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Global Supply Chains Under Strain: Navigating Geopolitical Tensions and Economic Uncertainty

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Abstract: ***This article explores the impact of escalating geopolitical tensions on global supply chains and macroeconomic stability, with a focus on the challenges posed by the COVID-19 pandemic and ongoing conflicts. Geopolitical disputes, such as the U.S.-China trade war, the Russia-Ukraine conflict, and regional territorial disagreements, have exacerbated vulnerabilities in the interconnected systems that drive the modern global economy. These tensions disrupt supply chains, particularly in procurement, demand forecasting, and inventory management, while influencing business continuity and economic volatility. The study examines how nations and firms are adapting to these disruptions, with strategies such as reshoring, supply diversification, and "China+1" approaches. By analyzing the cascading effects of geopolitical shocks, the article highlights the need for enhanced resilience and adaptability in supply chain operations. This literature review synthesizes existing research to identify key gaps in understanding how firms and policymakers can balance efficiency with security, offering insights into sustaining macroeconomic stability amidst an increasingly fragmented global landscape.***

Keywords: Geopolitical tensions, Supply Chain, Trade Wars, Macroeconomic Stability and Outcomes, Supply Chain Disruption and Resilience

1. Introduction

In recent years, the global landscape has been increasingly shaped by the resurgence of geopolitical tensions, a term referring to strategic conflicts, rivalries, and disputes between nations or regions over resources, territorial control, ideological dominance, or economic influence (Roscoe, et al., 2022). These tensions, frequently materializing in the form of trade wars, sanctions, military posturing, or diplomatic standoffs, generate far-reaching ripple effects that extend beyond national borders, as exemplified by the disruptions triggered by the outbreak of COVID-19. Indeed, since the onset of the COVID-19 pandemic in early 2020, such frictions have intensified, exposing vulnerabilities in the interconnected systems that underpin the modern global economy. The pandemic itself acted as a catalyst, exacerbating preexisting rivalries while triggering new forms of competition—from vaccine nationalism to supply chain weaponization (Glencross, 2024). For instance, the U.S.-China trade war, ongoing since 2018 (Boylan, et al., 2021), expanded into technological decoupling, with restrictions on semiconductor exports and bans on platforms like Huawei and TikTok (Mirrlees, 2024). Similarly, the Russia-Ukraine conflict, erupting in 2022, disrupted energy markets and food supplies (Zhou, et al., 2023), while territorial disputes in the South China Sea and escalating sanctions on Iran further illustrate the breadth of contemporary geopolitical strife.

These developments have profound implications for macroeconomic stability, particularly through their impact on global supply chains—the vast, interdependent networks responsible for producing and distributing goods worldwide. Supply chains, by their nature, rely on seamless cross-border collaboration, making them acutely sensitive to geopolitical disruptions (Montoya-Torres, 2021). The COVID-19 pandemic laid bare this fragility, as lockdowns, port closures, and labor shortages caused unprecedented delays in manufacturing and logistics. For example, semiconductor shortages, mainly sourced from Asia, crippled automobile production, while shipping container imbalances drove inflation to multi-decade highs. Geopolitical tensions have since compounded these challenges, prompting nations to prioritize “self-reliance” over globalization (Posen, 2024). Policies such as reshoring critical industries, diversifying suppliers, or stockpiling essentials, while prudent for national security, risk fragmenting supply chains and raising production costs. The Russia-Ukraine conflict, for instance, not only disrupted wheat and fertilizer exports but also triggered energy price volatility, straining economies reliant on imports. Meanwhile, escalating U.S.-China competition has spurred firms to adopt “China+1” strategies, relocating segments of production to Southeast Asia—a transition fraught with logistical and financial hurdles (Xia & Lorente-Salabarria, 2023).

Against this backdrop, macroeconomic stability faces dual pressures: supply-side constraints and demand-side uncertainties. Disruptions in procurement—such as delayed raw material shipments or inflated input costs—threaten business continuity, while fluctuating consumer demand, influenced by inflationary pressures or shifting trade policies, complicates forecasting (Guerrieri, et al., 2022). The interconnectedness of modern supply chains means that localized geopolitical shocks can cascade globally, amplifying economic volatility. For instance, a factory closure in East Asia due to trade restrictions may ripple through European automotive assembly lines, African consumer markets, and North American retail sectors. Such dynamics underscore the need to reevaluate traditional models of supply chain resilience and adaptability.

This study conducts a comprehensive literature review to analyze the multifaceted challenges confronting global supply chains in an era of heightened geopolitical friction. Focusing on three critical dimensions—procurement, demand forecasting, and inventory management—it examines how geopolitical risks reshape operational strategies and macroeconomic outcomes. By synthesizing existing research, the paper aims to identify gaps in understanding how firms and policymakers can mitigate disruptions while balancing efficiency with security. In doing so, it contributes to broader

conversations on sustaining economic stability in a world where geopolitical and macroeconomic forces are inextricably linked.

