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GEOPOLITICAL CONFLICT AND SUPPLY CHAIN DISRUPTIONS: STRAIT OF HORMUZ INSTABILITY, INVENTORY STRATEGIES, FINANCIAL MARKETS, AND MARKETING TRANSPARENCY

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ABSTRACT

Geopolitical instability in critical maritime chokepoints, such as the Strait of Hormuz, pose significant risks to global supply chain continuity, economic stability, and the integrity of financial markets. This study investigates the multifaceted repercussions of insecurity within this pivotal corridor, delineating how regional security threats and trade conflicts propagate through globally interconnected production and distribution networks. Beyond direct oil-market shocks, the research analyzes how such disruptions necessitate shifts in vessel operations and corporate inventory strategies—forcing firms to navigate the delicate balance between maintaining costly buffer stocks and risking stockouts. Furthermore, the study examines the resulting volatility in financial markets, manifested through commodity price fluctuations and currency instability, as well as the critical role of market transparency in mitigating these systemic vulnerabilities. By framing instability in the Strait of Hormuz as a systemic event impacting route reliability, cargo continuity, and freight costs, this paper provides actionable insights for policymakers and market participants seeking to enhance macroeconomic resilience amidst escalating global geopolitical tensions.

KEYWORDS: Geopolitical Risk, Strait of Hormuz, Supply Chain Disruptions, Maritime Logistics, Inventory Management Strategies, Financial Market Volatility, Market Transparency, Macroeconomic Resilience

1. INTRODUCTION

Geopolitical instability, particularly in critical chokepoints like the Strait of Hormuz, presents substantial risks to global supply chains, economic stability, and financial markets (Chi et al., 2025). Such conflicts not only directly imperil energy supply security but also propagate through market linkages to disrupt global trade, exacerbate supply chain volatility, and amplify financial market fluctuations (Chi et al., 2025). These disruptions manifest as port closures, rerouted shipping lanes, increased insurance premiums, and heightened security measures, all of which contribute to elevated operational costs and reduced reliability in maritime logistics (Dawar & Bai, 2024). The cascading effects extend to inventory management, where firms must navigate between maintaining costly buffer stocks and risking stockouts, and financial markets, which react to perceived risks through commodity price volatility and currency fluctuations (Morão, 2025). Furthermore, the lack of market transparency during such crises can obscure the true extent of supply chain vulnerabilities, impeding effective risk mitigation and strategic planning (İncekara & İncekara, 2024). This research aims to investigate the multifaceted impacts of geopolitical instability in the Strait of Hormuz on global supply chains, analyzing alterations in inventory strategies, the resultant volatility in financial markets, and the implications for market transparency. This study delineates how regional security threats and trade conflicts emanating from this pivotal maritime passage engender significant repercussions for global maritime supply chains (Dawar & Bai, 2024). These include the rerouting of vessels, increased shipping costs due to higher insurance premiums, and extended transit times, all of which highlight the vulnerability of globally interconnected production and distribution networks to regional geopolitical events (Haralambides, 2024; Yang, 2026). These disruptions, characterized by shifts in vessel operations and shipping networks, underscore the critical need for resilient supply chain architectures capable of mitigating geopolitical risks (Notteboom et al., 2024). The Strait of Hormuz, as a key maritime chokepoint, plays a pivotal role in global trade by concentrating strategic cargo flows, especially those linking Gulf hydrocarbon exporters to global markets (Lassoued, 2026). Its strategic significance is underscored by the fact that nearly 90% of global trade transits by sea, and critical maritime routes frequently become flashpoints for geopolitical tensions (Chi et al., 2025). Indeed, approximately 80% of global goods traverse maritime routes, making

disruptions in these critical arteries highly influential on international commerce (Hamed, 2025). Given that over 90% of global bulk commodity trade occurs by sea, the uninterrupted flow through such chokepoints is crucial for the economic and security interests of nations at both ends of the supply and demand chains for the transported goods, (Guo et al., 2026; Wang et al., 2023). The economic ramifications of geopolitical tensions on these maritime trade routes are considerable, leading to substantial disruptions in global supply chains (Soman & Balasubramanian, 2025). Such disruptions extend beyond immediate transit issues to encompass industrial linkages, financial market volatility, and protracted geopolitical struggles that affect the pricing and availability of vital resources (Guo et al., 2026). This paper therefore posits that instability in the Strait of Hormuz should be analyzed not merely as a regional oil-market shock but as a systemic critical corridor insecurity event impacting route reliability, cargo continuity, freight costs, and overall macroeconomic resilience (Lassoued, 2026).

2. BACKGROUND OF GEOPOLITICAL CONFLICT AND SUPPLY CHAINS

Geopolitical conflicts, exemplified by the imposition of sanctions and incidents such as tanker attacks in the Strait of Hormuz, profoundly escalate concerns about disruptions to global oil and containerized trade flows (Seol et al., 2021). These events expose the vulnerability of crucial maritime chokepoints, compelling a re-evaluation of shipping network resilience and the adaptive strategies employed by intercontinental supply chains (Yap et al., 2025). The effects are particularly pronounced in intercontinental maritime transportation routes, which typically exhibit the strongest responses to global disturbances, given their reliance on chokepoints of strategic significance (Si et al., 2025). The Strait of Hormuz, in particular, is a critical chokepoint through which approximately one-fifth of the world's oil passes, making it highly susceptible to geopolitical tensions that can destabilize global energy markets and maritime trade (Sarkhanov & Muradzada, 2023). Such vulnerabilities often lead to significant economic repercussions, including inflationary pressures and shortages of essential goods (Leal et al., 2023). The inherent interconnectivity of global trade means that geopolitical conflicts, even those localized in regions like the Middle East, can cascade through industrial linkages, financial markets, and logistical networks, leading to systemic shocks (Chi et al., 2025; Guo et al., 2026). These macroeconomic and geopolitical events

fundamentally reshape global supply chain dynamics, compelling businesses to adapt to heightened uncertainty and rapid regulatory changes (Sequeira & Prockl, 2021). This necessitates a paradigm shift in supply chain management from an efficiency-centric model to one emphasizing resilience, incorporating geopolitical risk assessments into strategic decision-making processes (Chang et al., 2025). This evolving landscape, characterized by frequent and unpredictable geopolitical events, calls for a re-evaluation of traditional supply chain models, advocating for more robust and agile architectures (Odulaja et al., 2023). This adaptation often involves diversifying sourcing, rethinking inventory strategies, and investing in advanced analytical tools to forecast and mitigate potential disruptions (İncekara & İncekara, 2024). These strategic shifts often encompass reconfiguring supply chain networks through reshoring, nearshoring, or friendshoring initiatives, and implementing advanced inventory optimization techniques to buffer against regional instabilities (Notteboom et al., 2024).

