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Global Trends in Logistics: The Impact of Geopolitical Factors on Supply Chains

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Abstract: This article examines key geopolitical factors influencing global supply chains in the modern world. It analyzes trade wars, sanctions, and political tensions that disrupt logistics operations and compel companies to reconsider their production and distribution strategies. Special attention is given to risk mitigation mechanisms, including supplier and market diversification, the formation of strategic reserves, the implementation of new monitoring technologies, and the reconfiguration of supply chains through regionalization and nearshoring. The study consolidates recommendations to enhance the resilience and flexibility of logistics systems in an environment of increasing geopolitical uncertainty. The scholarly contribution of this work lies in the systematization of contemporary approaches to managing geopolitical risks in logistics and the development of an integrated model for a resilient supply chain.

Keywords: Agile methodologies, customer orientation, massage studio, operational process, optimization, resource management, digitalization, workplace ergonomics.

Introduction: Global supply chains have become an integral part of the modern economy due to decades of globalization. Production and trade are now distributed across multiple countries; for example, product development may take place in the United States, components may be manufactured in Japan, and final assembly may occur in China [1]. This fragmentation of production, known as global value chains, has enabled companies to achieve high efficiency and cost reduction. However, growing interdependence has also made supply chains vulnerable to external shocks, particularly geopolitical factors. Political tensions, trade conflicts, and sanctions can instantly disrupt

established logistics networks.

In recent years, the geopolitical landscape has significantly intensified. Trade wars, primarily between the United States and China, have resulted in the imposition of reciprocal tariffs on goods worth hundreds of billions of dollars [1]. Sanctions have become a widely used tool for exerting pressure in international conflicts and disputes. For instance, in 2023, the United States tightened export restrictions on semiconductor supplies to China, prompting China to impose export limitations on rare earth materials, which are critical for electronics [2]. Such events have increased uncertainty in global trade and forced companies to reconsider their global logistics strategies. Moreover, the COVID-19 pandemic and its related cargo movement restrictions have exposed the fragility of existing just-in-time models. As a result, ensuring supply chain resilience in the face of geopolitical instability has become a priority for businesses and governments alike.

The relevance of this topic is supported by research findings. Smyrnov et al. (2025) note that in recent years, international conflicts, political changes, and economic sanctions in Europe have had a significant impact on global transport and logistics networks, creating various obstacles [3]. According to another study, geopolitical tensions and the pandemic have dealt a severe blow to global supply chains, causing unprecedented disruptions, rising costs, and situations where some countries found themselves nearly powerless in the face of large-scale challenges [4]. Specifically, increasing tariffs, trade restrictions, and sanctions are fragmenting supply chains, driving up costs, and limiting companies' access to markets [4]. These findings indicate that geopolitical risks are no longer an abstract threat but have become tangible factors shaping global logistics strategies.

The objective of this study is to conduct a comprehensive analysis of global logistics trends under the influence of geopolitical factors. The main section examines how specific geopolitical events—such as trade wars and sanctions—impact international supply chains, with a focus on examples from the United States and the European Union. Additionally, strategies employed by companies and governments to mitigate these risks and enhance the resilience of logistics networks are analyzed.

The scholarly contribution of this work lies in synthesizing contemporary data and forming a holistic view of the impact of geopolitics on logistics, as well as interpreting the findings from a risk management perspective. Generalized recommendations are proposed to improve supply chain resilience in the evolving global landscape. Thus, this study integrates an analysis of current sources, which holds significance for both logistics management theory and practice.

1. Geopolitical challenges and their impact on global supply chains

Foreign policy decisions of states directly affect global trade and logistics. Key geopolitical risk factors include international conflicts (military actions, border disputes), economic sanctions, trade and tariff policies (tariff increases, trade restrictions), as well as broader phenomena such as the rise of protectionism and the breakdown of international agreements. Unlike traditional risks (e.g., natural disasters), geopolitical risks involve deliberate human intervention and can have long-term consequences. Politically motivated trade barriers can restructure trade and raw material flows that have been developed over decades.

