

7. POLITICAL RELATIONS AND BILATERAL TRADE: EVIDENCE FROM CHINA AND TRADING PARTNERS

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Abstract

This study examines the causal relationship between political relations and bilateral trade involving China and its 12 primary trading partners. Through the utilization of bootstrapping Panel Granger causality test and generalized impulse response functions, our findings reveal that countries such as the US, Japan, Russia, Germany, Pakistan, and Indonesia are categorized into the "Flag Group", signifying a unidirectional causality running from political relation to trade. In contrast, the "Trade Group" encompasses the UK, France, India, Australia, and Vietnam, emphasizing the unidirectional causality from trade to political relation. Lastly, South Korea is identified as the "Neutral Group," suggesting a lack of causality between political relations and trade in this particular context. In addition, more sophisticated relations among positive and negative political relations and trade surplus and deficit are tested using generalized impulse response functions. The empirical results yield significant policy implications for both China and its trading partners.

Keywords: Political relations; bilateral trade; causality test; bootstrapping; China

JEL Code: F5, F1, C22

1. Introduction

As China becomes a major player in international affairs, the country's political relations become increasingly important for trade flows (Cai et al., 2022, 2023a) and hence attracted researchers' attention. The existing literature has widely investigated the relation between conflicts and trade (Pollins, 1989a; Pollins, 1989b; Reuveny and Kang, 1996, 1998; Kastner, 2007; Jinjark, 2009; Armstrong, 2012; Steinbach, 2023). However, the literature on China has mainly focused on the spillover effects of Sino-US political relations (Cai et al., 2022, 2023a, 2023b) and ignored the interactions of China's political relations with other nations. This study extends the literature by examining the causality between trade balance and political relations between China and 12 major trading partners covering the period from China's accession to WTO in 2001 to present.

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China's WTO membership is crucial to the country's economic development since it represents increased foreign investment, the elimination of trade barriers, and more transparent and predictable rules for foreign investors. As a result, China's economy has been strongly boosted since 2001, and its achievements in manufacturing and high-tech industries have elevated the country's position in international affairs. However, politics matters in international trade especially during Donald Trump presidency with multiple sanctions against other countries. Therefore, it is important to understand the causality between trade balance and political relations between China and main trading partners. Another intriguing question concerns the asymmetric causality between political relations and trade balance, specifically the different causality between positive or negative political relations and trade surpluses or trade deficits.

To investigate these questions, this study employs a bootstrapping panel Granger causality test proposed by Kónya (2006), which offers two advantages over previous studies such as Pollins (1989a, 1989b). First, it considers contemporaneous correlation across panel members without the requirement of joint hypotheses. Second, it does not require pretesting the dataset.⁴ To examine the asymmetric impacts, we follow the method proposed by Hamilton (1996), which involves isolating positive and negative political relation shocks and impacts on trade surpluses and deficits. We then construct a bivariate VAR model and use structural and generalized impulse response functions (GIRFs) to capture the asymmetric effects.

Our study contributes significantly to the extant literature in several dimensions. Firstly, our findings shed light on the categorization of countries, such as the US, Japan, Russia, Germany, Pakistan, and Indonesia, into the "Flag Group." This classification denotes a discernible unidirectional causality from political relations to trade. Secondly, we delineate the composition of the "Trade Group," which includes the UK, France, India, Australia, and Vietnam. This grouping underscores a distinct unidirectional causality from trade to political relations among these nations. Lastly, our examination identifies South Korea as the "Neutral Group," revealing a notable absence of causality between political relations and trade within this specific context. These findings contribute substantially to our understanding of the nuanced interplay between political relations and bilateral trade dynamics among diverse nations, offering valuable insights for both scholarly inquiry and policymaking endeavors.

The remainder of this study is organized as follows. Section 2 introduces the datasets and research method. Section 3 presents empirical results. The last section concludes the paper.

