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Home Bias in Trade within China: The Role of Trust

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Home Bias in Trade within China: The Role of Trust*

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Abstract

The home bias is a well-documented phenomenon highlighting how administrative borders hinder economic transactions. This paper estimates the magnitude of China's provincial border effect using inter-provincial and intra-provincial trade data, with a particular focus on the role of trust in shaping these effects. To address potential endogeneity, I employ a novel instrumental variable leveraging provincial exaggerations highlighted by media during the Great Leap Forward. The analysis uncovers a significant provincial home bias, with provincial borders substantially reducing inter-provincial exports. Importantly, both the exporter-to-importer trust and the importer-to-exporter trust emerge as crucial mechanisms driving this effect.

Keywords: Home bias; Trust; Instrumental variable; Exaggeration; Great Leap Forward

JEL: F14, F15, F40

1 Introduction

Economic transactions, such as trade or investment, often exhibit a trend in which a larger proportion occurs within administrative borders rather than across them (Helble, 2007; Wynter, 2018). This phenomenon is referred to as the "border effect" or, alternatively, the "home bias".[1] It has become a prominent topic, particularly due to its implications for economic integration. Earlier studies emphasize

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[1]In this paper, the terms *home bias* and *border effect* are used interchangeably to convey the same concept.

country borders and reveal their substantial impact on impeding trade, attributing it to the apparent existence of tariff and non-tariff trade barriers imposed on international trade (Coughlin and Novy, 2021). Interestingly, the border effect remains substantial even between countries that lack tariff barriers and share similar or identical trade policies, such as countries within the European Union or between Canada and the United States (Chen, 2004; McCallum, 1995). Consequently, invisible barriers, such as cultural differences, linguistic gaps, social networks, and taste biases, have been highlighted in previous studies as key factors contributing to the border effect (Evans, 2003; Combes et al., 2005; Zhang, 2020). Further, with more detailed domestic trade data, studies have revealed a pronounced negative impact of sub-national borders on trade, often finding that this effect is even larger than the international border effect within the same country (Fally et al., 2010; Coughlin and Novy, 2013).

In the case of China, studies have shown a significant domestic border effect (Xing and Li, 2011; Li, 2025) even if there are no tariffs between domestic regions, and the well-developed transportation network significantly reduces inter-regional transportation costs. Moreover, the country benefits from a unified legal and monetary system, and cultural differences are relatively minimal. This raises an important question: what explains the strikingly significant domestic border effect? Previous studies have attempted to explain it through spatial heterogeneity linked to fundamentals such as differences in regional industrial structures, foreign trade structures (Li et al., 2022), and local protectionism (Poncet, 2005; Cai et al., 2024). However, even after accounting for these factors, the border puzzle remains unresolved. Furthermore, China launched the "National Unified Market" initiative in 2022, aiming to strengthen the internal cohesion of its economy, harmonize domestic and international markets, and eliminate local protectionism and market fragmentation. This underscores the importance of exploring alternative underlying sources of China's internal border barriers. In particular, the role of bilateral trust in shaping the observed border effect within China remains underexplored.

In parallel, several studies highlighted the positive influence of trust on trade (Guiso et al., 2009; Spring and Grossman, 2016; Xing and Zhou, 2018). These "trade-trust" analyses often estimate either destination-to-source trust or source-to-destination trust separately (Guiso et al., 2009), even though these two types of trust could simultaneously affect bilateral trade. Additionally, as shown by Lin et al., (2018), unlike in cases where trust exhibits symmetry (countries with higher trustworthiness tend to trust others more as well (Glaeser et al., 2000; Sapienza et al., 2013; Guiso et al., 2009)), the better-trusted provinces in China do not demonstrate higher levels of trust toward other provinces. This asymmetry indicates that the directionality of trust may have a significant impact on China's bilateral

trade. Therefore, a comprehensive analysis of trust from different directions should be conducted for the case of China.

To address endogeneity arising from measurement errors (particularly in trust surveys), omitted variables, or reverse causality, "trade-trust" analyses are often conducted using instrumental variables (IV) approach, where trust is instrumented with factors such as religious similarity or measures of somatic distance (Guiso et al., 2009). However, such IVs may violate the exclusion restriction, as they could directly affect trade or influence it through other channels. Furthermore, in the context of Chinese internal trade, these measures may be inefficient, providing limited variation in anthropometric characteristics and being less relevant due to the relatively low importance of religions for the majority of the population in China (Xing and Zhou, 2018).

To address the aforementioned gaps and in light of recent Chinese policies, this paper focuses on the provincial home bias in trade within China and emphasizes the significant role of trust in shaping this bias. Specifically, this paper contributes to the literature by answering the following research questions: (1) What is the magnitude of the provincial home bias in trade within China? (2) Can inter-provincial trust explain the observed home bias, especially after addressing endogeneity? In particular, what are the respective roles of destination-to-source trust, source-to-destination trust, and their joint effect in influencing trade and shaping provincial home bias?

Methodologically, I employ the inter-provincial and intra-provincial trade statistics of China and conduct the IV using the provincial number of reports on highly-inflated agricultural yields in official media, *People's Daily*, during the Great Leap Forward as an instrument for trust toward that province decades later. This measure leverages exaggerated agricultural output reports from the radical Great Leap Forward era decades ago to address endogeneity concerns. The rationale is that if a province was frequently highlighted for its fantastical and apparently unrealistic agricultural output, it would leave an impression of untrustworthiness on people from other provinces. Since trust is deeply rooted in historical experiences (Nunn and Wantchekon, 2011), and does not change easily with time (Rainer and Siedler, 2009), these false reports are likely to influence trustworthiness and be transmitted for decades.[2]

I find a significant provincial home bias, with intra-provincial exports being approximately 83 times greater than inter-provincial exports in the baseline OLS regression without accounting for bilateral trust. Including either importer-to-exporter trust or exporter-to-importer trust separately under the IV approach sharply reduces the estimated border effect, with intra-provincial exports decreasing to 21 times more than inter-provincial exports. Meanwhile, I find that the provincial border effect diminishes

[2]For a detailed description of the IV and the historical background, please refer to Section 6.

as either of the two trust measures increases. In addition, both importer-to-exporter trust and exporter-to-importer trust are found to have a trade-boosting effect of comparable magnitude. Furthermore, when both trust measures are included together, both the magnitude and significance of the home bias estimates decrease dramatically. In this case, intra-provincial exports decrease to approximately four times more than inter-provincial exports. These findings indicate that inter-provincial trust plays a substantial role in facilitating trade and explaining the observed home bias.

