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Study of Supply Chain Selection Strategies of Firms under Geopolitics

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ABSTRACT

Based on the geopolitical perspective, the study analyzes the interaction between global trade policies and supply chain strategies, and constructs a theoretical model to explore how the tariff structure of final products is shaped by value-added content and the role of the most-favored-nation (MFN) rule and the principle of reciprocal trade in it. The findings suggest that geopolitical factors have a significant impact on international trade strategies and supply chain configurations. This theoretical framework indicates the importance for policymakers to consider geopolitical complexity in maintaining the global trade order and supply chain resilience, and promotes the construction of solid and adaptable international trade and supply chain management strategies.

KEYWORDS

Geopolitics; Supply Chain Management; Political Economy Modeling; Tariff Structure.

1. INTRODUCTION

With the deepening of globalization, enterprise supply chains have crossed international borders and become the new normal in global trade. However, the increasingly complex geopolitical landscape has exerted unprecedented pressure on international supply chain management and global trade policy. The intensification of geopolitical conflicts has forced enterprises to cope with the ever-changing and highly uncertain international trade environment, which undoubtedly increases the difficulty and risk of business operations. The optimization of supply chain selection strategy is particularly important in such a context. It is directly related to the survival and development of enterprises, as well as the balance and security of trade between countries. Therefore, the study of enterprise supply chain selection strategy under the influence of geopolitics is not only theoretically innovative, but also instructive for practical operation.

Since Håkansson & Snehota (1989) proposed the theory of enterprise network, the field of supply chain management has received extensive attention [1]. In recent years, along with the fluctuation of the international situation, how to make supply chain strategy decisions under the influence of geopolitics has received more and more research attention. In particular, the impact of geopolitical factors on trade policy and supply chain management in today's world economic order has become a topic worthy of in-depth study. The continuous adjustment and optimization of trade policies have been proven to effectively deal with uncertainties and risks in international trade [2]. In addition, how

multinational enterprises (MNEs) make supply chain decisions based on the geopolitical dimension also has an important feedback effect on trade policies [3]. Based on the linkage between geopolitics and international supply chain management, we focus on how geopolitical forces reshape global trade routes and analyze how countries and firms adjust their trade strategies in this process to cope with geopolitical risks and to protect and strengthen the robustness of supply chains. By exploring how global supply chain linkages shape the motives and means by which countries implement import protection policies, it provides new theoretical references for global supply chain management and expands international trade theory, especially the geopolitical dimension, contributing to the innovation and development of international economics theory.

2. LITERATURE REVIEW

2.1. Geopolitical Conflicts and International Trade

In the traditional field of international trade, researchers have consistently focused on how geopolitical factors affect international business behavior. Despite a long history of research, this topic has come back to the forefront in the past few decades as geopolitical conflicts have gradually intensified. For example, in Akram's (2020) study, they analyzed uncertainty in international trade from a geopolitical perspective, emphasizing the impact of political stability on the country's image and export trade flows [4]. Since then, numerous scholars have proposed a more nuanced framework for considering geopolitical factors.

In this context, Góes and Bekkers (2022) proposed a model of the impact of geopolitical conflicts on international trade flows and explored how to mitigate the risk through diversified supplier strategies, providing a theoretical basis for subsequent studies [5]. Their study emphasized the direct impact of political tensions between countries on trade policy and market access. With the development of globalization, the impact of geopolitical conflicts on international trade has become more complex.Goldberg and Reed (2023) revealed how geopolitical tensions can lead to the re-routing of trade routes and the adjustment of supply chains through case studies of several countries and regions [6]. The study suggests that firms must take geopolitical factors into account when developing international trade strategies.

In recent years, researchers have begun to focus on the impact of geopolitical conflicts on specific industries.Focusing on the energy sector, a study by Escribano and Valdes (2017) explored how geopolitical tensions affect energy prices and security of supply [7]. Their findings suggest that geopolitical conflicts can lead to disruptions in energy supply, which can have far-reaching effects on the global energy market. In addition, geopolitical conflicts may also affect the laws and rules of international trade.Hoekman et al. (2023) examined how international trade dispute settlement mechanisms respond to geopolitical conflicts and proposed a series of reforms [8]. Their study emphasized the importance of maintaining a fair and effective international trade system in the face of geopolitical tensions.

In summary, the relationship between geopolitical conflict and international trade is multidimensional, involving multiple dimensions such as political, economic and legal. Future research needs to further explore how these factors interact with each other and how to develop effective international trade strategies in a changing geopolitical environment.

