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Regionalizing global supply chains under geopolitical uncertainty

Nearshoring and friendshoring for supply chain resilience

International business

Bachelor's thesis

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Bachelor's thesis**Subject:** International Business**Author:** Anni Urpomäki**Title:** Regionalizing global supply chains under geopolitical uncertainty: Nearshoring and friendshoring for supply chain resilience**Supervisor:** D. Sc. Henna Leino**Number of pages:** 34 pages (+ appendices 1 page)**Date:** 9.4.2026**Abstract**

Over the decades global supply chains have become complex and geographically dispersed. This complexity affects their resilience. Supply chain resilience is a crucial element of a well-functioning supply chain as well as of global trade. Supply chain resilience is put on test in times of disruptions. In the light of the recently increasing geopolitical uncertainty and the disruptions caused by it, regionalization and its strategies, nearshoring and friendshoring, are becoming gradually more relevant in finding ways to preserve supply chain resilience.

While supply chain resilience and geopolitical risks have been researched before and more recent work has addressed nearshoring and friendshoring, there remains a lack of research that integrates these perspectives within the context of regionalization and investigates how nearshoring and friendshoring influence supply chain resilience. The aim of this thesis is to examine how nearshoring and friendshoring contribute to supply chain resilience under geopolitically uncertain times. There are three sub-questions. These questions depict what supply chain resilience means, how geopolitical uncertainty affects global supply chains and increases risks and how regionalization manifests through nearshoring and friendshoring.

Supply chain resilience is examined through its phases and principles which in the end are combined with characteristics of the regionalization strategies. Supply chain resilience is about how quickly and effectively the supply chain can recover after a disruption. It includes elements like collaboration, agility and visibility. Supply chain resilience is greatly affected by disruptions caused by geopolitical uncertainty like Covid-19 and the US–China trade war. The identified effects included, for example, price fluctuations and halts in production and supply. The thesis found that regionalization strategies contribute to supply chain resilience, for example, through stronger collaboration and more visibility and flexibility. Nearshoring was found to improve resilience through shorter physical distance whereas friendshoring through more aligned politics and letting go of “unfriendly” countries. It was also identified that regionalization is industry dependent and not always very cost-efficient. It depends on the company if regionalization strategies are deemed beneficial for them.

Keywords: supply chain resilience, regionalization, nearshoring, friendshoring, geopolitical disruptions

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Tiivistelmä

Vuosikymmenten aikana globaaleista toimitusketjuista on tullut monimutkaisia ja maantieteellisesti hajanaisia. Tämä monimutkaisuus vaikuttaa niiden resilienssiin. Resilienssi on kriittinen osa hyvin toimivaa toimitusketjua sekä maailmankauppaa. Toimitusketjujen resilienssiä testataan häiriöiden aikaan. Viimeaikojen kasvavan geopoliittisen epävarmuuden ja sen aiheuttamien häiriöiden vuoksi alueellistaminen ja sen strategiat nearshoring ja friendshoring kasvattavat merkitystään toimitusketjujen resilienssin suojelussa.

Vaikka toimitusketjujen resilienssiä ja geopoliittisia riskejä on tutkittu aieminkin, ja viime aikoina tutkimus on keskittynyt myös nearshoring- ja friendshoring-strategioihin, tutkimusaukkona on edelleen näiden perspektiivien yhdistäminen alueellistamisen kontekstissa sekä nearshoring- ja friendshoring-strategioiden vaikutus toimitusketjujen resilienssiin. Tämän tutkielman tavoitteena on tutkia, miten nearshoring ja friendshoring voivat avustaa toimitusketjujen resilienssiä geopoliittisen epävarmuuden aikana. Tutkimuksessa on kolme osakysymystä. Nämä kysymykset pohtivat, mitä toimitusketjujen resilienssi tarkoittaa, miten geopoliittinen epävarmuus vaikuttaa globaaleihin toimitusketjuihin ja lisää riskejä sekä miten alueellistaminen toteutuu nearshoring- ja friendshoring-strategioiden kautta.

Toimitusketjujen resilienssiä tutkitaan vaiheiden ja toimintaperiaatteiden kautta, jotka lopussa yhdistetään alueellistamisstrategioiden piirteiden kanssa. Toimitusketjujen resilienssi tarkoittaa sitä, miten nopeasti ja tehokkaasti toimitusketju palautuu häiriön jälkeen. Se sisältää elementtejä kuten yhteistyö, ketteryys ja näkyvyys. Geopoliittisen epävarmuuden aiheuttamat häiriöt, kuten Covid-19 sekä Yhdysvaltojen ja Kiinan välinen kauppasota, vaikuttavat toimitusketjujen resilienssiin suuresti. Huomattuja vaikutuksia ovat esimerkiksi hintojen vaihtelut ja tuotannon sekä tarjonnan pysähtymiset. Tutkielmassa huomattiin, että alueellistamisstrategiat avustavat toimitusketjujen resilienssiä muun muassa vahvemman yhteistyön ja suuremman näkyvyyden sekä joustavuuden kautta. Nearshoring-strategian huomattiin parantavan resilienssiä lyhyempien välimatkojen kautta, kun taas friendshoring-strategia parantaa sitä yhtenäisen politiikan ja epäystävällisten maiden kiertämisen kautta. Tutkielmassa huomattiin myös, että alueellistaminen on hyvin riippuvaista toimialasta eikä aina kaikkein kustannustehokkainta. Riippuu yrityksestä, ovatko alueellistamisstrategiat hyödyllisiä juuri sille.

Avainsanat: toimitusketjujen resilienssi, alueellistaminen, nearshoring, friendshoring, geopoliittiset häiriöt

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1 Introduction

1.1 Background of the thesis

Global supply chains are the centerpiece of international business (Gereffi et al. 2021, 506). Over decades, supply chains have become gradually more globalized, geographically dispersed and complex. The interconnectedness between suppliers and manufacturers made firms more dependent on each other than ever before. In a stable environment it means efficient and effective supply chains but in case of disruptions these supply chains are vulnerable. (Kamalahmadi & Parast, 2016, 116.) Globalization usually includes some form of offshoring. Offshoring means restructuring a firm based on geography and it includes the relocation of some operations to a foreign country due to, for example, reduction of costs, access to highly skilled labor and exploitation of foreign markets. (Contractor et al. 2010, 1417–1418.)