2. Literature Review

Geopolitical Tensions, Macroeconomic Stability, and Procurement

For decades, multinational corporations (MNCs) have relied on global procurement to optimize costs, access diverse materials, and leverage competitive advantages (Short, et al., 2016). As noted by (Porter, 1990), "A company's global strategy is shaped by its ability to source inputs from regions offering the highest value at the lowest risk." This approach has been driven by the economic principle of comparative advantage, wherein countries specializing in producing goods at lower opportunity costs gain the opportunity to attract business from other nations, fostering cross-border trade and economic interdependence (Gunasekaran, et al., 2015). For instance, manufacturers in high-wage economies such as Germany and the U.S. have traditionally outsourced labor-intensive tasks to countries like China or Vietnam, reducing production expenses by up to 40% (O'Byrne, 2025). Key performance indicators (KPIs) such as cost-per-unit savings and supplier lead times have reinforced this practice, with firms achieving an average cost reduction of 15–20% through global sourcing (Akbari, 2024).

The primary motivators behind this strategy have been cost arbitrage, resource availability, and market diversification, factors that have historically enabled MNCs to achieve both scale and scope efficiencies. For instance, cost arbitrage or rather cost advantages have extended beyond labor savings to encompass tax incentives and regulatory benefits. Countries like India and Vietnam, epitomize this idea, having attracted major automakers through special economic zones offering tax holidays and reduced import duties (Thomas & Thomas, 2011). Toyota's plant in Bengaluru, operating at 30% lower costs compared to its Japanese facilities (Simplay & Hansen, 2014), demonstrates this advantage. Similarly, the textile industry's shift to Bangladesh—where labor costs are 50% lower than in China —has fueled a 7% annual growth in the country's exports (ILO, 2016).

Market diversification has as well allowed MNCs to align procurement with demand centers. For instance, consumer goods giants like Unilever have launched localized sourcing hubs in Southeast Asia and Africa to cater to regional preferences and reduce transportation delays. In Indonesia, Unilever sources 80% of its palm oil locally, cutting logistics costs by 25% while adapting products to local tastes (Ruysschaert, et al., 2019). This strategy also mitigates currency risks; by procuring in local currencies, firms like Nestlé have reduced foreign exchange exposure by up to 18% in emerging markets (Naidu, 2023).

However, this strategy assumes a stable geopolitical environment and predictable macroeconomic conditions—an assumption that has been increasingly challenged in recent years. Since the late 2010s, rising geopolitical tensions—including trade wars, sanctions, and regional conflicts—have disrupted traditional procurement models. The U.S.-China trade war (2018–2020), for instance, introduced tariffs exceeding 25% on $550 billion worth of goods (Wong & Katy, 2020), eroding cost savings and forcing firms to reevaluate sourcing strategies. Concurrently, macroeconomic instability, including inflationary pressures and currency fluctuations, have compounded risks. (Riaz, et al., 2025), for instance, report that global supply chain disruptions contributed to a 1.5% rise in consumer prices in advanced economies, while emerging markets faced even sharper spikes. Such conditions have accelerated a shift from "just-in-time" to "just-in-case" inventory management, with firms prioritizing resilience over lean efficiency (Zhang & Doan, 2023).

The consequences of these shifts are evident across multiple sectors. In the semiconductor industry, U.S. sanctions against Chinese tech giant Huawei forced the company to stockpile chips at a cost of $20 billion in 2020 (Bloomberg, 2020), while automakers worldwide faced $210 billion in lost revenue due to pandemic-related chip shortages (Wayland, 2021). Similarly, the Russia-Ukraine war triggered energy market turmoil, with European manufacturers paying 300% more for natural gas in 2022 (IEA, 2024), prompting the reshoring of energy-intensive industries to more stable regions such as North America. These examples illustrate how geopolitical shocks act as "multipliers" of macroeconomic risk, undermining the viability of long-distance supply chains.

Implications for Global Supply Chains: Resilience vs. Efficiency

The evolving landscape demands a balance between efficiency and resilience. As noted by (Linati, 2021), "The era of uncritical globalization is over; firms must now adopt a strategy of 'glocalization'—global integration with local adaptation." Consequently, this shift has manifested in three key trends:

Nearshoring: Companies like Apple and Toyota are investing in production facilities closer to key markets, reducing transit times and tariff exposure. Mexico's share of U.S. imports rose to 6.4% in 2024 totalling $505.9 billion, up from $30.6 billion in 2023 marking United States' top goods trading partner (USTR, 2024).

Supplier Diversification: Firms are expanding their supplier bases beyond traditional hubs. The European Union's Critical Raw Materials Act (2023) aims to ensure that no more than 65% of any critical mineral is sourced from a single country by 2030 (EUC, 2024).

Digitalization: AI-driven tools and blockchain technology are being deployed to enhance supply chain transparency and predict disruptions. Gartner (2023) estimates that by 2025, 50% of large firms will use AI for risk analytics, up from 15% in 2020.