2.2. Supply Chain Trade Diversion

With the deepening of globalization, the concept of supply chain trade diversion has gained widespread attention in the early 21st century. Firms began to seek more flexible and cost-effective supply chain solutions.Danny et al. (2002) reviewed the literature on supply chain trade diversion, proposed a theoretical framework for supply chain trade diversion, and made suggestions for its

conceptualization and operationalization, thus providing direction for subsequent research [9]. Their study highlights the importance of supply chain network design and how these networks can be optimized through supply chain trade diversion.

However, as geopolitical tensions increase, firms are faced with new challenges.Lund et al. (2020) found that geopolitical risk has an increasingly significant impact on supply chain trade diversion [10]. Their study suggests that firms need to evaluate the trade-off between political risk and economic benefits when considering supply chain shifts. In addition, Lund et al. (2020) revealed how firms adjust their supply chain strategies under geopolitical uncertainty by examining cases across multiple industries, emphasizing the importance of supply chain diversification and geographic dispersion to reduce dependence on a single market or supplier [11].

Recent studies have further explored the relationship between supply chain trade diversion and firm competitiveness.Liu et al. (2024) characterized the relationship between supply chain trade diversion, firm flexibility, and competitiveness through modeling [12]. It was found that through effective supply chain trade diversion, firms can improve their adaptability to market changes and thus enhance their competitiveness. In addition, firms' supply chain selection strategies are also closely related to their long-term sustainability goals.Anderson et al.'s (2020) study focused on the impact of supply chain trade diversion on corporate social responsibility and environmental sustainability [13]. Their study suggests that firms need to consider the long-term environmental and social impacts of their supply chain trade shifts.

Firms' supply chain trade shifting is a multidimensional issue that involves firms' strategic decisions, geopolitical risks, competitiveness, and sustainability. Future research needs to further explore how these factors interact and how firms can make optimal supply chain choices in a changing international environment, i.e. geopolitics.

3. RESEARCH AND ANALYSIS

3.1. Tariff Preference Modeling

Building on existing trade policy models, this study designs a theoretical framework to meet the institutional context in which bilateral trade policies are formulated. Particular attention is paid to two institutional issues that figure prominently in the empirical investigation: the most favored nation (MFN) rule and the role of reciprocity in bilateral trade agreements.

The MFN rule: the MFN rate is the upper limit of bilaterally applied tariffs, and we focus on bilateral deviations from MFN treatment rather than on MFN tariffs per se, while analyzing how discriminatory bilateral tariffs respond to value-added content under MFN constraints. In doing so, MFN tariffs are taken as given. This assumption references Hoekman and Mavroidis (2017), who also treat MFN tariffs as given when analyzing politically optimal bilateral trade agreements [14].

Reciprocity: most bilateral preferences are unilateral (non-reciprocal) in nature, and since non-reciprocal trade preferences are usually the product of comprehensive negotiations between partner countries, their tariff reciprocity may partially neutralize the externalities of bilateral terms of trade [15]. Therefore, this topic analyzes reciprocal trade preferences separately from non-reciprocal preferences. Optimal bilateral tariffs are first derived under the assumption of unilaterally set preferences. Then, the optimal tariffs are rederived under the assumption of cooperative tariff setting in reciprocal trade agreements.

In addition, the study makes partially technical assumptions: focusing on an operational partial equilibrium setting with a number of sectors, quasi-linear preferences, and sector location-specific factors of production. This setup separates the direct determinants of trade policy from potential general equilibrium pollutants. At the same time, the quantities of specific factors used in production are taken as given, and input tariffs affect final product tariffs through value added.

3.2. Modeling

Set up a multi-country, multi-commodity environment in which each country produces and trades potentially multiple final goods. The set of countries is C={1,... ,c}, and there are (x+1) final goods. The final product price for each country is denoted by p_x^c, where c denotes the country and s denotes the final product sector. Denote the vector of final product prices for country c by $\vec{p}^c = (p_1^c,\ldots,\ p_x^c)$, the vector of sectoral prices for each country by s, and the complete (1 × sc) vector of final product prices for each country in the world by $\vec{p}^c = (p_1^c,\ldots,\ p_x^c)$. Each country is a continuum of identical workers, given by a total utility function due to their quality normalized to 1 and preferences that are all identical quasi-linear preferences:

$$U^c = d_0^c + \sum_{x\in X} u_x(d_x^c) \qquad \forall c \in C \tag{1}$$

Where, d_x^c represents consumption of the final product in country c's s sector, and the sub-utility of the non-quantity annual product is variable and strictly concave. Consumption is chosen to maximize utility subject to the budget constraint, $d_0^c + \sum_x p_x^c d_x^c \le I^c$, where I^c is country c's annual GNI.