Recent studies highlight the growing role of geopolitics in supply chain disruptions. According to Smyrnov et al., political instability, armed conflicts, and sanctions lead to direct failures in global supply chains, forcing companies to reroute shipments and seek alternative suppliers and logistics routes [3]. Similarly, Incekara & Incekara indicate that geopolitical tensions, including trade conflicts and regulatory changes, are among the main drivers of rising supply chain costs [4]. In other words, political decisions by states have direct economic effects, disrupting the rhythm of international logistics.

One of the most striking examples of geopolitical influence on logistics is the trade war between the United States and China, which began in 2018. Between 2018 and 2019, the two largest economies in the world imposed reciprocal tariffs on nearly half of their bilateral trade. The weighted average tariffs imposed by the United States on Chinese goods increased from 3.1% to 19.3%, while Chinese tariffs on American goods rose from 8% to 20.3% [1]. These tariffs affected approximately $550 billion worth of Chinese imports into the United States and $185 billion worth of American exports to China [1]. These measures significantly increased costs for companies whose supply chains relied on bilateral trade. The most affected sectors included high-tech industries, where production chains are deeply integrated across countries, from electronics to automotive manufacturing.

The consequences of the trade war were reflected in global logistics flows. Companies with production operations in China faced rising costs and delays. Many were forced to urgently shift orders to other countries or pay surcharges for emergency adjustments to supply

routes [2]. As a result, China's share in U.S. foreign trade began to decline. In 2018, China accounted for more than 21% of U.S. merchandise trade, but by 2023, this figure had dropped to approximately 14% [5]. At the same time, trade volumes between the United States and neighboring countries increased. Mexico emerged as the United States' largest trading partner, surpassing both China and Canada [5].

