FTA	0.157***				0.315***
	(−2.63)				(−4.89)
Constant	3.260***	9.660***	6.031***	5.342***	2.863***
	(−7.42)	(−14.16)	(−10.64)	(−9.14)	(−4.10)
Year FE	No	Yes	Yes	Yes	Yes
Area FE	No	Yes	Yes	Yes	Yes
Observation	924	924	924	924	924
R-squared	0.833				
Pseudo R-squared		0.794	0.844	0.862	0.886

Note: The explained variable in POLS (column 1) is the natural log of trade. t-statistics and Z-statistics are reported in parentheses for tests with POLS (column 1) and PPML (columns 2–5) tests, respectively. ***, **, * denote statistical significance at 1%, 5%, and 10% levels of significance, respectively.

It is noteworthy that the negative effect of cultural distance on China's total foreign trade obtained from the POLS regression (column 1) is significantly smaller than the negative effect of cultural distance on China's total foreign trade obtained under the PPML method (columns 2–5), indicating that the biased and inconsistent problem of OLS can underestimate the negative effect of cultural distance on China's total foreign trade. The economic implications from the estimated results of PPML(5) shows that for each unit increase in cultural distance between China and its trading partners, China's total trade with its partners will decline by 23.4%. It implies that the increase in the costs of trade, such as communication and information costs, and the cost of integrity risks caused by cultural differences leads to a significant decrease in China's total foreign trade.

In terms of the control variables, the economic size of China and the trading partner countries (given by China's GDP and partners' GDP in Table 3) are significantly and positively correlated with the total trade. Numerically, for every 1% increase in China's and trading partners' GDP, China's total foreign trade will increase by 0.614% and 0.621%, respectively, showing that the economic size of China and its trading partner, despite much faster means of transports available these days, such as China-Europe freight trains, and inter-country trade and transport, is one of the most important factors affecting the foreign trade of China.

The variable ED, representing the ratio of GDP per capita between the two countries, as expected, has a negative effect on trade although the result is not significant in all estimations. Additionally, in the PPML model the variable economic freedom is positive and significant, indicating that China tends to trade more with partner countries which has higher economic freedom.

The positive and significant results related to dummy variables indicate that the trade convenience provided by the proximity of two countries by land and sea (NE) continues to be important for international trade. Likewise, APEC and FTA membership provide a good platform for smoother trade cooperation promoting China's foreign trade.

4.2. Impact of different cultural dimensions

In order to study the impact of cultural differences, this study seeks to understand the effect of all six cultural dimensions of Hofstede et al. (2010). Accordingly, the impact of six cultural dimensions is analysed individually for which we repeat use of the PPML model given by Eq. (4). Similar to Table 3, PPML estimations are carried out for the distance of each of the six cultural dimensions separately and the results are reported in Table 4.

The results in Table 4 show that cultural differences in all six dimensions have a significant negative impact on trade between China and its trading partners except for long-and short-term inclinations (LS) dimension.

It is noteworthy that the two variables, masculinity and feminism (MF) and indulgence and self-restraint (IR), as shown by the coefficient values, have the greatest negative impact. Conceptually, MF symbolise the typical qualities represented by men and women, such as boldness and assertiveness for men, caring and meticulousness for women. As shown by the results, a larger difference in the MF possessed by the people of the two countries would imply a greater effect on trade between the two countries. Similarly, the results for IR show that the large differences between China and the trading partner country, for example in the choice of people's basic needs and hedonistic desires, will be detrimental to the foreign trade of China. The results of power distance (PD) and individualism and collectivism (IC) indicate people's dislike of unequal distribution of power and the differences in individual choices. The results on the uncertainty avoidance (UA) indicate that people find it difficult to accept the occurrence of uncertain events and it is difficult to make ad hoc adjustments possibly due to the inability to anticipate them in advance. In contrast, the impact of long- and short-term inclination (LS) on trade between China and partner countries is small and insignificant, possibly indicating that people can have longer time frame to entertain their material and spiritual needs.

Table 4
Impact of cultural dimensions on China's foreign trade.

Variables	1	2	3	4	5	6
Power distance	−0.040***					
	(−3.72)					
Individualism and collectivism		−0.025**				
		(−2.21)				
Masculinity and feminism			−0.077***			
			(−6.29)			
Uncertainty avoidance				−0.051***		
				(−9.38)		
Long- and short-term orientation					−0.002	
					(−0.21)	
Indulgence and self-restraint						−0.076***
						(−8.01)
China GDP	0.608***	0.583***	0.760***	0.756***	0.591***	0.638***
	(−8.12)	(−7.34)	(−10.84)	(−10.69)	(−7.75)	(−8.54)
Partner GDP	0.617***	0.644***	0.558***	0.570***	0.602***	0.591***
	(−27.62)	(−20.36)	(−25.10)	(−23.97)	(−25.96)	(−26.69)
Geo-Distance	−0.297***	−0.260***	−0.584***	−0.366***	−0.287***	−0.171**
	(−4.34)	(−3.79)	(−8.40)	(−6.67)	(−4.35)	(−2.52)
Economic distance	−0.065	−0.025	−0.190***	−0.195***	−0.030	−0.066
	(−1.36)	(−0.55)	(−3.94)	(−4.14)	(−0.61)	(−1.54)
Economic freedom	0.033***	0.035***	0.014***	0.011**	0.032***	0.033***
	(−6.47)	(−6.39)	(−2.66)	(−2.00)	(−5.93)	(−6.86)
Border	0.580***	0.567***	0.521***	0.519***	0.559***	0.498***
	(−6.09)	(−6.16)	(−6.88)	(−6.15)	(−5.85)	(−5.80)
Member — APEC	0.258***	0.267***	0.282***	0.363***	0.306***	0.305***
	(−3.04)	(−3.06)	(−3.88)	(−4.26)	(−3.73)	(−4.04)
Member — FTA	0.427***	0.406***	0.375***	0.363***	0.431***	0.383***
	(−6.30)	(−5.94)	(−6.37)	(−5.95)	(−6.25)	(−5.78)
Constant	2.114***	1.709**	5.308***	3.759***	2.146***	1.16
	(−2.86)	(−2.19)	(−6.74)	(−5.96)	(−2.93)	(−1.58)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Area FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation	924	924	924	924	924	924
Pseudo R-squared	0.875	0.874	0.884	0.884	0.873	0.882

Note: The above tests were performed using the PPML estimation method by making use of Eq. (4), where cultural distance is replaced by individual cultural dimensions of Hofstede et al. (2010). Z-statistics are reported in parentheses. ***, **, * denote statistical significance at 1%, 5%, and 10% levels of significance, respectively.

4.3. Non-linear influence estimations

This section incorporates quadratic (CD^2) and cubic (CD^3) cultural distance as the additional explanatory variables to explore potential non-linear associations with China's foreign trade. For this purpose, we apply the models outlined in Eqs. (5)–(7). In terms of non-linearity, empirical studies have shown evidence of a S-shaped relationship but they attach conditions to it. Drawing from the logic forwarded by Contractor et al. (2003) and results of Hsu (2006), the following two conditions must be met to check the existence of a horizontal S-curve relationship. First, the signs of the coefficients of CD, CD^2, and CD^3 variables must change in sequence and the results should be significant. Second, the Pseudo R^2 value of the models containing cubic variables should be greater than the Pseudo R^2 value of the models containing only the first-power and quadratic variables. The test results are shown in columns 1–3 of Table 5.