2. Literature Review and Hypothesis Formulation

Pollins (1989a) examines the intricate relationship between political conflicts and trade flows. Their findings underscore the profound impact of political relations on trade dynamics. Building upon this foundation, Pollins (1989b) provides compelling empirical evidence highlighting the significant role of diplomacy in shaping commercial activities. Reuveny and Kang (1996) contribute to this discourse by investigating the causal linkages between international trade and political conflict/cooperation, revealing a reciprocal relationship between the two phenomena. Furthering this line of inquiry, Reuveny and Kang (1998) identify a bidirectional causality between bilateral trade and political relations, noting that as diplomatic ties improve, bilateral trade between the US and China tends to increase. However, Kastner (2007) provides a counterpoint to this

⁴ Although Kónya (2006) suggested that the proposed bootstrapping panel Granger causality test does not require pretesting the dataset, we still implement the unit root and cointegration tests to check the integrating order of the variables. The results indicate that all variables are $I(1)$ processes and cointegrated.

argument, suggesting that instances exist where political relations and trade operate independently; even under hostile political conditions, bilateral trade can flourish.

Jinjarak (2009) explores the intricate interplay between trade diversity and political conflict, finding empirical evidence suggesting a close association between the variety of imported products and the occurrence of political conflicts. Armstrong (2012) employs a gravity model to investigate the nexus between politics and bilateral trade, concluding that politics exert minimal influence on trade dynamics. In contrast, Steinbach's (2023) examination of the impacts of the Russia-Ukraine conflicts on global trade reveals a nuanced picture, with imports from Ukraine significantly declining while Russia's mineral oil and gas exports experience a surge amidst the conflict.

In more recent research, Cai *et al.* (2022) analyze the influence of US-China political relations on the oil market, finding that deteriorating relations between the two superpowers could dampen oil demand while boosting oil supply in the medium- and long-term. Expanding their focus, Cai *et al.* (2023a) investigate the effects of US-China political relations on Australia-China bilateral trade, revealing that worsening political ties could lead to reduced exports from and imports to Australia. Furthermore, Cai *et al.* (2023b) employ a time-varying Granger causality test to explore the relationship between US-China political relations and China's stock market, uncovering enduring causal impacts of shifts in diplomatic relations on stock market fluctuations.

According to existing studies, no empirical studies systematically examine the causal relation between political relation and trade of China with his main trading partners. We utilize a bootstrapping Granger causality test to examine the dynamics between the political relations and bilateral trade. We formulate the following hypotheses:

Hypothesis I: Unidirectional causality running from political relation to bilateral trade.

This hypothesis suggests that changes or developments in political relations between two countries directly influence the volume or nature of bilateral trade between them. In other words, improvements or deteriorations in diplomatic ties, agreements, or conflicts lead to corresponding changes in the level of trade activities between the nations. This hypothesis implies that political relations are the primary driver or cause of changes in bilateral trade.

Hypothesis II: Unidirectional causality running from bilateral trade to political relations.

This hypothesis posits that changes in the level or nature of bilateral trade between two countries directly affect their political relations. It suggests that economic interactions, such as trade agreements, trade imbalances, or economic dependencies, shape diplomatic ties, agreements, or conflicts between nations. In essence, this hypothesis suggests that the economic aspects of bilateral relations are the primary drivers of changes in political relations.

Hypothesis III: No causality between bilateral trade and political relations.

This hypothesis proposes that there is no direct causal relationship between bilateral trade and political relations. It suggests that changes or developments in one aspect (bilateral trade or political relations) do not systematically influence changes in the other aspect. Essentially, this hypothesis implies that economic interactions and political relations between two countries operate independently of each other. Earlier studies, such as Kastner (2007), lend support to the notion of a neutral hypothesis regarding the non-causality between bilateral trade and political relations.

3. Datasets and Model Setup

3.1 Datasets

The index of political relations between China and 12 main trading partners is available at the official website of Institute of International Affairs of Tsinghua University

(<http://www.tuiir.tsinghua.edu.cn/imiren/>)⁵ The index is bounded between -9 and +9 which represent the most severe confrontation and the friendliest relations, respectively. To calculate the trade balance between China and partner countries, we draw the export and import datasets from Direction of Trade database maintained by International Monetary Funds. The sample covers the period from 2002M1 to 2022M7.