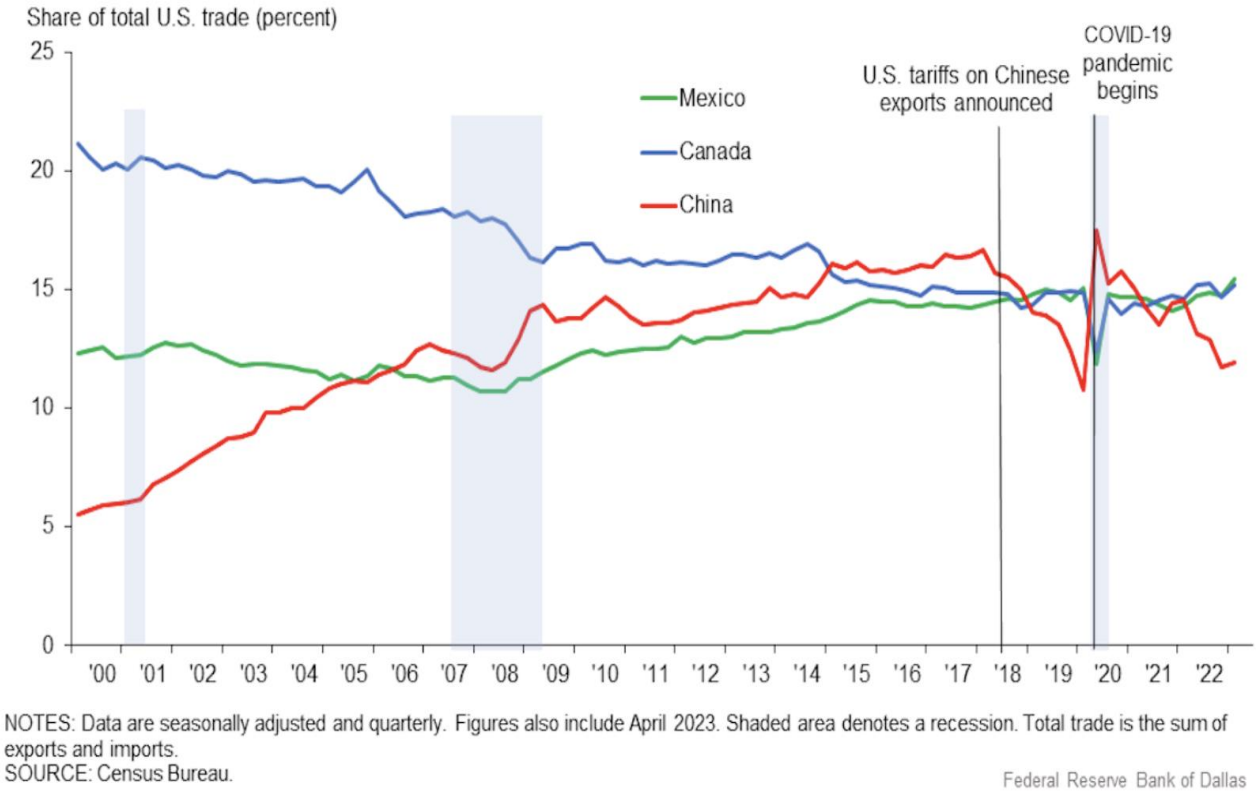

Figure 1. Share of China (red line), Mexico (green), and Canada (blue) in total U.S. trade, 2000–2022. After 2018—the start of the trade war—China's share declined, while Mexico's share increased, reaching the top position. Source: U.S. Census Bureau, Federal Reserve Bank of Dallas data [6].

Figure 1 illustrates how geopolitical decisions, such as the introduction of tariffs in 2018, reshaped supply chain structures: China's share in U.S. trade sharply declined, while closer partners such as Mexico and Canada filled the gap. This shift indicates a trend toward regionalization of supply chains driven by political risks. U.S. companies began restructuring their supply chains by switching to suppliers from countries with more predictable trade policies or geographical proximity. For example, electronics and apparel manufacturers relocated part of their orders from China to Vietnam, India, and Mexico [2]. A similar process occurred in the European Union following Brexit: The United Kingdom's exit from the EU introduced customs formalities, prompting European firms to seek new logistics partners within the bloc or redirect trade flows.

Another powerful geopolitical factor affecting logistics is sanctions. Sanctions impose restrictions on trade, investments, and financial operations, introduced by states or international organizations in response to specific actions by violating countries. In recent years, sanctions regimes have affected major economies and key resources, which has inevitably impacted global supply chains.

For example, U.S. and EU sanctions against Iran and Venezuela restricted oil exports from these countries. For global supply chains, this meant a restructuring of energy commodity flows: European consumers had to replace Iranian oil with supplies from other regions, increasing the burden on tanker transportation and altering traditional routes. Sanctions against Chinese high-tech companies, such as Huawei, limited their access to critically important components (semiconductors, software) [2], forcing Chinese companies to seek new suppliers and develop their own solutions. In response, China threatened to restrict the export of rare earth elements, which are almost monopolized in its territory and are critically important for electronics and electric vehicle production [2]. This escalation of sanctions threatens entire industrial

supply chains, from smartphone manufacturing to green energy, which depends on rare materials.

Military conflicts and political instability also severely impact logistics. Armed clashes near key trade routes, such as the Suez Canal or the Strait of Hormuz, can disrupt shipping and cause delivery delays across thousands of kilometers of supply chains. Geopolitical conflict zones force multinational companies to develop more flexible and resilient supply chain management strategies—diversifying their supplier base, establishing alternative routes, and maintaining backup logistics solutions in case of crisis [3]. For example, conflicts in the Middle East or Eastern Europe lead to the redistribution of energy supply flows: European countries urgently restructure gas and oil supply chains, switching to alternative suppliers and other types of fuel to ensure energy security. This leads to a transformation of related infrastructure, from LNG terminals to railway routes for fuel transportation.

A common denominator among various geopolitical shocks is their negative impact on the efficiency and reliability of supply chains. First and foremost, delivery timeliness suffers: border delays, increased customs control, and route changes all prolong cargo transit times. For example, after the introduction of tariffs and retaliatory inspections between China and the U.S., average delivery times increased, and companies were forced to hold larger in-transit inventories. In the EU, following unexpected political events (Brexit, sanctions), companies reported longer customs clearance times and frequent supply schedule disruptions.

