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Mapping Geopolitical Leverage in Global Trade: A Multilevel Analysis of Jurisdictional Influence and Industry Risks

Findings from the telecommunication and PCB industry

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ABSTRACT

This master thesis examines how geopolitical dynamics influence global trade patterns and what strategic implications it entails for global players. In this study, it is exemplified by the telecommunication industry with Ericsson and with the PCB industry as a case example. By combining empirical data with theoretical frameworks from power influence theories, supply chain risk management, and economic complexity, the study aims to understand how jurisdictions exert trade leverage and how companies can respond to the emerging challenges of a geopolitically fragmented global trade environment.

The research applies a mixed-methods approach, with a qualitative foundation supported by quantified secondary data from sources such as the Global Trade Alert (GTA), trade volume statistics and OEC measurements. The study is guided by two overarching research questions: What are the key geopolitical forces reshaping trade influence across global markets? Followed by, how can patterns in driving forces, trade power, and economic influence affect Ericsson supply chain in a vital industry, such as the Printed Circuit Board industry?

The empirical analysis identifies power and leverage patterns among a set of pre-determined jurisdictions. Central actors like China and the United States combine large trade volumes with a high level of policy intervention, using tools such as export controls, FDI screening, and industrial subsidies. Bridging and transitional actors, such as India, Mexico, and South Korea, exhibit different strategic postures, often restricted by structural dependencies or limited coercive power. The study uses power influence mapping and resource-based theory to explain how states create, manage, or leverage interdependencies to their advantage.

A focused analysis of the PCB industry reveals concentrated upstream production in East Asia, exposing supply chains to regionally clustered risks. The results show that global firms are vulnerable to sudden export bans, retaliatory trade measures, and shifting regulatory strategies. These risks are compounded by institutional asymmetries, where policy measures are unevenly applied across jurisdictions.

For Ericsson, a multinational enterprise with operations in the US, Europe, India, and China, the thesis outlines strategic risks and potential responses. These include the need for upstream diversification, enhanced digital traceability, supplier redundancy, and stronger engagement in trade policy dialogues. Institutional asymmetries also require internal organizational capabilities to monitor and respond to geopolitical signals across jurisdictions.

Overall, this thesis contributes to a better understanding of how geopolitical conditions and trade policy tools shape supply chain resilience. It offers both theoretical insights and practical strategies for firms navigating a world characterized by an increasingly protectionist narrative.

Keywords: Geopolitics, Trade Dynamics, Telecommunication, Printed Circuit Boards (PCB), Economic Complexity, Power influence mapping, Supply Chain Resilience

Contents

1. Introduction

In recent years, geopolitical requirements and restrictions have placed increasing pressure on the telecommunications industry. These requirements stem from a broader shift away from globalization and toward protectionist trade policies. McCaffrey & Jones (2021) exemplify how jurisdictions are moving to promote domestic technologies, innovation, and production, departing from previous norms of liberalized international exchange. The shift towards restrictive geopolitical policies, such as import–export controls, strategic decoupling, and targeted financial interventions, poses challenges for global actors like Ericsson in ensuring the delivery of their products to key markets.

However, despite the growing strategic use of trade and financial policy instruments, there remains limited understanding of how jurisdictions exert geopolitical trade leverage in practice, especially in ways that disrupt firm-level operations across global value chains. The restrictive turn in global trade can be illustrated by actions taken by major economies, such as the United States and China, to reshape supply chains through export bans, subsidy packages, and bilateral control regimes. Additionally, global trade is threatened by geopolitical disruptions such as wars and disputes over territory.

This thesis addresses the gap by identifying jurisdictional indicators of trade influence, examining the mechanisms through which geopolitical control is exercised, and analyzing the consequences for firms embedded in globally fragmented industries, specifically using Ericsson and the PCB industry as a case.

1.2 Background

In recent years, the global telecommunication industry has been subjected to pressures driven by geopolitical requirements, signaling a shift away from the liberalized trade environment that characterized earlier decades of globalization (McCaffery & Jones, 2021). Financial leverage, trade policies, and evolving state relationships presented in *Figure 1.2:1* now serve as critical arenas where geopolitical power is exercised, and relationships are tested. Each of these domains reflect deeper tensions, which in turn reshape the global market dynamics for actors like Ericsson and other multinationals operating.

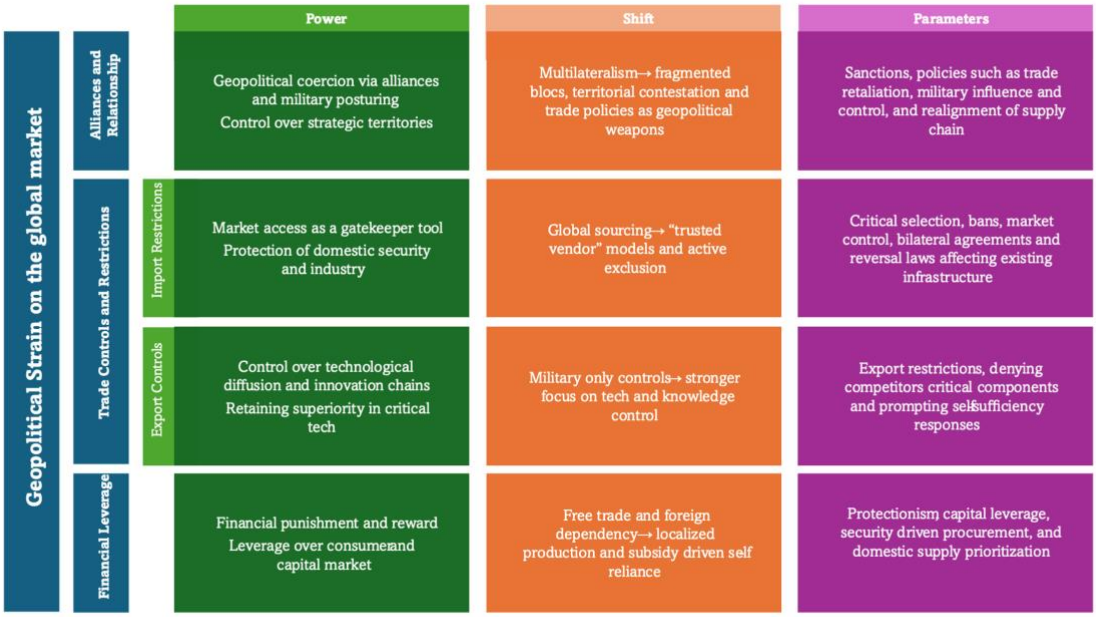

Figure 1.2:1 "Geopolitical Strain on the Global Market" is a result of the problematization for this study and illustrates four key levers indicating how geopolitical power is currently exercised. Each lever is described through recent developments, how they are used and how they can both serve and destabilize a nation. The power section describes what is trying to be achieved and how while the shift illustrates the movement from the current state and the parameters are the policy interventions that the different jurisdictions are utilizing.