3.2 Bootstrapping Panel Granger Causality Test

For empirical analysis, we utilize the bootstrap panel Granger causality test proposed by Kónya (2006). To consider a bivariate finite-order vector autoregression (VAR) model,

$$\begin{aligned} Y_{i,t} &= c_{1,i} + \sum_{l=1}^p \beta_{1,i,l} Y_{i,t-l} + \sum_{l=1}^p \gamma_{1,i,l} X_{i,t-l} + \varepsilon_{1,i,t} \\ X_{i,t} &= c_{2,i} + \sum_{l=1}^p \beta_{2,i,l} Y_{i,t-l} + \sum_{l=1}^p \gamma_{2,i,l} X_{i,t-l} + \varepsilon_{2,i,t} \end{aligned} \quad (1)$$

where $Y_{i,t}$ and $X_{i,t}$ denote the political relation index and trade balance between China and trading partner i at year t . l is the order of lags to be decided. $\varepsilon_{1,i,t}$ and $\varepsilon_{2,i,t}$ are assumed to be white noise errors which are correlated for a given country, but not across countries. All variables are in logarithmic form since $Y_{i,t}$ and $X_{i,t}$ are tested and show evidence of cointegration. The system of equation (1) implies that, for country i there is unidirectional causality running from $X_{i,t}$ to $Y_{i,t}$ when not all $\gamma_{1,i,l}$'s are zero in the first equation but all $\beta_{2,i,l}$'s are zero in the second equation. Likewise, the unidirectional causality running from $Y_{i,t}$ to $X_{i,t}$ if $\gamma_{1,i,l}$'s are zero in the first equation but not all $\beta_{2,i,l}$'s are zero in the second equation. In addition, there is bi-directional causality between $Y_{i,t}$ and $X_{i,t}$ if neither all $\beta_{2,i,l}$'s and $\gamma_{1,i,l}$'s are zero. Finally, no Granger causality is supported when all $\beta_{2,i,l}$'s and $\gamma_{1,i,l}$ are zero.

The system of equation (1) for country i indicates that there are $2N$ equations to be estimated in any preferred order. Following Kónya (2006), we extend the above model to a seemingly unrelated regressions (SUR) system. Therefore, the variables can be predetermined in different questions. Since we consider the relation between China's political relations and trade balance, contemporaneous correlation in the system is highly suspected.

3.3 Impulse Responses Analysis

To understand asymmetric effects between political relation and bilateral trade, we construct a bivariate VAR model as follows,

$$Y_t = c + \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \dots + \Pi_p Y_{t-p} + \varepsilon_t, \quad t = 1, \dots, T \quad (2)$$

where $Y_t = (y_{1t}, y_{2t})'$, ε_t is an unobservable white noise vector process with zero means, and p is the lag order to be decided by BIC criteria information. Π_i for $i = 1, 2, \dots, p$ are coefficients matrices. In order to calculate the impulse response functions, we transform equation (2) to the Wold representation under recursive identification scheme as follows,

⁵ The 12 trading partners are US, Japan, Russia, UK, France, India, Germany, South Korea, Australia, Pakistan, Indonesia, and Vietnam.

$$Y_t = c + \varepsilon_t + \Psi_1 \varepsilon_{t-1} + \Psi_2 \varepsilon_{t-2} + \dots \tag{3}$$

where Ψ_s denotes the moving average matrix which is recursively determined. The impulse response functions (IRFs) or dynamic multiplier is expressed as follows,

$$\frac{\partial y_{i,t+s}}{\partial \varepsilon_{j,t}} = \frac{\partial y_{i,t}}{\partial \varepsilon_{j,t-s}} = \varphi_{ij}^s, \quad i, j = 1, 2 \tag{4}$$

where φ_{ij}^s is the (i, j) -th element of the matrix Ψ_s . To avoid the reverse causality issue in the VAR, we employ a more robust Generalized Impulse Response Functions (GIRFs) proposed by Pesaran and Shin (1998) to tackle the ordering problem. In addition, a moving block bootstrapping method is utilized to generate 90% confidence intervals with 5,000 repetitions.