At the same time, costs are rising. Geopolitical turbulence increases logistics expenses through several channels:

1.Direct increases in tariffs and duties (in the case of trade tariffs, goods become more expensive for the importer by the amount of the imposed tariff).

2.Higher transportation costs due to longer or suboptimal routes.

3.The need to insure additional risks or maintain reserve stockpiles.

Studies indicate that in recent years, political risks rather than traditional factors, such as fuel prices, have become the primary driver of rising logistics costs [4]. Incekara & Incekara conducted an econometric analysis demonstrating that the increase in transportation costs from 2020 to 2023 was driven not so much by oil prices as by geopolitical and economic risks—trade conflicts, sanctions, and political instability [4].

Another consequence is the shortage of certain goods and raw materials. If a country falls under sanctions or trade restrictions, its products may disappear from the global market, causing supply disruptions for dependent companies. A classic example is the semiconductor shortage in 2020–2021, exacerbated by trade restrictions: U.S. sanctions against Chinese chip manufacturers and Taiwanese equipment, combined with the pandemic, led to global automotive production halts due to a lack of semiconductors. This chain reaction illustrates the link between geopolitics and logistics: a seemingly localized political decision (sanctions in the technology sector) resulted in a global logistics crisis in a related industry.

Finally, geopolitical risks have exposed the need for supply chain resilience. Just-in-time inventory management models, which minimize warehouse reserves, proved inadequate in the face of politically driven disruptions. When supplies are suddenly cut off due to sanctions or border closures, companies lack time buffers or stockpiles, leading to rapid production shutdowns. According to Smyrnov et al., sudden supply chain breaks due to geopolitical events can result in production stoppages and multimillion-dollar losses [3]. Their study shows that supply chain disruptions caused by geopolitical crises lead to cost increases, delivery delays, and even factory shutdowns [3]. As a result, the business community has begun discussing a shift from a just-in-time strategy to a just-in-case approach, which involves maintaining larger reserves and redundant resources.

These examples demonstrate that geopolitical factors, such as trade wars, sanctions, and conflicts, significantly disrupt global supply chains. Companies and entire industries are forced to respond to these challenges. The second part will examine the risk mitigation and resilience strategies firms and governments use to adapt to the new geopolitical reality.

2. Strategies for minimizing geopolitical risks in supply chains

Geopolitical disruptions in recent years have forced supply chain participants to rethink the organization of global logistics. While efficiency—cost minimization, inventory optimization, and fast delivery—was previously the primary criterion, resilience and flexibility have now taken precedence [7]. This refers to the supply chain's ability to withstand external shocks and recover quickly. Governments and companies are implementing a range of strategies aimed at reducing dependence on geopolitically vulnerable links and creating reserves for crisis situations. Below are the main approaches to risk minimization, supported by examples from the United States and the European Union.

One of the fundamental principles of risk management is not to put all eggs in one basket. In logistics, this translates to supply chain diversification: using multiple sources of raw materials and components instead of relying on a single supplier, distributing production across various countries, and developing alternative transportation routes. The goal is to avoid critical dependence on a single partner or region, which could become a bottleneck in the event of a geopolitical crisis. In recent years, many companies have adopted "China+1" strategies, seeking to reduce reliance on Chinese production sites while retaining the advantages of the Asian manufacturing base. According to surveys, firms with a high share of procurement from China are the most active in diversifying suppliers [8]. The China+1 approach involves developing significant production capacity in at least one additional country besides China, such as Vietnam, India, or Mexico. According to the International Trade Council, since 2018, many businesses have relocated part of their production from China to Vietnam, India, Mexico, and other Southeast Asian nations to reduce tariff costs and geopolitical risks [2]. As a result, Vietnam, Malaysia, and Thailand have experienced growth in manufacturing and exports in categories affected by the trade war.