Starting from the top-left and going down vertically in Figure 1.2:1, the evolving alliances and jurisdictional relationships emphasize the reordering of global power structures, with direct implications for global trade. This reconfiguration reflects a broader shift in which jurisdictions increasingly deprioritize longstanding alliances and multilateral frameworks, instead favoring strategic realignments driven by national interest. As a result, geopolitical tensions have intensified, and military influence is playing a more prominent role in shaping international relations and trade flows. This is demonstrated by Russia's invasion of Ukraine, which disrupted European energy markets and triggered sanctions affecting a wide range of industries (Sun et al., 2024; European Commission, 2025; "Ukraine and Russia Sanctions", 2022). In East Asia, China's military exercises around Taiwan following alleged U.S. provocations illustrate how military posturing and territorial disputes can affect trade policy and economic security (McCarthy et al., 2025). Moreover, a clear shift from historical allies to more fragmented blocs can be reflected through heightened tensions between the United States and Denmark over strategic territories (Kayali, 2025). Underlying these developments is a hardening of jurisdictions' behaviors centered around the control of critical resources such as minerals, technology, and land (BBC, 2024; Abdurasulov & Plummer, 2025). Geopolitical events like these can cause direct trade disruptions and result in global trade restrictions and policy trends, which will be exemplified in the next paragraphs.

Moving down to trade controls and restrictions, particularly imports, jurisdictions are increasingly employing restrictive measures as a power mechanism to protect domestic industries, regain market control, and mitigate perceived security threats through import regulations. There is a clear shift towards deglobalization, as seen in India's 2020 National Security Directive on the Telecommunication Sector (NSDTS) that institutionalized a trust-based vendor system, explicitly banning procurement from designated untrusted sources (Insights of India, 2020). Parallel developments unfolded in Europe, where eleven EU nations, instituted bans on Huawei equipment, expanding the scope beyond new installations and requiring the removal of existing infrastructure (Kroet, 2024). Similarly, the United States imposed bans on Chinese telecommunication hardware (Lipscombe, 2024).

Regarding export controls, most business leaders are aware of export controls on military goods. However, it is often more challenging to navigate these as export restrictions have evolved from traditional military-focused measures into broad-based controls that include cutting-edge civilian technologies such as semiconductors, AI, and quantum computing (Levy et al., 2025). Unlike tariffs, which are often subjected to negotiated settlements, export controls are frequently implemented unilaterally and without notice, driven by urgent national security objectives and the need to regain control over knowledge, or more specifically, technology diffusion. Such sudden restrictions catch companies off guard, forcing them to rapidly recalibrate supply chains and global strategies. Notably, even trace amounts of restricted material embedded in a product can trigger restrictions, compounding the complexity. One example is the U.S. restriction on semiconductor exports to China, which in turn prompted China to impose export controls on rare earth minerals critical to high-tech industries. Thus, export controls can disrupt current industry constellation and force industry players to rethink. Restrictive trade policies can for example also drive foreign investments into affected technologies, eventually weakening the effectiveness of the controls. China has pursued this strategy by building innovation systems focused on technological self-sufficiency (Groenewegen-Lau & Laha, 2023). A key element of China's approach is expanding manufacturing capabilities of advanced industries, where it now leads global production in seven out of ten sectors, (Atkinson, 2025). Such internal capabilities serve as leverage points which the Chinese state can use to ensure an indigenous innovation chain. Thus, export controls create dynamic tensions that both serve and destabilize global trade power structures.

Following the Trump administrations announcement of the tariffs increasing from 2.5% to 24, a more quantitative example would be to look at what effects this might have on the world. According to Gautry & Lok, (2025), analysts have calculated that this will result in a reduction of 0.3-0.7 percentage points in U.S. GDP and 0.5-0.7 percentage points in Chinas GDP, with a global growth loss exceeding 1 percentage point in a full trade war scenario. While a 0.5% GDP reduction may seem modest in percentage terms, for the United States this represents roughly $140 billion in lost economic output, equivalent to the annual GDP of a medium size country such as Morocco (World Bank, 2025). These quantitative estimates highlight how tariff escalations not only disrupt bilateral trade but also pose systemic risks to global economic stability.

Lastly, from a financial leverage perspective in global trade, the United States' turn towards aggressive tariff policies as financial punishment as a retaliation for unfair trade exemplifies how nations seek to recalibrate economic dependencies. In April 2025, the White House employed tariffs aimed at redressing what it termed unfair trade arrangements that had depleted domestic manufacturing and created a trade deficit (The White House, 2025). These financial restrictions intend not only to stimulate American industry and reduce deficits but also to address national security concerns by mitigating dependency on foreign suppliers in critical sectors like defense and technology (The White House, 2025). However, this strategy hinges on the assumption that the United States' role as a major consumer economy provides leverage, a point contested by several economists who note China's dominant manufacturing capabilities in sectors where few alternatives exist (Kong 2025; Zurcher, 2025). Here, financial trade restrictions become a double-edged sword: they seek power through control of consumption but risk vulnerability when supply alternatives are limited.

The shift from liberalization to increased trade restrictions and protectionist policies, reflected in *Figure 1.2:1* and the events and actions described above, creates complex challenges for companies with global supply chains. Actors are already restructuring supply routes, as illustrated by firms redirecting deliveries through Mexico to avoid new U.S. tariffs introduced in April 2025 (Engelland, 2025). Security concerns deepen these challenges; a Moody's (2025) article highlights the importance of tracking both the geographical origin and the routing of components, as well as ensuring that customers are operating in approved regions.

Companies with a global footprint, such as Ericsson, must look beyond compliance to assess their broader dependencies on jurisdictional markets that could become subject to export controls or security-driven regulations (Levy et al., 2025). The observations highlight another phenomenon, namely that the focus on supply chain resilience from disruptions caused by geopolitical risks and economic instability is increasing (Harapko, 2023). As supply chains become increasingly politicized, new strategies emerge. A TVSVS (2025) report highlights that companies with complex international supply chains should not rely on one supplier for a certain component but include multiple geographically dispersed suppliers. Other supply chain strategies that have come under scrutiny are nearshoring, friendshoring and reshoring. The ideas behind these strategies are to position one's supply chain with little proximity to the customer, outsource one's supply chain activities to jurisdictions with sympathetic policies or transform the supply chain so that e.g. vital manufacturing processes are performed on domestic soil (Ellerbeck, 2023).

With the presented levers the report will focus on how they affect the primary jurisdiction in Ericsson's supply chain network and how Ericsson can work proactively to ensure a resilient Supply Chain for a critical components category. The purpose is to create a foundation that strategy teams in global companies can utilize to orient themselves in the multidimensional global market. This foundation will be tested on a critical component category which will be presented under section 1.7 (limitations).

1.3 Case company Ericsson: industry context and characteristics

This study is requested partly by Ericsson AB, a Swedish industry firm active in the telecommunications industry. Ericsson is a multinational global leader in telecom, active in more than 180 countries. With more than 100 years' experience in telecom, Ericsson provides seamless connectivity through its main business segments; Networks, Digital services, Managed Services and Emerging Business, and others. The product areas include software and hardware solutions in combined efforts for global ICT (Ericsson, 2025). Networks represent Ericsson's largest segment providing Radio Access Networks (RAN), transport networks and core network solutions for 4G and 5G. Digital services give operational systems, business support and network automation to telecom operators (Ericsson, 2025). Managed services represent Ericsson service offerings to telecommunications operators in areas such as network operations, IT managed services and Network design & optimization. Finally, Emerging businesses and others include the emerging IoT industry, application of 5G in private networks e.g. transportation & manufacturing and edge computing. This last product area includes scanning markets and evaluating potential new revenue streams and emerging technology trends (Ericsson, 2025). Hence, Ericsson's business model includes both hardware and software sales plus installation and aftermarket services on software and hardware products.