4. Empirical Results

4.1 Granger Causality Test

Our analysis investigates the causality between the political relation index (*PR*) and trade balance (*TB*) of China and trading partners. The lag order is determined to be 1 by using the Schwarz-Bayesian information criterion.⁶ Table 1 shows the empirical results. Case I, $PR_{t-1} \xrightarrow{NG} TB_t$, denotes the null hypothesis that the political relations do not Granger cause trade balance.

Case II, $TB_{t-1} \xrightarrow{NG} PR_t$, denotes the null hypothesis that trade balance does not Granger cause political relations. For Case I, the Wald statistics are significant for US, Japan, Russia, Germany, Pakistan, and Indonesia, respectively (and hereafter the “flag” group). That is to say, the changes in political relation index would Granger cause variations in trade balance between China and these 6 countries. For Case II, the null hypothesis is rejected for the UK, France, India, Australia, and Vietnam (and hereafter the “trade” group). The variations in trade balance would cause changes in political relations for these 5 countries. Finally, we find no causal evidence between trade balance and political relations for South Korea (and hereafter the “neutral” group). As a result, the twelve countries are divided into three groups namely the flag, trade and neutral groups. Our findings are to some extent different from those in the existing literature which support the bi-directional causality between trade and political conflicts (Reuveny and Kang, 1996, 1998). Specifically, we find significant effects of shifts in political relations on trade balance as Cai et al. (2023a) did. This also contradicts Armstrong (2016) who documented that the bilateral trade between China and Japan was not disturbed by political tensions.

Table 1 Bootstrapping Panel Granger Causality Test Results

	Case I: $PR_{t-1} \xrightarrow{NG} TB_t$		Case II: $TB_{t-1} \xrightarrow{NG} PR_t$	
	Wald Statistics	5% CV	Wald Statistics	5% CV
US	5.86***	5.18	2.58	6.12
Japan	12.09***	4.02	0.76	4.42
Russia	5.09***	4.52	0.19	4.10
UK	3.81	4.73	19.76***	3.90

⁶ We also utilize Akaike information criterion for robustness checks. The results remain unchanged.

	Case I: $PRI_t \xrightarrow{NG} TB_t$		Case II: $TB_t \xrightarrow{NG} PRI_t$	
	Wald Statistics	5% CV	Wald Statistics	5% CV
France	1.06	4.08	7.37***	3.88
India	0.06	4.89	9.32***	6.54
Germany	17.59***	4.41	3.86	3.91
South Korea	4.19	4.55	0.18	4.41
Australia	0.06	4.99	34.05***	3.91
Pakistan	14.71***	5.22	0.42	3.85
Indonesia	17.15***	4.11	2.80	4.30
Vietnam	0.49	4.53	4.78***	3.96

Note: The number of lags is determined to be 1 according to Schwarz-Bayesian information criterion. *** denotes that the Wald statistics are significant at 95% level by using bootstrapping method with 20,000 repetitions.

4.2 Impulse Responses Functions (IRFs)

We utilize IRFs to capture the dynamic effects of political relations and trade shocks. Positive and negative political relation shocks may have different impacts on trade balance. Trade surplus and deficit shocks also differently affect political relations between China and trading partners. Therefore, it is necessary to understand the asymmetric effects through the analysis of the IRFs.⁷

4.2.1 Identifying Shocks

According to Armstrong (2012), a positive (negative) shift in the political variable demonstrates the tendency towards increased political proximity (political divergence). To capture the asymmetric effects of China's political relation shocks, we utilize the method proposed by Hamilton (1996). Consider the following nonlinear transformation,

$$\Delta pri_t^+ = \max(0, pri_t - \max(pri_{t-1}, \dots, pri_{t-12})), \quad (5)$$

$$\Delta pri_t^- = \min(0, pri_t - \min(pri_{t-1}, \dots, pri_{t-12})). \quad (6)$$

where Δpri_t^+ and Δpri_t^- denote positive and negative changes of Chinese political relation index. Then we construct a bivariate VAR model by incorporating Δpri_t^+ (or Δpri_t^-) and trade balance respectively.