However, recent years have exposed structural vulnerabilities in highly global, complex and interconnected supply chains. The COVID-19 pandemic, that began to affect normal lives in early 2020, significantly disrupted supply, production, transportation and labour availability across continents and revealed the fragility of tightly optimized and geographically concentrated international supply chains (Chowdhury et al. 2021, 2, 10). Russia's attack on Ukraine, that started in 2022, intensified geopolitical tensions, disrupted global supply chains, especially in the energy and commodity markets, and caused large price fluctuations. Many developed nations imposed heavy sanctions against Russia which led to even higher geopolitical tensions, price volatilities and energy supply issues. (Cui et al. 2023, 1–2.) It underscored the risks associated with dependence on politically unstable and unpredictable countries. In parallel, strategic competition between major economic powers, particularly between the United States and China, has increased the politicization of international trade. Trade restrictions, export controls, tariffs and national security concerns have become central factors influencing corporate location and sourcing decisions. As a result, firms and policymakers are reevaluating traditional offshoring strategies that prioritize cost minimization over resilience, some moving towards a more protectionist standpoint. (Guo et al. 2025, 1–4.) These are just a few examples of incidents that have tested the resilience of global supply chains during recent years.

This has led companies as well as scholars to rethink the significance of geography in global supply chains and challenge traditional beliefs on the direction of globalization (da Rocha et al. 2025, 16). Disruptions like the pandemic or the US–China trade war with its trade restrictions, and government

policies caused by the disruptions, drive the world towards deglobalization and companies to geographic reconfiguration whether it happens in the form of reshoring back home or to other locations nearby. (Gereffi et al. 2021, 509, 517–518.) After a long period of increase in globalization and internationalization, particularly through offshoring in international business, new forms of geographically driven supply chain reconfiguration strategies have begun to emerge. It is not anymore only about how companies can preserve themselves in the face of disruptions but how the recurring disruptions have begun to change the strategic choices of businesses and the dynamics of global trade. International businesses now have to adapt to a more geopolitically uncertain and fragmented world.

Regionalization of supply chains takes place when businesses relocate their manufacturing or other facilities to lower cost nations close to the home country of the business (Roscoe et al. 2022, 1410). Regionalization is seen as a one of the possible answers to lessen the effects of geopolitical disruptions on global supply chains' resilience (Bednarski et al. 2023, 552). Increasing protectionist policies, the aim for a more sustainable economy and recent geopolitical disruptions like the Covid-19 drive global supply chains towards this regionalized reconfiguration. Disruptions have shown the vulnerability of geographically long supply chains and caused shortages of crucial products and price volatility in some raw materials as well as final products. (Pla-Barber, 2021, 206). In a geopolitically uncertain world, resilience has become as important if not even more important than efficiency in many supply chains (Golgeci et al. 2020, 14). Da Rocha et al. (2025, 2–4) state that regionalization is a phenomenon that includes nearshoring and friendshoring. Nearshoring is defined as the relocation of certain supply chain facilities to the same region of the home country or notably closer to home than the previous offshored location. The term first appeared in academic references in the mid-2000s but was already part of corporate vocabulary prior to that. Friendshoring is a new term. It first appeared in 2023 as an alternative to nearshoring. Friendshoring means the relocation of supply chain activities to “politically friendly” countries. There are inconsistencies and confusion in academic writing whether the term also regards geographical distance. Compared to nearshoring, which is driven by geographical distance, friendshoring is driven more by political distance. While prior studies have explored supply chain resilience and geopolitical risks, and more recent research has had some focus on nearshoring and friendshoring, there is limited research that combines these perspectives within the broader framework of regionalization and examines the ways nearshoring and friendshoring affect supply chain resilience.

Supply chain resilience is a key concept in understanding the topic of this thesis. It has been defined by multiple scholars but there is no one set definition. To some, resilience is reactive abilities used after a disruption whereas to others it is proactive competences used for preparing for disruptions. (Kamalahmadi & Parast, 2015, 116.) Ponomarov and Holcomb (2009, 131) define supply chain resilience as: “The adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function.” This definition is used noticeably often in literature regarding supply chain resilience (Kamalahmadi & Parast, 2015, 117). Another definition is for example by Christopher and Peck (2004, 1), who explain it as: “The ability of a system to return to its original state or move to a new, more desirable state after being disturbed”. In this thesis the more quoted definition by Ponomarov and Holcomb is used. It captures supply chain resilience wholly. It should also be noted that supply chain resilience is a relatively new concept and terminology, especially to some developing countries (Han et al. 2020, 4551). According to Carvalho and Cruz-Machado (2011, 39) the main resilient supply chain practices include flexible transportation, risk sharing, strategic inventory, responsiveness, capacity buffers, small batch sizes and demand visibility.

1.2 Aim and structure of the thesis

This thesis aims to shed light on the impact of geopolitical uncertainty on global supply chains and the emergence of newer geographic supply chain reconfiguration strategies like nearshoring and friendshoring. The resilience of global supply chains is essential for global trade as disruptions from past years have demonstrated. Businesses’ resilience largely depends on their supply chain networks, since they operate within relationships where partners may either constrain or enable their activities (Bednarski et al. 2023, 544). Due to the growing geopolitical tensions and the risks, they cause, it is appropriate to evaluate regionalization strategies and how they can preserve resilience in global supply chains. As stated in chapter 1.1, the regionalization strategies are nearshoring and friendshoring. They are both geographic relocation strategies. Friendshoring focuses more on geopolitics and is a newer term whereas nearshoring focuses on physical distance and is a more familiar term. Nearshoring can be used in the context of also other types of risks such as natural disasters. Considering all of this, the research question crafted for this thesis is: *“How do nearshoring and friendshoring contribute to strengthening supply chain resilience under geopolitical uncertainty?”* To answer this question, three sub-questions have been established:

- What is supply chain resilience?

- How does geopolitical uncertainty affect global supply chains and increase supply chain risks?
- How does the regionalization of global supply chains manifest through strategies such as nearshoring and friendshoring?

The first and second sub-questions are addressed in chapter 2, which focuses on the meaning of supply chain resilience and the effects of geopolitical uncertainty on global supply chains in respective sections. Chapter 3 focuses on the regionalization of global supply chains overall as a structural shift and from the perspectives of nearshoring and friendshoring as resilience strategies, in respective sections, under geopolitical uncertainty. In chapter 4 the effect of these regionalization strategies to supply chain resilience is discussed. The thesis concludes in chapter 5.

2 Supply chain resilience under geopolitical uncertainty

2.1 Supply chain resilience as a concept

Resilience by itself is a multidimensional and multidisciplinary concept. It has been researched, for example in developmental psychology and ecosystems for a long time but it is a bit newer regarding supply chain management. The origins of the resilience research are in development theory of social psychology. (Ponomarov & Holcomb, 2009, 124–125.) Supply chains or networks extend all over the world which impacts the risk of disruptions in them. Supply chain vulnerability is a network-level phenomenon. (Kamalahmadi & Parast, 2016, 124.) As a result, enhancing supply chain resilience has become increasingly important for managing these vulnerabilities and ensuring continuity in global supply chains.