The remainder of this paper is organized as follows: Section 2 reviews the relevant literature. Section 3 details the data utilized in this study. Section 4 shows the estimation strategy and Section 5 presents the baseline results. Section 6 addresses the endogeneity problem and offers corresponding results. Section 7 explores several robustness checks. The final section concludes the paper.

2 Literature review

The home bias, also known as border effect, refers to the tendency for trade or other economic transactions to occur more frequently domestically than internationally (McCallum, 1995; Wei,1996). This effect is considered to be driven by factors such as tariffs, regulatory differences in standards, linguistic gap, judicial asymmetries, currency barriers, etc (Evans, 2003; Turrini and van Ypersele, 2020; Sousa and Lochard, 2005). In addition to goods trade, the home bias is also significant in services and other types of transactions (Broocks and Studnicka, 2024; Zhu et al., 2024). For example, Abou El-Komboz and Goldbeck (2024) find that borders reduce software developer collaboration across Europe. The border effect is also applicable to the sub-national administrative border (Martínez-San Román et al., 2017), known as the domestic border effect. Wolf (2000) reveals that the state border impedes inter-state trade of the U.S., even though there are no tariffs, linguistic barriers, or foreign exchange costs between U.S. states. On the other hand, the first-level sub-national administrative unit of China is the province, which was shaped in 13th century by Yuan Dynasty (Guo and Minier, 2021), and remained mostly unchanged since the 17th century (Sng et al., 2018). Xing and Li (2011) show that provincial borders significantly reduce trade within China. The domestic border effect is often attributed to supplier co-location, networks etc (Hillberry and Hummels, 2008; Garmendia et al., 2012). Unlike the U.S., where much of the domestic border effect might be attributed to statistical artifacts (Coughlin and Novy, 2021), the domestic border effect in China has been shown to stem from more fundamental factors, such as variations in industrial structure, and local protectionism (Li et al., 2022; Zhao and Ni, 2019; Li, 2025). However, these factors have not fully resolved the border effect puzzle within China, making it worthwhile to explore additional

contributing factors.

Meanwhile, trust is regarded as a fundamental driver of human interactions, profoundly shaping economic transactions and fostering development (Dearmon and Grier, 2009). Some studies suggest that bilateral trust can boost bilateral trade (Guiso et al., 2009; Xing and Zhou, 2018) and facilitate foreign direct investment (Da Rin et al., 2019). These trust-related studies typically focus on estimating trust in a single direction. For example, when examining the impact of bilateral trust on trade, most studies emphasize destination-to-source trust (Guiso et al., 2009; Spring and Grossman, 2016; Xing and Zhou, 2018), while in the context of FDI, origin-to-destination trust is often used as a key measure (Da Rin et al., 2019). Import decisions are often influenced by sentiment or affiliation (Ouyang and Yuan, 2021; Hu et al., 2022), while exporters often bear the risk of non-payment or default. Thus, both destination-to-source and source-to-destination trust play crucial roles in influencing bilateral trade. Yu et al. (2015) separately evaluate the effects of these two types of trust on bilateral trade, demonstrating that each direction of trust can independently enhance trade. To the best of my knowledge, a comprehensive analysis that simultaneously examines the roles of these two types of trust in bilateral trade and their influence on home bias remains under-explored. This paper seeks to address this gap.

Guiso et al. (2009) show that higher bilateral trust leads to more international trade. To address endogeneity, they use cultural determinants as IVs for trust, including somatic distance, which reflects the physical similarity between people from different countries, and religious similarity. Conversely, Spring and Grossman (2016) re-evaluate this relationship based on additional somatic distance measures and conclude that the impact of bilateral trust or cultural proximity on bilateral trade is limited. However, such IVs are often deemed to violate the exclusivity assumption. For example, religious commonality could affect trade through channels other than trust or directly affect bilateral trade volume (Fehr, 2009). In addition, unlike in international trade, these measures typically exhibit limited variation in the context of domestic trade, particularly in China, where the regional somatic distance is relatively small and religion plays a less significant role compared to other countries, which could challenge the effectiveness of IVs. Therefore, more appropriate IVs should be identified for the case of China to address the endogeneity issue.

The literature has also emphasized the role of past events in shaping trust (Chen et al., 2022; Xing and Zhou, 2018). For instance, Hu et al. (2022) uncover that the foreign aid sent from the Soviet Union to China decades ago had a long-term impact on fostering inter-group trust and enhancing trust-intensive goods trade. Given that trust is ingrained through past experiences, long-lasting, passed down across

generations, and could be spread across regions (Akçomak and Ter Weel, 2009; Dohman et al., 2012), I employ an IV for trust measures based on a major trust crisis in China—the Great Leap Forward of late 1950s. The Great Leap Forward was initiated to achieve rapid industrialization. This era was marked by a "wind of exaggeration" (Peng, 1987). Exaggerated agricultural yields were often praised and publicized by national media as political messages, widely disseminated across the country. Such exaggerations could have long-term impacts on trust behaviors, potentially contributing to issues such as today's financial misconduct (Chen et al., 2022).

To summarize, in line with current Chinese policy for internal integration, this paper contributes to the literature by exploring additional factors behind China's domestic border effect, emphasizing the impact of trust in shaping it, and simultaneously evaluating trust in both directions.