As observed in Table 5 (columns 1–3), the sign of the coefficients for all three variants of cultural distance have changed in sequence (first negative, then positive and again negative). Additionally, the Pseudo R^2 values in the tests of columns (1–3) in Table 5 increase sequentially, with the Pseudo R^2 values of the models with cubic variables being the largest (0.892). These results fulfil the test condition for the existence of a horizontal S-curve relationship between trade and cultural distance. With this condition met, we proceeded to test whether there is a horizontal S-curve relationship between cultural distance and China's total foreign trade. By omitting all variables in the model except for the first-power (CD), quadratic (CD^2), and cubic (CD^3) cultural distances, the following equation on cultural distance and total foreign trade is obtained:

$$\text{Trade} = \exp(0.892 - 1.002\text{CD} + 0.257\text{CD}^2 - 0.023\text{CD}^3)$$

Subsequently, upon calculating the first-order derivative of the Trade equation and setting it equal to zero, it becomes apparent that no real-number solution exists. This implies that the equation is a monotonically decreasing function, indicative of a S-shaped curve relationship between cultural distance and China's total foreign trade. Furthermore, the analysis reveals a critical point: when CD = 3.724, the second-order derivative of the equation equals zero. This signifies that the concavity of the function is inconsistent, suggesting that within various cultural distance ranges, even a subtle increase in cultural distance can have differing degrees of negative impact on China's total foreign trade.

In situations where cultural differences are minimal, consumers seek a balance between desiring products that are similar and different across countries. Within this context, consumers' response to uncertainty remains constant, ultimately weakening trade. However, when cultural differences are moderate, consumers express a heightened desire for diverse products, positively impacting their psychological uncertainty and promoting foreign trade. Conversely, significant cultural disparities can lead to a clear sense of rejection among consumers. Excessive cultural differences result in negative psychological uncertainty benefits, hampering foreign trade. Moreover, when cultural differences broaden, trade costs, including communication expenses and integrity risks, become more pronounced (Mataveli et al., 2022; Moon et al., 2016). Furthermore, the expenses related to managing and organising the trading process between the two countries would also

Table 5
Test on the non-linear influence of cultural differences on trade between China and other countries.

Variables	Trade (1)	Trade (2)	Trade (3)	Export (4)	Export (5)	Export (6)	Import (7)	Import (8)	Import (9)
Cultural distance	−0.234***	−0.611***	−1.002***	−0.256***	−1.137***	−2.956***	−0.178***	0.420***	2.501***
	(−7.89)	(−8.45)	(−4.72)	(−7.52)	(−13.69)	(−13.24)	(−3.85)	(−4.27)	(−8.34)
Cultural distance (quadratic)		0.072***	0.257***		0.165***	1.011***		−0.118***	−1.103***
		(−5.88)	(−2.78)		(−11.72)	(−10.91)		(−5.82)	(−8.24)
Cultural distance (cubic)			−0.023**			−0.105***			0.126***
			(−2.15)			(−9.78)			(−8.02)
China GDP	0.614***	0.670***	0.688***	0.412***	0.534***	0.631***	0.897***	0.812***	0.748***
	(−8.30)	(−9.06)	(−9.36)	(−4.79)	(−6.73)	(−8.22)	(−10.39)	(−9.51)	(−8.74)
Partner GDP	0.621***	0.618***	0.615***	0.693***	0.690***	0.673***	0.548***	0.555***	0.561***
	(−28.35)	(−28.97)	(−28.38)	(−26.98)	(−31.15)	(−31.05)	(−16.81)	(−16.76)	(−17.62)
Geo-Distance	−0.331***	−0.357***	−0.383***	−0.319***	−0.403***	−0.525***	−0.388***	−0.369***	−0.240***
	(−5.13)	(−5.42)	(−5.66)	(−3.53)	(−4.56)	(−6.07)	(−4.70)	(−4.56)	(−3.29)
Economic distance	−0.059	−0.127***	−0.149***	0.245***	0.089*	−0.037	−0.447***	−0.349***	−0.280***
	(−1.44)	(−2.94)	(−3.38)	(−5.25)	(−1.94)	(−0.80)	(−8.01)	(−5.88)	(−4.39)
Economic freedom	0.030***	0.021***	0.016***	0.074***	0.050***	0.027***	−0.033***	−0.021***	−0.005
	(−6.91)	(−4.69)	(−3.37)	(−13.30)	(−10.03)	(−5.27)	(−5.58)	(−3.16)	(−0.71)
Border	0.426***	0.387***	0.373***	0.590***	0.467***	0.368***	0.034	0.077	0.061
	(−4.58)	(−3.86)	(−3.73)	(−5.20)	(−3.96)	(−3.30)	(−0.29)	(−0.78)	(−0.73)
Member — APEC	0.357***	0.361***	0.356***	0.225***	0.258***	0.255***	0.627***	0.637***	0.710***
	(−5.34)	(−5.13)	(−4.99)	(−2.95)	(−3.43)	(−3.37)	(−6.69)	(−7.95)	(−10.47)
Member — FTA	0.315***	0.296***	0.299***	0.265***	0.228***	0.243***	0.337***	0.376***	0.360***
	(−4.89)	(−4.89)	(−4.96)	(−2.79)	(−2.71)	(−3.01)	(−4.72)	(−5.26)	(−5.27)
Constant	2.863***	3.826***	4.462***	0.101	2.674***	5.821***	5.474***	4.293***	1.335
	(−4.10)	(−5.45)	(−5.69)	(−0.10)	(−2.90)	(−6.22)	(−6.36)	(−4.95)	(−1.50)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	924	924	924	924	924	924	924	924	924
Pseudo R-squared	0.886	0.891	0.892	0.855	0.879	0.893	0.788	0.798	0.816

Notes: The above tests were performed using the PPML estimation method. Z-statistics are reported in parentheses. ***, **, * denote statistical significance at 1%, 5%, and 10% levels of significance, respectively.

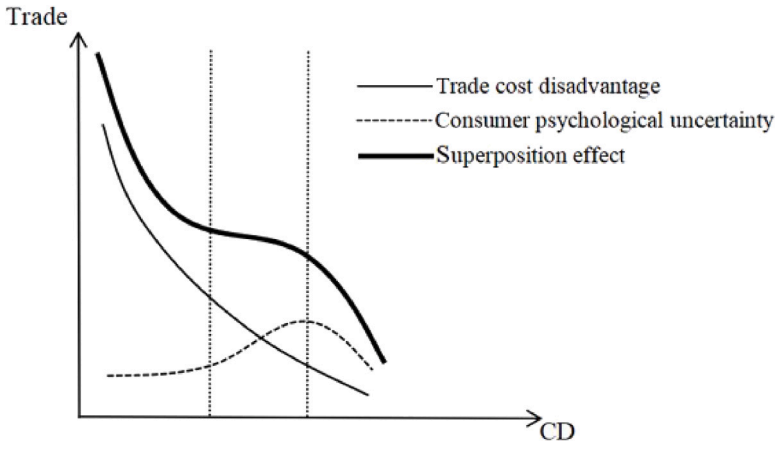

Fig. 3. The effect of cultural differences on the mechanism of China's total foreign trade.

increase (Demir & Im, 2020), and cultural disparities may pose integrity risks. This consistent increase in trade costs acts as a hindrance to foreign trade. Consequently, it establishes the trade cost disadvantage curve illustrated in Fig. 3.