Supply chain resilience was already defined in chapter 1.1, but it is crucial to understand it holistically as a concept. Supply chain resilience started attracting more attention in the 2000s and 2010s. According to Fiksel et al. (2015, 81–82) the idea of supply chain resilience gained interest due to the issues in traditional risk management which is mostly about risk identification and statistics even though a lot of risks are unforeseeable and do not have statistical information yet. They argued that resilience complements traditional risk management processes. Supply chain resilience is closely related to supply chain risk management and can be looked at from that perspective. Ponomarov and Holcomb (2009, 129–131) argued that resilience is one of the main elements of supply chain risk management. Supply chain risk management faced increased interest in the 2000s due to, for example, globalization, outsourcing and increased threats. In the emerging study of supply chain risk management, supply chain resilience was one of the new constructs that needed more research. They state that it is also a driver of competitive advantage.

Supply chain resilience can be parted into three phases: readiness, response and recovery. To reduce the impact of unpredictable disruptions, supply chains must incorporate event readiness, be ready to respond to it efficiently and effectively and be able to recover to their original or an even better state after the disruption. (Ponomarov & Holcomb, 2009, 1, 135.) Kamalahmadi and Parast (2016, 121–122) described similar phases and named them anticipation, resistance and recover & response. Anticipation means that supply chain managers should anticipate disruptions and be prepared for the unexpected. The impacts of these disruptions should also be understood and prepared for. Resistance stands for the ability to resist and minimize the effects of disruption and ensure the continuity of operations when a disturbance occurs. Maintaining control over structure and

functions is crucial. Recovery and response mean the immediate and effective response to minimize the negative impacts of the disturbance with the available resources. The ideal response would not only get the supply chain to its original state but to an even more desired state and lead to competitive advantage. Han et al. (2020, 4546) considered the readiness, response and recovery theory and added eleven essential capabilities of supply chain resilience to those phases. As illustrated in the summarizing Figure 1 at the end of this section, situation awareness, visibility, security and redundancy matches to readiness, agility, flexibility, collaboration and leadership matches to response and knowledge management, contingency planning and market position matches to the recovery phase.

Christopher and Peck (2004, 6–11) theorized about the supply chain resilience principles. They stated that the four principles are supply chain (re)engineering, supply chain collaboration, agility and creating a supply chain risk management culture. Supply chain reengineering includes supply chain understanding, supply chain design and supply base strategy. Supply chains rarely used to be designed for resilience but for example to be cost effective and customer service oriented. The new globalized world with its increasing supply chain risks needs more supply chains designed with risk reduction in mind. Christopher and Peck continue that supply chain collaboration contains collaborative planning and supply chain intelligence. A high level of collaboration in a supply network helps mitigate risks, and the exchange of information reduces uncertainty. According to them agility includes visibility, velocity and acceleration. Supply chain agility means the ability to respond quickly to unpredicted shifts in demand or supply. Visibility and velocity are two key factors of agility. Visibility in this context means that there is a clear view for everyone, of the upstream and downstream production, purchasing, inventories and demand and supply conditions. It is closely related to collaboration in information sharing. The other main part, velocity, is defined as “distance over time”. Velocity and acceleration are about how fast the supply chain can react to changes. Lastly, they state that creating a supply chain risk management culture is about establishing supply chain continuity teams, factoring risk considerations into decision making and board-level responsibility and leadership. The same way, for example, quality is everyone’s concern; supply chain risk management should be too. They argue that supply chain risks are the most serious threat to business continuity and that supply chain risk assessment should be a key element of decision-making at all levels.

Soni et al. (2014, 14) reported similar results when researching the enablers of supply chain resilience. According to them the biggest supply chain enablers in order are agility, collaboration, visibility and risk management culture. Kamalahmadi and Parast (2016, 122–127) built on the

supply chain principle -theory of Christopher and Peck (2004) and highlighted trust and information sharing on collaboration, and leadership and innovativeness on supply chain risk management culture. They also pointed out the links between flexibility and velocity, and information sharing and visibility as illustrated in Figure 1. Golgeci and Ponomarov (2013, 606, 611–612) named innovativeness as one of the key enablers of resilience. Their study found that firm innovativeness and innovation magnitude positively affect supply chain resilience.

Agility is widely discussed in the literature regarding supply chain resilience and clearly one of its key elements. Agility has been discussed from different perspectives. Some consider it as an enabler or a principle of resilience whereas some see it as a separate element part of agile supply chains. Wieland and Wallenburg (2013, 301–302) parted resilience into two dimensions: the proactive dimension which is about robustness and the reactive dimension which is about agility. Agility is tightly intertwined into the rapid responsiveness of supply chains in case of disruptions. On top of agility, also flexibility and redundancy are brought up a lot regarding supply chain resilience. Flexible production, transportation, capacity, labour and supply are all elements that improve resilience in a supply chain. Redundancies like having safety stock or multiple different suppliers also enhance resilience. (Kamalahmadi & Parast, 2016, 122.) Figure 1 illustrates and summarizes chapter 2.1.

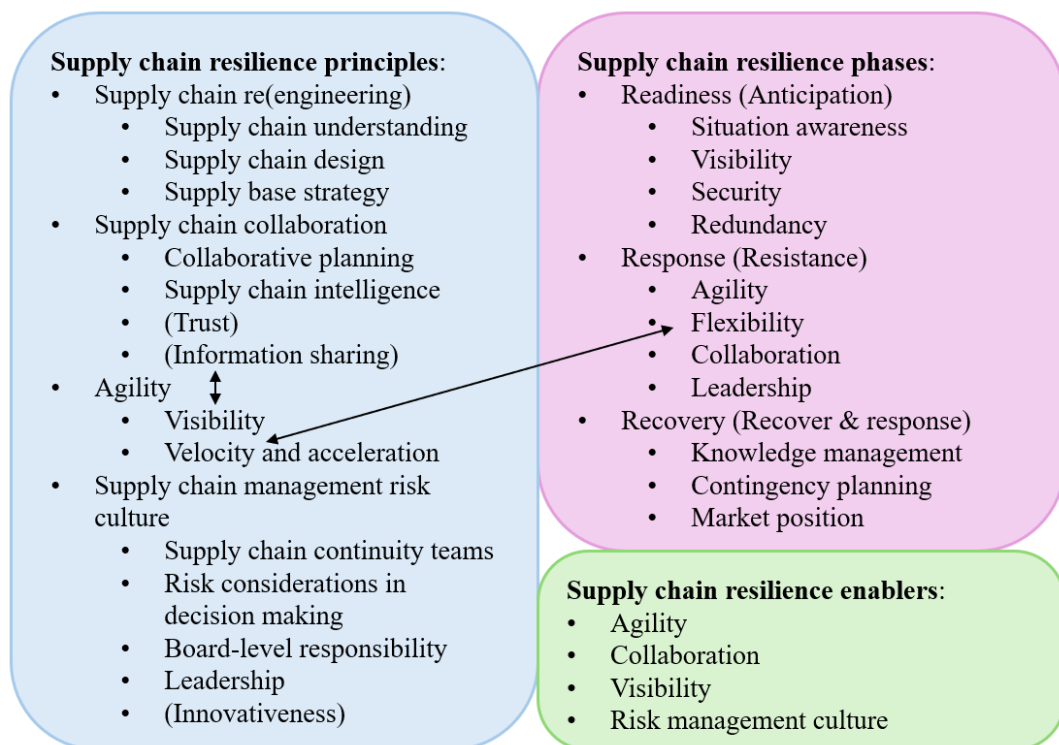


Figure 1 Supply chain resilience principles, phases and enablers

It can be noticed in Figure 1 that some elements are mentioned in many categories. For example, visibility is seen as part of agility in the principles, part of response in the phases and as an enabler. Collaboration is also seen as one of the principles, a part of the response phase and an enabler. Risk management culture is a principle as well as an enabler, and leadership is a part of risk management in the principles and an enabler. The arrows in Figure 1 showcase the connections between visibility and information sharing as well as velocity and flexibility like Kamalahmadi and Parast (2016) pointed out.