3 Data

I follow the approach used in much of the literature by calculating inter-provincial and intra-provincial trade flows using the Input-Output Table (Hayakawa, 2017; Li et al., 2022). Specifically, I use China's Multi-regional Input-Output Tables (MRIO), which allow me to calculate transactions both between and within provinces. The sample period includes 2007, 2010, and 2012. There are gaps in years, as the official input-output table is not available for each year. The data for 2007 and 2010 are sourced from the MRIO compiled by Liu et al. (2012) and Liu et al. (2014) respectively.[3] The MRIO for 2012 is obtained from the Carbon Emission Accounts and Datasets (CEADs) database.[4]

The trust measure is sourced from Zhang and Ke (2002) and has been widely employed by many previous studies.[5] This is the only dataset that specifies bilateral trust between provinces in China (Xing and Zhou, 2018). Zhang and Ke constructed a trust matrix for each pair of Chinese provinces using survey data from the 2000 China Entrepreneur Survey System. Over 5,000 entrepreneurs across 13 industries with diverse ownership structures from all over China were asked to rank the five most trustworthy provinces for business partnerships. The trust matrix was then calculated, with each element representing the percentage of respondents from one province who considered people from another province the most trustworthy. Some provinces were never regarded as the most trustworthy, resulting in zero values in the matrix (Xing and Zhou, 2018).[6] Unlike in European countries, where the most trusted countries

[3] Key Laboratory of Regional Sustainable Development Modeling, China Academy of Sciences.
[4] `https://www.ceads.net/`
[5] See Wu et al. (2014), Li et al. (2017), Lin et al. (2018) and Li et al. (2019).
[6] For more detailed data description, please refer to Zhang and Ke (2002).

tend to trust others the most (Guiso et al., 2009), in China, bilateral trust among provinces is not reciprocal (Zhang and Ke, 2002; Zheng and Zhu, 2021). Thus, both importer-to-exporter trust and exporter-to-importer trust are incorporated into the analysis.

The data used to construct the IV (the provincial number of reports on "high-yield agricultural satellites" in *People's Daily*) is sourced from Chen (2011), who had extracted it from *People's Daily* issues published between June 1958 and December 1960. Following Li et al. (2024), the excess death rate during the Great Leap Famine, used for robustness checks, are calculated based on the demographic data disclosed by the National Bureau of Statistics (NBS).

Provincial-level control variables include Gross Domestic Products (GDP), foreign trade, the fiscal expenditure-to-revenue ratio, and the share of the secondary sector in GDP. These data are sourced from *China Statistical Yearbooks* published by the NBS. Geographical distances are calculated using the great-circle distance between each province's capital. The latitude and longitude data required for this calculation are sourced from R package "worldcities". Additionally, I obtain each province's geographical area from the Ministry of Civil Affairs (2018), which is necessary for determining intra-provincial distances. Following the methodology of Nitsch (2000), the internal distance for each province is calculated by dividing the province's area by π and then taking the square root.

Table 1 presents the summary statistics of the variables used in the baseline regressions. I exclude the outliers of bilateral trust as identified in Lin et al. (2018). This results in a final sample of 2,752 observations. The export volume, geographical distance, provincial GDP, provincial foreign trade are in logarithmic form. The statistics for importer-to-exporter trust are identical to those of exporter-to-importer trust. Similarly, the summary statistics of provincial-level control variables are equivalent from both the importer and exporter perspectives.

Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Export	2,752	13.98	1.74	6.14	21.04
Local	2,752	0.03	0.18	0	1
Bilateral trust	2,752	3.18	7.32	0	57.90
Geographical distance	2,752	6.99	0.66	4.12	8.18
Provincial GDP	2,752	9.19	0.95	6.55	10.95
Provincial foreign trade	2,752	14.86	1.60	11.13	18.53
Provincial fiscal expenditure/revenue	2,752	2.33	1.32	1.05	10.46
Share of secondary sector in provincial GDP	2,752	48.55	7.65	22.70	60

Summary statistics of the sample used in Table 3. The export volume, distance, GDP and foreign trade are in logs.

4 Empirical strategies

For the baseline regression, I employ the Ordinary Least Squares (OLS) regression based on the gravity model. In particular, I examine the domestic border effect first by estimating Equation 1.

$$Export_{ijt} = \beta_0 + \beta_1 Distance_{ij} + \beta_2 Local_{ij} + \beta_3 GDP_{it} + \beta_4 GDP_{jt} + \gamma_i + \gamma_j + \gamma_t + \epsilon_{ijt} \tag{1}$$

The dependent variable is the logarithmic export from province i to j in year t. $Distance_{ij}$ is the logarithmic geographical distance between i and j, $Local_{ij}$ is a border dummy variable that equals one for intra-provincial exports and zero for inter-provincial exports. Yearly provincial GDP of both exporters and importers (in logs) are included as control variables. γ_i, γ_j and γ_t are the exporter, importer and year fixed effects.

Subsequently, I integrate trust measurements to elucidate the role of trust in shaping trade and explaining border effects. Initially, I estimate the trust exporters place in importers, as highlighted by Yu et al. (2015). Next, I separately analyze the trust an importer has in the exporter, as examined in previous studies (Guiso et al., 2009; Xing and Zhou, 2018). To enhance the comprehensiveness of the analysis, I further examine the two aforementioned dimensions of trust simultaneously.[7]

$$Export_{ijt} = \beta_0 + \beta_1 Distance_{ij} + \beta_2 Local_{ij} + \beta_3 Trust_{ij} + X_{it} + X_{jt} + \gamma_i + \gamma_t + \epsilon_{ijt} \tag{2}$$

As shown in Equation 2, $Trust_{ij}$ represents the perceived trustworthiness of the importer j, as viewed from the perspective of the exporter i. Unlike bilateral trade cost variables (e.g., distance, border), which remain the same for both parties, $Trust_{ij}$ depends on the direction. Consequently, the importer fixed effect is excluded, as $Trust_{ij}$ measures the trustworthiness of the importer from the perspective of the exporters.

Each entry in the bilateral trust matrix constructed by Zhang and Ke (2002) indicates the percentage of respondents from a given province who rated people from another province as the most trustworthy. Thus, $Trust_{ij}$ is strongly correlated with importer fixed effects. Provinces that are generally perceived as most trustworthy such as Beijing, and Shanghai tend to be most trusted by the majority of other provinces, resulting in high trust values (Zhang and Ke, 2002; Lin et al., 2018). Conversely, numerous

[7] For brevity, only the equations including exporter-to-importer trust are shown.

provinces are never perceived as the most trustworthy, leading to a significant number of zero entries in the matrix (Xing and Zhou, 2018). The inclusion of an importer fixed effect would reduce variation in trust levels across provinces, potentially biasing the results (Zhou, 2001).[8]

Following Xing and Zhou (2018), I include year-specific provincial control variables X_{it} and X_{jt}. These variables include GDP, foreign trade volume, the share of the secondary sector in the economy, the ratio of fiscal expenditure to fiscal revenue. The fiscal expenditure over revenue can measure both the management ability and the conservatism of a provincial government.[9] However, the exporter fixed effect γ_i is included. I employ the method proposed by Baier and Bergstrand (2009) to manually adjust both $Distance_{ij}$ and the $Local_{ij}$ for multilateral resistance terms (MRTs).