Conclusion: A New Era of Strategic Procurement

Geopolitical tensions and macroeconomic volatility have irrevocably altered the procurement landscape. While global sourcing remains a cornerstone of MNC strategy, its execution now requires a nuanced approach that prioritizes agility, redundancy, and political risk assessment. As economist Nouriel Roubini (2022) warned, "In a fractured world, supply chains must be as flexible as the geopolitical faults they cross." Firms that fail to adapt risk not only financial losses

but also strategic irrelevance in an era defined by unpredictability. The path forward lies in hybrid models—blending global reach with localized contingencies—to achieve both stability and sustainability.

Geopolitical Tensions, Macroeconomic Stability, and Demand Forecasting

Besides dynamics linked to procurement, the evolving landscape of geopolitical instability continues to present profound challenges to demand forecasting as well, necessitating adaptive strategies that mitigate the risks associated with macroeconomic volatility. In particular, the unpredictability of trade relations, supply chain disruptions, and regulatory realignments underscores the complexities of projecting future demand with precision. Given that procurement strategies often hinge on stable and predictable market conditions, the heightened uncertainty resulting from geopolitical tensions introduces significant obstacles in aligning supply with fluctuating demand patterns.

Geopolitical risks have been widely acknowledged as a primary driver of demand volatility, influencing both short-term consumption patterns and long-term investment decisions (Parray, et al., 2024). Trade wars, economic sanctions, and armed conflicts disrupt traditional supply-demand equilibria, thereby complicating forecasting efforts. For instance, the ongoing trade tensions between the United States and China have led to abrupt shifts in supply chain networks, forcing firms to recalibrate their demand models in response to tariff fluctuations and shifting trade policies (Handfield, et al., 2020). Similarly, the Russia-Ukraine conflict has significantly impacted global energy and agricultural markets, leading to unforeseen spikes in commodity prices and demand fluctuations across interconnected economies (Jones, et al., 2022). Such disruptions underscore the challenges of maintaining forecast accuracy in the face of external shocks that alter both supply availability and consumer behavior.

In addition to direct geopolitical disruptions, trade policies play a pivotal role in shaping demand planning. Sudden changes in tariffs, export restrictions, and regulatory barriers can render previously reliable demand forecasts obsolete, compelling businesses to adopt more dynamic and responsive forecasting models. For example, the renegotiation of trade agreements, such as the transition from NAFTA to USMCA, altered supply chain structures, thereby necessitating recalibrations in demand projections for industries reliant on cross-border trade (Trejo-Nieto, 2023). Moreover, Brexit introduced substantial uncertainty for businesses operating in the UK and EU markets, as regulatory misalignment and customs delays added further unpredictability to demand signals (Casadei & Iammarino, 2021).

The strategic importance of critical raw materials further exacerbates demand uncertainty, particularly in industries reliant on scarce resources concentrated in politically sensitive regions. For instance, the global semiconductor shortage, fueled by both geopolitical tensions and supply chain constraints, exemplifies how dependencies on specific materials can create cascading effects on demand forecasting. A notable example is the U.S. restrictions on semiconductor exports to China, which disrupted supply chains for major technology firms, forcing them to revise demand models to accommodate fluctuating supply availability. Particularly, in October 2022, the U.S. imposed sweeping export controls, restricting China's access to advanced semiconductor technology. Consequently, China's semiconductor imports fell by 20% in 2023 (Trueman, 2024), leading firms such as Huawei and SMIC to reassess production capabilities and adjust long-term procurement strategies. The unpredictability in semiconductor availability forced companies across various industries—including automotive and consumer electronics—to shift from just-in-time (JIT) models to more conservative demand forecasting approaches, incorporating higher safety stock levels to mitigate future disruptions.

Simultaneously, China's dominance in rare earth metal production further exacerbates forecasting uncertainties. As the country supplies nearly 34% of the world's rare earth metals (Reuters, 2023), any geopolitical maneuvering can significantly impact demand planning. A critical instance occurred in 2010 when China reduced rare earth exports by 40%, causing neodymium and dysprosium prices to surge by over 700% within a year (Bohlsen, 2019). This sudden price volatility led companies in renewable energy and high-tech manufacturing to overhaul their demand models, incorporating risk-adjusted forecasts that accounted for potential material shortages. In response, firms sought alternative sourcing strategies, such as Japan's investment in Australian rare earth projects, to reduce dependency on Chinese suppliers.

The restricted access to rare earth metals—essential for electronics and renewable energy technologies—demonstrates the vulnerability of demand planning to geopolitical maneuvering, particularly as nations impose export controls or prioritize domestic industries. As seen in the semiconductor sector, firms are consequently increasingly adopting scenario-based forecasting techniques, leveraging AI-driven predictive analytics to assess potential supply chain shocks and develop contingency strategies that enhance resilience (Buchholz, et al., 2022). Consequently, firms must explore alternative sourcing strategies, such as supplier diversification and nearshoring, to mitigate risks associated with geopolitical dependencies and enhance forecast reliability.