A similar trend is observed in Europe. Companies dependent on imports from a single non-EU country are securing secondary suppliers within the single market or in other stable jurisdictions. For instance, European electronics manufacturers that previously sourced rare earth materials exclusively from China have begun investing in extraction and processing projects in Africa and Australia to establish alternative supply channels. Statistical data confirms the effectiveness of regional diversification: 44% of EU companies importing from China experience significant logistics disruptions, whereas only 22% of firms working solely with suppliers within the EU report similar issues (Figure 2) [8]. The EU's internal market serves as a buffer, reducing vulnerability to external shocks [8]. Thus, diversifying the geographical distribution of supply sources is a key tool for mitigating geopolitical risks.

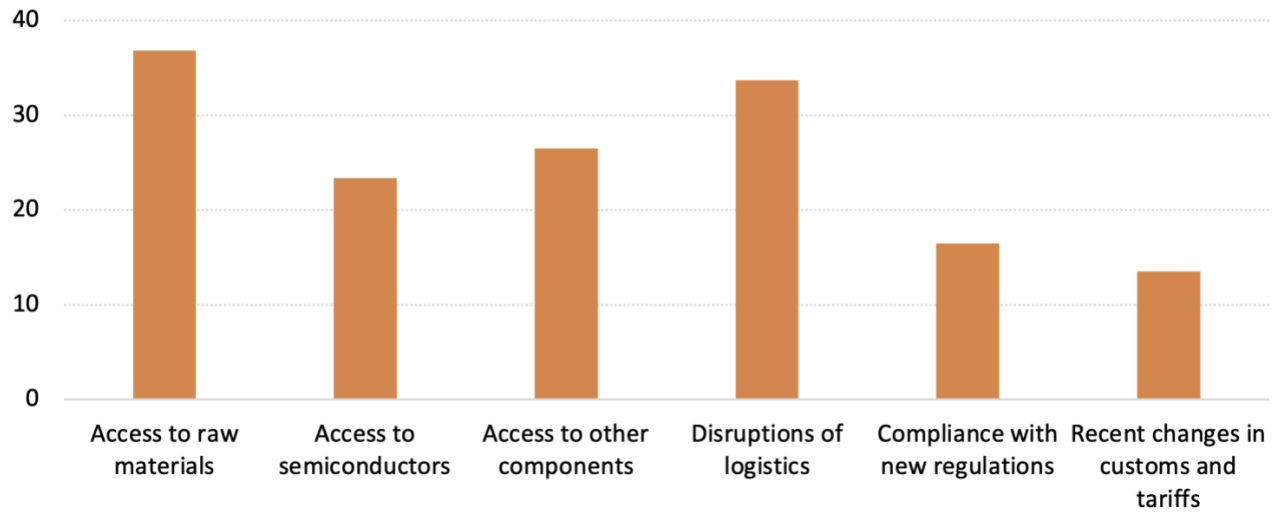

Figure 2. Major trade disruptions for EU firms (share of firms, %) [8]

The trend toward regionalizing supply chains—relocating production and inventory closer to end markets or friendly countries—is gaining momentum alongside geographical diversification. The terms nearshoring (shifting production to nearby countries) and reshoring (bringing production back to the home country) have become firmly embedded in business terminology. This strategy partially contrasts with globalization: instead of manufacturing in the cheapest locations, often on the other side of the world, companies are willing to sacrifice some efficiency in favor of locating production where geopolitical risks are lower, and logistics are more predictable.

In response to the trade war and other factors, many American firms relocated production lines from Asia to North America. By 2023, Mexico had surpassed China and Canada to become the United States' largest trading partner [5]. It also became the primary foreign supplier of industrial goods to the U.S. [6]. Mexico's growing industrial sector has positioned it as an attractive alternative to China: its proximity to the U.S. reduces delivery times and costs, while its participation in the USMCA (formerly NAFTA) ensures predictable trade conditions. As noted by the Federal Reserve Bank of Dallas, "the expansion of Mexico's manufacturing base has offered an alternative to production in China,"

particularly in industries oriented toward the American market [6]. Additionally, even Chinese companies have begun establishing factories in Mexico—such as appliance and auto parts manufacturers—to serve the U.S. market without tariff risks [6]. This phenomenon has been termed friend-shoring, where Western corporations and Asian firms alike are leveraging Mexico and other Latin American countries as secure platforms for accessing U.S. markets.