The Ericsson Group Function Supply is located within Networks which contributes to approximately 70% of Ericssons revenue. Group function Supply is responsible for supply chain management (SCM) for all different business areas previously mentioned. For this report it is important to illustrate that Ericsson's supply chains are globalized with operations in South America, North America, East Asia, West Asia and Europe with more than 20 000 suppliers spread across geographical areas. Customer examples include telecommunications operators, mobile network operators, enterprises & industries, and governments or public sectors. Customer and partner networks span the entire globe and demand technology leadership traits in Ericsson products and are characterized as large corporations, state agencies and governmentally run enterprises or agencies. Geographically, customers are segmented into five different markets areas (MA): Middle East and Africa (MEA), Nort America (MANA), Europe and Latin America (MELA), Oceania and India (MAOI) and East Asia (MAEA). Hence, Ericsson may very well be affected by rupturing geopolitical relationships between jurisdictions (Ericsson, 2025).

The telecommunications market exhibit traits such as intense technological innovation, significant global impact, high regulatory environment and long product lifecycles. Advancements in technology evolve rapidly with continuous innovation with products such as 5G enabling IoT networks, underlined by large investments in R&D. Moreover, telecommunication networks are global products where infrastructure investments and partnerships with commercial partners as well as governing bodies are common (Ericsson, 2025). Investments in infrastructure, and large institutional collaborations between telecom actors and governing bodies may result in path dependencies or lock-in effects and overreliance on one or a few telecom providers, such as the UK reliance on Ericsson and Nokia (Doran,

2025). Telecommunication networks are governed by alternating regulatory frameworks depending on where the network is situated. Since networks ensure connectivity and communication data privacy and security is heavily regulated (Blackman & Srivastava, 2011). Regulations differ between different states and can range from import restrictions to economic sanctions on telecom products with components originating from certain jurisdictions (Kroet, 2024).

Conclusively, it is not difficult to conclude that Ericssons business operations, including its supply chain is affected by geopolitical tensions and disruptions. Since Ericssons supply chain is built up by 20 000+ vendors and partners and as mentioned above, spread across different jurisdictions globally, it will be affected by import and export regulations. Additionally, given the high technology and regulatory characteristics of Ericsson's ecosystem (customer base, products and complete industry) it can be deducted that bi- and multilateral relations plus financial trade leverage between jurisdictions will impact Ericsson's operations including its supply chain.

1.3.1 Case industry – Printed Circuit Boards

The study will use the printed circuit board industry as a case industry to assess how geopolitical tensions affects a component deemed as vital for the telecommunications industry. The PCB industry was selected due to its relevancy for Ericsson products. Here, a brief description of PCB and their usage areas will be provided.

Printed Circuit Boards (PCBs) are fundamental components used to mechanically support and electrically connect electronic components in devices. They are essential in a wide range of applications, including consumer electronics, computers, and telecommunications sectors that together account for about 70% of global PCB demand. While the east Asian region dominates both production and demand, reshoring efforts in regions such as North America face challenges due to the capital-intensive and complex nature of PCB manufacturing, compounded by trade restrictions and limited domestic capabilities. North America's PCB market has experienced declining demand recently, with reduced bookings reflecting economic pressures. A detailed industry description will be provided in section 4.2.1.

1.4 Purpose Statement

The purpose of the study is to explore how geopolitical dynamics shape the global trade by identifying and analyzing indicators, driving forces, and leverage points used by jurisdictions to exert power over trade flows, market access, and reshape global markets in favor of their priorities. Furthermore, the purpose of the study is to identify the amount of trade power in the market and how the different key, and emerging jurisdictions are utilizing this. By categorizing these mechanisms and analyzing their impacts, the study will help actors in the telecommunication, and adjacent sector orient themselves within an increasingly politicized trade environment.

In the second part of the study, these insights will be applied to the PCB industry, a sector critical to several industries, including the telecommunication industry. The PCB industry was selected through interviews with Ericsson because of its importance in telecommunication products and industry exposure to geopolitical tensions. The purpose of this part of the study is to assess and analyze which nations hold leverage in terms of regional concentration, and trade dependencies by examining jurisdictions revealed comparative advantage (RCA) and their exposure to geopolitical influence from the levers examined in the first part of the study. The result of the study will be a foundation that strategy teams in global companies can utilize to orient themselves in the multidimensional global market.

1.5 Research Questions and Objectives

RQ1 What are the key geopolitical forces reshaping trade influence across global markets?

This question investigates how jurisdictions use trade leverage to exercise external control over markets by applying policy instruments to shape market behavior, reorient supply chains, and restructure industry dynamics. The analysis aims to identify which actors are central and the types of leverage different actors possess, determine who they exert influence over, and analyze through which driving force this influence is applied. Furthermore, the study will seek to understand the underlying driving forces motivating these interventions, including national security concerns, economic sovereignty, and technological supremacy.

RQ1.1 What driving forces and policy instruments are affecting current market areas? To what extent are jurisdictions utilizing these driving forces?

RQ1.2 How much trade leverage do different jurisdictions hold based on *Economic Complexity Index* and their global trade/import ratios?

RQ2 How can patterns in driving forces, trade power, and economic influence affect Ericsson supply chain in a vital industry, such as the Printed Circuit Board industry?

Building on the findings from RQ1, this question applies the geopolitical market analysis to the PCB industry to understand the geopolitical risks and how it could impact a large telecommunication company. The analysis aims to identify the main actors on the supply and buyer sides, assess the regional concentration of production and consumption, and evaluate how much influence different regions could potentially exert based on their degree of trade and financial leverage.

RQ2.1 What is the global market structure of the PCB industry in terms of key supply and demand actors, regional concentration, and trade dependencies?

RQ2.2 What nations possess the largest relative competitive advantage (RCA)?

RQ2.3 How is the case company's supply chain affected by the geopolitical patterns and leverages identified in *RQ1 from the PCB industry perspective* ?

1.6 Deliverables

To answer the research questions, the study will present a series of analytical outputs that together provide a structured overview of geopolitical influence in global trade and its impact on the PCB industry. For *RQ1*, a power–influence map will categorize jurisdictions as central, bridging, or transitioning based on their geopolitical influence and trade volumes, supported by import/export data and insights from grey literature. This will be followed by a global dependency map visualizing trade relationships and alliances to highlight structural interdependencies. A heatmap of driving forces will illustrate the extent to which different jurisdictions apply tools such as tariffs, export controls, or sanctions, and which jurisdictions are most frequently affected. In addition, the study will present a trade and technology leverage matrix, comparing jurisdictions Economic Complexity Index with trade volumes.