2.2 Effects of geopolitical uncertainty on the resilience of global supply chains

Globalization has made supply chains extremely complex, complicated and constantly changing. Due to their internationally dispersed systems, they are vulnerable to disruptions that disturb the supply chain's overall performance. (Kazancoglu et al. 2024, 505–506.) On top of the longevity and complexity of the supply chains, production methods like lean and just-in-time increase vulnerability due to, for example, inflexibility and lack of safety stock (Shih, 2020, 3). These methods work in normal international trade during stable times, but they are not sustainable in times of disruption. Due to globalization, multinational businesses have offshored manufacturing operations to lower cost nations, for example to countries in South-East Asia, to offer intermediary or finished products to their domestic retail businesses with a lower cost. (Yang et al. 2021, 1.) Global supply chains nowadays face challenges such as political disagreements, pandemics, wars, terrorism including cyber-attacks, and climate change issues including natural disasters (Grossman et al. 2021, 1). Over the past decade, the globalization trend has begun to transform. Newer trends like sustainability, protectionism, interventionist policies and growing digitalization in manufacturing are driving a transformation towards de-globalization and regionalization. (Pla-Barber et al. 2021, 204; Petricevic & Teece, 2019, 1504.) This implies reconfiguring the long and complex global supply chains closer to home. Instead of changing their suppliers, businesses have started to change their outsourcing strategies. (Kazancoglu et al. 2024, 506, 509.) Outsourcing is usually done to lower cost nations far away but due to the newer trends and the unpredictable geopolitical state of the world, they are now starting to lean towards more regionalized supply chains. They offer more control and a reduced risk of disruptions due to the geopolitical uncertainty.

Geopolitical uncertainty in this thesis refers to the unstable relationships and tensions between nations and the possible and unpredictable disruptions that can happen because of them. Caldara and Iacoviello (2018, 2) define geopolitical disruptions as risks associated with wars, terrorist acts

and tensions between nations that impact peace and normal international relations. According to Bednarski et al. (2023, 552) tensions between nations mean “strained or uneasy relations between two or more countries, which may arise due to ideological differences, political disagreements, economic competition, territorial disputes, or cultural and religious differences”. In real life they can be seen for example as economic sanctions, military threats and armed or diplomatic conflicts.

2.2.1 Geopolitical disruptions

The geopolitical disruptions from the last few years that are widely discussed in the literature regarding their effect on global supply chains include for example Brexit, the US–China trade war, Covid-19 and the Russia–Ukraine war. Covid-19 was a global pandemic that shut down production and closed country borders. It was not a similar geopolitical disruption to the others, but it became one when governments began withholding and hoarding vaccines to themselves as a protectionist measure before helping and shipping needed products to less fortunate countries. This led to intensified trade tensions. (Bednarski et al. 2023, 544.) Epidemics and pandemics have very distinct characteristics for disruptions. They are unpredictable in scaling and time duration, and can affect all: supply, demand and logistics. (Ivanov, 2020, 2904.)

There have been more geopolitical disruptions during the last ten years, such as Japan–South Korea trade dispute in 2019 that affected chemical supplies and semiconductors, and China weaponizing their rare earth supply, but not all of them have gained interest with researchers (Bednarski et al. 2023, 544–545). Going through one disruptive event is one thing, but going through multiple in the span of few years is another thing. The combined risks and problems arising from these disturbances have steered businesses to re-evaluate their supply chain designs (Handfield et al. 2020, 1650). Supply chain disruptions are the new normal and because of that building supply chain resilience is crucial (Blessley & Mudambi, 2022, 58).

2.2.2 Effects of disruptions

Disruptions affect supply chains in many ways. Roscoe et al. (2022, 1415–1420) identified perceived disruption risks of Brexit, the US–China trade war and Covid-19 by supply chain managers in their research. These risks included supply continuity, material and equipment availability, lack of regulatory alignment, labour risk, increased costs, customs/tariff risks, currency volatility, compliance and border delays. The interviewees in their research talked about how these disruptive events led to extremely high pressure from multiple stakeholders like customers, governments and suppliers, and how it affected decision making. Other factors influencing decision

making about redesigning supply chains during difficult times were the managers' view of the geopolitical disruption risk and how difficult moving suppliers and supply chain assets would be.

Srai et al. (2023, 290, 293–294) researched the concerns of managers and impact of the Russia–Ukraine war on global supply chains. The concerns included, for example, the war's impact on energy prices and the suppliers' locations close to the conflict zone in Eastern European countries. Problems arose from wanting to collaborate only with suppliers who had cut their ties to Russia in the supply chain, and the suspension of warehouses and production sites located in Russia. It was also driven by the hardship of shipping products in and out of Russia due to the imposed sanctions. These problems led to reconfigured trade relationships. Transportation routes also needed reconfiguring. Other effects of the conflict were, for example, unprecedented commodity price peaks, medium-term price volatility and policy interventions. Public opinion also led businesses to reconsider their links to Russia.

Overreliance on single regions in the supply chain can become a problem during geopolitical disruptions. Concentrating supply in one place is driven by, for example, economies of scale, unique capabilities or characteristics of the supplier or unique resources tied to said place (Shih, 2020, 3). Recent disruptions have highlighted the vulnerability of offshored centralized production. It has been seen during natural disasters, like the earthquake and tsunami in Japan in 2011, but also during Covid-19, the Russia–Ukraine war and the US–China trade war. Russia used to be a huge energy supplier for multiple European countries but because of the war that led to sanctions, these countries had to begin searching their energy from elsewhere which created trouble and higher costs. Ukraine is also an important grain supplier for many countries in the Middle East, but this was disrupted because of the war. (Srai et al. 2023, 298–299.) The impact on energy supply affected greatly the most gas-reliant industries in Europe, like chemicals and steel. The prices of oil and gas shot up due to the sanctions. (Bednarski et al. 2023, 536.) The US–China trade war led to many multinationals, for example Apple, to move at least some of their production out of China because of the increases in duties and tariffs (Zhang et al. 2020, 2224). Some US-based businesses tried to evade the pressures with trade associations or working with policymakers. Some were able to take advantage of free trade zones and so on evade the tariffs. (Roscoe et al. 2022, 1417.) The protectionist objective of these increased tariffs led by President Donald Trump was to move production back to the USA (Bimantara, 2019, 190–191). This didn't go all the way as planned because many businesses ended up relocating to nearby countries of the previous location, like Vietnam or Malaysia, instead of the USA. Some US businesses came a little closer to home as they ended up nearshoring production to Mexico. (Roscoe et al. 2022, 1420.)