A similar trend, referred to as "de-risking" by the European Commission, is unfolding in Europe, focusing on reducing dependence on specific foreign countries while maintaining openness to trade [9]. The EU aims to bring the production of critical goods, such as microchips and pharmaceuticals, back within the Union or to neighboring friendly states. Supported by government programs, such as EU semiconductor funds modeled after the U.S. CHIPS Act, new manufacturing facilities are opening across EU countries to make European supply chains less susceptible to external pressure. A notable example is the construction of semiconductor plants in Germany involving companies from Asia and the U.S., designed to reduce the EU's reliance on chip imports from Taiwan and South Korea.

Executive surveys confirm a widespread shift toward regionalization. According to Bain & Company, in 2024, 81% of global companies planned to move supply chains closer to their primary markets, up from 63% in 2022 [10]. At the same time, the share of firms reducing their presence in China increased from 55% in 2022 to 69% in 2024 [10]. These figures highlight the business sector's commitment to restructuring logistics in response to geopolitical realities. This transformation is also supported at the governmental level: in the U.S., the Inflation Reduction Act (IRA, 2022) provides subsidies and loans to firm's reshoring production, particularly in strategic sectors such as microelectronics and renewable energy [10]. Similarly, the EU is considering offering incentives to companies that localize critical manufacturing within the Union.

Another pillar of resilience strategies is stockpiling. This involves both creating additional safety reserves of materials and components and maintaining backup production capacities that can be quickly activated in case of supply chain disruptions. This approach contrasts with the minimalist just-in-time model that previously dominated. Although stockpiling increases storage costs, it serves as a buffer against disruptions.

Companies affected by shortages of essential components, such as semiconductors or pharmaceutical ingredients, due to geopolitical conflicts are reevaluating their inventory policies. Expanding safety stocks is now seen as a necessary cost for reliability. For example, after the semiconductor crisis, automakers started signing long-term supply contracts and keeping more chips in stock than before. Research by the International Trade Council indicates that many firms are increasing reserves of critical components to mitigate trade-related disruptions [2]. Strategic stockpiling became widespread between 2020 and 2022, with some governments even creating national reserves of medical supplies, rare earth metals, and other essential materials to safeguard strategic supply chains.

Maintaining large inventories is expensive, so businesses aim to apply this selectively for the most critical materials. Analytics play a crucial role in this process: companies use algorithms and scenario modeling to identify the most vulnerable bottlenecks in the supply chain. Based on these insights, contingency plans are developed, such as securing alternative suppliers in different countries, maintaining inventory for a specified number of production days, or contracting additional freight capacity to handle peak demand [3]. Essentially, companies are shifting from reactive to proactive risk management—preparing response strategies for geopolitical disruptions in advance. According to the European Investment Bank, the businesses that navigate crises most successfully are those that have preemptively diversified their sources, increased stockpiles, or digitized their supply chains [8]. Thus, building redundancy, whether in inventory or production, has become a critical strategy for ensuring supply chain continuity.

Advanced technologies are playing an increasingly significant role in managing global supply chains. In an environment of geopolitical uncertainty, companies seek greater supply chain visibility to track goods movement, inventory status, and potential disruptions in real time. To achieve this, digital platforms, monitoring systems, and data analytics tools are being implemented. Blockchain-based solutions are used to track product origins and identify bottlenecks quickly, artificial intelligence is employed to predict risks and optimize routes, and cloud systems facilitate information exchange among all supply chain participants [2]. Deloitte notes that many firms are investing in digital solutions that enhance visibility and responsiveness, allowing them to react more quickly to sudden changes [2].

Beyond monitoring, technologies are also being leveraged to increase supply chain autonomy. The development of additive manufacturing (3D printing) enables the production of components closer to the point of consumption, reducing dependence on distant

suppliers and potential trade barriers [11]. Warehouse and production automation decrease reliance on human labor, which is particularly crucial during political disruptions, such as border closures affecting migrant workers. Scenario modeling tools allow companies to test various stress scenarios—including geopolitical risks such as tariff impositions, sanctions, or strait closures—and prepare contingency plans in advance [3].