Furthermore, geopolitical instability compromises supply chain visibility, thereby affecting the accuracy of demand signals. The opacity of supply networks in conflict-prone regions, where infrastructure is often unreliable and data reporting mechanisms are weak, creates significant challenges in obtaining accurate and timely demand information (Kalaiarasan, et al., 2022). For instance, the ongoing conflict in Ukraine has disrupted key supply routes for critical commodities such as wheat, fertilizers, and industrial metals, making it difficult for businesses to anticipate shortages and adjust procurement strategies accordingly. Similarly, in politically volatile regions such as the Middle East, where trade routes are vulnerable to blockades or attacks on key infrastructure, businesses struggle to obtain real-time logistics data, leading to increased forecast errors and inventory mismatches.

Moreover, opaque supply chains, particularly in industries reliant on rare earth minerals, exacerbate demand forecasting difficulties. The Democratic Republic of the Congo, which supplies over 70% of the world's cobalt (World Bank, 2021)—a key material for electric vehicle batteries—frequently experiences political instability and unregulated mining practices, making supply chains unpredictable. The lack of transparency in sourcing and export flows means that manufacturers must either stockpile materials or secure alternative suppliers, both of which introduce volatility in demand projections.

Artificial intelligence and predictive analytics have emerged as crucial tools for enhancing visibility amid uncertainty, enabling firms to adjust forecasts dynamically in response to geopolitical developments (Ivanov, et al., 2019). However, challenges persist in integrating fragmented data sources across global supply chains, particularly when dealing with suppliers operating in politically volatile markets.

As geopolitical tensions drive firms to reconsider their sourcing and manufacturing strategies, the ongoing debate between regionalization and globalization adds another layer of complexity to demand forecasting. Nearshoring and friendshoring efforts, driven by the desire to mitigate geopolitical risks, alter the traditional flow of goods and services, thereby reshaping demand patterns (Ruban, 2023). For instance, the expansion of trade alliances, such as the BRICS coalition, has introduced new market dynamics that influence global demand projections, requiring firms to adapt their forecasting models accordingly. Multinational corporations with operations in BRICS nations are adjusting their inventory strategies and regional distribution models to align with evolving trade policies and economic agreements, ensuring greater flexibility in responding to demand variability. Consequently, firms are now reevaluating their forecasting methodologies to account for shifting trade patterns and emerging consumer markets. Many businesses are integrating geopolitical risk analysis into their demand forecasting models, leveraging AI-driven predictive analytics and scenario planning to anticipate fluctuations in trade flows. Additionally, companies are diversifying their supplier networks and exploring nearshoring options to reduce reliance on markets affected by shifting trade alliances (Azevedo, et al., 2024).

Energy security remains a critical concern in demand forecasting, as geopolitical conflicts continue to disrupt energy supply chains and create volatility in fuel prices. The impact of such instability is particularly pronounced in industries reliant on stable energy inputs, where fluctuations in oil and gas prices necessitate continuous adjustments in demand forecasts (Yergin, 2020). Furthermore, the transition toward renewable energy sources introduces additional forecasting challenges, as shifting regulatory frameworks and investment incentives influence demand projections across industrial sectors.

Finally, economic sanctions and trade restrictions imposed on politically isolated nations introduce further uncertainty in demand forecasting. Countries such as Iran, Venezuela, and Russia have faced significant disruptions in their trade flows, compelling businesses operating in these markets to reassess their forecasting approaches (Evenett & Fritz, 2022). In response, firms have adopted adaptive strategies, such as scenario-based forecasting and market diversification, to navigate the complexities of operating under sanctions-induced constraints.

In light of these considerations, the interconnection between geopolitical instability, macroeconomic volatility, and demand uncertainty necessitates a more agile and resilient approach to forecasting. By integrating advanced analytical tools, diversifying supply networks, and adopting flexible demand planning strategies, firms can enhance their ability to navigate the unpredictable nature of global markets. As geopolitical tensions continue to shape the economic landscape, the ability to anticipate and respond to demand fluctuations will remain a critical determinant of supply chain resilience and business sustainability.

Geopolitical Tensions, Macroeconomic Stability, and Inventory Management

Building upon the challenges posed by geopolitical instability and economic uncertainty in demand forecasting, inventory management emerges as a critical function that is significantly shaped by these external forces as well. In an era where global supply chains are increasingly susceptible to trade disputes, resource constraints, and shifting alliances, firms must adopt strategies that balance cost-efficiency with resilience. The following discussion explores how various aspects of inventory management are influenced by geopolitical risks and macroeconomic fluctuations.