For *RQ2*, the study will produce a PCB market map identifying key global actors and trade flows, consolidated by region to capture strategic clusters. A regional RCA and vulnerability table will follow this, linking geopolitical exposure to comparative production advantage. Finally, an industry exposure dashboard will be presented to connect geopolitical risks with Ericsson's PCB procurement strategy and supply chain footprint.

1.7 Limitations

This study is subject to several limitations in scope and focus. First, the geopolitical and trade analysis has been limited to a selection of jurisdictions presented by Ericsson, based on Ericsson's market areas (*See Figure 1.7:1*). These include the United States, China, India, Japan, the European Union, Brazil, Taiwan, the Republic of Korea, Canada, and the United Kingdom. While this selection captures regions with a high concentration of vital operations and geopolitical influence, it does not represent the full global landscape. Moreover, due to the time constraints of this thesis, the financial leverage aspect identified in figure 1.2:1 is excluded from the scope.

Secondly, when addressing RQ2 and applying the levers presented above, the study will be limited to Ericsson and its ecosystem. The study deliberately narrows its focus to the printed circuit board (PCB) industry rather than attempting to analyze the entire telecommunications component ecosystem. This choice was made to enable a more targeted and in-depth assessment of how geopolitical indicators identified in RQ1 may translate into tangible implications for a specific, strategically critical component. The PCB sector was selected (after interviews with Ericsson) because it meets several key criteria: it is essential to telecom infrastructure, not easily substitutable, and mature enough to provide sufficient public and

industry data. This allows for a meaningful market-level analysis of global supply and demand concentration, trade dependencies, and potential geopolitical exposure within a clearly defined industrial segment.

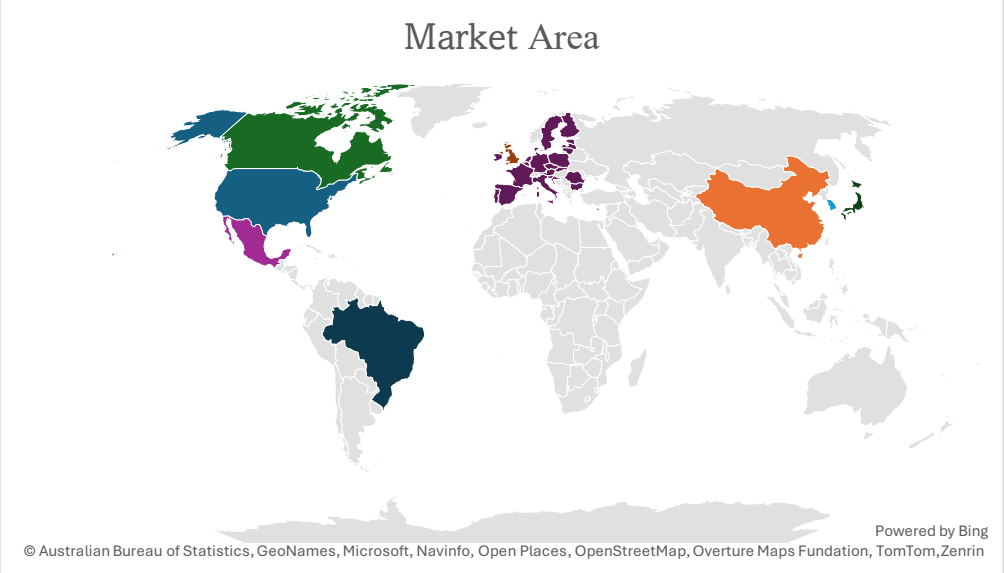

Figure 1.7:1 presents the jurisdictions being analyzed in the study.

2. Theoretical framework

Given the is evolving and interdisciplinary nature of this topic, this study draws not only on academic theory but also on grey literature, including consultancy reports, policy briefings, and news articles, to capture recent developments and real-world applications to analyze how geopolitical dynamics shape global trade strategies and influence sector-specific dependencies (see *Figure 2:1*). The goal is to understand not only which jurisdictions currently hold global influence, but also which are emerging as strategic players in sectors with importance, such as the PCB industry. By grounding the analysis in supply chain theory, the study first explores how global disruptions impact firm-level resilience and sourcing strategies. Concepts like supply chain vulnerability, risk, and resilience provide the basis for assessing how geopolitical tensions translate into operational challenges and reconfigurations in global trade networks.

For RQ1, the theoretical emphasis is on understanding how states and regions use their geopolitical position to influence global markets, and to what degree they can do so. The framework draws on ideas from geopolitical power, economic leverage, and trade dependency to explain how jurisdictions deploy policy instruments such as tariffs, export controls, sanctions, and investment restrictions to assert influence. These mechanisms are analyzed through tools like the power–influence, and indicators of trade and financial leverage. The structure allows for an assessment on a jurisdictions position on the supply and buy side, the instruments used and the extent of their control within the global trading system.

RQ2 builds on this geopolitical framework by applying it to the PCB industry and bring the analysis down to a firm level, where national industrial capabilities intersect with component-level trade structures. The analysis is guided by the resource-based view (RBV), with particular emphasis on revealed comparative advantages (RCA) and trade dependency. These concepts help assess which jurisdictions hold strategic advantages in PCB production and how exposed they are to geopolitical pressure. By combining RCA scores with the trade and financial leverage indicators developed in RQ1, the study evaluates how macro-level power structures shape vulnerabilities and influence in the PCB value chain, which in turn, influencing Ericsson's sourcing and supply chain.

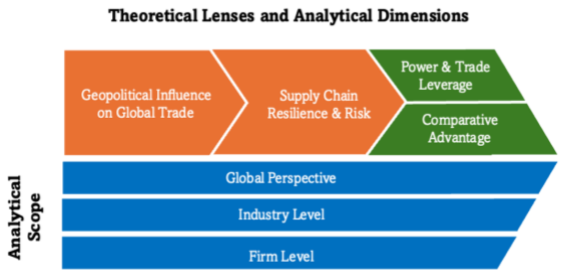

Figure 2:1: The figure illustrates how key theoretical concepts are applied across three levels of analysis: global, industry and firm level, where the bottom shows the analytical scope, and the top shows the theoretical lens applied.

2.1 Supply Chain Vulnerability and Resilience

To understand how geopolitical influence on global trade translates into operation consequence for industries and firms, this section begins by examining the theoretical foundation of supply chain vulnerability and resilience. This section presents the current academic theory in supply chain resilience and strategy, However, the concept of geopolitical disruptions to supply chain is considered an emerging area of research, rendering current theory output limited (Bednarski et al., 2023). The concepts presented here are mostly central to *RQ2* which focuses on how such disruptions influence the PCB industry and, by extension companies like Ericsson. By grounding the analysis in supply chain resilience, this section establishes the necessary foundation for *RQ1* that is based on interpreting how macro-level power structures interact and *RQ2* that further investigates RQ1's interaction with supply configurations and sourcing strategies.