Production: Every country possesses two core factors of production. The first is a common factor of production, which can circulate freely between industries within the country but is not transferable across borders. Primary products produced using this factor ensure standardization of wage levels across countries with constant returns to scale. Secondly, special value-added factors play an important role in this framework, which are allocated across countries in the framework of GSCs according to the demand of the target country and specific industry where the final product is produced. The value-added inputs under this assumption highlight the far-reaching impact of geopolitical factors on the structure of GSCs and firms' strategic decisions, especially in the formulation of production and supply strategies targeting the production and supply of final goods.

The final product of country c's non-agricultural industry x is produced using homogeneous factors, domestic value-added inputs and foreign value-added inputs:

$$q_x^c = f_x^c(l_x^c,\ v_{xc}^c,\ \vec{v}_{x*}^c) \qquad \forall x \in X,\ c \in C \tag{2}$$

Where, q_x^c is the quantity of final goods produced, l_x^c is the quantity of homogeneous factors used, v_{xc}^c is the quantity of home country value-added inputs used in country c, and $\vec{v}_{x*}^c$ is a (1 × (C-1)) vector of foreign value-added inputs used in country c, sector x. And the superscript indicates the country where production takes place and the subscript indicates the production sector and the country of origin of the value-added inputs.

According to the standard, specific value-added factors converge into all potential gains from the production process (i.e., quasi-rents), whose prices are automatically adjusted in response to fluctuations in the price of the final product. The quasi-rents associated with π_x^i production in sector x in country i are given by the following equation:

$$\pi_x^i(p_x^i) = p_x^i q_x^i(p_x^i) - w l_x^i(p_x^i) = \sum_{c\in C} r_{xc}^i v_{xc}^i \tag{3}$$

Where, r_{xc}^{i} denotes the price of value-added inputs in each country c for the production of product x in country i. The value-added input price r_{xc}^{i} depends on the final product output price and the vector of value-added inputs in production: $r_{xc}^{i} \equiv r_{xc}^{i}(p_{x}^{i};\vec{v}_{x}^{i}) \ \forall i,j,x$.

The model optimally simplifies the production chain of the GSC by focusing on two key factors:First, it highlights the fact that the production process is dependent on two different sources of factors of production, domestic and foreign. Second, drawing on the arguments of Michael et al. (2015), it emphasizes the high degree of dependence and exclusivity between buyers and sellers in GSCs, which is reflected in the idiosyncratic nature of factors of production [16]. Accordingly, this study assumes the fixed nature of the effect of the final product price on the return received from its value-added factors (i.e., quasi-rents), and that this effect can be quantitatively analyzed through the price elasticity ε_{sc}^{ri}.

National income: National income is equal to the sum of tariff revenue and payments for homogeneous factors and value-added inputs:

$$I^{i} = R(\vec{p},I^{i};\vec{v}) + 1 + \sum_{x\in X} r_{xi}^{i} v_{xi}^{i} + \sum_{x\in X}\sum_{c\neq i\in C} r_{xi}^{c} v_{xi}^{c} \tag{4}$$

Where, tariff revenue is $R(\vec{p},I^{i};\vec{v}) \equiv \sum_{x\in X}\sum_{c\neq i\in C}(p_{x}^{i}-p_{x}^{c})M_{xc}^{i}(\vec{p},I^{i};\vec{v})$, M_{sc}^{i} is country i's imports of goods s from country c, and homogeneous factors are normalized by labor income. Using (3) one can rewrite (4) as:

$$I^{i} = 1 + \vec{p}^{\,i}\cdot\vec{q}^{\,i}(\vec{p}^{\,i},\vec{v}^{\,i}) + R(\vec{p},I^{i};\vec{v}) - \underbrace{\sum_{x\in X}\sum_{c\neq i\in C} r_{xc}^{i} v_{xc}^{i}}_{\equiv FVA^{i}(\vec{p}^{\,i})} + \underbrace{\sum_{x\in X}\sum_{c\neq i\in C} r_{xi}^{c} v_{xi}^{c}}_{\equiv DVA_{i}(\vec{p}^{\,*})} \tag{5}$$