Geopolitical Disruptions and Inventory Buffer Strategies

Inventory strategies must accommodate the uncertainties stemming from geopolitical tensions, including trade wars, sanctions, and armed conflicts. Firms operating in politically sensitive regions often face sudden supply chain disruptions that necessitate adjustments in inventory stocking decisions (Tang & Veelenturf, 2019). For example, the semiconductor industry has seen heightened volatility due to U.S.-China trade restrictions, prompting companies to stockpile critical components to mitigate supply interruptions (Tan, 2025). This shift underscores the inherent trade-off between lean inventory practices, which prioritize cost reduction, and resilience-focused approaches that emphasize safety stock and redundancy, approaches well advocated as far back as a decade ago (Maslaric, et al., 2013). Consequently, firms must continually evaluate their exposure to geopolitical risks and recalibrate inventory levels to maintain operational continuity.

Trade Policies and Inventory Management Adjustments

The imposition of tariffs, export controls, and regulatory changes influences how firms position and distribute their inventory. Sudden shifts in trade policies, such as Brexit and the transition from NAFTA to USMCA, have forced businesses to reconsider warehouse locations and sourcing strategies (Wieland, 2021). Particularly, a surge in online retailing during this period drove increased stockpiling of goods, compelling businesses in certain sectors to secure additional storage space to accommodate larger inventories, often for extended durations.

The use of bonded warehouses and free trade zones has emerged as a viable strategy to navigate policy-induced

disruptions, allowing companies to defer customs duties and gain greater flexibility in inventory deployment. Bonded warehouses enable firms to store imported goods without immediate tax obligations (MIC, 2025), thereby reducing financial strain and enhancing cash flow management. This approach provides businesses with the agility to redirect inventory based on evolving market conditions, ensuring that stock remains strategically positioned without incurring unnecessary costs. For instance, in the wake of Brexit-related uncertainty, several UK and EU-based companies increasingly relied on bonded warehouses to hold goods duty-free until new trade regulations were clarified, thereby mitigating the risk of sudden tariff hikes and customs-related bottlenecks (McMahon, 2023). Similarly, free trade zones (FTZs) offer a mechanism through which businesses can process, assemble, or store goods under favorable regulatory conditions before entering domestic markets. These zones play a crucial role in helping firms adapt to shifting trade policies, as seen in the case of electronics manufacturers that have rerouted supply chains through FTZs in Vietnam and Mexico to assemble and store products, effectively circumventing heavy tariffs imposed on direct US-China imports (Sturgeon & Zylberberg, 2016). The strategic use of bonded warehouses and FTZs enhances supply chain resilience by enabling companies to adjust inventory distribution in response to geopolitical instability while maintaining supply chain continuity. Moreover, by positioning critical materials closer to key consumer markets, businesses can improve demand responsiveness and mitigate disruptions caused by unpredictable trade policies. Consequently, these trade facilities serve as essential components in optimizing inventory management and ensuring supply chain stability amid an increasingly volatile global trade environment. Additionally, organizations are adopting more regionally dispersed inventory strategies to mitigate the risks associated with protectionist policies, ensuring that goods remain accessible despite evolving regulatory landscapes (Gereffi & Lee, 2016).

Regionalization vs. Globalization and Inventory Allocation

Geopolitical uncertainty has accelerated the shift from globalization to regionalization, with firms reconsidering the geographical distribution of their inventory. The trend toward nearshoring and friendshoring seeks to reduce dependency on politically unstable regions, leading to a reconfiguration of supply chain networks (Handfield et al., 2020). As a result, inventory placement decisions must account for the implications of reduced global interconnectivity, often requiring firms to invest in local storage facilities to buffer against external shocks (Seric & Winkler, 2020). This transition also contributes to a re-evaluation of just-in-time (JIT) versus just-in-case (JIC) inventory models, with firms increasingly favoring resilience over efficiency in uncertain geopolitical climates.

Critical Resource Dependencies and Strategic Stockpiling

The control of essential resources by specific nations introduces vulnerabilities in inventory planning, particularly for industries reliant on rare earth metals, crude oil, and agricultural commodities. Governments and businesses alike have recognized the importance of strategic stockpiling to safeguard against supply shortages caused by geopolitical disputes (Van den Bossche et al., 2022). For instance, the U.S. government has encouraged semiconductor stockpiling to reduce dependency on Asian suppliers amid rising geopolitical tensions (Brown & Goolsbee, 2021). Such measures highlight the evolving role of inventory management as a tool for both corporate and national security.

Supply Chain Visibility and Inventory Risks Amid Political Instability

Political instability exacerbates the challenge of maintaining supply chain visibility, as disruptions in conflict-prone regions can hinder real-time tracking of inventory flows. Advances in artificial intelligence (AI), blockchain, and real-time monitoring technologies have provided firms with enhanced capabilities to anticipate and respond to geopolitical risks (Saberi et al., 2019). However, obtaining reliable demand signals remains problematic in opaque supply chains where data accessibility is limited (Ivanov, 2021). As firms seek to fortify their inventory risk management strategies, investment in digital transparency tools becomes a crucial enabler of supply chain resilience.