The relationship between trade cost and consumer uncertainty can be further summarised by a new effect line, the superposition effect, which defines the relationship between cultural distance (CD) and trade while changing consumer psychological uncertainty and trade costs prevail. As shown in Fig. 3, under the overlapping influence of consumer psychological uncertainty benefits and trade cost disadvantages, cultural differences exert a non-linear negative effect on China's total foreign trade.

Drawing from the results of the empirical tests and the underlying mechanism, we can now affirm the presence of a negative and non-linear trade relationship between China and its trading partners. Additionally, it can be noted in Fig. 3 that when CD falls within a small or large range (outside the vertical parallel line), a small change in the cultural distance between the two countries causes a significant change in the total trade. In contrast, when the cultural distance is moderate range (within the vertical parallel line), a small change in the cultural difference between the two countries causes little change in the total trade.

4.4. Non-linear tests on export and import trades

In the preceding discussions, our focus has been on the outputs presented in columns 1–3 of Table 5, which pertain to China's overall foreign trade volume. Recognising the distinct roles China plays in

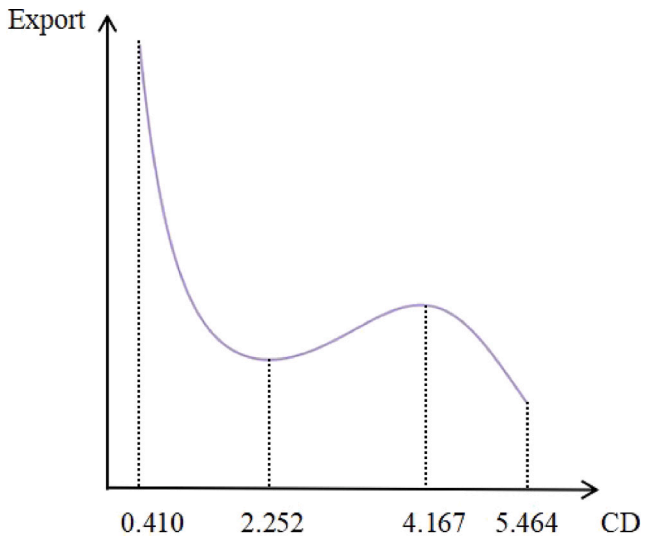

Fig. 4. Cultural distance and Chinese export trade.

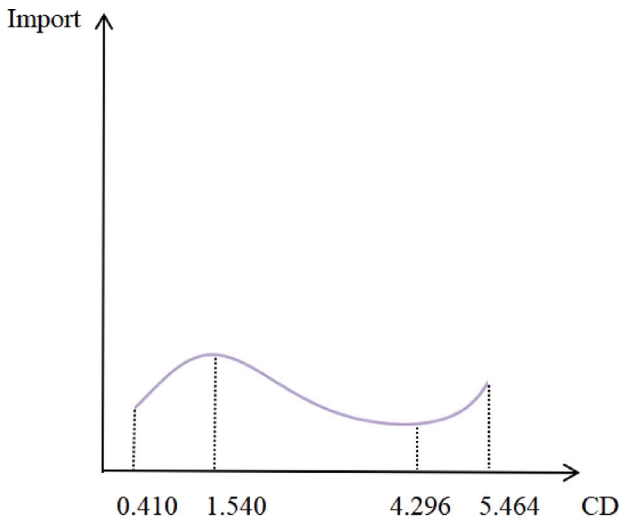

Fig. 5. Cultural distance and Chinese import trade.

export and import activities, the next step involves treating China's export and import trades as separate dependent variables. This analysis mainly aims to discern whether cultural distance exerts divergent effects on imports and exports compared to its impact on the overall trade.

Similar to results in columns 1–3, the results in columns 4–9 of Table 5 meet the two test conditions outlined above. First, the condition of sequential change in the sign of CD, CD^2, and CD^3 can be noted. They are first negative, then positive and again negative for export (columns 4–6), and first positive, then negative and again positive for import (columns 7–9). Similarly, the second condition is also met as the Pseudo R2 value of the cubic variable is again the largest for both the export (0.893) and import (0.816) trades. With the conditions met, we can proceed to test whether there is a horizontal S-curve relationship between cultural distance and China's export and import trades. By omitting other variables except for CD, CD^2, and CD^3 terms in the model, the following equation on cultural distance and export trade is obtained:

$$\text{Export} = \exp(5.821 - 2.956\text{CD} + 1.011\text{CD}^2 - 0.105\text{CD}^3)$$

Taking the first-order derivative of the equation and making it equal to zero, we can get two solutions: $CD_1 = 2.252$ and $CD_2 = 4.167$, which are the horizontal coordinates of two inflection points of the influence of cultural distance on China's export trade. The cultural distance between China and the 44 sampled trading partners is 0.410 at the minimum and 5.464 at the maximum. The two inflection points divide the influence of cultural distance on China's export trade into three intervals, which is a horizontal S-shaped non-linear influence relationship. This is presented in Fig. 4.

In the first interval ($0.410 \leq CD < 2.252$), cultural distance has a significant negative impact on China's export trade. When the cultural differences between China and its trading partners are small, the influence of similar consumption preferences outweighs the psychological effect of consumer curiosity. In the case, when China's trading partners (as importers), make choices, the widening cultural differences between the two countries will cause foreign consumers to reduce the import of Chinese products. Therefore, under the influence of consumer psychology, cultural distance within this range hinders China's export trade.

In the second interval ($2.252 \leq CD \leq 4.167$), cultural distance has positive effect on China's export trade. The main reason may be that in this interval, the cultural difference between the foreign countries and China is moderate, and foreign consumers are more likely to be driven by consumer curiosity when they import Chinese products, thus increasing the import volume. Hence, the relationship between China's export trade and cultural distance is positive in the second interval.

In the third interval ($4.167 < CD \leq 5.464$), cultural distance again exerts a negative impact on China's export trade. The substantial cultural difference between China and its trading countries results in increased trade costs, such as communication and costs related to building trade trust. These become the predominant factors hindering foreign countries' import of Chinese products.

Lastly, China's import trade volume is considered as the explained variable to Repeating the process as in total trade and export trade, following equation on cultural distance and China's import trade is obtained:

$$\text{Import} = \exp(1.335 + 2.501\text{CD} - 1.103\text{CD}^2 + 0.126\text{CD}^3)$$

Taking the first-order derivative of the equation and making it equal to zero, two solutions can be obtained as 1.540 and 4.296 respectively, which are the horizontal coordinates of the two inflection points of the influence of cultural differences on China's import trade. Combined with the minimum and maximum of the cultural distance in the sample, the two inflection points divide the influence of cultural distance on China's import trade into three intervals, which is a "flipped" horizontal S-shaped nonlinear influence relationship. This is shown in Fig. 5.