2.1.1 Supply Chain Disruptions

Supply chain vulnerability can be both internal and external, according to Sáenz et al. (2018). External supply chain vulnerability, although more rare than internal, cause a large impact on the enterprise in question. Here, focus will lay on external vulnerabilities exposing supply chains to risks of disruption. Moving along, disruptions are defined as events that disturb the predetermined order or process of an event. Hence, supply chain disruptions have been defined as unplanned situations that disrupt the normal flow of goods within a supply chain or a supply chain network (Macdonald & Corsi, 2013). Such disruptions can be exemplified by multiple events including earthquakes, energy crises, component and raw material shortage and geopolitical tensions (Macdonald & Corsi, 2013).

Given the purpose of this study, we zoom in on the latter example of disruptions caused by geopolitical tensions to which Bednarski et al. (2023) adds that geopolitical disruptions on supply chains are emerging as a new sub-research field, adding an aspect to previous research on external disruptions caused by e.g. pandemics. Bednarski et al. (2023) segments the subfield into three themes: supply chain design, tension between nation states (jurisdictions) and technology. Rasshyvalov et al. (2024) continues to explain that tensions between states encompasses risks such as: international conflicts, political instability, economic sanctions, export/import restrictions and changes in governments, which in turn can lead to geopolitically caused supply chain disruptions. Finally, geopolitical supply chain disruptions are classified as global disruptions since they arise from tensions between jurisdiction (Sawik, 2014; Katsaliaki et al., 2021). This study will adhere to the definition of geopolitical supply chains as presented above.

2.1.2 Supply Chain Resilience

The concept of supply chain resilience (SCRES) refers to the ability to prepare for and respond to a disruption in a timely and cost-effective manner to ensure recovery (Tukamuhabwa et al.,

2015). The performance of the supply chain after the recovery should either be equal to that prior the disruption, or preferably better (Tukamuhabwa et al., 2015). Additionally, previous performance levels should be met or surpassed whilst ensuring better cost efficiency than competitors to induce a competitive advantage following the disruption (Tukamuhabwa et al. 2015).

Tukamuhabwa et al. (2015)'s aggregate definition of SCRES identifies four consecutive actions that define resilience actions in the event of a disruption. They appear in the following order: preparation for a disruptive event; response to an event; recovery for the event; and growth/competitive advantage after that event. The ability to adapt to circumstances beyond internal control is of utmost importance through all phases. Adapting according to disruptive events means that elements of the supply chain should change to match the requirements of the disruption. Tukamuhabwa et al., (2015) continues to argue that a supply chain may develop capabilities from past disruptive events to tackle similar events in the future. Moreover, after a disruptive event, performance can either increase decrease or converge to previous levels, as indicated by figure 2.1.2:1 where the *boost* or *decrease* of performance after a disruptive event is illustrated.

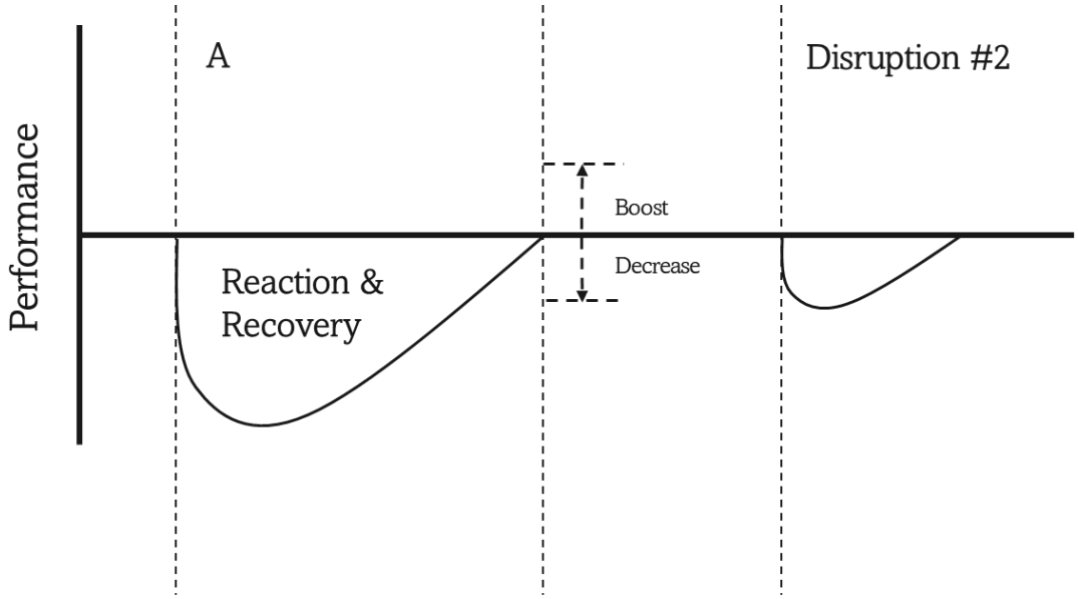

Figure 2.1.2:1 illustrates the phases adjacent to a supply chain disruption, a remodeled version of the Tukamuhabwa et al. (2015) model.

The four phases identified in the previous paragraph should, according to Tukamuhabwa et al. (2015)'s definition of SCRES be used as data points to measure its performance. Period A in figure figure 2.1.2:1 illustrates a disruptive event which induces the four phases of SCRES which are preparation, response, recovery and growth. Subsequently Period B shows a second disruptive event after which the area between the X-axis and the performance deficit curve is significantly smaller as compared to the first disruption. The area difference attempts to show how a supply chain learns from previous events (Tukamuhabwa et al. 2015).

2.1.3 Supply Chain Risk Management

The concept of supply chain risk management (SRCM) sets out to prohibit and minimize the impact of supply chain risk, where risk is defined as the likelihood and impact of unexpected macro or micro events or conditions that adversely influence any part of a supply chain leading to operational, tactical or strategic level failures or irregularities (Roscoe et al., 2020). Wagner & Bode (2005) exemplifies that supply chain risks increase when strategically important components are sourced from a concentrated area or cluster of suppliers. SRCM strategies can be passive, reactive and proactive. Passive strategies will do nothing until the risk manifests itself and then react rigorously after the disruption. Reactive strategies are similar but will react sooner than passive strategies and most often contain measures such as building redundancies like excess inventory while some scholars suggesting it also involves moving production facilities to avoid disruptions altogether (Roscoe et al., 2020). Proactive SRCM strategies are contingent upon the commitment of fixed assets into production facilities, supplier contracts or risk monitoring systems, examples are reshoring and/or muti-dual/sourcing (Roscoe et al., 2020).

2.1.4 Supply Chain Strategies

As modern-day supply chains face increasing disruptions stemming from geopolitical threats, new strategies emerge designed to keep supply chains resilient. The uncertain geopolitical environment of today makes companies scramble competence and resources to stay competitive by ensuring resilience. Consequently, academic interest in research on supply chain design for resilience towards geopolitical risk is increasing and emerging as a subfield in supply chain design which aims not only to optimize operational procedures such as stock management but also to achieve resilience (Sáenz, 2018; Bednarski et al., 2022). Throughout the literature review in this study, the authors have identified several strategies employed by companies and suggested by academia that focus on supply chain resilience to combat geopolitical disruptions: Supply chain redesign, Technological integration, product design for resilience and lobbying for resilience. This literature research has been limited to the geopolitical aspect of supply chain resilience due to the purpose of the study.