Many solutions to minimize the risks coming from geopolitical uncertainty recognized by scholars lean towards regionalization, meaning they suggest relocating production and storage closer to the end markets. It is argued that it enhances their resilience and better protects them from geopolitical disruptions. (Bednarski et al. 2023, 545–546.) Banaszyk (2023, 30) states that maximizing profit through outsourcing is likely to be replaced by regionalization through nearshoring and friendshoring.

3 Regionalization of global supply chains

3.1 Regionalization as a structural shift in global supply chains

3.1.1 Defining regionalization as a concept and phenomenon

The European Bank for Reconstruction and Development and some national banks of European countries conducted a survey for leading eurozone companies where they were asked about supply chain risks. The survey and its results indicate that nearshoring and friendshoring play a crucial role in supply chain resilience and that companies are gradually leaning towards relocating production facilities within and nearby the European Union over the next few years. 42% of the companies answered that they are considering strategies where they would move their production closer to the end market, meaning regionalization, to strengthen the resilience of their supply chains. Almost half of these businesses stated geopolitical risks as crucial factors in decisions to relocate back to Europe. Geopolitical disruptions of the last years have certainly affected this and the rising consideration for resilience. The results of the survey highlight the trend towards regionalization to strengthen supply chains against geopolitical risks. (Attinasi et al. 2023.)

Regionalization means reshoring production or other facilities closer to home. For example, an American business that used to manufacture in China relocates their manufacturing to Mexico. Regionalization debates have been ongoing already before the unstable geopolitical state of the 2020s, but the continued geopolitical disruptions followed by protectionist measures by governments have accelerated them. Multiple scholars suggest that the disruptions bring forward a more fragmented global economy. (Pla-Barber et al. 2021, 204–205.) The main regions in the world economy are Europe, Asia and the Americas (Baldwin & Lopez-Gonzalez, 2015, 1695–1696). It is important to notice that even though regionalization is often linked to deglobalization, it does not mean the same thing. Regionalization changes the structure of global supply chain dynamics, but they still stay international. Deglobalization is more about reshoring back to the business' home nation. Regionalization is also not the opposite of globalization (Wang & Sun, 2021, 73).

The regionalization of supply chains is very industry dependent. Not all supply chains will regionalize at the same speed or to the same extent. Some industries have specific characteristics that influence the geography of their supply chains. If economies of scale and low costs are the main competitive factors, a global supply chain will likely win over a regionalized one. For example, textiles and apparel belong in this category. (Pérez et al. 2020 according to Pla-Barber, 2021, 207.) Some industries are location-bound due to their unique natural resources and are likely

not to regionalize like mining and agriculture (Pla-Barber et al. 2021, 207). Industries that tend to have shorter supply chains have product differentiation or customization needs and high innovation intensity, like electronics and machinery. They are more likely to lean towards regionalization. (UNCTAD, 2020, 130.) Javorick (2020, 322–323) states that global supply chains can be separated into two categories: producer- and buyer-driven. Producer-driven global supply chains are for multinational firms in advanced industries with high barriers of entry, like aircraft and automobiles. In these chains profits come for example from technological superiority due to high investing in R&D. In buyer-driven global value chains, large retailers and brand owners organize decentralized production in developing countries, while retaining control over high-value activities like design, marketing, and branding. They are usually in consumer goods industries like toys, garments and houseware. Javorick argues that the faster change in reconfiguring supply chains geographically will happen in the buyer-driven supply chains. He suggests that in the European Union it would mean moving production from Asia to Eastern Europe and in the United States it would mean moving it to Mexico. Also, even with compelling reasons to reorganize the supply chains, it is not a fast change.

3.1.2 Drivers of regionalization

Regionalization is one of many strategies to improve the resilience concerns of supply chains in the light of disruptions (Butollo et al. 2025, 780). It is suggested that a more regionalized global economy might be able to improve the weaknesses of globalization by establishing global supply chains that integrate resilience, efficiency and sustainability. The regionalization trend also brings up discussion about combining the aim for better resilience by reshoring closer to home while keeping the supply chain efficient. (Pla-Barber et al. 2021, 205, 208.) Though, in the light of severe disruptions, resilience needs to be prioritized over efficiency in global supply chains (Golgeci et al. (2020, 14). In certain industries a resilient supply chain flow is just as important as efficiency and cost. These industries are more likely to lean towards regionalization. (Pla-Barber et al. 2021, 210.) Other drivers for regionalization are, for example, quality issues, loss of flexibility due to long delivery times, the reduction of labour cost gaps, the “made-in” reputation and overall, too high total costs including transportation (Dachs et al. 2019, 2). Da Rocha et al. (2025, 14) list drivers such as the pandemic, improvements in automation, strengthening protectionism, evolving industrial policies and changing geopolitical dynamics. Drivers for reshoring closer to home are not necessarily just about unit costs but can be corrections to non-cost issues caused by offshoring like the level of responsiveness. Responsiveness is one of the factors which is easier to manage the shorter the physical distance of the supply chain is. (Gray et al. 2017, 41–43.)

Digitization and the development of new manufacturing technologies, like in automation and robotics, are driving regionalization. They allow production processes to be brought back closer to home from developing countries. These help the firms to control their costs while being physically closer to the end market. Examples of new manufacturing technologies driving regionalization can be found especially in industries where customization and response speed win over costs. (Ancarani et al. 2019, 361, 368–369.) New manufacturing technologies reduce transaction and governance costs and also allow more integrated production methods. Reduced reliance on labour costs and the benefits of economies of scale encourage more concentrated production while regionalization trends push firms to reshore closer to home. (Dachs et al. 2019, 1.) These were driving regionalization already before the pandemic, but disruptions like such intensified it. These technical and technological advancements can be referred to as Industry 4.0. They are big investments for companies and require new infrastructure increasing production costs. Then again in the future they will reduce said costs through automation and robotization. Also, if large scale production can be done closer to home with reduced costs through Industry 4.0, costs in transport will also significantly decrease as physical distance lessens. This makes regionalization a bit more financially attractive. (Banaszyk, 2023, 31–32.)