In the first interval ($0.410 \leq CD < 1.540$), cultural distance exerts a positive influence on China's import trade. The reason behind this may be that, as China acts as the importer and the cultural distance between the two countries is small, specific cultural differences can fully stimulate Chinese consumers' curiosity and desire for foreign products. In this context, cultural distance plays a role in promoting China's import trade.

In the second interval ($1.540 \leq CD \leq 4.296$), an increase in cultural distance hinders China's import trade. Within this range of cultural distance between the two countries, Chinese consumers tend to hold a more conservative mindset subconsciously. As a result, the growing cultural distance diminishes the appeal of foreign products to Chinese consumers, leading to a rejection of such products. Hence, the relationship between China's import trade and cultural distance is reversed in the second interval.

In the third interval ($4.296 < CD \leq 5.464$), even though there are substantial cultural differences between China and its trading partners,

Table 6
Subsample test on the influence of cultural distance on trade.

Variables	Developed country (1)	Developing country (2)	Asia export (3)	Asia import (4)	Europe export (5)	Europe import (6)	America export (7)	America import (8)
Cultural distance	−0.333***	−0.163***	−0.315***	0.212***	0.144**	−0.527***	0.118***	−0.514***
	(−8.43)	(−3.20)	(−4.23)	(−2.89)	(−2.55)	(−12.34)	(−3.99)	(−11.06)
China GDP	0.374***	1.369***	0.718***	0.848***	0.300***	1.097***	0.453***	0.616***
	(−3.49)	(−14.34)	(−5.92)	(−7.07)	(−2.90)	(−7.81)	(−8.98)	(−6.64)
Partner GDP	0.775***	0.406***	0.247***	0.338***	0.875***	0.807***	1.073***	0.902***
	(−26.00)	(−12.85)	(−5.05)	(−5.79)	(−26.70)	(−22.23)	(−63.46)	(−32.75)
Geo-Distance	−0.417***	−0.884***	−0.325***	−0.474***	1.544***	0.288	0.988***	2.558***
	(−4.43)	(−7.84)	(−4.28)	(−7.11)	(−3.55)	(−0.82)	(−5.53)	(−11.43)
Economic distance	0.138	−0.684***	−0.048	−0.337***	0.529***	−0.904***	0.341***	0.087
	(−1.19)	(−14.31)	(−0.41)	(−4.12)	(−5.42)	(−6.98)	(−6.40)	(−1.15)
Economic freedom	0.065***	−0.015***	0.049***	−0.030***	0.047***	0.045***	0.028***	0.034***
	(−13.36)	(−2.80)	(−4.28)	(−3.76)	(−8.43)	(−7.65)	(−6.89)	(−5.67)
Border	0.714***	0.480***	0.962***	0.134	0.881***	2.258***		
	(−6.16)	(−6.62)	(−7.31)	(−1.15)	(−4.97)	(−15.4)		
Member — APEC	−0.459***	0.355***	−0.036	1.672***			0.406***	0.650***
	(−4.20)	(−6.60)	(−0.31)	(−13.06)			(−4.79)	(−7.76)
Member — FTA	0.176**	0.113*	0.029	0.055	−1.361***	−0.160	0.147	0.069
	(−2.31)	(−1.73)	(−0.33)	(−0.80)	(−10.60)	(−1.11)	(−1.39)	(−0.63)
Constant	2.561***	7.669***	1.352	5.284***	−14.771***	−7.906**	−11.047***	−25.028***
	(−2.87)	(−8.02)	(−1.64)	(−5.98)	(−3.60)	(−2.48)	(−5.84)	(−10.20)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	483	441	273	273	357	357	168	168
Pseudo R-square	0.925	0.832	0.891	0.891	0.792	0.874	0.990	0.949

Notes: The above tests were performed using the PPML estimation method. Z-statistics are reported in parentheses. ***, **, * denote statistical significance at 1%, 5%, and 10% levels of significance, respectively.

Chinese consumers approach this cultural diversity rationally. As a result, it does not negatively impact China's imports from its trading partners, and cultural distance ends up promoting China's import trade in this scenario.

4.5. Robustness tests

In order to enhance the credibility of the research findings obtained in Table 5, this section carries out robustness tests, categorising countries into developed and developing statuses and further into their respective continents. Table 6 applies the estimation model from Eq. (4), i.e., without the inclusion of quadratic (CD^2) and cubic (CD^3) terms of cultural differences.

Table 6, columns 1 and 2, reports the effect of cultural distance on China's total foreign trade for developed and developing countries, respectively. The results are negative and strongly significant at 1%, further reinforcing our findings from Tables 3–5. It is worth noting in columns 1 and 2 that the negative impact of cultural distance varies among countries with different economic development statuses. Comparing the two columns, we can see that cultural distance exerts a more pronounced hindering effect on developed countries. Specifically, when the trading partner country is developed, each unit increase in cultural distance between China and the trading partner country results in a 33.3% reduction in China's total foreign trade. In contrast, when the trading partner country is developing, the same unit increase in cultural distance leads to a 16.3% reduction in China's total foreign trade. Consequently, the adverse impact of cultural distance on China's trade is more than twice as significant with developed countries compared to developing ones.

The differing impacts identified above can be attributed to several factors. Developed countries, in comparison to developing counterparts, possess superior domestic economic development, advanced technological capabilities, and more comprehensive production systems for their products. Consequently, when faced with substantial cultural differences between developed countries and China, these nations are better equipped to pivot towards consuming domestic products or engaging in trade with other countries where cultural disparities are less pronounced. Simultaneously, when China encounters products from developed countries, the cultural differences between the two nations can instill distrust among Chinese consumers. These dual factors contribute to a heightened negative effect of cultural distance when China engages in trade with developed countries.

In terms of additional robustness test, next this paper checks for the horizontal S-shaped effect of cultural distance on China's export trade and the "flipped" horizontal S-shaped effect on China's import trade found in Section 4.3 above. To test, we grouped sample trading partner countries separately into Asia, Europe, and American continents. The sample included 13, 17, and 8 trading partner countries of China from three continents, namely Asia, Europe, and America, respectively. There were fewer countries (only six) from Africa and Oceania continents, so we avoided these two continents. Table 6 (columns 3–8) show the test results of cultural differences on China's export and import trades with sample countries from Asia, Europe, and America. Next, we located the mean value of cultural distance for countries in each continent. They are found to be 1.286, 2.957 and 3.546 between China and trading countries in Asia, Europe and America, respectively.

For Asia, the mean value of cultural distance (1.286), therefore, falls inside the first interval of Fig. 4 ($0.410 \leq CD < 2.252$) and Fig. 5 ($0.410 \leq CD < 1.540$). The results obtained in column 3 and column 4 of Table 6, are consistent with Figs. 4 and 5 because the test coefficient of cultural distance on China's export and import trades are negative and positive, respectively in the two columns. The results are significant at 1% level, confirming that for export trade, cultural distance has a positive influence on China and sample countries from Asia, while on China's import trade, it has a negative influence.