Supply chain redesign

Supply chain redesign strategies include regionalization and localization, where the first one limits supply chain nodes such as vendors, hubs and manufacturing to one region and the other takes it one step further by limiting nodes to the local market aiming to bring supply chain activities even closer (Bettiol & Burlina, 2021; PwC, 2024). By exercising such strategies companies can isolate themselves from increasing tensions between jurisdictions (Bednarski et al. 2023). Additionally, Celestin & Sujatha (2024) points out that companies could adopt supply chain diversification strategies by securing sources across different jurisdictions, with manufacturing capabilities owned both internally and outsourced, to ensure delivery if tensions arise, known as a dual capability strategy. These strategies, although quite different, seek out to provide solutions to the same problem. Moreover, Bednarski et al. (2023) argues that actors

should consider redesigning supply chains by scrapping just in time strategies in favor of increased stock security levels, providing freedom of movement during temporary shortages whilst the actors search for new sources. Such changes in supply chain strategy indicates a shift from supply chain planning in terms of stock level predictions capability planning towards planning for resilience. Finally, Bednarski et al. (2023) brings up how actors can redesign supply chains by modularization to increase customization of products and deliveries across different markets.

Technology Integration

Next, it has become apparent that technology integration in supply chains complement and ease supply chain (re)design. Rasshyvalov et al. (2024) suggests integrating high technology in supply chains to optimize routing and demand planning. Such technologies would provide companies with the ability to respond swiftly after geopolitical disruptions and steer demand and route planning accordingly. These methods enabled by technology could be used to execute Roscoe et al. (2022)'s suggestion to prioritize tactical approaches towards switching production volumes between manufacturing sites. Rasshyvalov et al. (2024) underlies that there exist prerequisites for technology solutions, namely, skilled workers and a digitalized supply chain. Celestin & Sujatha (2024) adds by advocating for the integration of AI, Block Chain and machine learning into supply chains to sharpen predictions and ease automation.

Lobbying for resilience

Bednarski et al. (2023) suggests that firms may use their influence on lobby decision makers that have power to influence decisions on policies relevant to the firm. Moreover, companies can pool their political capital by using intermediaries such as trade associations when negotiating with policy makers (Bednarski et al., 2023). Alam et al. (2024) adds that CEOs of large entities can increase the financial performance of a company during geopolitical crises if they leverage their power to ensure resilience for the firm.

Product design for resilience

Since the 1990s, product design phases have included the aspect of the manufacturing process to determine its final design to increase manufacturing efficiency. More recently, that manufacturing aspect was broadened to include the complete supply chain of a product. By doing so global companies with complex supply chains could gain a competitive advantage and cut costs by e.g. modularizing products in such a way that adaptations to different jurisdictional markets of the same product could be made further downstream in the value chain (Lee, 2012). Building on Lee's theories we introduce the concept of designing for resilience as explained by Browning et al. (2023). Design for resilience (DFR) further extends the supply chain aspect in product design to include resilience, meaning that companies should think of how the design of a product can reduce exposure to supply chain disruptions (Browning et al., 2023).

Given the focus on geopolitical resilience of this report, DFR can be extended to include planning for geopolitical disruptions during the product design phase. However, recent focus has shifted further by including the fact that companies must include geopolitical risks when designing a product. This argument is upheld by Levy et al., (2025) where it is argued that actors need to assess whether to include sensitive technology which could be the subject of future export restrictions on some markets. Hence, actors need to make contingency plans across the entire product lifecycle (Levy et al., 2025).

Levy et al., (2024) (1) exemplifies how companies have used investments in R&D on a local scale to ensure adaptability of products on local markets, an approach that could be revised to include the extended product lifecycle perspective with a design that could stay resilient from local policy changes on important components. This approach would not only ensure a resilient and tailored product but also ensure future growth and give the company a competitive advantage on the local market (Levy et al., 2025). Furthermore, this can serve as extensions on commonly employed product lifecycle management (PLM) theories such as those presented by Schuh et al. (2008). The assessment of how a combination of current PLM literature could be extended to include the design for geopolitical resilience aspect raised by (Levy et al., 2025) will be discussed later in this report.

2.2 Power-influence and actor typologies, a snapshot of today

This section outlines how jurisdictions exert geopolitical influence in global trade through using driving forces and how these interventions shape their position within the international economic system. Drawing on jurisdiction's behavior the study conceptualizes policy instruments, such as foreign investments, export controls, and sanctions, as key instruments through which states pursue strategic objectives. Building on this, the section introduces power and influence mapping framework as presented by Boyles (2022) to categorize actors based on their geopolitical and economic leverage. By classifying jurisdictions as central, bridging or transitioning, the framework connects the tools of governmental influence on their relative positioning within global trade networks. This theoretical approach supports *RQ1* by providing a basis for analyzing both the mechanisms jurisdictions deploy and the structural bi and -multi lateral relationships that shape global markets dynamics, as reflected in trade volumes, alliances and network centrality. Furthermore, the study integrates three analytical levels for understanding how jurisdictions exert economic influence: unilateral, bilateral, and multilateral, linking national trade roles with broader patterns of geopolitical influence, supporting both the mapping of state relationships in *RQ1* and the evaluation of supply chain risks in *RQ2*.

2.2.1 Policy interventions

This report analyses the extent to which a jurisdiction employes strategic trade policies by measuring the intensity of its announced policy interventions. Policy interventions are defined as any course of action or program enforced by a national or international authority that governs a certain jurisdiction ("International and national policy intervention", 2025). Brander (1995)

explains how jurisdictions can optimize their trade policy through using export controls that target strong industries. Additionally, Levy et al., (2025) exemplifies how jurisdictions use export related policy interventions to restrict knowledge and technology spillover to jurisdictions seen as foes.

To structure this study's analysis, the policy interventions will be divided into absolute and financial control. Absolute controls are policy interventions that imposes hard bans on e.g. certain imports or export goods or services from crossing international boarders (Ericsson, 2025). Policy interventions that use financial control on the other hand are soft measures such as tariffs. Tariffs are a tax on imported goods that add an additional cost to the good that is being imported from a specific jurisdiction (Radcliffe, 2025). Consequently, the key difference between absolute and financial control is that absolute policy interventions are firm bans whilst financial policy interventions raise costs and impact monetary revenue.

The policy interventions used in this report are presented in a table in Appendix 1 and they have been analyzed using the Global Trade Alert (GTA) database.

2.2.2 Definition of power - jurisdictions relationships

This study also draws on insights from Baldwin's (2013) distinction between "power as resources" and "relational power" in international relations theory. The former conceptualizes power as the possession of resources, such as GDP, natural resource endowments, or technological capabilities, that enable a state to exert influence. However, a key limitation of this approach is that it overlooks how power also comes from the structure of interdependencies between jurisdictions within the global economy. The relational power approach addresses this gap by viewing power as embedded in the interactions and dependencies between actors, where influence stems not solely from resources, but from the ability to leverage positions within economic networks. This relational dimension is particularly relevant in today's interconnected global economy, where a state's geoeconomic power is mediated and shaped by international trade flows, financial networks, and multilateral arrangements.