Energy Security and Inventory Costs

The volatility of energy markets, often driven by geopolitical conflicts, has direct implications for inventory holding costs and warehouse operations. Supply chain disruptions in major oil-producing regions have historically led to fluctuations in fuel prices, subsequently affecting logistics costs and storage expenses (Yao et al., 2020). Additionally, firms operating in energy-intensive industries must align their inventory decisions with evolving renewable energy policies, as governments worldwide push for sustainable energy transitions that may alter production and distribution dynamics (Jenkins et al., 2021).

Currency Fluctuations and Inventory Valuation Amid Geopolitical Uncertainty

Exchange rate volatility resulting from geopolitical crises introduces complexities in inventory pricing and valuation. Firms engaged in international trade often face fluctuating procurement costs due to currency depreciation or inflationary pressures driven by macroeconomic instability (Gopinath, 2020). To mitigate these risks, businesses employ hedging strategies that stabilize inventory costs and protect profit margins in politically volatile environments (Broll & Eckwert, 2021). Furthermore, inflationary trends linked to geopolitical events can influence working capital requirements, necessitating adaptive financial planning in inventory management.

Sanctions and Inventory Shortages in Restricted Markets

Economic sanctions impose constraints on inventory availability, particularly for firms operating in or sourcing from restricted regions. Countries subject to trade embargoes, such as Iran and Venezuela, have experienced widespread inventory shortages due to reduced access to global supply chains (Evenett, 2020). In response, businesses often explore alternative procurement routes, leveraging intermediary markets or adjusting product specifications to circumvent restrictions (Rodrik, 2018). However, such adaptations also heighten the risk of counterfeit goods entering supply chains, posing quality and compliance challenges for inventory management (Fernandes & Tang, 2021).

3. Conclusion

The interplay between geopolitical tensions, macroeconomic stability, and inventory management necessitates a strategic approach that balances cost efficiency with resilience. As firms navigate the complexities of trade disruptions, resource dependencies, and policy shifts, inventory strategies must evolve to accommodate emerging risks. Technological advancements, alternative sourcing mechanisms, and regionally adaptive inventory policies will play an increasingly vital role in shaping supply chain resilience amid ongoing geopolitical uncertainties. Future research should further explore the long-term impact of shifting geopolitical alliances on inventory optimization models and supply chain network configurations.

References

[1] Akbari, M. (2024). Outsourcing in supply chain management. *The Palgrave Handbook of Supply Chain Management*, 845-871.

[2] Azevedo, D., Bakliwal, S., Chen, C., Gilbert, M., Koch-Weser, I., Lang, N., & McAdoo, M. (2024, April 29). *An Evolving BRICS and the Shifting World Order*. Retrieved from www.bcg.com: https://www.bcg.com/publications/2024/brics-enlargement-and-shifting-world-order

[3] Bloomberg. (2020, October 22). *Huawei Outhustles Trump by Hoarding Chips Vital for China 5G*. Retrieved from www.bloomberg.com: https://www.bloomberg.com/news/articles/2020-10-22/huawei-outhustles-trump-by-stockpiling-chips-needed-for-china-5g

[4] Bohlsen, M. (2019, July 22). *Investor Intel: The U.S. rare earths saga continues….* Retrieved from www.murkowski.senate.gov: https://www.murkowski.senate.gov/press/article/investor-intel-the-us-rare-earths-saga-continues#:~:text=2006%2D10%20%E2%80%93%20China%20imposed%20rare,month%20period%20in%20H1%2C%202011.

[5] Boylan, B. M., McBeath, J., & Wang, B. (2021). US–China relations: Nationalism, the trade war, and COVID-19. *Fudan Journal of the Humanities and Social Sciences*, https://dx.doi.org/10.1007/s40647-020-00302-6.

[6] Buchholz, P., Schumacher, A., & Al Barazi, S. (2022). Big data analyses for real-time tracking of risks in the mineral raw material markets: implications for improved supply chain risk management. *Mineral Economics*, https://dx.doi.org/10.1007/s13563-022-00337-z.

[7] Casadei, P., & Iammarino, S. (2021). Trade policy shocks in the UK textile and apparel value chain: Firm perceptions of Brexit uncertainty. *Journal of International Business Policy*, https://dx.doi.org/10.1057/s42214-020-00097-z.

[8] EUC. (2024). *European Critical Raw Materials Act*. Retrieved from commission.europa.eu: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan/european-critical-raw-materials-act_en

[9] Gereffi, G., & Lee, J. (2016). Economic and social upgrading in global value chains and industrial clusters: Why governance matters. *Journal of business ethics*, https://dx.doi.org/10.1007/s10551-014-2373-7.

[10] Glencross, A. (2024). The geopolitics of supply chains: EU efforts to ensure security of supply. *Global Policy*, 729-739.