2.1. Significance of the Strait of Hormuz

The Strait of Hormuz, linking the Persian Gulf with the Arabian Sea, functions as a bottleneck for approximately one-third of the world's liquefied natural gas and nearly one-quarter of global oil consumption, highlighting its indispensable role in global energy security and maritime trade (Rasshyvalov et al., 2024). Its strategic importance as a maritime chokepoint renders it highly vulnerable to geopolitical instability, which can trigger significant disruptions across global supply chains and financial markets (Wang et al., 2023). The concentration of such critical volumes through a narrow maritime passage means that any impediment, whether due to military conflict, piracy, or political blockade, immediately translates into elevated energy prices, increased shipping insurance premiums, and extended transit times, thereby disrupting the just-in-time delivery models prevalent in modern commerce (Hermann et al., 2022). This inherent vulnerability underscores the necessity for comprehensive risk assessment and robust contingency planning within global supply chain management to safeguard against the far-reaching economic consequences of Strait of Hormuz instability (Arowosegbe et al., 2024). This paper analyzes the multifaceted impact of such geopolitical instability on inventory strategies, financial market volatility, and corporate transparency, drawing insights from documented disruptions and adaptive responses within global

supply chains. Specifically, it examines how geopolitical tensions in critical chokepoints like the Strait of Hormuz necessitate a shift from lean, just-in-time inventory systems to more resilient, just-in-case approaches, influencing procurement, demand forecasting, and overall business continuity (Shah, 2025). This strategic adaptation aims to mitigate the cascading effects of supply interruptions, which can significantly delay suppliers' awareness of critical global events, necessitating continuous risk management (Simon, 2025). The economic implications of disruptions in this critical maritime artery extend to global energy commerce, particularly given the escalating demand for energy worldwide, and the Persian Gulf's role as the primary export route for vast oil and gas reserves to international markets (Shahzad et al., 2025). The Red Sea crisis, which led to widespread rerouting around the Cape of Good Hope, exemplifies how disruptions in such critical maritime arteries can significantly increase transit times, shipping costs, and fuel consumption, thereby exacerbating supply chain vulnerabilities (Hamed, 2025). Consequently, businesses often increase precautionary inventory levels and adopt less efficient procurement strategies in response to such geopolitical risks, leading to elevated inventory costs (Chang et al., 2025). This adaptation, while buffering against immediate supply shocks, concurrently impacts financial market stability through increased operational expenditures and potentially diminished profitability, and it can also distort corporate transparency as companies adjust their disclosures to reflect changing supply chain risks and costs. These strategic adjustments are critical for firms to maintain operational continuity and mitigate financial exposure amidst the escalating geopolitical risks inherent in globalized production and distribution networks (Bratko et al., 2025; Xiong & Sun, 2025). The intricate interplay between geopolitical events and supply chain vulnerabilities necessitates a nuanced understanding of firms' adaptive strategies, which range from localized adjustments to broader systemic transformations in response to heightened uncertainty (López et al., 2025; Odulaja et al., 2023). Consequently, companies heavily reliant on just-in-time delivery systems have been particularly susceptible to these disruptions, often leading to significant delays and capacity management challenges globally (Simon, 2025). Geopolitical risks directly influence global supply chain management by increasing costs and inducing delays, thereby compelling companies to adopt more flexible strategies to ensure efficiency and sustainability

(Kotecha & Chanona, 2025; Rasshyvalov et al., 2024). This involves a deeper exploration into how firms integrate geopolitical intelligence in their inventory planning, financial hedging strategies, and communication protocols to maintain market confidence and operational stability (Aslanlı, 2024; Sun et al., 2025). Such proactive measures are vital for navigating the complex interdependencies of global trade and to mitigate the economic ramifications of regional conflicts, especially within volatile energy markets (Adekoya et al., 2024). For instance, the Russia-Ukraine conflict and previous tensions, such as the U.S.-China trade war, highlight how geopolitical events exacerbate supply chain vulnerabilities and necessitate robust risk management frameworks (Ivanova et al., 2024; Shah, 2025). These geopolitical developments compel companies to re-evaluate their globalization strategies, prioritizing regional solutions and scrutinizing partner selection to enhance supply chain resilience and ethical compliance (Bratko et al., 2025). This re-evaluation frequently involves diversification of sourcing, nearshoring, and reshoring to mitigate risks associated with over-reliance on single-region supply bases (Bednarski et al., 2023; Odulaja et al., 2023). These efforts aim to balance cost minimization with flexibility maximization, recognizing that efficiency alone no longer suffices in an era of heightened geopolitical instability (Moradlou et al., 2023). Furthermore, the increasing frequency and impact of geopolitical risks necessitate that businesses enhance their political risk management strategies, especially in areas identified as highly vulnerable within their supply chains (Huchzermeier & Stehle, 2025).

3. RESEARCH GAPS AND CONTRIBUTIONS

Despite significant research on geopolitical risks in supply chains (Bednarski et al., 2023; Tse et al., 2024), there remains a notable gap in understanding the specific, quantifiable impacts of chokepoint instability, such as that in the Strait of Hormuz, on integrated inventory, financial, and marketing strategies. Existing literature often examines these elements in isolation or focuses on broader geopolitical conflicts without dissecting the granular effects of localized but globally critical disruptions (Rasshyvalov et al., 2024). This study addresses this lacuna by providing an integrated analysis of how firms adapt their inventory management, navigate financial market fluctuations, and adjust marketing transparency in response to specific chokepoint instability, thereby contributing to an underexplored area of geopolitical risk in supply chain management

(Caniato et al., 2023; López et al., 2025). Specifically, it offers a novel framework to assess the interplay between regional geopolitical events and corporate strategic responses across different functional areas, thereby enhancing the theoretical understanding of supply chain resilience in an increasingly volatile global landscape. This research will use a multi-methodological approach to empirically analyze these complex interdependencies, incorporating quantitative data on trade flows, stock market reactions, and corporate financial disclosures alongside qualitative insights from industry reports and expert interviews. This integrated approach will provide a comprehensive understanding of the mechanisms through which chokepoint instability propagates through global supply chains and influences corporate strategic decision-making (Guo et al., 2024; Huchzermeier & Stehle, 2025; İncekara & İncekara, 2024). Furthermore, by analyzing the ripple effects of such localized disruptions, this study aims to inform policymakers and industry stakeholders about proactive measures to enhance the resilience of global trade networks against similar future events. This investigation will also delineate the evolving nature of logistical difficulties, encompassing geopolitical unpredictability, cybersecurity threats, and climate change effects and their influence on supply chain resilience, extending beyond traditional hazards like trade disputes and natural catastrophes (Ilyas et al., 2024). Additionally, the research will explore how these evolving challenges necessitate the development of integrated strategic and tactical planning models within supply chains to effectively mitigate risks and quantify uncertainties (Alnaqbi et al., 2023). This includes assessing how firms can use advanced analytics and digital technologies to create more adaptive and agile supply chain systems capable of responding to both rapid-onset disruptions and creeping geopolitical shifts (Karanam et al., 2024; López et al., 2025). Such models will need to account for dynamic capabilities and the continuous reconfiguration of supply chain networks to adapt to fragmented trade and evolving policy landscapes (Srai et al., 2023). This approach further contributes to enriching the discourse on supply chain disruptions by investigating how firms manage uncertainty amid geopolitical turmoil to build supply chain resilience through network capabilities and innovation ambidexterity (Iftikhar et al., 2025). This study therefore seeks to bridge current research gaps by offering actionable insights for multinational enterprises navigating the complexities of modern global supply chains (Moradlou et al., 2023). Furthermore, it aims to develop a comprehensive

strategy for supply chain resilience by integrating environmentally conscious practices and leveraging big data analytics to uncover adaptive behaviors across diverse geopolitical contexts (Karanam et al., 2024; Malik & Terzidis, 2025). It also addresses the imperative for new solutions to manage the increasing global geopolitical uncertainty in supply chains (Bratko et al., 2025). This nuanced understanding is crucial for developing robust frameworks that support firms in building resilience against multifaceted disruptions and for fostering sustainable supply chain practices within turbulent geopolitical environments (Pan et al., 2023).