Furthermore, this study integrates the conceptualization of geoeconomic power developed by Christie et al (2025). Their framework distinguishes three analytical levels for understanding how jurisdictions exert economic influence: unilateral, bilateral, and multilateral.

1. At the unilateral level, geoeconomic power refers to a state's net position in relation to the global market. This approach is particularly useful for assessing a state's own vulnerabilities or leverage based on its role as a net exporter or importer of critical resources. For example, jurisdictions with large export shares of essential commodities like crude oil, can exert power over net importers simply by their market share, making trade positions a fundamental indicator of power at this level.
2. The bilateral level focuses on the specific leverage one jurisdiction holds over another. This is often visible in instances of economic coercion, such as trade restrictions or embargoes targeting a particular jurisdiction. While bilateral analysis offers detailed insights into dyadic relationships, it reduces generalizability. Nevertheless, bilateral

case studies inform how power asymmetries manifest between specific actors and highlight the strategic use of trade dependency and economic measures for targeted influence.

3. The multilateral level expands the focus to jurisdictions influence over a broader set of countries, emphasizing network effects and structural dependencies. Power in multilateral contexts may stem from occupying pivotal positions within economic networks, what Farrell and Newman (2019) describe as "panopticon" (informational advantage) or "chokepoint" (control over essential flows) effects. However, the presence and strength of such hubs depend on whether the economic network is densely or sparsely connected. Influence is more diffuse in dense networks, while in sparse networks with few critical hubs, leverage may be concentrated in key actors.

2.2.3 Power-influence mapping

To assess the present geopolitical landscape, this study adopts Power–Influence Mapping as a framework to map global trade relationships, alliances, and the dynamics of geopolitical control. This approach helps identifying which jurisdictions hold influence over strategic resources, trade policies, and financial institutions, and provides insight into how different jurisdictions interact within global trade networks. By analyzing patterns of influence, the framework enables an understanding of why certain jurisdictions dominate global trade, how alliances are formed, and what factors drive shifts in geopolitical positioning.

Power Influence Mapping originates from change management, where it is used to map an organization's political landscape and identify key actors who hold influence over critical resources and decisions (Boyles, 2022). At its core, the method seeks to answer two foundational questions: what is valued, and who controls what is valued? (Boyles, 2022). The framework evaluates influence by assessing which actors are central, those who control important resources or relationships - and which act as bridges, connecting otherwise disconnected groups or regions. This mapping includes several key aspects: identifying central actors, determining the resources they control, evaluating who has access to these resources, understanding the level of control exercised, and mapping existing alliances and relationships.

In this study, Power-Influence Mapping is adapted to a geopolitical context to analyze the relationships between jurisdictions and regions based on their control over trade flows, bi and multi-lateral relationships, use of policy interventions as control measures, financial leverage and trade dependencies based on the OEC measurements ECI. By categorizing jurisdictions as central actors (high geopolitical influence, high trade volumes, often rule-setting), bridging actors (strategically aligned with multiple blocs), or transitioning actors (emerging influence or indicating a will to increase influence), the framework offers a structured way to assess global power constellations. This analysis supports an understanding of which jurisdictions exert direct or indirect power, through absolute or financial control, and how these dynamics translate into the use of policy instruments such as tariffs, export controls, or sanctions. Ultimately, this approach helps to illuminate the underlying power structures shaping global trade relations and the leverage different actors hold within them.

2.3 Trade leverage

This section introduces the theoretical foundations for analyzing trade leverage as a dimension of geopolitical power. By examining indicators such as trade share, trade surplus or deficit, and bilateral dependency, alongside measures of economic complexity (ECI), revealed comparative advantages (RCA), and resource-based capabilities (RBV), the analysis provides a basis for understanding how jurisdictions derive influence or face vulnerability through their trade positions. These concepts support RQ1 by helping to identify which jurisdictions hold strategic trade power, and RQ2 by offering tools to assess dominance, specialization, and exposure in critical sectors such as the PCB industry, forming the analytical foundation for the RCA vulnerability table and jurisdiction-level assessments presented in the study.

2.3.1 Trade share and dependencies

This study incorporates the concept of trade dependency as a core mechanism through which states exert or experience geopolitical influence. Drawing on Christie et al. (2025), a state's power in global trade can be conceptualized through its net trade position: states (or jurisdictions) that are major net exporters of critical goods gain leverage over import-dependent countries, while net importers face structural vulnerabilities. This dynamic is central to applied analyses of security of supply, where governments seek to assess the risks associated with reliance on foreign producers for key resources. The market share of a state in global supply chains thus provides a practical indicator of its ability to exercise geoeconomic power.

Trade-based leverage is further shaped by the structure of economic networks. Farrell and Newman (2019) highlight that power may emerge not only from trade volumes, but also from a jurisdictions position within economic interdependencies. They describe two forms of structural power: the panopticon effect, where informational advantages accrue to key hubs; and the chokepoint effect, where states can block or restrict flows others depend on. These effects are contingent on whether a trade network is sparse or dense. In sparsely connected networks, such as those for oil or specialized minerals, a small number of producers act as irreplaceable hubs, amplifying their leverage over importers. In contrast, densely interconnected trade networks, as seen in aggregate global trade, lack critical chokepoints but still confer disproportionate importance to large economies through their aggregate trade share.

In densely connected systems, deterioration of relations with a major trading jurisdiction may not cause immediate supply failure in any single product but can still lead to economic risks across many sectors, what Farrell and Newman (2019) describe as "*death by a thousand cuts*." Consequently, while centrality may diminish in dense networks, market share and overall trade volume remain valid measures of a jurisdictions economic weight and potential leverage.

These insights suggest that both structural trade dependencies (import/export ratios, trade deficits/surpluses) and network-based amplification effects contribute to a jurisdictions geoeconomic power. For this study, these concepts provide a theoretical foundation for mapping trade dependencies, identifying leverage points, and assessing how trade-based power is exercised across unilateral, bilateral, and multilateral relationships.

2.3.2 Economic complexity index (ECI)

The Economic Complexity Index (ECI) acts as an additional metric to better understand who has control over scarce resources and to what extent. ECI, developed by Hidalgo and Hausmann, (Hidalgo & Hausmann, 2009) measures the knowledge intensity of an economy by considering the diversity and ubiquity of its exports. ECI addresses the problem of estimating economic complexity by indicating rarity and complexity of resources within a jurisdiction (The Observation of Economic Complexity, 2025). Estimating economic complexity is about understanding how advanced both jurisdictions and the activities they engage in such as production, and exports are. The idea is that a jurisdiction's mix of production and exports reveals a certain complexity and capabilities within a jurisdiction while the number of jurisdictions or regions participating in the same area shows the rarity or how sophisticated it is to produce. The ECI has been shown to predict macroeconomic outcomes including a jurisdiction's level of income and economic growth (Hidalgo & Hausmann, 2009). Furthermore, Economic Complexity methods are used by multilateral organizations and national development agencies to predict the evolution of international trade patterns, and by financial companies to predict long term economic growth.