[11] Guerrieri, V., Lorenzoni, G., Straub, L., & Werning, I. (2022). Macroeconomic implications of COVID-19: Can negative supply shocks cause demand shortages? *American Economic Review*, https://dx.doi.org/10.1257/aer.20201063.

[12] Gunasekaran, A., Subramanian, N., & Rahman, S. (2015). Supply chain resilience: role of complexities and strategies. *International Journal of Production Research*, https://dx.doi.org/10.1080/00207543.2015.1093667.

[13] Handfield, R. B., Graham, G., & Burns, L. (2020). Corona virus, tariffs, trade wars and supply chain evolutionary design. *International Journal of Operations & Production Management*, https://dx.doi.org/10.1108/IJOPM-03-2020-0171.

[14] IEA. (2024). *Analysing the impacts of Russia's invasion of Ukraine on energy markets and energy security*. Retrieved from www.iea.org: https://www.iea.org/topics/russias-war-on-ukraine

[15] ILO. (2016). *Wages and productivity in the garment sector in Asia and the Pacific and the Arab States.* Retrieved from www.ilo.org: https://www.ilo.org/media/430096/download

[16] Ivanov, D., Dolgui, A., Das, A., & Sokolov, B. (2019). Digital supply chain twins: Managing the ripple effect, resilience, and disruption risks by data-driven optimization, simulation, and visibility. *Handbook of ripple effects in the supply chain*, https://dx.doi.org/10.1007/978-3-030-14302-2_15.

[17] Jones, C., Kilpatrick, J., & Maccanico, Y. (2022). At what cost? Funding the EU's security, defence, and border policies, 2021–2027. *Amsterdam: Transnational Institute*.

[18] Kalaiarasan, R., Olhager, J., Agrawal, T. K., & Wiktorsson, M. (2022). The ABCDE of supply chain visibility: A systematic literature review and framework. *International Journal of Production Economics*, https://dx.doi.org/10.1016/j.ijpe.2022.108464.

[19] Linati, G. (2021). Glocalisation in manufacturing: Redesigning supply chains.

[20] Maslaric, M., Backalic, T., Nikolicic, S., & Mircetic, D. (2013). Assessing the trade-off between lean and resilience through supply chain risk management. *International Journal of Industrial Engineering and Management*, https://dx.doi.org/10.24867/ijiem-2013-4-128.

[21] McMahon, P. (2023). *Customs Warehousing*. Retrieved from http://brexitlegalguide.co.uk/: http://brexitlegalguide.co.uk/customs-warehousing/

[22] MIC. (2025). *Bonded Warehouse*. Retrieved from www.mic-cust.com: https://www.mic-cust.com/products-services/customs-compliance-software/special-customs-procedures-including-inventory-management/bonded-warehouse/#:~:text=MIC%2DCUST%C2%AE%20BWH%20for,Optimized%20Duty%20Calculations

[23] Mirrlees, T. A. (2024). The US and China's digital tech war: A new rivalry within and beyond the US empire. *Socialist Register*, 105-140.

[24] Montoya-Torres, J. R. (2021). Managing disruptions in supply chains. *Service Oriented, Holonic and Multi-Agent Manufacturing Systems for Industry of the Future: Proceedings of SOHOMA LATIN AMERICA 2021*, 272-284.

[25] Naidu, R. (2023, June 26). *Nestle ramps up Nigeria raw material sourcing to reduce foreign-exchange exposure*. Retrieved from www.reuters.com: https://www.reuters.com/business/retail-consumer/nestle-ramps-up-nigeria-raw-material-sourcing-forex-squeeze-bites-2023-06-26/

[26] O'Byrne, R. (2025, Feb 2). *8 Biggest Risks when Outsourcing to a Low Country like China?* Retrieved from www.logisticsbureau.com: https://www.logisticsbureau.com/low-cost-country-sourcing-risks/

[27] Parray, W. A., Soudager, M. A., Dada, Z. A., Yasmin, E., & Darzi, T. A. (2024). Impact of geopolitical risk on tourism demand: evidence from asymmetric NARDL approach. *Journal of Hospitality and Tourism Insights*, 2546-2559.

[28] Porter, M. E. (1990). New global strategies for competitive advantage. *Planning review*, https://dx.doi.org/10.1108/eb054287.

[29] Posen, A. (2024, June). *Geopolitics Is Corroding Globalization*. Retrieved from www.imf.org: https://www.imf.org/en/Publications/fandd/issues/2024/06/Geopolitics-Corroding-Globalization-Adam-S-Posen

[30] Reuters. (2023, December 21). *China's rare earths dominance in focus after it limits germanium and gallium exports*. Retrieved from www.reuters.com: https://www.reuters.com/markets/commodities/chinas-rare-earths-dominance-focus-after-mineral-export-curbs-2023-07-05/

[31] Riaz, A., Ullah, A., & Muhammad, B. (2025). The impact of global supply chain pressure on the stock market: A sectoral view. *Humanities and Social Sciences Communications*, https://doi.org/10.1057/s41599-025-04634-0.