To identify trade surplus and deficit, we respectively filter out the positive and negative values in trade balance. Since we divided the 12 countries into 3 groups according to the results of panel bootstrapping Granger causality tests, we implement different strategies to figure out the interactions between political relations and trade balance. For countries in the flag group, we locate political relation changes before trade balance. As for countries in the trade group, we locate trade surplus (or deficit) before the political relation index. Although we provide the Granger causal relationship and use different strategies for model identification, the reverse causality test

⁷ For the flag group of countries, we identify positive and negative political relation shocks because only unidirectional causality running from political relation index to trade balance is found. In terms of the trade group, we need to identify trade surplus and deficit shocks. As for South Korea neutral group, we do not calculate the impulse response functions because no causality between political relation index and trade balance is found.

is still hard to cope with by using the structural IRFs. Therefore, the GIRFs proposed by Pesaran and Shin (1998) are used to avoid the problem of variable ordering.

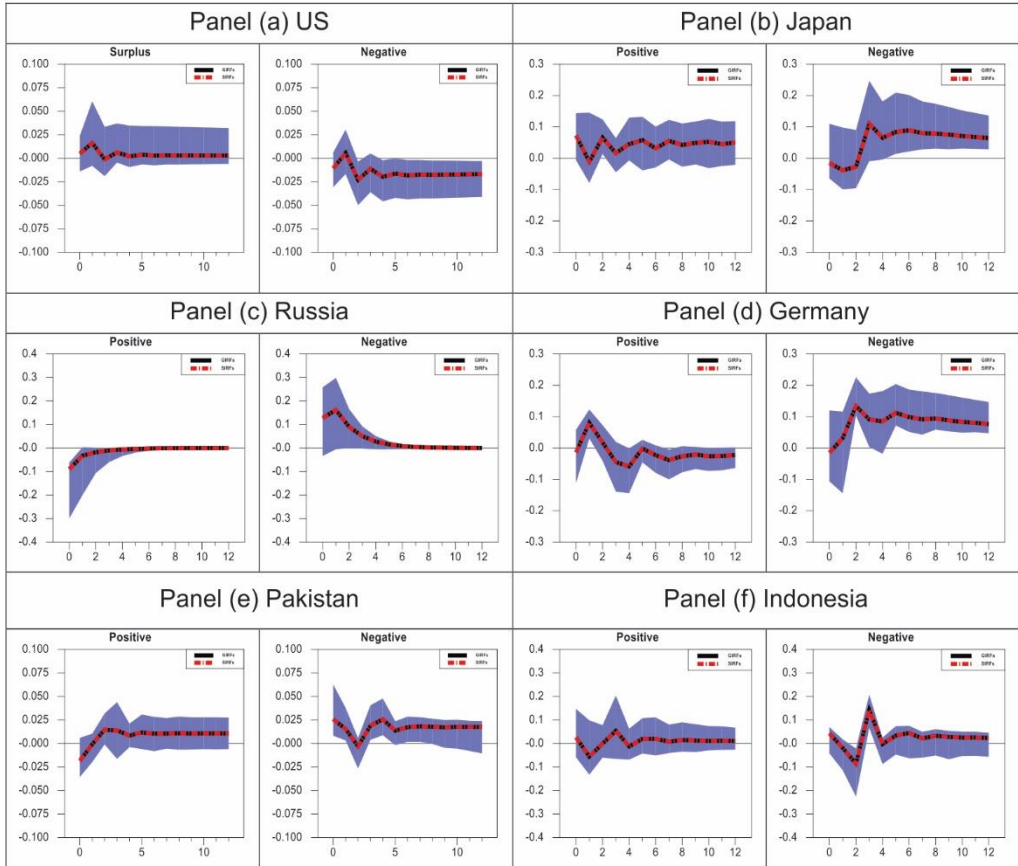
4.2.2 Empirical Results

The empirical results are depicted in Figures 1 and 2, with confidence intervals generated using the moving-block bootstrapping method with 5,000 repetitions. Figure 1 reveals that positive shifts in political relations do not significantly affect trade balance, except for Russia. Furthermore, negative political shocks have a significant negative impact on the trade balance of the US but a significant positive impact on the trade balances of Japan, Russia, Germany, and Pakistan. The findings from Figure 1 offer insightful policy implications for policymakers navigating the complex intersection of political dynamics and trade balances. While positive shifts in political relations generally do not significantly affect trade balances across examined countries, except for Russia, the significant negative impact of negative political shocks on the US trade balance suggests potential vulnerabilities in its trade relations during diplomatic turmoil. Conversely, the positive effects of negative shocks on the trade balances of Japan, Russia, Germany, and Pakistan underscore the resilience or opportunistic nature of these economies in responding to adverse diplomatic events. Policymakers may need to reassess diplomatic priorities in light of trade resilience to diplomatic improvements and implement strategies to mitigate adverse effects of negative shocks while capitalizing on trade opportunities arising from political tensions. An adaptive approach to policymaking, considering both direct and indirect effects of diplomatic events on trade, could foster more resilient and sustainable trade relations globally.

In Figure 2, it is evident that trade surplus shocks lead to a significant decrease in the PRI of the UK, France, India, and Vietnam. Conversely, trade deficit shocks do not have a significant impact on the PRI of the UK and France. Moreover, the deficit shocks increase the PRI of India but decrease the PRI of Australia and Vietnam. Policymakers should pay attention to their country's trade balance and how it might affect political risk. They might need to work on strategies to balance trade or strengthen relationships with trading partners to reduce political risk. Additionally, they could focus on boosting their country's economy and improving stability to make it more resilient to trade imbalances and political uncertainties.