In the next step, I estimate Equation 3 to investigate the heterogeneity of the border effect with respect to trust. Here, particular attention is given to β_4, which quantifies how home bias changes as the exporters' trust in the importers increases.

$$Export_{ijt} = \beta_0 + \beta_1 Distance_{ij} + \beta_2 Local_{ij} + \beta_3 Trust_{ij} + \beta_4 Trust_{ij} * Local_{ij} + X_{it} + X_{jt} + \gamma_i + \gamma_t + \epsilon_{ijt} \tag{3}$$

5 Baseline results

Table 2 presents the estimates of the provincial border effect. Column 1 does not consider the MRTs. Column 2 incorporates exporter and importer fixed effects to control for MRTs, while column 3 employs the method proposed by Baier and Bergstrand (BB). Both approaches yield remarkably similar results, with the coefficient for $Local_{ij}$ estimated at around 4.429. This implies that intra-provincial trade is approximately 83 times greater than inter-provincial trade, underscoring the significant trade-restricting impact of provincial borders. Following Coughlin and Novy (2021), I plot the individual border effects for each province in Figure 1.

Table 3 details the role of trust in shaping the provincial border effect. Inspired by Lin et al. (2018), I exclude from the sample extreme values of the trust measure: Shanghai's trust in itself (0) and in Zhejiang (77.7).[10] Column 1, 4 and 7 are the benchmark specifications without taking into account trust.

First, columns 1 to 3 focus on the exporter-to-importer trust. Column 2 examines whether the

[8] A similar issue arises with importer-to-exporter trust, so exporter fixed effects are not included when analyzing $Trust_{ji}$.
[9] Provincial GDP, and provincial foreign trade volume are in logarithmic form.
[10] The results obtained using the full sample remain robust and are provided in Section 7.6.

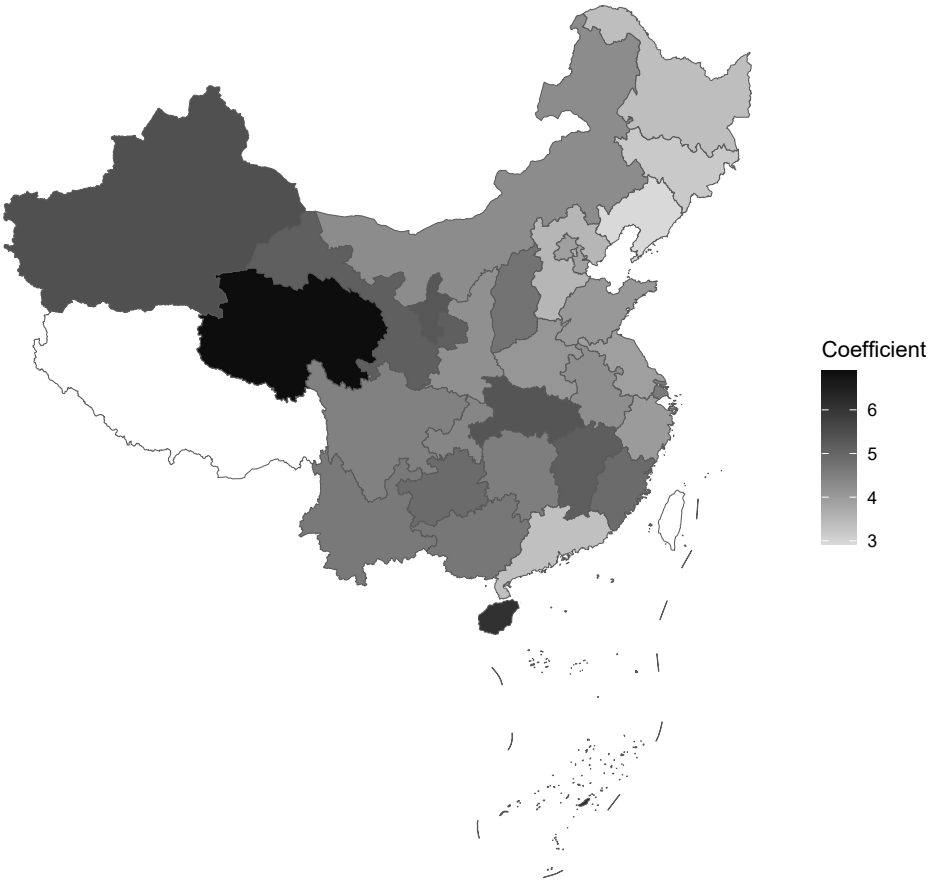

Figure 1: Coefficient of *Local* for each province

Note: Blank areas indicate missing information. Xizang Autonomous Region is in blank because data is only available for 2012, resulting in a small number of observations (31). The results are statistically significant across all specifications, with a 99% confidence interval.

Table 2: Provincial home bias: OLS

	(1)	(2)	(3)
$Local_{ij}$	4.562***	4.429***	4.429***
	(0.137)	(0.194)	(0.144)
$Distance_{ij}$	-0.417***	-0.499***	-0.499***
	(0.036)	(0.041)	(0.043)
GDP_i	0.955***	1.102***	1.005***
	(0.026)	(0.210)	(0.026)
GDP_j	0.817***	0.569***	0.867***
	(0.025)	(0.207)	(0.024)
Constant	0.699	1.963	-2.936***
	(0.491)	(2.767)	(0.342)
Fixed effects:			
Exporter	-	Y	-
Importer	-	Y	-
BB	-	-	Y
Observations	2,761	2,761	2,761
Adjusted R-squared	0.809	0.884	0.808

Dependent variable: log export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. *** p<0.01, ** p<0.05, * p<0.1.

exporter's trust in the importer mediates the relationship between the provincial border and provincial trade. As shown, higher trust from exporters towards importers is associated with increased exports. The inclusion of $Trust_{ij}$ reduces the coefficient of $Local_{ij}$ from 4.462 to 4.292, indicating that trust partially explains the provincial home bias. Specifically, intra-provincial exports decrease from being 86 times larger to approximately 72 times larger than inter-provincial exports. In column 3, the negative coefficient of $Trust_{ij} \times Local_{ij}$ suggests that home bias diminishes significantly as the exporter's trust in the importer increases.

Columns 4 to 6 examine the effect of importer-to-exporter trust. In column 5, $Trust_{ji}$ does not exhibit a significant association with bilateral trade, and its inclusion only slightly reduces the border coefficient compared to column 4. However, as shown in column 6, the border effect significantly decreases with an increase in importer-to-exporter trust.