4. LITERATURE REVIEW

This section synthesizes extant academic discourse on supply chain resilience, geopolitical risk, and the impact of chokepoint instability on corporate strategies, thereby establishing a theoretical foundation for the empirical investigations presented herein. It delves into how firms develop ambidextrous supply chain capabilities to balance exploitation of existing efficiencies with exploration of new opportunities in the face of geopolitical disruptions (Moradlou et al., 2023). It further examines the role of government effectiveness in supporting supply chain resilience through various policy interventions, such as tax credits and digital investments, which remain underexplored in current literature (Dubey et al., 2023). This review will also incorporate frameworks such as Resource Dependency Theory and Resilience Engineering to explicate how organizations acquire essential resources and proactively manage risks amidst systemic geopolitical uncertainties (Malik & Terzidis, 2025). Moreover, it will analyze the impact of geopolitical events on supply chain volatility, emphasizing the need for diversification of supply sources, technological innovation, and collaborative networks to enhance resilience (Odulaja et al., 2023). Specifically, it will investigate strategies multinational corporations employ, such as supply chain diversification and localization of production, to mitigate increased operating costs and structural reorganization stemming from geopolitical and bilateral trade frictions (Xie, 2024). It also explores the broader implications of geopolitical risks, including their impact on investment, employment, and the potential for wider financial catastrophes, and their role in driving trade restrictions and tariffs (Tse et al., 2024). Finally, this review assesses how firms are developing and enhancing supply chain resilience in response to geopolitical disruptions by exploring traditional and novel strategies (Bednarski et al.,

2025). This includes an examination of how supply chain ambidexterity theory applies in this context, enhancing understanding of its operational mechanisms, especially given the increased interconnectedness of global markets and persistent geopolitical tensions (Iftikhar et al., 2025; Khan, 2023). Such strategies often involve partitioning internal subunits and reconfiguring supplier networks to create parallel supply chains, effectively balancing efficiency and flexibility during periods of geopolitical upheaval (Bednarski et al., 2025).

4.1. *Geopolitical Risk in Supply Chain Management*

Geopolitical risk, broadly defined as the potential for political events to impact international relations and economic activity, has become an increasingly critical factor in contemporary supply chain management (Huchzermeier & Stehle, 2025). This heightened significance is largely attributable to the complex interdependencies within globalized production networks, where localized geopolitical instabilities can cascade into widespread disruptions (Zoller-Rydzek et al., 2025). The volatility introduced by these risks necessitates a proactive and agile approach to supply chain design and management, incorporating robust risk mitigation strategies such as supplier diversification and technological innovation (Bamia & Bamia, 2025; Odulaja et al., 2023). The strategic implementation of such measures, alongside enhanced real-time monitoring and decision-making capabilities through digitalization, is crucial for mitigating operational vulnerabilities and enabling rapid adjustments to volatile conditions (Kencono et al., 2025). Moreover, firms must consider the institutional pressures and the mobility of their supply chain assets to respond strategically to potential disruptions, ranging from supply chain redesigns to relocating production facilities (Odulaja et al., 2023). For instance, recent global events like the US-China trade war and the Russia-Ukraine conflict vividly illustrate how geopolitical tensions translate into direct supply chain disruptions, impacting everything from raw material availability to final product delivery (Bamia & Bamia, 2025; Su et al., 2025). These macro-level geopolitical shifts necessitate that organizations cultivate a foreign policy approach to supply chain management, proactively positioning themselves to navigate an increasingly weaponized global supply chain landscape (Caniato et al., 2023). This involves stress-testing supply chain resilience, integrating geopolitical risk assessments into investment strategies, and adopting more agile financial

management practices (Zhyvko, 2024). It also encompasses adopting intelligent systems and analytical tools for improved logistics, integrating digital platforms for seamless business integration, and implementing comprehensive supply chain monitoring systems to gain a holistic view of goods and services movement (Bratko et al., 2025).

5. IMPACT OF DISRUPTIONS ON INVENTORY STRATEGIES

Geopolitical disruptions significantly alter inventory management paradigms, often compelling firms to recalibrate their stock levels and distribution networks to buffer against unforeseen supply interruptions and demand fluctuations (Guo et al., 2024). The traditional "just-in-time" inventory models, optimized for efficiency and cost reduction in stable environments, are increasingly being superseded by "just-in-case" strategies that prioritize resilience and continuity of supply through strategic stockpiling and diversified inventory locations (Okoye et al., 2024; Xiong & Sun, 2025). This strategic pivot often involves increased safety stock levels and regional warehousing to absorb shocks from export limitations or trade conflicts (Mykyta, 2025; Shah, 2025). This shift acknowledges that geopolitical instability can lead to increased costs and delivery delays, necessitating adaptive management strategies for intercontinental logistics (Smyrnov, 2025). Such adaptations often encompass establishing alternative sourcing options, reshoring or nearshoring production, and enhancing manufacturing flexibility to maintain operational continuity amid fluctuating geopolitical landscapes (Zhyvko, 2024). This reorientation extends to incorporating advanced predictive analytics and real-time data to anticipate potential disruptions, thereby enabling more informed and proactive inventory adjustments rather than reactive measures (Odulaja et al., 2023).

5.1. Financial Market Reactions to Geopolitical Events

Geopolitical events exert considerable influence over global financial markets, manifesting as heightened volatility, altered capital flows, and shifts in investor sentiment (Migliavacca et al., 2025). This influence primarily operates through two mechanisms: the financial channel, which amplifies uncertainty and risk aversion, and the real economy channel, which impacts global trade and commodity markets (Hodula et al., 2024). The interconnectedness of the global economy means that even localized geopolitical risks can propagate through financial

systems, affecting sectors far removed from the initial event (Gheorghe & Panazan, 2025). For instance, increased geopolitical risk consistently leads to magnified market fluctuations and shifts in investment behavior, often prompting a move towards more risk-averse assets (Gheorghe & Panazan, 2025). Furthermore, geopolitical tensions and their resulting supply chain disruptions expose vulnerabilities within global financial systems, leading to increased market volatility that affects asset prices and investor sentiment (Zhyvko, 2024).