For regionalization to be beneficial, the locations and suppliers should be considered thoughtfully (Mohiuddin, 2024, 49). Things to evaluate when relocating include costs, access to labour, available and needed infrastructure, legal and political environment, transport routes, weather-related aspects, like the likelihood of natural disasters, and physical proximity to the home country (Canosa, 2024, 153; Mohiuddin, 2024, 49). The most significant factors depend on whether regionalization happens through nearshoring or friendshoring. However, in both strategies, picking the correct suppliers is essential for successful cooperation. A well-functioning collaboration between buyers and suppliers can lessen risks, increase identified innovation opportunities and optimise costs. Sharing data, insights and ideas typically help in getting towards set performance targets. This highlights the importance of cooperation and visibility regarding supply chain resilience. Stronger supplier relationships also enable better supply chain planning, product innovation and tackling sustainability issues. They can also be helpful in geopolitically and economically difficult times. (Canosa, 2024, 153.)

3.1.3 Effects of regionalization

A positive effect of regionalization is the likely stimulation of local development. Stronger involvement of local firms in supply chains creates opportunities to upgrade the supply chain and

decrease environmental impact of the whole firm. Managers of all actors in supply chains must know that environmental and social issues will drive large strategic decisions more in firms and government policies. Managers should enforce trust and coordination, especially in times of uncertainty. (Pla-Barber et al. 2021, 210.) Regional supply chains can enhance resilience as well as sustainability (Kareem et al. 2025, 328). Tuna and Swinney (2023, 2181–2183) argue that as regional supply chains are closer to the target market, their environmental impact during distribution is smaller. Offshored production usually happens in lower cost nations, and these nations usually also have less sustainable practices and infrastructure. They have weaker environmental regulations and attitudes towards them, and they use less environmentally friendly energy sources like coal than the end markets in developed countries with higher costs. They argue that it indicates that also production activities may generate a smaller environmental impact when regionalized. However, they found that a regionalized supply chain might also increase environmental impact compared to an efficient offshored supply chain due to the level of responsiveness and the multiple ways responsiveness affects environmental impact.

Regionalization or any type of geographic reconfiguration of global supply chains is not easy. It includes lots of costs for new infrastructure and technology. Also seeking new and reliable suppliers in the wanted region can be and is likely to be more expensive. The infrastructure, raw materials and intermediate products are less available in lots of developed countries due to the destruction of the industrial base. This can cause shortage risks in some supply chains. (Gandoy & DíazMora, 2020 according to Pla-Barber et al. 2021, 207.) The shift also will not happen fast, as all of it takes a lot of time, but gradually and depending on the industry.

Pla-Barber et al. (2021, 210) argue that regionalization might negatively affect some developing countries. The supply chain activities happening in these countries are usually not very strategically important for the multinationals or their home nation and are more focused on low costs. These supply chains will likely stay as they are. They state that the shift will likely affect critical industries like pharmaceuticals. Such industries need resilient supply chains and are more likely to regionalize. This may lead to shortages of essential products in times of need in developing countries. They argue that it might also lead to developing nations creating policies to secure these strategically important activities and make it difficult to relocate by implementing restrictions and barriers. It can be expected that these countries try to make themselves more attractive to investors and more locationally important. In developed countries, the shift can create opportunities to attract investors who want to build resilience by diversifying their supply bases. It can lead to strengthening of industrial clusters.

Locating production close to the home country is also a step closer to bringing production back home. For example, the US and the EU intend to establish export controls to secure intellectual property and to become less dependent on external suppliers. Especially in the United States, there is a bigger plan to better the resilience of their economy and secure their supply chains. Nearshoring and friendshoring are parts of this plan. (Canosa, 2024, 150.)

Regionalization is a phenomenon that contains nearshoring and friendshoring and typically tends to enhance supply chain resilience and security while reducing dependence on suppliers (Di Bernardino et al. 2024, 364). Da Rocha et al. (2025) made a literature review about nearshoring and friendshoring and found that out of 51 articles regarding these subjects, 29 were published after 2020. They state that especially the Covid-19 had a large influence on researching these topics. For friendshoring they mention that the US–China trade war was an accelerating actor. The earliest study on friendshoring as a concept was published in 2022 even though the term itself was not explicitly used in it.

3.2 Nearshoring as a resilience strategy

Nearshoring is a more familiar and researched term and strategy than friendshoring. Research has focused mostly on drivers and motives but also barriers began gaining attention from mid 2010s when businesses began to be more concerned with relocating. (da Rocha et al. 2025, 5, 14.)

Outsourcing of some supply chain activities to nearby countries of the home country of the business is called nearshoring.

Nearshoring works in improving resilience for global supply chains. Given the closer proximity, outsourcing to countries in the same region gives the company, for example, better control over production processes and more effective and reliable monitoring over compliance with legal requirements and the company's own code of conduct than when outsourcing to countries on the other side of the world. Nearshoring typically makes it easier to access to, collaborate and communicate with the suppliers. (Canosa, 2024, 144; Fratocchi & Mayer, 2023, 584.) Cultural differences and psychic distance, especially cultural factors, between businesses and their suppliers, and their positive effect on nearshoring decisions has also been researched (da Rocha et al. 2025, 14). A shorter distance between individual production facilities and the end market means that the goods must travel less, reducing the risks of problems in transport coming from geopolitical uncertainty like armed attacks (Canosa, 2024, 144). It makes for shorter lead times and better operational flexibility, control and responsiveness which are important resilience capabilities (Fratocchi & Mayer, 2023, 584; da Rocha et al. 2025, 16). Shorter lead times also make it easier to

react efficiently to demand fluctuations (Banaszyk, 2023, 30). Logistical problems like bottlenecks in harbours or air traffic delays are less likely to affect these supply chains. There are also economic factors that favour nearshoring and regionalization in general like the availability of skilled labour and better managing of currency fluctuations. (Canosa, 2024, 144, 147.)

Trade agreements between the cooperating countries are central for successful nearshoring. Two examples of these trade agreements are the European Union and the Common Market of the South, called Mercosur, which is an economic and political alliance between some South American countries. Trade agreements can also be made between these unions, as happened between the EU and Mercosur in 2019. (Canosa, 2024, 145)

Nearshoring improves resilience but it might come at the expense of cost efficiency. Nearshoring has barriers and aspects that make the relocation less favourable. It is typically expensive as wages and cost of living are higher, for example, in Eastern European countries than the Far East. Some developed countries have weakened industrial structures which makes nearshoring less preferable and, again, more expensive. In some industries there are also shortages of skilled labour in developed countries. (Sirilertsuwan et al. 2019, 568.) Nearshoring also obviously does not eliminate all risks and problems of the supply chain.

An example of a successful nearshoring made due to geopolitical uncertainty and disruptions is an American manufacturer of household appliances called Whirlpool Corporation. They chose to relocate some of their production to Argentina in December 2020. This choice was done due to the rising costs in energy and logistics because of the uncertain situation in Ukraine, and halt in Chinese production due to the pandemic lockdowns. They wanted to initiate long term competitiveness by moving some production to Argentina. (Canosa, 2024, 147.)