In the case of Europe and America, the mean values, 2.957 and 3.546, respectively, falls within the second interval of both Fig. 4 ($2.252 \leq CD \leq 4.167$) and Fig. 5 ($1.540 \leq CD \leq 4.296$). Looking into the results that are again significant at 1% (columns 5–8 of Table 6), it can be confirmed that cultural distance has facilitating effect on China's export trade but hindering effect on China's import trade when the trading partner country is from European or American continents. The results, positive for export and negative for import for both the

Table 7
Test on the influence of cultural distance on trade in different periods.

Variables	2001–2007		2008–2013		2014–2021	
	(1) Export	(2) Import	(3) Export	(4) Import	(5) Export	(6) Import
Cultural distance	−2.131***	2.210***	−2.931***	1.966***	−3.038***	2.748***
	(−4.53)	(4.08)	(−7.99)	(3.59)	(−9.35)	(6.43)
Cultural distance (quadratic)	0.689***	−1.039***	0.971***	−0.891***	1.067***	−1.177***
	(3.58)	(−4.26)	(6.31)	(−3.69)	(7.82)	(−6.20)
Cultural distance (cubical)	−0.068***	0.122***	−0.099***	0.104***	−0.113***	0.133***
	(−3.07)	(4.26)	(−5.52)	(3.68)	(−7.09)	(5.99)
China GDP	0.996***	0.815***	0.404***	0.818***	0.399	0.633**
	(6.77)	(5.19)	(2.94)	(4.33)	(1.61)	(2.24)
Partner GDP	0.760***	0.532***	0.755***	0.543***	0.646***	0.646***
	(14.80)	(9.67)	(20.34)	(8.90)	(20.27)	(13.56)
Geo-Distance	−0.224**	−0.225***	−0.770***	−0.458***	−0.586***	0.008
	(−2.06)	(−2.66)	(−6.30)	(−3.35)	(−4.92)	(0.06)
Economic distance	−0.098	−0.134	−0.087	−0.395***	0.012	−0.348***
	(−1.16)	(−1.36)	(−1.29)	(−2.81)	(0.18)	(−3.74)
Economic freedom	0.019***	0.015	0.025***	−0.016	0.023***	−0.013
	(2.88)	(1.29)	(3.42)	(−0.98)	(2.92)	(−1.08)
Border	0.029	0.176	0.372**	−0.088	0.216	0.231**
	(0.13)	(1.02)	(2.13)	(−0.56)	(1.46)	(1.99)
Member — APEC	0.690***	0.985***	−0.053	0.590***	0.362***	0.598***
	(6.17)	(8.90)	(−0.45)	(5.03)	(3.32)	(6.16)
Member — FTA	1.165***	−0.327	0.717***	0.321*	0.121	0.786***
	(5.84)	(−1.49)	(4.83)	(1.88)	(1.11)	(6.11)
Constant	2.154*	0.290	8.911***	4.094**	7.962***	−0.339
	(1.81)	(0.24)	(6.85)	(2.06)	(4.64)	(−0.16)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Area FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation	308	308	264	264	352	352
Pseudo R-square	0.930	0.854	0.904	0.798	0.867	0.800

Notes: The above tests were performed using PPML estimation method. t-statistics are reported in parentheses. ***, **, * denotes statistical significance at 1%, 5%, and 10% level of significance, respectively.

continents, are again consistent with second interval part of Figs. 4 and 5.

Above robustness test results are, therefore, fully consistent with the findings shown in Figs. 4 and 5. The robustness tests above therefore verifies that cultural distance has a negative effect on China's total foreign trade, and the negative effect varies in magnitude across different ranges of cultural distance, which is non-linear and negative. Additionally, the findings that cultural distance has a horizontal S-shaped effect on China's export trade and a "flipped" horizontal S-shaped effect on China's import trade are also verified.

To further test robustness, we conduct analyses centred on two major international events, namely 2008 Global Financial Crisis and China's 2013 "Belt and Road" initiative. Such event dynamics are also utilised by studies involving stock market responses (Egger & Zhu, 2020) and volatilities (Zhou et al., 2019) but since our focus is international trade, we use these events to further test the validity of our results. Accordingly, we divide the 2001–2021 period into three distinct intervals 2001–2007, 2008–2013, and 2014–2021. We then examine whether the horizontal S-shaped effect of cultural differences on China's export trade and its "flipped" horizontal S-shaped effect on import trade persist across these sub-periods. Results are reported in Table 7.

As shown in Table 7 (columns 1, 3, and 5), the positive and negative signs of the coefficients of the first-power (CD), quadratic (CD^2), and cubic (CD^3) terms of cultural differences, regardless of the time period, vary sequentially. The Pseudo R-Square value of the models containing cubic variables should be greater than the Pseudo (R^2) value of the models containing only the first-power and quadratic variables. These findings therefore align with the conditions for an S-shaped relationship (Hsu, 2006).

Further, after isolating the first-power (CD), quadratic (CD^2) and cubic (CD^3) terms and deriving the equations for cultural distance and exports, we solve for inflection points by setting first derivatives to zero. Two real solutions exist for all three periods, confirming two inflection points and reinforcing the horizontal S-shaped effect of cultural differences on exports.

While inflection point positions remain stable in 2001–2007 and 2008–2013, the left inflection point shifts significantly leftward in 2014–2021 (post-"Belt and Road" initiative), with the right point unchanged. This implies that after 2013, more countries with smaller cultural differences benefit from cultural distance's positive effect on Chinese exports.

Similarly, Table 7 (Columns 2, 4, 6) reveals that cultural differences' impact on China's imports satisfies (Hsu, 2006) conditions for a "flipped" horizontal S-shaped relationship across all periods. Two distinct real solutions for derivatives again confirm inflection points, validating this inverted pattern.

Here, the left inflection point's x-coordinate increases markedly in 2014–2021, while the right point remains stable. Given the inverted S-shape, this rightward shift indicates that post-initiative, China sources imports from more culturally proximate countries, with cultural distance now promoting import trade in these cases.

Collectively, these tests reinforce the stability of our nonlinear models (Barnett et al., 1995; Dou et al., 2023) and offer deeper insights into event-driven dynamics.

5. Conclusion

This paper highlights the recurring nature of trade tensions and the critical role international trade plays in China's economic growth, and explores whether reducing cultural differences can help lessen such tensions and foster a more stable trade relationships.

The literature reviewed in section two revealed a common inclination in prior research to treat cultural differences as static, neglecting

their dynamic nature. In our approach, we utilise a dynamic model to calculate cultural differences, enabling a nuanced exploration of the time-varying nature of cultural distance with 44 major trading partners of China over 2001–2021. To measure cultural distance, we employed all available six cultural dimensions from Hofstede et al. (2010). Furthermore, diverse methodological approaches identified in the literature are used, allowing us to use both linear and non-linear models to assess the relationship.