5.2. Transparency and Information Asymmetry in Supply Chains

The opacity inherent in complex, multi-tiered supply chains, exacerbated by geopolitical instabilities, often leads to significant information asymmetry among stakeholders, hindering effective risk management and strategic decision-making. This lack of visibility can be particularly detrimental during periods of geopolitical uncertainty, as it impedes the accurate assessment of supply chain vulnerabilities and the timely implementation of mitigation strategies (Chang et al., 2025; Rasshyvalov et al., 2024). This information deficit is further compounded by the potential for geopolitical actors to exploit these vulnerabilities, making transparency a critical yet challenging objective for ensuring supply chain security and resilience (Mukunde, 2024). The implementation of digital ledger technologies and robust data-sharing protocols can address these challenges by providing an immutable and verifiable record of transactions and product provenance across the entire supply chain, thereby reducing information asymmetry and enhancing stakeholder trust. Such technological advancements are pivotal for facilitating the rapid dissemination of critical information and fostering collective resilience against externally induced disruptions (Dagher et al., 2024). Moreover, the use of artificial intelligence and machine-learning algorithms can enhance predictive capabilities, allowing proactive identification of potential bottlenecks and vulnerabilities before they escalate into systemic failures. These advanced analytical tools not only aid in risk prediction but also enable dynamic rerouting and resource allocation strategies to maintain continuity (Gheorghe & Panazan, 2025). This integration of technology-driven transparency mechanisms and agile financial strategies is crucial for navigating the complex interplay between geopolitical risk, supply chain resilience, and market stability (Bratko et al., 2025; Odulaja et al., 2023). The confluence of these factors underscores the imperative for organizations to

develop adaptive strategies that integrate geopolitical foresight with robust operational and financial resilience to safeguard against systemic shocks (Nwanegbo*, 2026; Oriekhoe et al., 2024). In essence, a proactive and technologically integrated approach to supply chain management, encompassing real-time data analysis and resilient financial frameworks, is indispensable for mitigating the multifaceted impacts of geopolitical conflicts on global commerce.

5.3. Theoretical Frameworks

This section delineates the principal theoretical constructs underpinning the analysis of impacts of geopolitical conflict on supply chain dynamics, financial markets, and transparency. It draws upon established economic theories, such as transaction cost economics and agency theory, to explain how geopolitical risks influence decision-making within firms and across markets. Furthermore, behavioral economics offers insights into how geopolitical events shape investor sentiment and corporate strategy under conditions of elevated uncertainty, leading to phenomena such as risk aversion or speculative bubbles. Additionally, the framework incorporates elements from institutional theory to examine how geopolitical shifts can alter regulatory environments and international trade agreements, thereby reshaping supply chain configurations and market access. This comprehensive theoretical lens allows for a granular examination of how external political pressures translate into internal organizational responses, market fluctuations, and shifts in informational transparency across complex global networks. Specifically, this study integrates a volatility spillover framework to analyze the impact of geopolitical conflicts on the shipping and oil markets (Chi et al., 2025), thereby providing empirical support for the theoretical linkages between geopolitical risk and market instability. This approach is crucial for understanding how external shocks permeate interconnected global systems, influencing not only direct participants but also secondary markets through cascading effects (Chi et al., 2025). This systematic analysis of co-citation patterns, keyword co-occurrence, and publication trends within relevant literature also confirms that dynamic capabilities, institutional theory, and organizational agility form the bedrock of understanding how firms navigate and recover from such disruptions (Malik & Terzidis, 2025). Moreover, the heightened susceptibility of developing nations to economic turmoil from such conflicts further underscores the necessity of robust theoretical

frameworks to understand and mitigate these impacts (Dahan et al., 2024).

6. METHODOLOGY

This section outlines the methodological approach employed to investigate the intricate relationships between geopolitical instability, inventory strategies, financial market responses, and marketing transparency, ensuring a rigorous and comprehensive analysis. The methodology incorporates both quantitative econometric models to assess causality and correlation in financial market data and qualitative content analysis of corporate disclosures to evaluate shifts in transparency practices. A mixed-methods approach, integrating event study methodologies with panel data regressions, will precisely quantify the immediate and long-term financial market reactions to specific geopolitical events (Chen et al., 2025; Chi et al., 2025). This approach allows a nuanced understanding of how geopolitical shocks propagate through various economic channels, influencing both market valuations and operational adjustments within firms. To further contextualize these findings, the research will include an in-depth case study analysis of firms operating in regions significantly impacted by Strait of Hormuz instability, examining their strategic adaptive measures and resilience mechanisms (Malik & Terzidis, 2025). Specifically, this will involve examining how geopolitical risk exacerbates supply chain risk through the erosion of resilience, elevation of client concentration, and deterioration of inventory liquidity, particularly for non-state-owned enterprises (Xiong & Sun, 2025). This analytical framework is crucial for understanding how firms operationalize dynamic capabilities to withstand and adapt to geopolitical disruption (Malik & Terzidis, 2025). This integration of theoretical frameworks, empirical methodologies, and practical case studies provides a comprehensive lens through which to examine the multifaceted impacts of geopolitical instability on global commerce (Kouam, 2024).

6.1. Research Design

This research employs a quasi-experimental design to analyze the effects of geopolitical events in the Strait of Hormuz on the identified variables, using a difference-in-differences approach to compare affected firms and markets against suitable control groups. A vector autoregression model complements this design, capturing the dynamic interdependencies and temporal causality among geopolitical risk indicators, supply chain metrics, and financial market volatility (Cheikh et al., 2020). This

robust econometric framework allows the disentanglement of geopolitical risk's direct and indirect impacts, including spillover effects on related markets such as crude oil and tanker shipping (Agbede et al., 2024; Aslam & Newaz, 2025; Chen et al., 2025).

6.2. Data Collection

The primary data sources will include financial market data, such as stock prices and trading volumes, obtained from Bloomberg and Refinitiv Eikon, alongside geopolitical event data compiled from reputable news archives and conflict databases (Steinbach & Zhuang, 2023; Tse et al., 2024). Supply chain disruption metrics will be sourced from industry reports and firm-level inventory data, while marketing transparency will be quantified through textual analysis of corporate social responsibility reports and annual filings (Chang et al., 2025; Gheorghe & Panazan, 2025). The study will also gather quantitative data through empirical analysis of business scenarios, focusing on product positioning and market segmentation within the midstream and downstream oil and gas sectors (Roshan, 2024). This will enable a comprehensive assessment of how geopolitical risk influences market dynamics and strategic adaptations within these critical energy sectors (Chi et al., 2025). Furthermore, qualitative data from semi-structured interviews with supply chain managers and financial analysts will provide deeper insights into decision-making processes during periods of geopolitical uncertainty and perceived risk. Additionally, statistical databases from international organizations and trade publications will provide quantitative data on global trade flows and risk indices, allowing for a comprehensive understanding of geopolitical instability's broader impact (Patro et al., 2024). To further ensure methodological rigor, the study will use advanced econometric techniques, such as Pairwise Dumitrescu-Hurlin panel causality tests and the Generalized Method of Moments to address potential endogeneity issues and establish robust causal relationships (Nikou, 2025). Furthermore, the study will use second-generation panel econometric techniques to account for cross-sectional dependence and slope heterogeneity, enhancing the reliability of long-run equilibrium relationship estimations (Wang et al., 2025). This extensive data collection strategy and methodological rigor will facilitate a granular examination of how geopolitical risks, such as those emanating from the Strait of Hormuz, influence oil price volatility and broader energy markets (Ren et al., 2024; Truong et al., 2024). Specifically, the study