Furthermore, in column 8, both exporter-to-importer and importer-to-exporter trust are jointly estimated. Once again, the former significantly boosts trade, while no evidence is found to suggest that the latter has a trade-enhancing effect. In this scenario, intra-provincial exports are approximately 71 times greater than inter-provincial exports.

Table 3: Provincial border effect and the role of trust: OLS

	$Trust_{ij}$			$Trust_{ji}$			Both	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Local_{ij}$	4.462***	4.292***	5.151***	4.459***	4.408***	5.188***	4.456***	4.281***
	(0.167)	(0.185)	(0.205)	(0.166)	(0.172)	(0.193)	(0.157)	(0.182)
$Trust_{ij}$	-	0.012***	0.023***	-	-	-	-	0.012***
		(0.004)	(0.004)					(0.004)
$Trust_{ij}$*$Local_{ij}$	-	-	-0.058***	-	-	-	-	-
			(0.008)					
$Trust_{ji}$	-	-	-	-	0.004	0.013***	-	0.001
					(0.004)	(0.003)		(0.004)
$Trust_{ji}$*$Local_{ij}$	-	-	-	-	-	-0.053***	-	-
						(0.008)		
Constant	-7.821***	-7.633***	-7.603***	-4.056	-4.000	-3.973	-1.292**	-1.090**
	(2.422)	(2.417)	(2.414)	(2.494)	(2.495)	(2.492)	(0.542)	(0.549)
Exporter FE	Y	Y	Y	-	-	-	-	-
Importer FE	-	-	-	Y	Y	Y	-	-
Observations	2,752	2,752	2,752	2,752	2,752	2,752	2,752	2,752
Adjusted R-squared	0.851	0.852	0.859	0.853	0.853	0.858	0.819	0.820

Dependent variable: log export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. Multilateral resistances are accounted by employing BB's method. All specifications control for GDP, fiscal expenditure relative to revenue, the share of secondary industry in GDP, and the foreign trade of both importers and exporters, and distance. *** p<0.01, ** p<0.05, * p<0.1.

6 Endogeneity: solution and results

A common issue when using OLS to regress trade on trust is the reverse causality. While bilateral trust can promote trade, increased trade may either strengthen bilateral trust, or undermine it due to trade disputes. In addition, the issue of omitted variable bias may be present. Previous studies have used various IVs to address this problem, such as common religion, somatic distance, and historical institutions (Guiso et al., 2009; Xing and Zhou, 2018). As previously mentioned, these IVs are not suitable for the current context. Therefore, I employ a distinct IV estimation strategy specifically tailored to China, leveraging the Great Leap Forward of the late 1950s.

After the initial success in its socialist transformation, China launched the Great Leap Forward in 1958, aiming for rapid industrialization fueled partly by sharp growth in agriculture (Lin, 1990; Kung and Lin 2003). For instance, it sought to catch up with and surpass the UK in steel production within two years (Fan and Shi, 2013). In agriculture, collectivization and the establishment of people's communes were implemented in rural areas (Lin, 1990; Bai and Kung, 2014).

Inspired by the Soviet Union's 1957 launch of the Sputnik satellite, China used the term "launching agricultural high-yield satellites" to describe exceptionally high agricultural yields (Chen et al., 2022). For the sake of political messaging, these exaggerated statistics were often published in the official newspaper, *People's Daily*, to facilitate the execution of Great Leap Forward policies. A notable example is the front

page of *People's Daily* on August, 1958, which claimed, "A commune in Macheng, produced over 36,900 jin of early rice per mu" (Yang, 2008).[11] Since the *People's Daily* was highly influential and widely circulated across China, these reports were extensively disseminated, fostering an era dominated by exaggeration.

I use $Satellite_j$, the number of "high-yield agricultural satellites" reported in *People's Daily* for the importing province during the Great Leap Forward, as an IV for the trustworthiness of the importer, from the exporter's perspective. Similarly, I use $Satellite_i$ to instrument the importer's trust in the exporter. This does not refer to the actual total number of "satellites" launched by the province, but only those specifically highlighted by the newspaper. Provinces not mentioned in *People's Daily* regarding "satellites" in agriculture are assigned a value of zero. However, this does not necessarily indicate that these provinces refrained from exaggeration. Rather, it suggests that the *People's Daily* did not specifically emphasize their agricultural "success", which in turn limits their influence and impression on people from other provinces. The rationale is that if a province was frequently highlighted as a "high-yield role model" and its highly-inflated output prominently featured in the media, it could damage its credibility and leave a negative impression on people from other regions. Since trust is deeply rooted in historical experience, long-lasting trust can be passed on across generations, and across regions (Akçomak and Ter Weel, 2009; Dohman et al., 2012), these false reports are likely to affect trustworthiness decades later. The respondents of the trust data survey used in earlier sections were on average 47.5 years old in 2000 according to Xing and Zhou (2018). Thus, most of them have experienced the Great Leap Forward. In addition, the frequency with which a province is mentioned in newspapers is unlikely to impact current trade through channels other than shaping perceptions of its trustworthiness. Therefore, I estimate the Equation 4 where $\widehat{Trust_{ij}}$ is the predicted value generated by the instrument $Satellite_j$ in the first stage.

$$Export_{ijt} = \beta_0 + +\beta_1 Dis_{ij} + \beta_2 Local_{ij} + \beta_3 \widehat{Trust_{ij}} + X_{it} + X_{jt} + \gamma_i + \gamma_t + \epsilon_{ijt} \tag{4}$$

One might be concerned that provinces frequently highlighted for inflated output in the *People's Daily* were more likely to experience excessive procurement of food by the central government,[12] leading to a more severe situation during the subsequent Great Leap Famine. This could potentially influence current trade through other channels. However, previous studies have shown that the over-procurement

[11] jin is half a kilogram, mu is around 667 square meters. Thus, 36,900 jin per mu is equivalent to around 277 tons per hectare, which is highly impractical and scientifically impossible.

[12] During that period, the production and distribution of food in China were centrally planned by the government to facilitate the efficient transfer of agricultural surplus toward industrialization (Kung and Lin, 2003). After the harvest, grain was procured by the central government, and peasants were only permitted to use the retained grains allocated to their collective (Meng et al., 2015).

contributing to the famine was driven by increased demand from accelerated industrialization during the Great Leap Forward, not by exaggeration (Fan and Shi, 2013; Yu and Zhang, 2015). Additionally, in Section 7.5 of robustness checks, I control for the provincial excess death rate during the subsequent famine to address this potential endogeneity issue and account for any other confounding factors related to both the famine and the current trade.