Inspired by the gravity model of trade of Tinbergen (1962), we test the cultural distance and trade relationship using Pooled Ordinary Least Squares (POLS) and the Poisson Pseudo-Maximum Likelihood (PPML) regression techniques. Both the models consistently demonstrated a significant negative impact of cultural distance on China's international trade. The economic implications suggest that for each unit increase in cultural distance between China and its trading partners, China's total trade declines by 23.4%, emphasising the substantial role of cultural differences in trade costs, including communication, information, and integrity risks.

The analysis of individual cultural dimensions showed a consistent negative impact of cultural differences, except for long-and short-term inclinations (LS). Notably, masculinity and feminism (MF) and indulgence and self-restraint (IR) exhibited the most substantial negative effects, emphasising the influence of gender-related qualities and variations in basic needs and hedonistic desires on trade between China and its partners. The results further indicate a preference for equality in power distribution, individual choices, and an aversion to uncertain events, emphasising the nuanced impact of cultural dimensions on international trade.

To examine the non-linear dynamics of the relationship between cultural distance and China's international trade, we incorporated quadratic and cubic cultural distance as the additional explanatory variables in the PPML model. Similar to the linear regression findings, the non-linear tests, consistently indicated a negative and highly significant impact of cultural distance on China's total foreign trade. The results reveal a monotonically decreasing function, indicative of a S-shaped curve relationship between cultural distance and China's total foreign trade. The implication on the trade therefore vary: minimal cultural differences lead to a trade-weakening balance, moderate differences foster diversity and positively impact uncertainty, while wider differences hinder trade due to consumer rejection. Additionally, the findings that cultural distance has a horizontal S-shaped effect on China's export trade and a "flipped" horizontal S-shaped effect on China's import trade are also verified through robustness tests. While explaining the shape of the curve, this study connects it to consumer preferences and the psychological impact of purchasing foreign products. We argue that a better understanding of export goods that falls within the taste and choice of importing country's consumers preference can help strengthen Chinese exports.

Our findings have important policy implications. Even though cultural distances cannot be reduced in the short term, the potential gains from minimising the differences, such as through cultural exchange activities, especially with developed trading partners, can be economically advantageous. In dealing with nations with smaller cultural gaps, China should uphold a trade policy rooted in its own culture, while actively embracing foreign cultures in interactions with countries with larger distances. Regarding imports, maintaining a moderate cultural distance aligns with domestic consumers' preference for diverse products. Understanding the state of cultural differences is, therefore, crucial to promote trade and to minimise trade tensions.

This paper has some limitations. First, it focuses on a subset of trading partners, encompassing 44 major partners that collectively represent slightly above 90% of China's total trade. This strategic selection provides a comprehensive view of China's key international economic relationships but excludes over 150 other countries. Second limitation is related to the choice of the methodology. We relied on cultural dimensions of Hofstede et al. (2010) to compute cultural distance. While these dimensions provide a robust framework and allow us compare with past literature, cultural dynamics are sophisticated and may extend beyond the scope captured by the chosen dimensions. Additionally, although employing both linear and non-linear models adds depth to the analysis, the study's methodology is not exhaustive, and alternative estimation frameworks may offer complementary insights.

Appendix

See Table A.1.

Data availability

Data will be made available on request.

Table A.1
China's key trading partners used in this study.

S.No	Rank	TradePartners	Import (T$)	Export (T$)	Trade (T$)	%ofTrade	Sum%	S.No	Rank	TradePartners	Import (T$)	Export (T$)	Trade (T$)	%ofTrade	Sum%
1	1	USA	8.0167	1.8389	9.8556	16.3010	16.3010	28	28	Angola	0.0346	0.3368	0.3714	0.6143	85.7072
2	2	China, Hong Kong SAR	4.3841	4.7703	9.1543	15.1411	31.4421	29	29	South Africa	0.2309	0.1370	0.3679	0.6085	86.3158
3	3	Japan	3.0273	2.4006	5.4279	8.9777	40.4198	30	30	Czechia	0.3124	0.0292	0.3416	0.5650	86.8807
4	4	Rep. of Korea	1.5246	2.2107	3.7354	6.1782	46.5980	31	31	Philippines	0.2108	0.1240	0.3348	0.5538	87.4345
5	5	Germany	1.8889	1.4357	3.3246	5.4988	52.0967	32	32	Belgium	0.2062	0.1135	0.3197	0.5288	87.9633
6	6	Australia	0.7731	1.0689	1.8420	3.0466	55.1433	33	33	Peru	0.1346	0.1367	0.2712	0.4486	88.4120
7	7	Singapore	0.7186	0.7737	1.4923	2.4683	57.6116	34	34	Argentina	0.1547	0.0932	0.2479	0.4099	88.8219
8	8	United Kingdom	1.1308	0.3002	1.4311	2.3670	59.9785	35	35	Sweden	0.1344	0.1038	0.2382	0.3939	89.2159
9	9	Russian Federation	0.7305	0.6122	1.3427	2.2209	62.1994	36	36	**Iran**	0.1238	0.1071	0.2308	0.3818	89.2159
10	10	France	0.8837	0.3239	1.2076	1.9974	64.1968	37	37	New Zealand	0.1159	0.1080	0.2238	0.3702	89.5861
11	11	Brazil	0.5058	0.6827	1.1885	1.9657	66.1625	38	38	**Austria**	0.1558	0.0668	0.2227	0.3683	89.5861
12	12	Canada	0.8656	0.2744	1.1400	1.8856	68.0481	39	39	**Kazakhstan**	0.0789	0.1417	0.2207	0.3650	89.5861
13	13	India	0.8713	0.2402	1.1115	1.8384	69.8865	40	40	**Norway**	0.1351	0.0560	0.1912	0.3162	89.5861
14	14	Mexico	1.0132	0.0882	1.1013	1.8216	71.7081	41	41	Pakistan	0.1548	0.0283	0.1831	0.3028	89.8889
15	15	Viet Nam	0.7193	0.3515	1.0708	1.7711	73.4792	42	42	Colombia	0.1382	0.0417	0.1800	0.2977	90.1866
16	16	Thailand	0.6172	0.4215	1.0387	1.7180	75.1972	43	43	Ireland	0.0986	0.0715	0.1701	0.2813	90.4679
17	17	Malaysia	0.5482	0.4764	1.0246	1.6947	76.8919	44	44	Denmark	0.1185	0.0494	0.1679	0.2777	90.7456
18	18	Netherlands	0.7453	0.1736	0.9189	1.5199	78.4117	45	45	Nigeria	0.1352	0.0254	0.1606	0.2657	91.0112
19	19	Indonesia	0.4824	0.3602	0.8426	1.3937	79.8054	46	46	Finland	0.0960	0.0630	0.1590	0.2629	91.2742
20	20	Italy	0.6013	0.2247	0.8260	1.3662	81.1716	47	47	**Israel**	0.1046	0.0485	0.1530	0.2531	91.2742
21	21	Spain	0.4854	0.0928	0.5782	0.9563	82.1279	48	48	**Ukraine**	0.0996	0.0452	0.1448	0.2394	91.2742
22	22	Chile	0.2255	0.3067	0.5322	0.8803	83.0082	49	49	Hungary	0.1097	0.0298	0.1395	0.2307	91.5049
23	23	**United Arab Emirates**	0.4368	0.0538	0.4907	0.8116	83.0082	50	50	**Qatar**	0.0420	0.0930	0.1351	0.2234	91.5049
24	24	Switzerland	0.1838	0.2698	0.4536	0.7502	83.7584	51	51	Egypt	0.1235	0.0103	0.1338	0.2214	91.7263
25	25	Poland	0.3819	0.0338	0.4157	0.6876	84.4459	52	56	Greece	0.0675	0.0084	0.0759	0.1256	91.8518
26	26	**Saudi Arabia**	0.3151	0.0970	0.4122	0.6817	84.4459	53	67	Bangladesh	0.0540	0.0037	0.0577	0.0954	91.9472
27	27	Türkiye	0.3498	0.0413	0.3911	0.6469	85.0929								

Notes: United Arab Emirates, Saudi Arabia, Iran, Austria, Kazakhstan, Israel, Ukraine, Qatar, and Norway are excluded from the Top 50 trading partners due to their highly specialised trade relationships with China, often focused on single commodities such as oil and gas, which could skew the analysis.