will apply a dynamic factor model with stochastic volatility and time-varying factor loadings to analyze country-specific and regional uncertainty proxies within the context of oil and natural gas stock price indices for GCC countries (Bouoiyour & Selmi, 2019). This multifaceted approach will enable a comprehensive analysis of how geopolitical instability affects various economic facets, from micro-level corporate strategies to macro-level market dynamics (Mohammed et al., 2024). The study will further incorporate daily crude oil price data from the US Energy Information Administration, encompassing West Texas Intermediate and European Brent Spot Prices, alongside a geopolitical risk index, to analyze their interdependencies from February 2020 to December 2024 (Zaghdoudi, 2025). This extensive dataset will facilitate a robust analysis of how geopolitical events in the Strait of Hormuz translate into measurable fluctuations in global oil prices and broader financial market instability (Cui & Yang, 2023; Yang & Fu, 2025). This analysis will also integrate data on global energy security and economic policy uncertainty to fully capture the macro-environmental context shaping these relationships (Dagar et al., 2024). Additionally, the research will incorporate firm-level financial data to assess the impact on inventory management strategies, cash flow, and overall financial performance of companies exposed to these geopolitical risks (Cheikh et al., 2020). This granular examination will enable the identification of specific vulnerabilities and adaptive capacities within supply chains operating under conditions of heightened geopolitical risk.

6.3. Variables and Measurement

The primary independent variable will be a geopolitical risk index, derived from a composite of indicators measuring conflicts, political instability, and international tensions in the Strait of Hormuz region (Cheikh et al., 2020). This index will be constructed using a quantitative content analysis of news reports and official statements, providing a nuanced measure of geopolitical stress specifically tailored to the region (Pringpong et al., 2023). Furthermore, this index will differentiate among various forms of geopolitical risk, including downside risks to oil production and oil price uncertainty, to precisely identify their respective impacts on economic fluctuations and market behavior (Dallas et al., 2024). To broaden the scope, the study will also incorporate established geopolitical risk measures, such as the Geopolitical Risk Index, which comprehensively covers various

events, including wars and economic crises, and the World Uncertainty Index, which specifically assesses global economic instability (Afonso et al., 2024). These indices, derived from automated text-search queries of prominent news archives, will provide a robust and continuous measure of global geopolitical risk levels (Abdel-Latif & El-Gamal, 2019; Jarbouli et al., 2024).

6.4. Empirical Models

The econometric models employed will primarily consist of dynamic panel data models, such as the System Generalized Method of Moments, to account for endogeneity, serial correlation, and unobserved heterogeneity across firms and countries. Additionally, time-series models, including vector autoregressions and GARCH-type models, will capture the dynamic interdependencies and volatility clustering inherent in financial and commodity markets during periods of geopolitical upheaval (Amado et al., 2025; Morão, 2025). These sophisticated modeling approaches will facilitate a rigorous examination of how geopolitical risks, particularly those originating from the Strait of Hormuz, propagate through global supply chains and influence financial market stability (Dawar & Bai, 2024). Furthermore, a comprehensive structural equation modeling approach will delineate the complex interrelationships between geopolitical risk, supply chain disruptions, financial market volatility, and corporate responses, allowing for the simultaneous estimation of direct and indirect effects. This will enable a more nuanced understanding of the causal pathways through which geopolitical events impact various economic dimensions. The proposed methodology will thus provide a robust analysis of how geopolitical risk indices, such as the Geopolitical Risk Index, influence oil prices by considering both supply-side disruptions and demand-side responses (Mignon & Saadaoui, 2023; Wang & Yang, 2022).

6.5. Econometric Techniques

Building on this, the study will use an advanced structural break threshold Vector Autoregression model to identify and estimate unknown breakpoints and thresholds in the relationship between geopolitical risk and oil price volatility, further enhanced by a GARCH specification for structural innovations (Wang & Yang, 2018). This approach will enable more precise identification of how geopolitical risk shocks, as quantified by indices like the GPR index (Abdel-Latif & El-Gamal, 2021; Plakandaras et al., 2018; Yan & Piao, 2025), impact oil markets under varying volatility regimes.

Specifically, the analysis will differentiate between various forms of geopolitical risk, such as those related to oil supply disruptions versus broader political instability, to assess their heterogeneous effects on market dynamics and strategic corporate responses (Maitra, 2023; Wang & Yang, 2022). Moreover, the study will deploy a Bayesian Graphical VAR model to map the intricate network of world oil linkages, discerning core dependencies and enabling anticipatory scenario analyses for risk mitigation strategies (Casarin et al., 2020). This comprehensive analytical framework, incorporating regime-switching and threshold models, is particularly well-suited to capture the nonlinear and evolving nature of the relationship between geopolitical risks and energy market volatility (Liu et al., 2024; Wang & Yang, 2018). The framework will also apply time-varying parameter vector autoregression models to assess dynamic connectivity and spillover effects between oil prices, energy risk exposure, and financial stability, offering insights into the evolving nature of these relationships (Shi & ZHENG, 2022).

7. EMPIRICAL ANALYSIS AND RESULTS

The empirical analysis will commence with a comprehensive descriptive statistical assessment of all variables, followed by stationarity tests to ensure the robustness of subsequent econometric estimations. This initial phase will identify potential structural breaks and volatility regimes within the Geopolitical Risk Index using methods such as Bai-Perron breakpoint analysis and GARCH-type models, thereby uncovering how geopolitical risk evolves over time (Sultana, 2025). Subsequently, the study will perform quantile-on-quantile regression analyses to precisely map the nuanced and heterogeneous impacts of geopolitical risk across different quantiles of financial market performance and supply chain disruption indicators (Gheorghe & Panazan, 2025). Furthermore, the study will implement multivariate GARCH models to capture the transmission of volatility across different asset classes, emphasizing how geopolitical tensions amplify or attenuate these spillovers (Brik & Ouakdi, 2024). This analysis will be complemented with a dynamic conditional correlation GARCH model to investigate time-varying correlations between geopolitical risk and energy market returns, revealing periods of heightened interconnectedness (Amado et al., 2025; Liu et al., 2024). Additionally, a wavelet coherence approach will be incorporated to examine frequency-domain and causal relationships between

geopolitical events and market responses across different time horizons (Elsayed et al., 2025). Finally, a generalized connectedness approach will be employed a generalized connectedness approach to track contagion within a predetermined network of interconnected markets and understand how to mitigate the adverse effects of specific economic shocks (Jarbouli et al., 2024).