Table 4: Provincial home bias: the role of trust under IV

	$Trust_{ij}$		$Trust_{ji}$		Both
	(1)	(2)	(3)	(4)	(5)
$Local_{ij}$	3.061***	4.670***	3.134***	4.677***	1.665*
	(0.442)	(0.660)	(0.452)	(0.603)	(0.881)
$Trust_{ij}$	0.102***	0.114***	-	-	0.105***
	(0.020)	(0.020)			(0.030)
$Trust_{ij}$*$Local_{ij}$	-	-0.103**		-	-
		(0.045)			
$Trust_{ji}$	-	-	0.097***	0.108***	0.099***
			(0.021)	(0.022)	(0.030)
$Trust_{ji}$*$Local_{ij}$	-	-	-	-0.099**	-
				(0.043)	
First-stage F statistic (Kleibergen-Paap)	48.61	24.68	48.61	24.68	12.04
Exporter FE	Y	Y	-	-	-
Importer FE	-	-	Y	Y	-
Observations	2,752	2,752	2,752	2,752	2,752

Dependent variable: log export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. All specifications control for GDP, fiscal expenditure relative to revenue, the share of secondary industry in GDP, the foreign trade of both importers and exporters, and distance. *** p<0.01, ** p<0.05, * p<0.1.

Akin to the OLS regressions, both exporter-to-importer and importer-to-exporter trust are inclined in the IV estimation, with the results presented in Table 4. For all specifications, the F-statistics are above ten, ruling out weak instrument issues. As shown in column 1, the coefficient of $Trust_{ij}$ is significantly positive, indicating that an increase in exporter-to-importer trust leads to a rise in exports. The $Local_{ij}$ coefficient decreases significantly from 4.462 (column 1 of Table 3) to 3.061. After addressing the endogeneity, intra-provincial exports decrease from being 86 times larger to approximately 20 times larger than inter-provincial exports. Column 2 reaffirms the heterogeneity of home bias, showing that the higher the exporter's trust in the importer, the smaller the provincial home bias. In contrast to the OLS results, importer-to-exporter trust is found to significantly boost bilateral exports under IV, as shown in column 3. In this context, the intra-provincial exports are 22 time larger than the inter-

provincial exports. Furthermore, column 4 shows that the provincial home bias significantly decreases as importer-to-exporter trust increases. Eventually, in column 5, both types of trust significantly boost exports. When including them simultaneously in the model, both the significance and magnitude of the $Local_{ij}$ coefficient decrease dramatically. The intra-provincial exports become approximately only four times larger than the inter-provincial exports.

To summarize, after addressing endogeneity, trust between the importer and exporter contributes to bilateral trade, regardless of direction. These bilateral trusts explain a significant portion of the substantial provincial border effect observed previously.

7 Robustness check

In this section, I conduct several robustness checks. First, I address the possibility that the observed border effect is a statistical artifact by testing the sensitivity to the composition of the sample. Second, I employ the Pseudo Poisson Maximum Likelihood (PPML) regression method. Third, I estimate the border effect using sectoral trade data. Fourth, I conduct the bilateral-level IV. Fifth, I also check for potential violations of the exclusion restrictions. Lastly, I re-estimate the results using the full sample of the trust measure.

7.1 Sensitivity to sample composition

As suggested by Coughlin and Novy (2021), border-effect research should take into account the potential threat of statistical artifacts. Previously, Li et al. (2022) showed that the domestic border effect in China stems from fundamental factors rather than statistical artifacts. I examine the sample composition effect by gradually dropping the smallest provinces from the sample. The rationale is that smaller economies are considered to be associated with a higher border effect, if the observed border effect is due to sample composition, then there will be a clear declining trend of the border effect when gradually excluding the smallest units as shown in Coughlin and Novy (2021). However, as depicted in Figure 2, the case of China does not exhibit a clear sample composition effect and the effect remains stable, thereby ruling out the possibility of statistical artifacts.

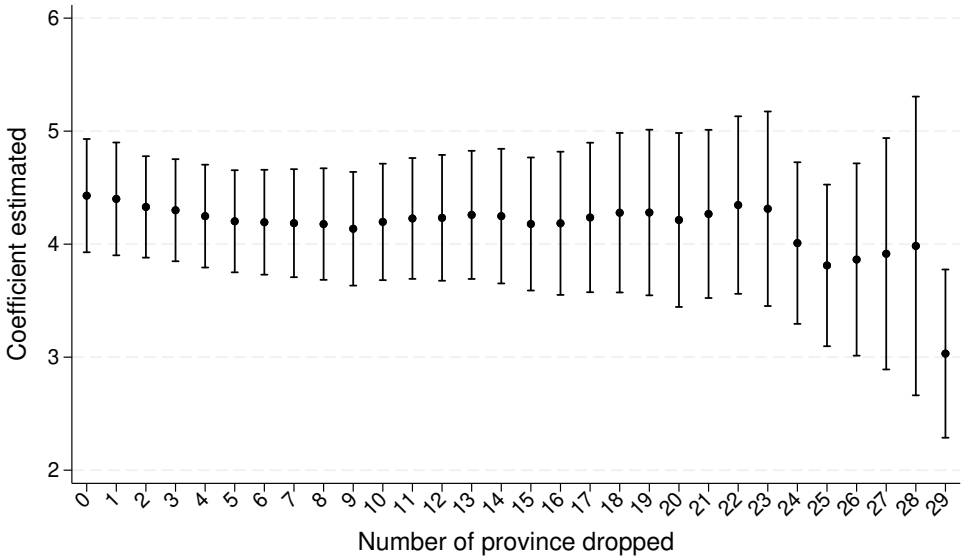

Figure 2: Coefficient of *Local* estimated by sequentially dipping smaller provinces from the regressions

Note: The smallest provinces in terms of economic size are gradually excluded from the sample. All specifications control for provincial GDP and distance, and include fixed effects for importer, exporter, and year. The results are statistically significant across all specifications, with 99% confidence intervals.