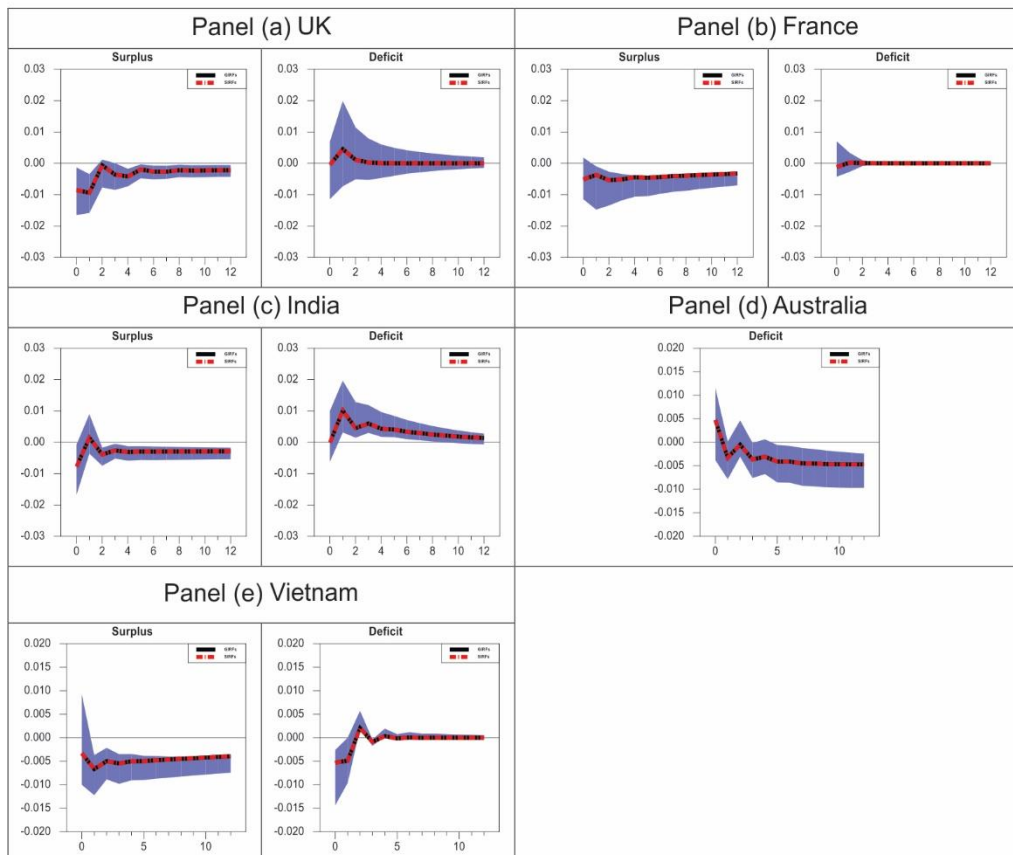
Although existing literature has widely discussed the interactions between political conflict/cooperation and trade, few studies examine the asymmetric effects between them. The results in this paper confirm that positive and negative political shocks have diverse impacts on trade balance, which are different from the findings in previous studies like Pollins (1989a, 1989b), Reuveny and Kang (1996, 1998), Kastner (2007), Jinjark (2009), and Armstrong (2012). For countries in the flag group, positive political shocks do not make significant impacts on trade balance. The negative political shocks would improve trade balance of China with Japan, Russia, Germany and Pakistan, but worsen trade balance with the US. In other words, political conflicts would only improve the trade account of the US. Therefore, during the US-China political conflicts, confrontation with China is not an ideal way to improve the trade balance of a third country with China. As for the identified trade shocks, trade surplus shocks of China would worsen the political relation with UK, France, India, and Vietnam. For the trade deficit shocks, the effects on political relations are mixed across countries. For instance, we find insignificant impacts of trade deficit shocks on political relation index of UK and France. However, the political relation index of India, Australia and Vietnam would respond to trade deficit shocks differently. The Chinese government's ability to utilize trade deficits as a means to enhance political relations with other countries is constrained.

Figure 1 Flag Group



Note: The black and red lines denote the median response of structural impulse response and generalized impulse responses, respectively. The shaded areas represent the 90% confidence interval obtained through moving-block bootstrapping method with 5,000 repetitions.

Figure 2 Trade Group