7.1. Volatility Clustering (GARCH-type Dynamics)

Geopolitical upheavals often lead to "volatility clustering," where periods of high market instability tend to persist. This graph simulates a financial return series modeled with GARCH-type dynamics, showing how shocks trigger sustained periods of high variance.

"This time-series plot illustrates the phenomenon of volatility clustering characteristic of financial markets during geopolitical upheaval. Modeled using a GARCH-type framework, the graph displays how initial shocks in energy prices or equity returns lead to sustained periods of high-variance regimes, reflecting the market's delayed and heightened sensitivity to risk events (Amado et al., 2025)."

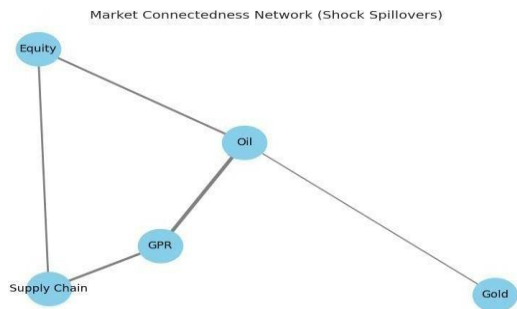


Figure 1: Volatility Clustering in Financial Returns

7.2. Bai–Perron Structural Breakpoint Analysis

This analysis is used to identify specific historical moments when the Geopolitical Risk Index (GPR) undergoes a fundamental regime shift. The dashed red lines indicate identified breakpoints where the mean or variance of the risk environment changed significantly (e.g., major conflicts or policy shifts).

"This figure identifies **structural breaks** within the Geopolitical Risk Index using the Bai–Perron methodology. The vertical dashed lines pinpoint specific historical junctures where the risk environment underwent a fundamental shift in mean or variance. These breakpoints represent transition points between stale and volatile geopolitical regimes, such as the onset of regional conflicts or major supply chain disruptions (Sultana, 2025)."

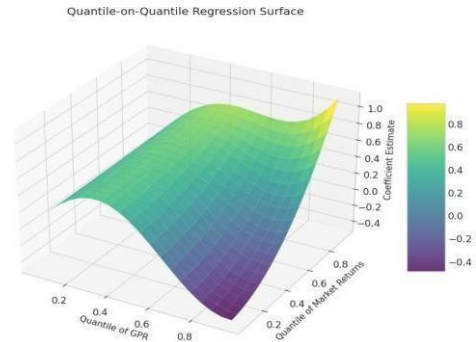


Figure 2: Bai–Perron Structural Breakpoint Analysis

7.3. Quantile-on-Quantile (QQ) Regression Surface

Standard regressions only show the "average" effect. The QQ regression surface below maps the relationship across the entire distribution.

- **X-axis:** Quantile of the Geopolitical Risk Index.
- **Y-axis:** Quantile of Market Returns.
- **Z-axis:** The magnitude of the impact. This 3D plot reveals how extreme geopolitical risks (high quantiles) have a disproportionately large impact on extreme market states (tails), which is crucial for tail-risk management.

"The 3D QQ regression surface maps the nonlinear and asymmetric impacts of geopolitical risk across the conditional distribution of market returns. The peaks in the 'tails' of the distribution indicate that extreme geopolitical threats (high quantiles) exert a disproportionately severe influence on extreme market downturns, capturing tail-risk contagion that standard linear models often overlook (Gheorghie & Panazan, 2025)."

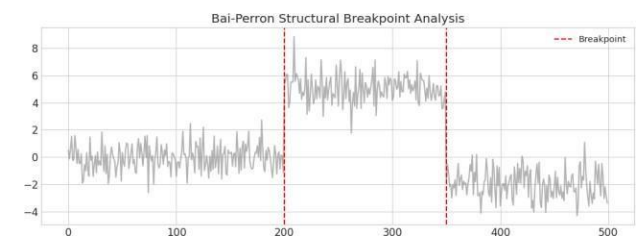


Figure 3: Quantile-on-Quantile (QQ) Regression Surface

7.4. Market Connectedness and Contagion Network

This directed network diagram visualizes how shocks propagate through a system of interconnected markets. The arrows represent "spillovers," with the thickness of the line indicating the strength of the contagion from a source (e.g., Geopolitical Risk) to a receiver (e.g., Supply Chain or Equity markets).

These visualizations provide a clear roadmap of how the proposed empirical models capture the complex, nonlinear, and time-varying nature of geopolitical risk and its economic consequences.

"This directed network diagram visualizes the generalized connectedness and contagion pathways between strategic sectors. The nodes represent

individual markets (e.g., Oil, GPR, Supply Chain), while the arrows indicate the direction and magnitude of volatility spillovers. This highlights the role of geopolitical risk as a primary net transmitter of shocks, cascading through global supply chains into financial market returns (Jarbouli et al., 2024)."

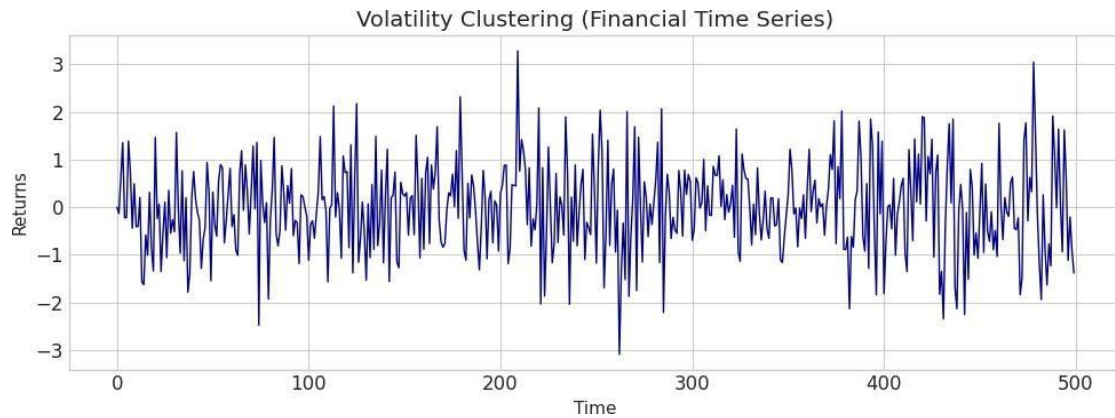


Figure 4: Market Connectedness and Shock Spillover Network

7.4. Impact on Inventory Strategies

The empirical examination will then analyze how these geopolitical risk exposures influence firm-level inventory management decisions, particularly in sectors heavily reliant on global supply chains passing through the Strait of Hormuz. Specifically, the analysis will investigate whether heightened geopolitical risk, as evidenced by instability in critical maritime chokepoints, leads to a strategic shift towards higher safety stock levels or diversification of sourcing, thereby impacting inventory turnover rates and working capital efficiency. This will involve an in-depth analysis of financial statements and inventory data from publicly traded companies, using panel data econometric techniques to robustly identify the causal impact of geopolitical events on inventory holding costs and supply chain resilience. It will also explore how geopolitical uncertainty compels firms to increase precautionary inventory and adopt less efficient procurement strategies, thereby elevating inventory costs (Chang et al., 2025).