References

Anderson, J. E., & Van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review*, *93*(1), 170–192.

Barnett, W. A., Gallant, A. R., Hinich, M. J., Jungeilges, J. A., Kaplan, D. T., & Jensen, M. J. (1995). Robustness of nonlinearity and chaos tests to measurement error, inference method, and sample size. *Journal of Economic Behavior and Organization*, *27*(2), 301–320.

Beckerman, W. (1956). Distance and the pattern of intra-European trade. *The Review of Economics and Statistics*, *38*(1), 31–40.

Bissoondoyal-Bheenick, E., Do, H., Hu, X., & Zhong, A. (2022). Sentiment and stock market connectedness: Evidence from the US–China trade war. *International Review of Financial Analysis*, *80*, Article 102031.

Boisso, D., & Ferrantino, M. (1997). Economic distance, cultural distance, and openness in international trade: Empirical puzzles. *Journal of Economic Integration*, 456–484.

Cheema, M. A., & Nartea, G. V. (2017). Momentum returns, market states, and market dynamics: Is China different? *International Review of Economics & Finance*, *50*, 85–97.

Chiswick, B. R., & Miller, P. W. (1997). *English language fluency among immigrants in the United States*. Citeseer.

Contractor, F. J., Kundu, S. K., & Hsu, C.-C. (2003). A three-stage theory of international expansion: The link between multinationality and performance in the service sector. *Journal of International Business Studies*, *34*, 5–18.

Contractor, F., Yang, Y., & Gaur, A. S. (2016). Firm-specific intangible assets and subsidiary profitability: The moderating role of distance, ownership strategy and subsidiary experience. *Journal of World Business*, *51*(6), 950–964.

Crowley, M., Meng, N., & Song, H. (2018). Tariff scares: Trade policy uncertainty and foreign market entry by Chinese firms. *Journal of International Economics*, *114*, 96–115.

Demir, F., & Im, H. (2020). Effects of cultural institutes on bilateral trade and FDI flows: Cultural diplomacy or economic altruism? *The World Economy*, *43*(9), 2463–2489.

Disdier, A.-C., & Head, K. (2008). The puzzling persistence of the distance effect on bilateral trade. *The Review of Economics and Statistics*, *90*(1), 37–48.

Dou, W. W., Fang, X., Lo, A. W., & Uhlig, H. (2023). Macro-finance models with nonlinear dynamics. *Annual Review of Financial Economics*, *15*(1), 407–432.

Egger, P. H., & Lassmann, A. (2012). The language effect in international trade: A meta-analysis. *Economics Letters*, *116*(2), 221–224.

Egger, P. H., & Zhu, J. (2020). The US–Chinese trade war: An event study of stock-market responses. *Economic Policy*, *35*(103), 519–559.

Fajgelbaum, P., Goldberg, P., Kennedy, P., Khandelwal, A., & Taglioni, D. (2024). The US-China trade war and global reallocations. *American Economic Review: Insights*, *6*(2), 295–312.

Faure, G. O., & Fang, T. (2008). Changing Chinese values: Keeping up with paradoxes. *International Business Review*, *17*(2), 194–207.

Felbermayr, G., & Sandkamp, A. (2020). The trade effects of anti-dumping duties: Firm-level evidence from China. *European Economic Review*, *122*, Article 103367.

Fensore, I., Legge, S., & Schmid, L. (2022). Ancestry and international trade. *Journal of Comparative Economics*, *50*(1), 33–51.

Fidrmuc, J., & Fidrmuc, J. (2016). Foreign languages and trade: evidence from a natural experiment. *Empirical Economics*, *50*(1), 31–49.

Ge, Y., Kong, X., Dadilabang, G., & Ho, K.-C. (2023). The effect of confucian culture on household risky asset holdings: Using categorical principal component analysis. *International Journal of Finance & Economics*, *28*(1), 839–857.

Guan, Y. (2023). Public preference for strongman rule in China: Degree, dynamics, and possible drivers. *Asian Survey*, *63*(4), 641–662.

Guo, L., Wang, S., & Xu, N. Z. (2023). US economic and trade sanctions against China: A loss-loss confrontation. *Economic and Political Studies*, *11*(1), 17–44.

Hajro, A., Caprar, D. V., Zikic, J., & Stahl, G. K. (2021). Global migrants: Understanding the implications for international business and management. *Journal of World Business*, *56*(2), Article 101192.

Hanousek, J., & Kočenda, E. (2014). Factors of trade in Europe. *Economic Systems*, *38*(4), 518–535.

Hanson, D., & Lackman, C. (1998). Managing through cultural differences. *Competitiveness Review: An International Business Journal*, *8*(2), 46–53.

Harms, P., & Shuvalova, D. (2020). Cultural distance and international trade in services: A disaggregate view. *Economic Systems*, *44*(2), Article 100786.

Helble, M. (2007). Is god good for trade? *Kyklos*, *60*(3), 385–413.

Hernandez, E. (2014). Finding a home away from home: Effects of immigrants on firms' foreign location choice and performance. *Administrative Science Quarterly*, *59*(1), 73–108.

Hofstede, G. (1984). *Culture's consequences: International differences in work-related values*: *vol. 5*, sage.

Hofstede, G., Gert Jan, H., & Minkov, M. (2010). *Cultures and organizations software of the mind intercultural cooperation and it importance for survival*.

Hörnell, E., Vahlne, J.-E., & Wiedersheim-Paul, F. (1973). *Export och utlandsetableringar*. Almqvist & Wiksell.

Hsu, C.-C. (2006). Internationalization and performance: The S-curve hypothesis and product diversity effect. *Multinational Business Review*, *14*(2), 29–46.

Hucker, C. O. (1975). *China's imperial past: An introduction to Chinese history and culture*. Stanford University Press.

Hutchinson, W. K. (2005). "Linguistic distance" as a determinant of bilateral trade. *Southern Economic Journal*, *72*(1), 1–15.

Inglehart, R. (2004). *Human beliefs and values: A cross-cultural sourcebook based on the 1999–2002 values surveys*. Siglo XXI.

Jane, W.-J. (2021). Cultural distance in international films: An empirical investigation of a sample selection model. *Journal of Economics and Business*, *113*, Article 105945.