7.2 PPML regression

In this section, I apply the PPML method to re-estimate the home bias of China (Silva and Tenreyro, 2006). In this approach, the dependent variable is the level of exports rather than its logarithm. This method can, to some extent, improve the consistency of the estimates compared to log-linear estimation (Martínez-San Román et al., 2017). Table 5 display the results, in which column 1 uses OLS. Column 2 and 3 employ the PPML, with the former using the fixed effect and the latter using the BB's method to account for MRTs respectively. As shown in column 3, the PPML results are similar to those obtained using OLS. The coefficient of 4.464 indicates that intra-provincial exports are approximately 86 times greater than inter-provincial exports.

7.3 Sectoral trade data analysis

As mentioned earlier, the MRIO data provides input and output information for each sector within a province, as well as for sectors in other provinces. This enables the calculation of sectoral export volumes between provinces. Accordingly, I utilize sectoral export data to re-estimate the provincial border effect and the role of trust in shaping this relationship. Due to the lack of data, I am unable

Table 5: Provincial home bias: PPML

	(1)	(2)	(3)
Local	4.464***	4.225***	4.461***
	(0.191)	(0.067)	(0.096)
Distance	-0.529***	-0.333***	-0.118**
	(0.039)	(0.040)	(0.060)
GDP_i	1.087***	0.940***	0.604***
	(0.212)	(0.210)	(0.037)
GDP_j	0.551***	0.237	0.610***
	(0.209)	(0.212)	(0.038)
PPML	-	Y	Y
Fixed effects:			
Exporter	Y	Y	-
Importer	Y	Y	-
BB	-	-	Y
Observations	2,752	2,752	2,752
Adjusted R-squared	0.888	-	-

Dependent variable: log export volume in column 1, export volume level in column 2. Robust standard errors are in parentheses and clustered by non-directional trade pairs. Year fixed effects are added in all specifications. *** p<0.01, ** p<0.05, * p<0.1.

to include the sectoral output of each province, which may result in less well-structured specifications. Nevertheless, the results derived from sectoral trade data still offer valuable insights for robustness checks. As shown in Table 6, similar to the previous findings based on aggregate trade volumes, the provincial border significantly reduces exports. Either exporter-to-importer trust or importer-to-exporter trust independently enhances bilateral exports, and the home bias diminishes as either trust measure increases. However, when both are included in the model simultaneously, only exporter-to-importer trust has a significant impact on boosting exports.

7.4 Mutual trust and a bilateral IV

Previously, the IV varied with either the exporter or the importer, while the endogenous variable, trust, varied bilaterally, depending on both parties. I generate a bilateral-level IV by adding up the agricultural high-yield satellites launched by both importers and exporters to instrument the mutual trust between them. The mutual trust is the sum of $Trust_{ij}$ and $Trust_{ji}$. The rationale is that the more frequently both were highlighted by the *People's Daily* regarding their exaggerated yields, the lower the mutual trust between them. As illustrated by Table 7, mutual trust significantly boosts bilateral trade, regardless of whether the method used is OLS or IV. Furthermore, as mutual trust increases, the provincial home

Table 6: Provincial home bias and the role of trust: using sectoral export data with PPML

	(1)	(2)	(3)	(4)	(5)
$Local_{ij}$	3.658***	4.353***	3.744***	4.420***	3.963***
	(0.159)	(0.143)	(0.168)	(0.152)	(0.120)
$Trust_{ij}$	0.026***	0.074***	-	-	0.010***
	(0.008)	(0.010)			(0.003)
$Trust_{ij}$*$Local_{ij}$	-	-0.076***	-	-	-
		(0.008)			
$Trust_{ji}$	-	-	0.021**	0.074***	-0.001
			(0.009)	(0.010)	(0.004)
$Trust_{ji}$*$Local_{ij}$	-	-	-	-0.079***	-
				(0.008)	
Fixed effects:					
Exporter FE	Y	Y	-	-	-
Importer FE	-	-	Y	Y	-
Sector	Y	Y	Y	Y	Y
Observations	71,756	71,756	71,756	71,756	71,756

Dependent variable: export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. All specifications control for GDP, fiscal expenditure relative to revenue, the share of secondary industry in GDP, and the foreign trade of both importers and exporters, and distance. *** p<0.01, ** p<0.05, * p<0.1.

bias diminishes significantly. These reconfirm the previous findings.

7.5 Great Leap Famine

A subsequent tragedy caused by the Great Leap Forward is the famine, which is often referred to as the "Great Leap Famine" (Ó Gráda, 2011; Garnaut, 2014). Previous work has shown both the short-term and long-term impacts of this calamity on various aspects, such as survivors' health, later institutional changes, GDP per capita, food consumption and more (Hu et al., 2017; Bai and Kung, 2014; Gooch, 2017; Li et al., 2024). As mentioned earlier, one may be concerned that the more frequently a province was highlighted by the *People's Daily* for its fantastical yields, the higher the likelihood that this province would be over-procured by the central government later, thereby contributing to the subsequent famine severity. This could, in turn, affect current trade through channels beyond altering trust. While previous research has shown that the exaggeration of "high-yield satellites" in the media did not induce over-procurement, I include the provincial excess death rate to account for all potential channels through which the famine may impact current trade, ensuring robustness. I calculate the excess death rate using official demographic data from the National Bureau of Statistics (NBS). Specifically, following Lin and

Table 7: Provincial home bias: an bilateral IV

	OLS		IV	
	(1)	(2)	(3)	(4)
$Local_{ij}$	4.281***	5.113***	1.665*	4.376***
	(0.182)	(0.189)	(0.881)	(0.664)
$Mutual_{ij}$	0.006*	0.018***	0.102***	0.128***
	(0.003)	(0.003)	(0.025)	(0.028)
$Mutual_{ij}$*$Local_{ij}$	-	-0.033***	-	-0.100***
		(0.004)		(0.032)
First-stage F statistic (Kleibergen-Paap)	-	-	24.09	13.29
Observations	2,752	2,752	2,752	2,752

Dependent variable: log export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. All specifications control for GDP, fiscal expenditure relative to revenue, the share of secondary industry in GDP, and the foreign trade of both importers and exporters, and distance. *** p<0.01, ** p<0.05, * p<0.1.

Yang (2000), Bai and Kung (2014), and Li et al. (2024), I define the excess death rate as the difference between the death rate in 1960, the year considered to have experienced the worst famine conditions, and the average death rate from the three years preceding the famine.[13]

Table 8 presents the results obtained after controlling for excess deaths during the famine. The findings remain robust, confirming that trust serves as a key mechanism through which provincial borders influence trade.