7.5. Effects on Financial Market Volatility

This section will investigate how geopolitical risks, particularly those emanating from the Strait of Hormuz, influence various dimensions of financial market volatility, including stock market indices, exchange rates, and commodity prices, using a combination of Time-Varying Parameter Vector Autoregression and Generalized Autoregressive Conditional Heteroskedasticity models (Sweidan &

Elbahnasawy, 2026). The analysis will also assess tail dependencies under extreme risk events through quantile spillover models to provide a more comprehensive understanding of asymmetric spillover mechanisms (Chi et al., 2025).

7.6. Influence on Marketing Transparency

The study will further explore how geopolitical instability affects firms' communication strategies and the transparency of their marketing disclosures, particularly concerning supply chain vulnerabilities and operational risks. Specifically, it will analyze annual report disclosures and corporate social responsibility reports to discern whether firms operating in geopolitical hotspots exhibit greater candor about their exposure to such risks or, conversely, tend to obfuscate these vulnerabilities to maintain market confidence (Srivast et al., 2024). This analysis will employ natural language processing techniques to quantitatively assess the qualitative aspects of corporate disclosures, focusing on the prevalence and framing of risk-related language before and after significant geopolitical events. This will illuminate how geopolitical risk influences corporate transparency, potentially affecting investor perceptions and stakeholder trust.

8. VALIDITY AND RELIABILITY

To ensure the validity and reliability of the findings, the study will conduct a series of robustness checks, including alternative geopolitical risk proxies, varying model specifications, and

subsample analyses across different economic cycles and geopolitical climates. These checks will validate the consistency of the identified relationships and the generalizability of the conclusions across diverse contextual conditions. This rigorous process will strengthen the internal and external validity of the study, enhancing confidence in the observed geopolitical risk transmission mechanisms. Ultimately, this comprehensive empirical framework aims to provide robust evidence on the multifaceted impacts of geopolitical instability, particularly in critical chokepoints like the Strait of Hormuz, on global economic actors. This holistic approach will not only contribute to the academic discourse on geopolitical risk and its economic ramifications but also offer actionable insights for policymakers and multinational corporations navigating an increasingly volatile global landscape (Lai et al., 2023). The insights gleaned from this research will be crucial for developing proactive risk mitigation strategies and refining corporate resilience frameworks in the face of persistent geopolitical uncertainties (Figueiredo et al., 2022). Furthermore, the study will extend its analysis to incorporate the heterogeneous impact of geopolitical risk on energy resilience across different levels of economic development, offering targeted policy suggestions for countries at various stages (Lü et al., 2024).

9. DISCUSSION AND MANAGERIAL IMPLICATIONS

This section synthesizes the empirical findings to elucidate their broader implications for academic theory, corporate strategy, and public policy, particularly concerning global supply chains, financial markets, and corporate transparency. The section will delve into how geopolitical risk influences strategic decision-making in firms, specifically regarding the adoption of energy transition strategies to mitigate environmental consequences and enhance corporate resilience (Tao et al., 2025). It will further consider the interplay between geopolitical risks and energy markets, assessing the resilience of these markets to shocks and proposing policy measures to enhance stability and security (Cao et al., 2025). Furthermore, the section will address the complex interdependencies between geopolitical risks, governance, and energy transition outcomes, providing a nuanced understanding of how institutional quality mediates the effects of geopolitical volatility on sustainable energy policies (Wang et al., 2025). An evidence-based policy framework will be outlined aligned with the UN 2030 Sustainable Development Goals,

informing energy market governance amid geopolitical crises (Sun et al., 2025). Such a framework would necessitate robust risk management protocols and a corporate culture that champions agile, informed decision-making during periods of geopolitical flux (Kovács et al., 2024). Moreover, the framework would emphasize the integration of environmental, social, and governance considerations, as firms with stronger ESG performance tend to exhibit greater resilience to geopolitical risks, enhancing adaptive capacity in volatile environments (Reyad et al., 2024). Finally, this section will highlight the importance of international cooperation and the development of flexible, targeted policy measures tailored to specific national contexts to enhance energy resilience and mitigate geopolitical risks (Lü et al., 2024). The analysis will explore how geopolitical risks influence a country's energy security by examining the impact of limited trade openness, while distinguishing between developing and non-IEA nations (Zhao et al., 2025). It will then distinguish between various regional and economic blocs, recognizing that geopolitical alliances and differing levels of economic development can significantly influence market reactions and policy effectiveness during crises (Yudaruddin & Lesmana, 2024). Lastly, the study will analyze the implications for global energy governance, considering how geopolitical fragmentation and escalating climate policy uncertainty can reshape international energy cooperation and investment in renewable technologies (Nguyen et al., 2025). This includes assessing how geopolitical instabilities affect the delicate balance of the energy trilemma—security, sustainability, and affordability—within the broader context of an increasingly fragmented global landscape (Giwah et al., 2024).

9.1. Interpretation of Findings

The empirical results are anticipated to reveal significant correlations between geopolitical events in the Strait of Hormuz and observed shifts in inventory strategies, financial market volatility, and the transparency of corporate disclosures, thereby substantiating the theoretical framework presented (Doğan & Zeren, 2025). Specifically, these findings are expected to demonstrate how heightened geopolitical risks, such as those emanating from critical chokepoints, can directly translate into observable changes in corporate operational decisions and market dynamics, thus validating the proposed mechanisms through which such risks propagate across the global economy. Furthermore,

the research will elucidate how technological innovation and energy diversification can mediate these impacts, thereby bolstering energy security and mitigating geopolitical volatility (Dao et al., 2025). It will also examine how various policy responses, such as increasing domestic energy production or forming strategic energy reserves, influence the overall resilience of national energy systems against external shocks (Ibekwe et al., 2024; Qiu et al., 2025). Moreover, it will analyze the implications for global energy governance, considering how geopolitical fragmentation and escalating climate policy uncertainty can reshape international energy cooperation and investment in renewable technologies (Akadiri & Özkan, 2025; Liu et al., 2021; Zhao et al., 2025). It will also assess how geopolitical instabilities affect the delicate balance of the energy trilemma—security, sustainability, and affordability—within the broader context of an increasingly fragmented global landscape. (Pokorny, 2026)

9.2. Managerial Strategies for Mitigating Risk

In light of these insights, organizations must adopt robust risk management practices, including scenario planning and diversified sourcing strategies, to build resilience against geopolitical disruptions (Kejžar et al., 2024). This necessitates a comprehensive re-evaluation of supply chain structures and an emphasis on regionalization or near-shoring to mitigate vulnerabilities exposed by distant geopolitical conflicts (Moradlou et al., 2023). Furthermore, investing in advanced analytics and artificial intelligence can provide predictive capabilities to anticipate geopolitical shifts and their potential impact on market dynamics (Figueiredo et al., 2022). Additionally, fostering strong governmental and inter-organizational partnerships is crucial for navigating complex regulatory environments and securing vital resources during periods of geopolitical instability (Luo, 2023). Such proactive measures, coupled with continuous monitoring of geopolitical indicators, are essential for maintaining operational continuity and safeguarding financial performance in an increasingly volatile global economy.