3.3 Friendshoring as a resilience strategy

Friendshoring is a very new term and concept. Earlier studies focused on traditional physical distance in the form of nearshoring but friendshoring focuses on geopolitics and political distance. The first study on the concept of friendshoring was done in 2022 by Khorana et al. and the first use of the term itself was in 2023. (da Rocha et al. 2025, 5, 14.) Canosa (2024, 144) defines friendshoring as the “relationship between companies in two countries that is based on a strategic and ideally long-term partnership between these countries from which both party-companies benefit”. Canosa states that it is not only about economic cooperation, but it also includes exchange of technologies, innovations and expertise. Close cooperation requires the countries to share similar

values. A close relationship like this also ensures great trust between the companies. The level of trust, cooperation and similar value base enhance resilience, reduce the disruption risks in the supply chain due to geopolitics as well as noncompliance of ethical requirements.

The main driver of friendshoring is widely agreed to be geopolitical tensions, which encourages businesses to partner up with firms in politically aligned countries (da Rocha et al. 2025, 14; Khorana et al. 2022, 81, 83). Friendshoring as a researched term in the context of economic relations has risen directly due to the ongoing geopolitical unrest and conflicts like the war in Ukraine and the conflict between Palestine and Israel (Canosa, 2024, 148). Traditionally supply chain resilience is sought more through further supply chain diversification but recently trade has been more and more weaponized which has forced governments, politicians and managers to focus more on the geopolitics of trade. In 2023 the EU Commissioner for Internal Market stated that dependencies and supply chains have become geopolitical instruments and are used as weapons. (Javorcik et al. 2024, 2872.)

A central element in friendshoring from the supply chain resilience point of view is the reduced dependence on untrustworthy countries with harsh governments and non-market economies, mainly China and Russia (Banaszyk, 2023, 30). Europe faced a huge energy supply shock because of the Russian aggression towards Ukraine and the sanctions that followed. Europe continues to rely on importing critical raw materials and energy. It is forced to diversify its supply and seek greater economic alliances with friendlier states to reduce the dependence on Russia and also China. (Canosa, 2024, 151.) In the United States, security interests come first. In 2022 the US Secretary of the Treasury described friendshoring as a way to deepen and diversify US supply chains with more trustworthy partners. Also, Joe Biden's, who was the President of the United States at the time, security adviser proposed a paradigm shift and an investment program to reinforce the United States and its allies in geopolitics and to go against China's influence. (Canosa, 2024, 150–151; Banaszyk, 2023, 30.) Banaszyk (2023, 30) states that resilience will force western countries to minimize their dependence on China and create new production facilities in friendlier countries preferably nearby. It is safe to say that friendshoring stabilizes trade during generally unstable times. It boosts bilateral trade during geopolitically uncertain time periods. (Jakubik & Ruta, 2023, 769.)

Friendshoring does give benefits related to security and helping friends while hurting enemies but at what cost? Javorcik et al. (2024, 2871–2873, 2891, 2898) argue that restricting trade to friendly countries may slow down GDP growth and is likely to be less efficient as it is driven by foreign policies and not necessarily by what is economically the best. They state that most countries do not

benefit economically from friendshoring in the medium term and that countries that stay non-aligned might see some benefits, but it is not guaranteed either. Some countries could benefit from friendshoring if their region imposed a unilateral additional trade cost on another region and did not face any retribution, but this is a very unlikely scenario.

An example of concrete friendshoring is the project of Deutsche E-Metalle AG, a German mining business, deciding to relocate to Argentina because it is one of the biggest economies and one of the most stable democracies in South America. Their requirements are also the same for foreign and domestic investors, which makes it an attractive country for foreign investors. Argentina has a lot of similarities with western countries including shared cultural values like language, political system and business practices which are all appreciated in friendshoring. (Canosa, 2024, 148.)

4 Regionalization strategies supporting supply chain resilience

Like stated in chapters 2.2 and 3.1, regionalization is happening due to global supply chains needing to be more resilient in today's geopolitically unstable world. Supply chain resilience phases, like readiness, response and recovery, and principles, like agility, flexibility and collaborative planning, are discussed in chapter 2.1 and summarized in Figure 1. Many of these principles and capabilities were then again mentioned as elements or characteristics of regionalization and its strategies in chapter 3.

Ponomarov & Holcomb (2009) named the supply chain resilience phases readiness, response and recovery. Later Han et al. (2020) matched eleven essential capabilities of supply chain resilience to these phases: situation awareness, visibility, security, redundancy, agility, flexibility, collaboration, leadership, knowledge management, contingency planning and market position. Regionalization improves multiple of these capabilities. Situation awareness and visibility, which are parts of readiness, increase when the suppliers are closer in distance and in trust. It happens in both nearshoring and friendshoring as illustrated in Figure 2. Sharing ideas and insights as well as the supply chain being clear to everyone helps in improving resilience, especially in the readiness phase. In the response phase, the key capabilities regarding regionalization are agility, flexibility and collaboration. Agility is about the quick and efficient responsiveness of the supply chain, and it is improved in nearshoring as it is easier to manage due to the shorter physical distance.

Nearshoring also shortens lead times which makes it easier to react to demand fluctuations efficiently as when being agile. The shorter physical distance in nearshoring, which also means the goods having to travel a shorter amount, improves operational flexibility and control, which are important regarding supply chain resilience, on top of responsiveness. Maintaining control over structure and functions is crucial in the recovery phase and easier to manage when nearshored. Nearshoring and friendshoring also make it easier to collaborate and communicate with suppliers, which is a key part of the response phase.

Christopher and Peck (2004) also theorized about the supply chain resilience principles. Their four principles of supply chain resilience are supply chain (re)engineering, supply chain collaboration, agility and creating a supply chain risk management culture. These principles included similar capabilities as Han et al. (2020) mentioned like collaboration and agility. They stated that supply chain reengineering includes supply chain design and supply base strategy. As can be seen in Figure 2, these can be linked to both nearshoring and friendshoring in the sense that the supply chain is less complex and more secure and resilient when it is physically closer to the end market and when the

supply does not come from an unstable or unfriendly country nor is it overly relied in a singular place. They state that supply chain collaboration includes information sharing which is mentioned as a key part of friendshoring. Friendshoring typically includes great trust and similar value bases which enhance collaboration. According to them a high level of collaboration helps mitigate risks and so improves resilience. They also mention visibility as did Han et al. (2020), but they mention it as a part of agility. Due to the physical proximity and information sharing, visibility is improved in both nearshoring and friendshoring. Visibility can also be seen as part of collaboration. Kamalahmadi and Parast (2016) added to the theory of Christopher and Peck (2004) highlighting trust and information sharing as crucial resilience capabilities. They are also key parts of regionalization strategies, especially friendshoring. A well-functioning collaboration, like in friendshoring, increases innovativeness which they also mention as an element of supply chain resilience. Figure 2 illustrates the contributions of each regionalization strategy for supply chain resilience.