7.6 Full sample analysis of trust

In earlier sections, I excluded observations of Shanghai exporting to itself and to Zhejiang, as the trustworthiness of Shanghai towards itself (0) and towards Zhejiang (77.7) represents potential outliers. Here, I incorporate the full sample, including these observations, and re-estimate the results. As shown in Table 9, the results obtained using the full sample remain robust across regression methods. Consistent with earlier findings, the inclusion of trust significantly reduces home bias, and as bilateral trust increases, home bias diminishes.

[13]Since the death toll from the famine remains a subject of debate, I also use the provincial excess death rates estimated by Cao (2005), which incorporate both official demographic statistics and data from local gazetteers. The results remain robust and are available upon request.

Table 8: Provincial home bias: the role of trust, controlling for excess death under IV

	$Trust_{ij}$		$Trust_{ji}$		Both
	(1)	(2)	(3)	(4)	(5)
$Local_{ij}$	2.839***	4.628***	2.917***	4.635***	1.193
	(0.501)	(0.701)	(0.515)	(0.641)	(1.057)
$Trust_{ij}$	0.119***	0.129***	-	-	0.122***
	(0.023)	(0.022)			(0.036)
$Trust_{ij}$*$Local_{ij}$	-	-0.113**	-	-	-
		(0.047)			
$Trust_{ji}$	-	-	0.113***	0.123***	0.116***
			(0.025)	(0.025)	(0.037)
$Trust_{ji}$*$Local_{ij}$	-	-	-	-0.108**	-
				(0.045)	
$Excess\ death\ rate_i$	-	-	0.036**	0.032*	0.038
			(0.017)	(0.016)	(0.026)
$Excess\ death\ rate_j$	0.037**	0.032**	-	-	0.038
	(0.016)	(0.015)			(0.026)
Exporter FE	Y	Y	-	-	-
Importer FE	-	-	Y	Y	-
First-stage F statistic (Kleibergen-Paap)	41.03	21.64	41.03	21.64	10.27
Observations	2,752	2,752	2,752	2,752	2,752

Dependent variable: log export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. All specifications control for GDP, fiscal expenditure relative to revenue, the share of secondary industry in GDP, the foreign trade of both importers and exporters, and distance. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Provincial home bias: the role of trust, full sample analysis under IV

	$Trust_{ij}$		$Trust_{ji}$		Both
	(1)	(2)	(3)	(4)	(5)
$Local_{ij}$	3.251***	4.733***	3.319***	4.774***	2.134***
	(0.428)	(0.782)	(0.432)	(0.708)	(0.803)
$Trust_{ij}$	0.099***	0.108***	-	-	0.099***
	(0.019)	(0.019)			(0.029)
$Trust_{ij}$*$Local_{ij}$	-	-0.095*	-	-	-
		(0.053)			
$Trust_{ji}$	-	-	0.093***	0.102***	0.094***
			(0.020)	(0.021)	(0.029)
$Trust_{ji}$*$Local_{ij}$	-	-	-	-0.093*	-
				(0.049)	
First-stage F statistic (Kleibergen-Paap)	48.94	25.83	48.94	25.83	12.34
Exporter FE	Y	Y	-	-	-
Importer FE	-	-	Y	Y	-
Observations	2,761	2,761	2,761	2,761	2,761

Dependent variable: log export volume. Robust standard errors are in parentheses and clustered by trade pair. Year fixed effects are added for all specifications. All specifications control for GDP, fiscal expenditure relative to revenue, the share of secondary industry in GDP, and the foreign trade of both importers and exporters, and distance. *** p<0.01, ** p<0.05, * p<0.1.

8 Conclusion

As one of the six major puzzles in international economics, the border effect puzzle has garnered significant attention (Rogoff and Obstfeld, 2000). Borders increase transaction costs, contribute to market fragmentation, and reduce the volume of cross-border trade. Country border effects on trade are primarily attributed to both visible and invisible trade barriers. Visible barriers include tariffs, regulatory discrepancies, and various trade policies, among others. However, this effect persists even in scenarios where such differences are minimal or absent, as exemplified by trade between the United States and Canada or within the European Union, and remains substantial (McCallum, 1995; Nitsch, 2000; Head and Mayer, 2000; Helble, 2007). This underscores the importance of invisible barriers—such as cultural differences, linguistic gaps, social networks, and variations in consumer preferences—in shaping the border effect. Furthermore, the presence of a pronounced border effect even within a single country further highlights the critical role of these invisible barriers. China, as a highly integrated domestic market with no tariffs or significant policy barriers and a well-developed inter-provincial transportation network and logistics system, has nevertheless been shown in previous studies to exhibit a strong and robust internal border effect. Consequently, it is worthwhile to explore what drives market segmentation in China, par-

ticularly in light of the country's recent policy shift from an external circulation focus to an emphasis on internal circulation. This paper investigates the border effect within China, emphasizing the critical role of inter-regional trust in shaping this phenomenon. Based on inter-provincial and intra-provincial trade statistics, I initially reveal a significantly negative provincial border effect on trade, with intra-provincial exports being more than 80 times larger than inter-provincial exports. Both the trust of exporters toward importers and the trust of importers toward exporters play a crucial and comparable role in the observed home bias, after addressing endogeneity through a tailored instrumental variable based on the media reports on provincial exaggeration during the Great Leap Forward. In these cases, intra-provincial exports are approximately 20 times larger than inter-provincial exports. Ultimately, a comprehensive analysis that includes both types of trust significantly reduces the border effect, with intra-provincial exports becoming roughly four times larger than inter-provincial exports.

Aligned with the Chinese government's recent "Unified National Market" strategy, this study emphasizes the importance of building trust and restoring regional reputations to enhance domestic transactions and eliminate internal trade barriers. For example, stricter credit reporting systems should be implemented to mitigate the risks associated with dishonesty, addressing concerns traders in certain regions might have when dealing with counterparts from other, particularly less trusted, regions. A nationally unified business platform could be established to reduce the intangible costs and barriers caused by local protectionism and inter-regional trust differences. Promoting transparent and fair information dissemination is also vital. More importantly, policymakers and the public should draw lessons from the exaggerated trends of past radical policies. Once trust is lost, its profound and lasting impact makes restoration challenging and demands significant time and effort to rebuild.

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