Note: The black and red lines denote the median response of structural impulse response and generalized impulse responses, respectively. The shaded areas represent the 90% confidence interval obtained through moving-block bootstrapping method with 5,000 repetitions.

5. Conclusions

This study investigates the linkages between political relations and bilateral trade between China and main trading partners, using panel Granger causality test and impulse response functions. The findings reveal that the causality between political relations and trade balance differs across countries. Additionally, the study also examined the asymmetric effects of trade surplus and deficit on political relations. Based on our findings, policymakers should prioritize diplomatic engagement, trade diversification, conflict resolution mechanisms, risk management strategies, bilateral and multilateral cooperation, investment in diplomatic capabilities, and continuous monitoring and evaluation to effectively navigate the complex relationship between political relations and trade dynamics. Specifically, countries falling within the "Flag Group" should focus on enhancing political relations with trading partners, while those in the "Trade Group" should

diversify trade partners to mitigate risks associated with overreliance on specific nations. Active engagement in conflict resolution mechanisms, coupled with investment in diplomatic capabilities, can help address underlying tensions and foster trust among trading partners. Additionally, implementing comprehensive risk management strategies and fostering bilateral and multilateral cooperation initiatives can promote stability and mutual economic interests. Continuous monitoring and evaluation of political and trade dynamics are crucial for identifying emerging challenges and opportunities, enabling proactive responses to evolving geopolitical landscapes.

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