[32] Roscoe, S., Aktas, E., Petersen, K. J., Skipworth, H. D., Handfield, R. B., & Habib, F. (2022). Redesigning global supply chains during compounding geopolitical disruptions: the role of supply chain logics. *International Journal of Operations & Production Management*, https://dx.doi.org/10.1108/IJOPM-12-2021-0777.

[33] Ruban, O. (2023, September 13). *Nearshoring, Friendshoring and Reshoring: Heads Up to Equity Allocators*. Retrieved from www.msci.com: https://www.msci.com/www/blog-posts/nearshoring-friendshoring-and/04065519030

[34] Ruysschaert, D., Carter, C., & Cheyns, E. (2019). Territorializing effects of global standards: What is at stake in the case of 'sustainable'palm oil? *Geoforum*, 1-12.

[35] Short, J. L., Toffel, M. W., & Hugill, A. R. (2016). Monitoring global supply chains. *Strategic Management Journal*, https://dx.doi.org/10.1002/smj.2417.

[36] Simplay, S., & Hansen, Z. (2014). Offshoring of engineering services: A case study from the automotive industry. *Proceedings of the DESIGN 2014 13th International Design Conference*, 1999-2010.

[37] Sturgeon, T., & Zylberberg, E. (2016). The global information and communications technology industry: where Vietnam fits in global value chains. *World Bank Policy Research Working Paper*, https://dx.doi.org/10.1596/1813-9450-7916.

[38] Tan, H. (2025, January 16). *China has been stockpiling a key US crop before Trump takes office*. Retrieved from africa.businessinsider.com: https://africa.businessinsider.com/politics/china-has-been-stockpiling-a-key-us-crop-before-trump-takes-office/3vsfrzg#:~:text=China%20is%20stockpiling%20more%20than,calculations%20of%20official%20customs%20data.&text=Buyers%20from%20China%20%E2%80%94%20t

[39] Tang, C. S., & Veelenturf, L. P. (2019). The strategic role of logistics in the industry 4.0 era. *Transportation Research Part E: Logistics and Transportation Review*, https://dx.doi.org/10.1016/j.tre.2019.06.004.

[40] Thomas, K. P., & Thomas, K. P. (2011). The Spread of Investment Incentives to Developing Countries. *Investment Incentives and the Global Competition for Capital*, 109-130.

[41] Trejo-Nieto, A. (2023). The political economy of a North–South trade agreement and the development prospects for Mexico: from NAFTA to USMCA. *Area Development and Policy*, https://dx.doi.org/10.1080/23792949.2022.2107034.

[42] Trueman, C. (2024, January 18). *US sanctions impact Chinese chip imports, but universities skirting restrictions*. Retrieved from www.datacenterdynamics.com: https://www.datacenterdynamics.com/en/news/us-sanctions-impact-chinese-chip-imports-but-universities-skirting-restrictions/#:~:text=Declines%20in%20revenue%20for%20Intel,companies%20without%20disclosing%20its%20involvement.

[43] USTR. (2024). *Mexico Trade Summary*. Retrieved from ustr.go: https://ustr.gov/countries-regions/americas/mexico

[44] Wayland, M. (2021, September 23). *Chip shortage expected to cost auto industry $210 billion in revenue in 2021*. Retrieved from www.cnbc.com: https://www.cnbc.com/2021/09/23/chip-shortage-expected-to-cost-auto-industry-210-billion-in-2021.html

[45] Wong, D., & Katy, A. C. (2020, August 25). *The US-China Trade War: A Timeline*. Retrieved from www.china-briefing.com: https://www.china-briefing.com/news/the-us-china-trade-war-a-timeline/

[46] World Bank. (2021, June). *Cobalt in the Democratic Republic of Congo.* Retrieved from documents1.worldbank.org: https://documents1.worldbank.org/curated/en/099500001312236438/pdf/P1723770a0f570093092050c1bddd6a29df.pdf

[47] Xia, L., & Lorente-Salabarria, J. (2023). Which economies are to benefit from China's industry relocation. *BBVA Research, Industry*.

[48] Yergin, D. (2020). *The new map: Energy, climate, and the clash of nations.* Penguin Uk.

[49] Zhang, H., & Doan, T. T. (2023, September 1). *From just-in-time to just-in-case: Global sourcing and firm inventory after the pandemic*. Retrieved from cepr.org: https://cepr.org/voxeu/columns/just-time-just-case-global-sourcing-and-firm-inventory-after-pandemic

[50] Zhou, X. Y., Lu, G., Xu, Z., Yan, X., Khu, S. T., Yang, J., & Zhao, J. (2023). Influence of Russia-Ukraine war on the global energy and food security. *Resources, Conservation and Recycling*, https://dx.doi.org/10.1016/j.resconrec.2022.106657.