Coordination with partners and governments is another important aspect. Many corporations are now engaging more closely with government agencies on trade policy matters, attempting to anticipate and mitigate the impact of new regulations. Major industry associations lobby for agreements ensuring uninterrupted trade, and international mechanisms for risk information exchange are being established. The previously mentioned concept of friend-shoring essentially involves alliances between like-minded countries to support mutual supply chains. An example of such collaboration is the U.S.-EU initiative to create an early warning system for disruptions in critical goods supply chains (Trade and Technology Council), which reflects joint governmental efforts to strengthen logistics resilience.

Below is a summary of key strategies for ensuring supply chain resilience against geopolitical risks, along with examples of their implementation.

Table 1. Key strategies for minimizing geopolitical risks in supply chains and their implementation examples

Strategy	Description and examples
Supplier diversification	Utilizing multiple sources of raw materials and components instead of relying on a single supplier. Reducing dependence on any single country. For instance, many companies implement the "China+1" policy by adding suppliers in Southeast Asia (Vietnam, India, etc.) alongside Chinese suppliers. This ensures an alternative in case of trade barriers with China.
Regionalization (nearshoring, reshoring)	Relocating production closer to primary markets or bringing it back to the home country. Reducing transcontinental supply chains in favor of regional networks. For example, U.S. firms are shifting part of their manufacturing to Mexico or the U.S., leading to Mexico becoming the United States' largest trading partner, surpassing China. In the EU, investments are being made in semiconductor plants within the Union.
Stockpiling	Building reserve inventories of essential materials and components. This helps withstand temporary supply disruptions. For instance, automakers began stockpiling semiconductors after shortages to prevent production halts during future disruptions. Governments in several countries are establishing strategic reserves of oil, medical equipment, and other critical supplies.
Digitization and monitoring	Implementing digital technologies to enhance real-time supply chain transparency and management. Companies are investing in blockchain and AI systems to track goods movement and perform predictive risk analytics. These technologies enable faster detection of border delays or regulatory changes and allow for immediate route adjustments.

As shown in Table 1, these strategies are comprehensive, ranging from structural changes (production and supply geography) to operational measures (inventory, technology). It is important to note that improving supply chain resilience is most effective when these approaches are combined. For example, diversification alone may not be sufficient without transparency—having multiple suppliers is ineffective if there is no system in place to detect issues with one supplier and switch to another in a timely manner. Leading companies are therefore developing integrated Supply Chain Risk Management (SCRM) systems [12], which include risk identification, probability and impact assessment, mitigation measures, monitoring, and continuous improvement.

Research confirms the effectiveness of these strategies.

According to a review by Bednarski et al., which analyzed multiple studies on the topic, adapting supply chain configurations (regionalization, reshoring, moving away from strict just-in-time models) and implementing new technologies (blockchain, 3D printing, AI) are key methods for mitigating the impact of geopolitical disruptions [11]. In other words, restructuring supply chains and adopting technological advancements significantly reduce vulnerability to political risks. Specifically, shifting from extreme optimization toward a balance of redundancy and flexibility has become a new trend, with companies incorporating resilience costs into their business models.

It is essential to consider that these measures are neither cost-free nor immediately effective. Relocating production is a complex and expensive process, stockpiling increases working capital requirements, and digitalization demands investments in IT infrastructure. As a result, firms often combine a “risk mitigation” strategy with an “adaptation” strategy. The latter implies an acceptance of some level of disruption while having rapid recovery plans in place, such as pre-established crisis protocols and insurance mechanisms. However, managerial surveys indicate that most global companies have recognized the critical importance of investing in supply chain resilience. According to Economist Impact (2024), 97% of companies worldwide reported taking steps to reorganize their supply chains by the end of 2023, up from 92% the previous year [5]. This figure represents nearly all major companies, demonstrating that resilience has become a mainstream element of logistics strategy.