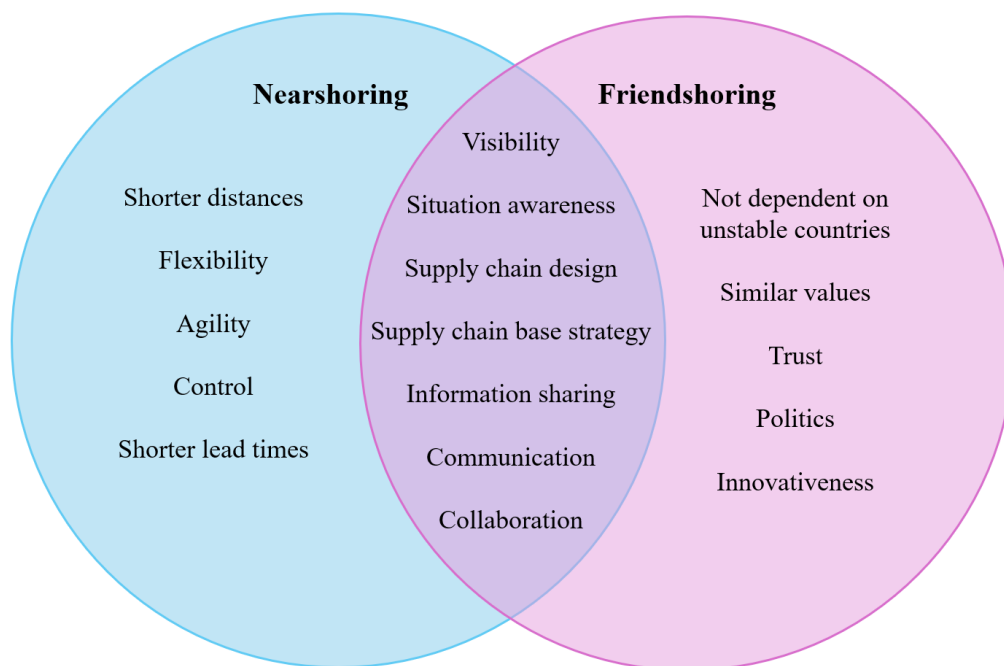


Figure 2 Supply chain resilience contributions of the regionalization strategies

In Figure 2 it can be seen which elements contributing to supply chain resilience are related to nearshoring and friendshoring. Most of the elements are related to both regionalization strategies. Even though nearshoring and friendshoring are similar, they still also have their own unique elements. It depends on the company, industry and situation which one is better for a certain business.

5 Conclusions

This thesis examines the regionalization of global supply chains under geopolitical uncertainty. The aim of the thesis is to review relevant literature focusing on regionalization from the point of view of nearshoring and friendshoring and their impact on supply chain resilience. First supply chain resilience and the effect of geopolitical uncertainty on supply chain resilience is considered. Then the focus is on regionalization and its strategies: nearshoring and friendshoring. Lastly, chapter 4 brings together the regionalization strategies and supply chain resilience, and it is discussed how these strategies affect the resilience of supply chains.

Due to growing geopolitical instability, the effect of geopolitical disruptions on global supply chains is increasing significantly. Scholars and managers have woken up to the reality that resilience is a crucial factor of a supply chain in today's world. Even though disruptions have always occurred, during recent years they have been frequent and have had stronger effects on supply chains. Especially, Covid-19 disrupted global trade in a way that has not been seen before and highlighted the attractiveness of secure supply and protectionist policies. The growing need for more resilient supply chains is driving companies towards regionalization. Regionalization, though driven by these disruptions, also has other drivers that make it possible, most importantly technological advancements like automatization and robotization. Considering the regionalization strategies, nearshoring and friendshoring, it was found that nearshoring is a more popular and familiar term than friendshoring which is a very new term. When examined through the supply chain resilience capabilities, it can be stated that nearshoring and friendshoring do contribute to the resilience of supply chains, especially by shorter physical distances, stronger cooperation and more visibility. Nearshoring improves resilience more through the pros of shorter distance like the ability to react to demand fluctuations more easily and the smaller risk of disruptions on the way to the end market. Friendshoring is more about politics and close cooperation, and it improves resilience through collaboration and by not relying on unfriendly countries. The cost-effectiveness and efficiency of the supply chains can be considered barriers to regionalization but as resilience is becoming increasingly significant and technology keeps advancing, the decision on what is most important and beneficial is left to the companies.

The real effects and especially longer-term effects of regionalization, and respective effects of both strategies, are mostly yet to be seen. As da Rocha et al. (2025, 15) state, the effects of nearshoring and friendshoring decisions have not really been investigated empirically yet. The limitations of this thesis lie mostly within this; the effects have not been investigated much yet since the concept is

somewhat new and the transformation ongoing. Especially friendshoring is a new term and it has not been defined properly which makes the existing research regarding it slightly confusing. Regionalization is also happening only in certain industries as a lot of industries are at least somewhat location-bound and don't have existing infrastructure in developed countries or it is very expensive.

This thesis contributes to existing literature by considering how the characteristics of nearshoring and friendshoring align with supply chain resilience principles and capabilities. It clears up how nearshoring and friendshoring affect the resilience of global supply chains, especially under geopolitical uncertainty. Nearshoring and friendshoring are notable strategies to be considered when wanting to improve supply chain resilience but it is up to the industry and company how beneficial they would be.

Future research could focus on the effects of nearshoring, friendshoring and regionalization in general, especially investigated empirically. Friendshoring is such a new term that it has many future research options, for example investigating what kind of companies would truly benefit from it and in what situations. On the geopolitical side, the effect of increasing protectionism on nearshoring and friendshoring would be an interesting research topic. Another suggested future research direction is the sustainability side of regionalizing supply chains, for example how much environmental issues and sustainability pressures affect nearshoring and friendshoring.

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Appendices

Appendix 1 Explanation of the use of AI-based tools

AI-based tools were used in preparation of this thesis. These tools included Scopus AI, UTU Volter AI and ChatGPT version 5. This thesis is completely written by its author and AI-based tools were used within the academic integrity guidelines. Scopus AI and UTU Volter AI were used in finding sources for the thesis.

ChatGPT was used in brainstorming the preliminary ideas for the research topic and narrowing it down. The prompts used were for example: “rajausehdotuksia kandin aihepiiriin geopolitiittisten ongelmien vaikutuksesta toimitusketjuihin”. AI did not give the topic of this thesis, but it gave multiple different ideas for narrowing it down, for example to one conflict like the Ukraine war, region like the Red Sea or phenomenon like reshoring versus offshoring, which then inspired me to craft my research topic closer to what it ended up being. Any text or direct idea produced by AI was not used in this thesis and ChatGPT was only used for inspiration.