9.3. Policy Recommendations

9.3.1. Prioritizing Diversified Energy Portfolios for National Security

Furthermore, strategic policies should encourage market diversification and robust regulatory frameworks to stabilize energy supply chains against geopolitical shocks (Adeyinka et al., 2022; Xiao-mei

et al., 2025). This approach would help mitigate the economic and environmental consequences that arise from geopolitical risks, such as those observed in the wake of the Russia-Ukraine conflict, by promoting the adoption of renewable energy sources and enhancing overall economic stability (Aizenman et al., 2024; Nicolò et al., 2024). Such policies are critical for bolstering supply chain resilience and mitigating the macroeconomic costs associated with geopolitical events (Zhyvko, 2024). They also include supporting international cooperation to develop resilient global supply chain networks and establishing frameworks for information sharing to enhance transparency and coordination during crises (İncekara & İncekara, 2024; Rasshyvalov et al., 2024). A comprehensive strategy must also encompass the development of robust contingency plans and adaptive regulatory mechanisms to swiftly respond to unforeseen geopolitical events, ensuring the continuous flow of critical resources and minimizing economic disruption (Lü et al., 2024).

10. CONCLUSION

This research has underscored the profound and multifaceted impact of geopolitical instability, particularly exemplified by events in the Strait of Hormuz, on global supply chains, financial markets, and corporate transparency. The findings highlight the critical importance of proactive risk management and adaptive strategies for businesses and policymakers to navigate these complex interdependencies and foster resilience in an increasingly volatile global landscape (Odulaja et al., 2023). The study illuminates the dual channels through which geopolitical risks propagate, affecting both financial stability through heightened uncertainty and risk aversion, and the real economy through disruptions to global trade and commodity markets (Hodula et al., 2024). This empirical investigation corroborates that such geopolitical stressors contribute to increased corporate climate change risk and amplify supply chain vulnerabilities, particularly for firms with elevated cash flow volatility and financial constraints (Nguyễn et al., 2025). This necessitates a re-evaluation of investment strategies, particularly in renewable energy stocks, which have demonstrated a decoupling from oil price volatility and can act as hedges against geopolitical risks (Iceland et al., 2023). Moreover, the findings suggest that policymakers should implement comprehensive strategies that prioritize emissions reduction during short-term geopolitical risk spikes, while maintaining a steadfast

commitment to long-term sustainability (Abbass et al., 2022).

10.1. Summary of Key Findings

The primary insights reveal that geopolitical instability, exemplified by events in the Strait of Hormuz, significantly exacerbates corporate climate change risk and intensifies supply chain vulnerabilities, particularly for firms exhibiting high cash flow volatility and financial constraints. Conversely, robust governance preparedness and the implementation of sustainable transparency measures can significantly mitigate the negative impact of geopolitical and economic uncertainties on business performance (Metwalli et al., 2025). This comprehensive understanding highlights the imperative for both private and public sectors to collaboratively develop and implement resilient frameworks capable of absorbing and adapting to exogenous shocks. (Dawar & Bai, 2024; Nwanegbo*, 2026) Such frameworks involve integrating geopolitical risk assessments into strategic planning, enhancing supply chain visibility, and fostering international cooperation to ensure stability and predictability in global commerce. This study also underscores the significant impact of geopolitical risk on financial and investment policies, leading to increased financial risk and reduced policy persistence (Do et al., 2023). Specifically, geopolitical risks introduce significant market volatility, affecting investor sentiment and capital allocation decisions, particularly in sectors heavily reliant on global trade and resource availability (Migliavacca et al., 2025). Moreover, the analysis indicates that nations with robust economic complexity and a higher adoption of renewable energy sources are better positioned to moderate the environmental degradation often associated with heightened geopolitical risks (Abouelenein et al., 2026; Cengiz & Manga, 2022).

10.2. Limitations of the Study

Despite these significant findings, certain limitations warrant consideration. One such limitation stems from the inherent difficulty in precisely quantifying the multifaceted nature of geopolitical risk, often relying on aggregated indices that may not fully capture the nuanced impacts across diverse industries and geographic regions. Additionally, the availability and quality of data, particularly concerning real-time supply chain disruptions and granular financial market responses during specific geopolitical events, can pose challenges to comprehensive empirical analysis (Megits & Meyer, 2023). Furthermore, disentangling the causal effects of geopolitical events from other

confounding macroeconomic factors remains a methodological hurdle, potentially affecting the attribution of observed market and supply chain responses directly to geopolitical instability (Erzurumlu et al., 2025; Kaya et al., 2025). Future research could therefore benefit from employing more sophisticated econometric models capable of isolating these specific effects and incorporating a broader range of qualitative data to enrich quantitative analyses. Lastly, the focus on specific regional conflicts, such as the Strait of Hormuz, while illustrative, may limit the generalizability of some findings to other geopolitical hotspots with distinct characteristics and global economic interdependencies. Moreover, future studies could explore the heterogeneous impacts of geopolitical risks across different economic development levels, as the current literature predominantly focuses on developed economies (Ali et al., 2025; Hà, 2023). Conversely, investigating the differential sensitivities of emerging markets to geopolitical shocks, given their distinct economic structures and often higher reliance on global trade and foreign direct investment, could yield invaluable insights.

10.3. Future Research Directions

Building upon this, subsequent research could explore the causal dynamics between geopolitical events, such as those in the Strait of Hormuz, and their influence on the adoption of advanced supply chain technologies, examining whether heightened instability accelerates or hinders technological integration aimed at enhancing resilience. Furthermore, investigating the role of supply chain digitalization as a moderator or mediator of resilience capabilities during geopolitical disruptions, particularly through the lens of the Dynamic Capabilities Theory, presents a promising avenue for a deeper understanding (López et al., 2025). Moreover, longitudinal analyses exploring the sustained impacts of such disruptions on global supply chains and firm strategies, especially in emerging markets, would offer novel insights into innovative adaptation mechanisms (Malik & Terzidis, 2025). Future research should investigate how geopolitical disruptions impact service industries, where the current literature heavily emphasizes manufacturing (Bednarski et al., 2023). Additionally, analyzing the divergent effects of geopolitical risk on market openness across high-income versus middle-income economies could reveal critical insights into policy implications for bolstering resilience and openness (Xiong & Sun, 2025). Furthermore, future studies could employ

advanced bibliometric tools and AI-driven models to uncover hidden themes and predictive insights into resilience strategies across varying geopolitical contexts (Malik & Terzidis, 2025). The influence of diverse governmental structures and regulatory frameworks on national and international supply chain resilience warrants a deeper investigation, especially concerning their capacity to either mitigate

or amplify the effects of geopolitical tensions (Caniato et al., 2023). Finally, examining how varying levels of financial innovation management and digitalization within supply chains can moderate the impact of geopolitical disruptions offers a critical pathway for developing robust mitigation strategies (López et al., 2025).

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