Formula (5) reflects the traditional composition of national income from the sum of gross output and tariff revenue. However, in the context of GSC linkages, we make key adjustments to this classical model to accommodate supply chain strategic choices in a geopolitical environment. First, a portion of the value of the final goods produced within the country is classified as foreign value added (FVA), taking into account that a portion of the value of the final goods produced within the country is actually paid to the international production chain. On the other hand, the supply of value added made domestically to the external market also generates a return, calling this part the domestic value added component (DVA). Both types of value-added gains are closely related to the pricing of the final product, which is regulated by tariff policy. In this way, trade strategy affects national income in an atypical pattern. In the context of geopolitical trends, this model helps to fully understand the complex link between supply chain strategies and the fiscal health of countries.

Political economy: The government's objective function is assumed to be given by the weighted sum of national income, consumer surplus and quasi-rents in production:

$$G^{i} = I^{i} + \xi(\vec{p}^{\,i}) + \sum_{x}[\delta_{x}^{i}\pi_{x}^{i}(p_{x}^{i}) + \delta_{x*}^{i}FVA_{x}^{i}(p_{x}^{i}) + \delta_{xi}^{*}DVA_{xi}(\vec{p}_{x}^{\,*})] \tag{6}$$

Where, $\xi(\vec{p}^{\,i}) \equiv \sum_x [u_x(d_x) - p_x^i d_x]$ is consumer surplus and $\{\delta_x^i, \delta_{x*}^i, \delta_{xi}^*\}$ is the political economy weights attached to various sources of rents relative to total welfare.

3.3. Optimal Bilateral Tariffs

The optimal tariff-maximizing equation (6) for country i for sector y final products for a given trading partner $j \in C$ is subject to two constraints. The first is the standard no-arbitrage condition: $p_y^i = \gamma_{yj}^i p_y^j$, where $\gamma \equiv (1 + t_{yj}^i)$ and $t_{yj}^{i,applied}$ are ad valorem tariffs. The second is the MFN rule, as described earlier. Let $t_y^{i,MFN}$ denote the MFN tariff, then the MFN rule implies $t_{yj}^{i,applied} \le t_y^{i,MFN}$, where $t_{yj}^{i,applied}$ is the bilaterally applied tariff. The unilateral optimal tariff for country i on imports y from country j is, taking into account the allocation of specific value-added inputs, the tariff schedules of each of the other countries, and the home country's MFN tariff:

$$\gamma_{yj}^i = \arg\max G^i \tag{7}$$

$$s.t. \begin{cases} p_y^i = \gamma_{yj}^i p_y^j \\ \gamma_{yj}^i \le \gamma_y^{i,MFN} \end{cases}$$

If the optimal tariff is not constrained, the next order condition can be solved:

$$G_{\lambda_{yj}^i}^i = \frac{dM_y^i}{d\gamma_{yj}^i} t_{yj}^i p_y^j - M_{yj}^i \frac{dp_y^j}{d\gamma_{yj}^i} + \delta_y^i q_y^i \frac{dp_y^i}{d\gamma_{yj}^i} + \theta_{yj}^{Ri} - (1 - \delta_{y*}^i) \frac{dFVA_y^i}{d\gamma_{yj}^i} + (1 + \delta_{yi}^*) \frac{dDVA_{yi}}{d\gamma_{yj}^i} = 0 \tag{8}$$

The first two items reflect typical trade motivations, i.e. standard terms-of-trade implications. The third one represents the political forces triggered by internal protectionist tendencies. $\theta_{yj}^{Ri} \equiv \sum_{c \ne i,j} \frac{dR_{yc}^i}{d\gamma_{yj}^i}$ reflects the possibility of trade deflection, which alters the tariff revenues that a country (country i) receives through trade with a third party country relative to trade with another country (country j). The last two components reveal the political influence of trade in value-added factors in the optimal tariff decision.