At the intergovernmental level, international cooperation has emerged as a distinct strategy for ensuring supply chain resilience. Countries are forming bilateral and multilateral agreements aimed at maintaining the uninterrupted flow of key goods, even in times of crisis. One example is energy-sharing agreements between European nations to mitigate supply disruptions, as well as the inclusion of special force majeure clauses in trade agreements that allow for flexible responses to sanctions. The World Trade Organization (WTO) has also urged governments to exercise restraint in imposing trade restrictions and to collaborate on global supply challenges [13]. At the same time, regional economic blocs are strengthening their cooperation; for instance, the Indo-Pacific Economic Framework (IPEF) includes joint initiatives to reinforce supply chain stability among participating nations. Thus, supply chain resilience has become a priority not only for businesses but also for high-level policy initiatives.

CONCLUSION

Over the past decade, geopolitical factors have shifted from being a peripheral concern to becoming one of the key drivers of global logistics evolution. The analysis has demonstrated that trade wars, sanctions, and political conflicts can fundamentally reshape the configuration and efficiency of international supply chains. The U.S.-China trade confrontation illustrates how protectionist measures lead to shifts in trade flows and compel companies to seek new partners. Sanctions and conflicts have exposed the fragility of the existing global outsourcing system, revealing critical dependencies on specific supplier countries, transportation corridors, and other logistical factors. As a result, both businesses and governments have been forced to rethink their approaches to supply chain management.

A clear global trend has emerged: a shift in priorities from maximum efficiency to resilience and controlled risk. Companies are actively diversifying production across multiple countries, relocating it closer to consumers, stockpiling critical supplies, and implementing digital tools for monitoring. Governments are supporting these efforts through incentives for key industries, such as subsidies for semiconductor plant construction in the U.S. and the EU, international coordination efforts, such as U.S.-EU supply chain dialogues, and regulatory updates. A new paradigm of global logistics is taking shape—"resilient globalization," where trade remains international, but supply chain elements are more distributed, duplicated, and insulated from disruptions. In the coming years, global trade is expected to resemble a network of interconnected regional supply chains rather than a single ultra-long chain, as was the case under the previous wave of globalization.

The academic and practical contributions of this study lie in the systematization of knowledge on the impact of geopolitics on supply chains and the consolidation of best practices for managing these risks. The examples from the U.S. and the EU demonstrate shared trends: both American and European companies are undergoing similar transformations in logistics models, albeit with regional variations. This supports the conclusion that supply chain resilience is not just a temporary reaction by specific regions but a new global norm.

Successful adaptation to geopolitical challenges requires a comprehensive approach that combines technical, organizational, and strategic measures. Companies are advised to integrate geopolitical risk management into their overall risk management systems, alongside financial and operational risks. Scenario planning should be developed, including

"what-if" models for various geopolitical scenarios, such as the imposition of new tariffs or escalations of conflicts in specific regions. Such planning will facilitate the development of response strategies and enable quicker supply chain adjustments when disruptions occur. Strengthening collaboration along the entire supply chain—from raw material suppliers to distributors—is also recommended to ensure that the costs and risks of resilience are shared equitably. Collective initiatives, such as shared stockpiles or mutual assistance agreements, can enhance overall industry resilience.

Despite the inevitable costs, investments in supply chain resilience are justified by the prevention of losses due to disruptions. Experts emphasize that in the long term, companies with robust and adaptive supply chains will gain a competitive advantage, ensuring uninterrupted service for customers while competitors face delays and shortages. Moreover, resilient supply chains are not only better equipped to handle geopolitical shocks but also more adaptable to other disruptions, such as future pandemics or climate-related disasters. Thus, a focus on resilience enhances overall crisis preparedness for businesses.

In conclusion, global supply chains will always be subject to external influences, including geopolitical factors. While risks cannot be entirely eliminated, they can be anticipated, distributed, and mitigated. Modern logistics is evolving in response to global uncertainty, and the success of this evolution will determine not only the stability of individual companies but also the economic security of entire nations and regions. Given the global nature of these challenges, equally global and innovative solutions are required. Understanding and accounting for geopolitical factors in supply chain management is essential for ensuring the sustainable development of the world economy in the 21st century.

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