Johanson, J., & Vahlne, J.-E. (1977). The internationalization process of the firm—A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, *8*, 23–32.

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalization of the firm—Four Swedish cases 1. *Journal of Management Studies*, *12*(3), 305–323.

Kogut, B., & Singh, H. (1988). The effect of national culture on the choice of entry mode. *Journal of International Business Studies*, *19*, 411–432.

Kristjánsdóttir, H., Guðlaugsson, Þ. Ö., Guðmundsdóttir, S., & Aðalsteinsson, G. D. (2017). Hofstede national culture and international trade. *Applied Economics*, *49*(57), 5792–5801.

Lee, S. M., & Peterson, S. J. (2000). Culture, entrepreneurial orientation, and global competitiveness. *Journal of World Business*, *35*(4), 401–416.

Lin, X., & Yang, X. (2017). From human capital externality to entrepreneurial aspiration: Revisiting the migration-trade linkage. *Journal of World Business*, *52*(3), 360–371.

Linders, G.-J., HL Slangen, A., De Groot, H. L., & Beugelsdijk, S. (2005). Cultural and institutional determinants of bilateral trade flows.

Liu, A., Lu, C., & Wang, Z. (2020). The roles of cultural and institutional distance in international trade: Evidence from China's trade with the Belt and Road countries. *China Economic Review*, *61*, Article 101234.

Liu, A., Lu, C., & Wang, Z. (2021). Does cultural distance hinder exports?: a comparative study of China and the United States. *Economic Modelling*, *105*, Article 105668.

Liu, C., Uchida, K., & Yang, Y. (2012). Corporate governance and firm value during the global financial crisis: Evidence from China. *International Review of Financial Analysis*, *21*, 70–80.

Lu, Y., Tao, Z., & Zhang, Y. (2013). How do exporters respond to antidumping investigations? *Journal of International Economics*, *91*(2), 290–300.

Mataveli, M., Ayala, J. C., Gil, A. J., & Roldán, J. L. (2022). An analysis of export barriers for firms in Brazil. *European Research on Management and Business Economics*, *28*(3), Article 100200.

Mayer, T., & Zignago, S. (2011). Notes on CEPII's distances measures: The GeoDist database.

Melitz, J. (2008). Language and foreign trade. *European Economic Review*, *52*(4), 667–699.

Moon, S., Mishra, A., Mishra, H., & Kang, M. Y. (2016). Cultural and economic impacts on global cultural products: Evidence from US movies. *Journal of International Marketing*, *24*(3), 78–97.

Nurullayev, D., Xu, P., & Garand, J. (2024). COVID, elite rhetoric, and Americans' attitudes toward US trade practices with China. *Social Science Quarterly*, *105*(7), 2236–2251.

Paul, J., Parthasarathy, S., & Gupta, P. (2017). Exporting challenges of SMEs: A review and future research agenda. *Journal of World Business*, *52*(3), 327–342.

Popli, M., Akbar, M., Kumar, V., & Gaur, A. (2016). Reconceptualizing cultural distance: The role of cultural experience reserve in cross-border acquisitions. *Journal of World Business*, *51*(3), 404–412.

Qi, J., Li, L., & Yang, L. (2012). Location choice of Chinese OFDI: based on the threshold effect and test of cultural distance. *Journal of International Trade*, *12*, 137–147.

Rauch, J. E. (1999). Networks versus markets in international trade. *Journal of International Economics*, *48*(1), 7–35.

Rauch, J. E., & Trindade, V. (2002). Ethnic Chinese networks in international trade. *Review of Economics and Statistics*, *84*(1), 116–130.

Shenkar, O. (2001). Cultural distance revisited: Towards a more rigorous conceptualization and measurement of cultural differences. *Journal of International Business Studies*, *32*, 519–535.

Shukla, P., & Cantwell, J. (2018). Migrants and multinational firms: The role of institutional affinity and connectedness in FDI. *Journal of World Business*, *53*(6), 835–849.

Shulgin, S., Zinkina, J., Korotayev, A., & Andreev, A. (2017). "Neighbors in values": A new dataset of cultural distances between countries based on individuals' values, and its application to the study of global trade. *Research in International Business and Finance*, *42*, 966–985.

Silva, J. S., & Tenreyro, S. (2006). The log of gravity. *The Review of Economics and Statistics*, 641–658.

Sun, J., Mostafiz, F., Cai, Y., & Yang, F. (2024). Cultural distance, language dissimilarity and trade disputes. *Applied Economics*, *56*(8), 941–955.

Tadesse, B., & White, R. (2010a). Cultural distance as a determinant of bilateral trade flows: do immigrants counter the effect of cultural differences? *Applied Economics Letters*, *17*(2), 147–152.

Tadesse, B., & White, R. (2010b). Does cultural distance hinder trade in goods? A comparative study of nine OECD member nations. *Open Economies Review*, *21*, 237–261.

Tadesse, B., White, R., & Zhongwen, H. (2017). Does China's trade defy cultural barriers? *International Review of Applied Economics*, *31*(3), 398–428.

Thomas, D. C. (1999). Cultural diversity and work group effectiveness: An experimental study. *Journal of Cross-Cultural Psychology*, *30*(2), 242–263.

Tihanyi, L., Griffith, D. A., & Russell, C. J. (2005). The effect of cultural distance on entry mode choice, international diversification, and MNE performance: A meta-analysis. *Journal of International Business Studies*, *36*, 270–283.

Tinbergen, J. (1962). Shaping the world economy: Suggestions for an international economic policy. *The Twentieth Century Fund*.

Tung, R. L., & Chung, H. F. (2010). Diaspora and trade facilitation: The case of ethnic Chinese in Australia. *Asia Pacific Journal of Management*, *27*, 371–392.

Tung, R. L., & Verbeke, A. (2010). Beyond Hofstede and GLOBE: Improving the quality of cross-cultural research. *Journal of International Business Studies*, *41*, 1259–1274.

Turco, A. L., & Maggioni, D. (2018). Effects of Islamic religiosity on bilateral trust in trade: The case of Turkish exports. *Journal of Comparative Economics*, *46*(4), 947–965.

Wang, P., & Liu, Z. (2024). Trade and flow of value in global value chains. *International Journal of Finance & Economics*.

Watson, W. E., Kumar, K., & Michaelsen, L. K. (1993). Cultural diversity's impact on interaction process and performance: Comparing homogeneous and diverse task groups. *Academy of Management Journal*, *36*(3), 590–602.

Whitten, G., Dai, X., Fan, S., & Pang, Y. (2020). Do political relations affect international trade? Evidence from China's twelve trading partners. *Journal of Shipping and Trade*, *5*, 1–24.

Wiedersheim-Paul, F. (1972). Uncertainty and economic distance: Studies in international business.

Wiedersheim-Paul, F., & Johanson, J. (1975). The internationalization of the firm-four swedish cases. *Journal of Management Studies*, *12*(3), 306.

Zhou, X., Cui, Y., Wu, S., & Wang, W. (2019). The influence of cultural distance on the volatility of the international stock market. *Economic Modelling*, *77*, 289–300.