Bilateral tariffs raise the price of local final goods (p_y^i) while increasing the returns to foreign value-added inputs embodied in domestic production ($r_{yc}^i(p_y^i)$). Decompose this effect as follows:

$$\frac{dFVA_x^i}{d\gamma_{xj}^i} = \sum_{c \ne i} \left[\frac{r_{yc}^i v_{yc}^i}{p_y^i} \left(\frac{dr_{yc}^i p_y^i}{dp_y^i r_{yc}^i} \right) \right] \frac{dp_y^i}{d\gamma_{yj}^i} = \varepsilon_{y*}^{ri} \sum_{c \ne i} \frac{r_{yc}^i v_{yc}^i}{p_y^i} \frac{dp_y^i}{d\gamma_{yj}^i} = \varepsilon_{y*}^{ri} \frac{FVA_y^i}{p_y^i} \frac{dp_y^i}{d\gamma_{yj}^i} \tag{9}$$

Where, $\varepsilon_{yc}^{ri} \equiv \frac{dr_{yc}^i v_{yc}^i}{dp_y^i} \frac{p_y^i}{r_{yc}^i}$ is the elastic response of foreign value-added inputs to domestic final product prices. The value of this elasticity is presupposed to be positive, which implies that an increase in the price of the final product will lead to an increase in the value-added returns to the

production of this product. For empirical application, it is further assumed that all foreign-sourced inputs have the same elasticity with respect to price, i.e., $\varepsilon_{yc}^{ri} = \varepsilon_{y*}^{ri} \ \forall c \neq i \in C$.

When bilateral tariffs are adjusted, affecting the pricing of the foreign final product, this price change in turn affects the payoffs of domestic value-added inputs, creating an interactive process. The direct and indirect effects of tariffs on prices are decomposed as follows:

$$\frac{dDVA_{yi}}{d\gamma_{yj}^{i}} = \frac{r_{yi}^{j} v_{yi}^{j}}{p_{y}^{j}} \left(\frac{dr_{yi}^{j}}{dp_{y}^{j}} \frac{p_{y}^{j}}{r_{yi}^{j}} \right) \frac{dp_{y}^{j}}{d\gamma_{yj}^{i}} + \theta_{yj}^{DVAi} = \varepsilon_{yi}^{rj} \frac{DVA_{yi}^{j}}{p_{y}^{j}} \frac{dp_{y}^{j}}{d\gamma_{yj}^{i}} + \theta_{yj}^{DVAi} \tag{10}$$

The direct price effect captures how the γ_{yj}^{i} moderates the impact of target country j on the value-added input price of country i. Indirect price effects, on the other hand, point to the role of tariffs on the prices of country i's value-added inputs in third-party countries. We therefore focus more on analyzing the direct effect and keep a record of the indirect effect in the θ_{yj}^{DVAi}. The strength of this direct effect is affected by the elasticity $\varepsilon_{yi}^{rj} \geq 0$. To summarize, the elasticity here is assumed to be positive, implying that an increase in the price of good x in country j leads to an increase in the cost of value-added inputs to produce that good in country i.

Substituting equations (9) and (10) into equation (8) yields the unconstrained optimal bilateral tariff:

$$t_{yj}^{i} = \frac{1}{\varepsilon_{yj}^{i}} \left(1 + \frac{\delta_{y}^{i} q_{y}^{i}}{\left| \lambda_{yj}^{i} \right| M_{yj}^{i}} - (1 + \delta_{yi}^{*}) \varepsilon_{yi}^{rj} \frac{DVA_{yi}^{j}}{p_{y}^{j} M_{yj}^{i}} - \frac{(1 - \delta_{y*}^{i}) \varepsilon_{y*}^{ri}}{\left| \lambda_{yj}^{i} \right|} \frac{FVA_{y}^{i}}{p_{y}^{i} M_{yj}^{i}} - \widetilde{\theta}_{yj}^{i} \right) \tag{11}$$

Where, $\lambda_{yj}^{i} \equiv \frac{dp_{y}^{j}}{d\gamma} \Big/ \frac{dp_{y}^{i}}{d\gamma} < 0$, $\varepsilon_{yj}^{i} \equiv \frac{dE_{yi}^{j}}{dp_{y}^{j}} \frac{p_{y}^{j}}{E_{yi}^{i}} > 0$ indicates bilateral export supply elasticities in specific sectors, and $\widetilde{\theta}_{yj}^{i} \equiv \frac{\theta_{yj}^{R_i} + \theta_{yj}^{DVAi}}{(dp_{y}^{j} / d\gamma_{yj}^{i}) M_{yj}^{i}}$ reflects the potential impact of trade diversion on third-party countries plus. Taking into account most-favoured-nation (MFN) restrictions, the applicable bilateral tariff will be the smaller of (11) and the most-favoured-nation (MFN) tariff:

$$t_{yj}^{i,applied} = \min \{ t_{yj}^{i}, t_{y}^{i,MFN} \} \tag{12}$$

3.4. Reciprocal Trade Agreements

Partial tariff reductions are negotiated through mutually beneficial Regional Trade Agreements (RTAs), where the value-added content plays a key role in determining the bilateral tariff structure. Therefore, consider two countries i and j that engage in bilateral trade consultations and exchange tariff preferences with each other, while assuming that this reciprocity fully balances the bilateral trade incentives in the agreement. In this absence of terms-of-trade incentive effects, the tariff concessions negotiated by country i optimize its government objective function. Under a particular limiting condition $dp_{y}^{j} / d\gamma_{yj}^{i} \to 0$, this process leads to an adjusted first-order conditional presentation of the government's optimal tariff choice problem:

$$G_{\gamma^i_{yj}} = \frac{\partial M^i_{yj}}{\partial p^i_y}\frac{dp^i_y}{d\gamma^i_{yj}} t^i_{yj} p^j_y + \delta^i_y q^i_y \frac{dp^i_y}{d\gamma^i_{yj}} - (1-\delta^i_{y*})\frac{dFVA^i_y}{d\gamma^i_{yj}} = 0 \tag{13}$$

The unconstrained optimal tariff can be written as:

$$t^i_{yj} \to \frac{1}{\tilde{\varepsilon}^i_{yj}}\left(\frac{\delta^i_y q^i_y}{\lambda^i_{yj} M^i_{yj}} - \frac{1-\delta^i_{y*}}{\tilde{\lambda}_{yj}}\varepsilon^{ri}_{y*}\frac{FVA^i_y}{p^i_y M^i_{yj}}\right) \tag{14}$$

Define $\tilde{\lambda}_{yj} \equiv \frac{p^j_y}{p^i_y} > 0$, $\tilde{\varepsilon}^i_{yj}$ to describe the trade elasticity under reciprocity.

The introduction of the principle of reciprocity has restructured the pattern of trade strategies, weakening the previous incentives for terms-of-trade manipulation and the direct influence of domestic value-added output (DVA) on tariff policy. Under the framework of reciprocity agreements, the role of DVA derived from terms-of-trade control motives in influencing tariff decisions is effectively weakened. However, the impact of the foreign value-added component (FVA) embedded in domestic production on the tariff framework remains, on the grounds that this component directly affects domestic prices through tariffs (p^i_y).

Therefore, the analysis of the principle of reciprocity in this study brings two immediate research claims. First, in regional trade agreements (RTAs) that hold reciprocity, we expect the role of DVA in tariff decision-making to become weak or even non-existent. Based on this inference, empirical research will focus on examining the role of DVA in the formation of tariff preferences in non-RTAs. Second, considering the trade elasticity $\vec{\varepsilon}^i_{yj}$ and other factors extracted in deriving optimal tariffs may show different correlations under reciprocity and non-reciprocity conditions. Consequently, in our analysis we will independently consider the differences in the coefficients corresponding to the conditions of reciprocal and non-reciprocal trade agreements in order to explore the differences in the coefficients behind the preferences of different types of trade agreements.

4. CONCLUSION AND SUGGESTIONS

This study explores the complex impact of geopolitics on global trade and supply chain strategies, providing a theoretical framework that integrates geopolitical dynamics with international trade theory. It reveals how the most-favored-nation (MFN) rule and reciprocal trade agreements (RTAs) play a key role in shaping bilateral trade policy, thus filling a significant gap in traditional economic models by incorporating geopolitical factors into global supply chain analysis.

Our study illuminates the complex interplay between geopolitical factors and trade policy, providing a conceptual blueprint for understanding the dynamics of international trade in the context of emerging geopolitical challenges. The study suggests that policymakers and international organizations must adopt strategies that address geopolitical nuances in order to safeguard the integrity and robustness of global supply chains. To this end, we contribute to the field by proposing a nuanced approach to trade policymaking that considers the geopolitical landscape as an important component of the decision-making process. This theoretical contribution is intended to guide future research and policy discussions focused on the development of resilient and adaptive trade and supply chain frameworks to withstand the uncertainties of a politically fraught global economy.

AUTHOR CONTRIBUTIONS

H-N X: access to funds, formal analysis, data collation and writing - original manuscript. Z-H X: writing - review and editing, methods. J-W Y: conceptualization,writing - review. S L: software and validation. X Y: conceptualization, methodology, resources. All authors contributed to the article and approved the submitted version.

CONFLICTS OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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