The ECI index gives an understanding of a jurisdiction's economy by interpreting trade data as a bipartite network in which actors are connected to the products they export; it quantifies the complexity of a jurisdictions economy by characterizing the structure of this network.

This report will use the ECI measures ECI trade and ECI technology. ECI Trade indices are realizations of the ECI methodology on export figures. They paint a picture of the sophistication and diversification of a jurisdiction's exported goods, i.e large ECI trade indices indicate diversified product exports of sophisticated goods from e.g. an advanced industries country (The Observation of Economic Complexity, 2025). Subsequently, ECI technology is an index derived from the number of patent filings and active patents in a jurisdiction. This index describes a jurisdictions engagement in pioneering technologies that required patent filing and protection. (The Observation of Economic Complexity, 2025).

2.3.3 Relative comparative advantage (RCA)

RCA is grounded in Ricardian trade theory, which suggests that trade patterns between jurisdictions are shaped by their relative difference in productivity (UNCTADstate, 2025). Since direct measures of productivity are often difficult to obtain, RCA provides an indirect way of identifying these differences by analyzing trade data. The metric offers an initial indication of jurisdiction's relative strength in exporting certain products. Hence, jurisdictions with a rising ECI and growing RCA in a certain industry may indicate new players as they gain dominance in the market. However, RCA does not account for policy related factors that influence competitiveness, such as tariffs and subsidies.

According to UN trade & development (UNCTADstat, 2025) a jurisdiction is said to have a revealed comparative advantage in each product when its ratio of exports of that product to its

total exports of all goods/products exceeds the same ratio for the entire world. Appendix 5 provides the formula used by the OEC to calculate RCA.

2.3.4 Resource based view (RBV)

A firm (or by extension, a jurisdiction) gains sustainable competitive advantage if it has valuable, rare, hard-to-copy, and well-organized resources (Barney, 1991). The idea here is that the internal resources are in focus to gain a competitive advantage rather than the external factors. The ECI framework assumes that the products a jurisdiction can make depends on its capabilities, many of which are non-tradable and hard to replicate (Hidalgo & Hausmann, 2009). This is very aligned with the RBV notion where valuable resources help putting opportunities to use (Barney, 1991). Hence jurisdictions with high ECI have a capability base that becomes a source of strategic advantage in global trade and in turn a type of leverage against other players. This is due to it increasing their leverage in trade negotiations and global supply chain due to them being less likely to be replaced (Hidalgo & Hausmann, 2009). This can translate into greater lobbying power, especially in bilateral trade deals or shaping technology standards.

2.4 Summary of theoretical frameworks

This section provides a summary of how the theoretical sections presented above will be employed throughout the report from the research questions to the analysis section. Most importantly, it outlines the contextual use of the theory to guide data collection of the empirical findings and the subsequent analysis. As is illustrated by table 2.5:1, one theory section can be used to ensure delivery of more than one research question.

Research question	Theory section	Empirics & analysis
RQ1.1	2.2.1 Policy interventions 2.2.2 Definition of power 2.2.3 Power influence mapping	Use the selected theoretical frameworks to guide the empirical findings presented in 4.1.1, 4.1.2 and 4.1.3 analyze the findings.
RQ1.2	2.3.1 Trade share and dependencies 2.3.2 ECI 2.3.4 Resource based view	
RQ2.1	2.3.1 Trade share and dependencies 2.3.4 Resource based view	Use the selected theoretical frameworks to guide the empirical findings in sections 4.2.1 and 4.2.2 on PCBs and further add the PCB perspective to analysis section 5.1.1.
RQ2.2	2.3.3 Relative comparative advantage (RCA)	
RQ2.3	2.1.1 Supply chain disruptions 2.1.2 Supply chain resilience 2.1.3 Supply chain risk management 2.1.4 Supply Chain Strategies	Use the selected theoretical frameworks to guide the empirical findings in section 4.3.1 and 4.3.2 and add Ericssons value chain perspective to analysis section 5.1.2.

Table 2.5:1, Research questions connection to theory, empirics and analysis.

3. Methodology

3.1 Overview of the research process

The *first phase* of the project included a focused literature review comprising of both scholarly and grey literature. This dual approach was necessary because the domain in which this study is situated, geopolitically induced supply chain risks, is rapidly evolving and not yet fully established in academic literature. Alongside this, qualitative onboarding activities were conducted with Ericsson, including internal training (ethics and security), observations, and stakeholder interviews. These steps helped define the scope and problem formulation and contributed to a contextual understanding of supply chain operations within a geopolitical and case company context. Semi-structured interviews and meetings allowed the authors to gain insight into organizational practices and align the research questions with both academic and practical relevance. This phase of this project resulted in a background presenting a structured approach illustrated by figure 1.2:1, outlining an inherent layout intended to guide the reaming parts of the study.

Next, in the *second phase*, a substantial document collection and analysis phase was initiated. Grey literature, such as consultancy reports, news articles, and official government statements, were collected and reviewed to identify and classify the types of policy interventions jurisdictions typically deploy and determine its market characterization (bridging, transitional or central). Through a theoretical sampling approach and purposive data collection (Bryman and Bell, 2015), this qualitative base was translated into measurable categories, laying the foundation for a structured definition of six driving forces, later categorized as either financial or absolute controls.

The *third phase* of this study south measures the usage of the six driving forces quantitively. By using the Global Trade Alert (GTA) database, data on policy updates was collected for each of the 11 jurisdictions selected in the study. GTA's bundle-search functionality allowed for the categorization of relevant intervention types aligned to each driving force, making the qualitative definitions quantifiable. This phase allowed the researchers to construct a comparative framework measuring the extent to which each jurisdiction employes the driving forces.

In the subsequent and *fourth phase*, trade flow data was collected using the World Bank's World Integrated Trade Solutions (WITS) database, offering secondary quantitative insights into import/export volumes and structural dependencies between jurisdictions. Complementing this, economic complexity data (ECI) and Relative Comparative Advantage (RCA) figures for the PCB industry were gathered to further map structural leverage within the PCB industry specific domain. Moreover, PCB industry specific import and export data was gathered to map dependencies and geographical clustering in global trade.

The *fifth and final phase* of the process included cross-validating data interpretations with Ericsson through iterative meetings. Empirical patterns identified through quantified data were

presented to the supervisor at Ericsson to ensure their alignment with real-world dynamics and the original purpose of the study. Moreover, qualitative interviews were conducted to map Ericssons overall supply chain structure as well as the specific sourcing and logistics strategies of the PCB component. Additionally, this phase involved synthesizing and interpreting the findings from RQs 1 and 2 to generate patterns applicable to the PCB industry and the case company's global supply chain structure. Theoretical insights from the literature review were then applied to analyze and contextualize the findings, to ensure relevancy and consistency with the research aim.

In summary, the methodology combined iterative qualitative reasoning with structured quantitative measurement as shown in Figure 3.1:1. Through a flexible but robust research design, the process allowed for both broad mapping from a qualitative research strategy and deep contextual analysis from a quantitative view, enabling the study to answer its research questions in a way that balances academic and strategic relevancy.

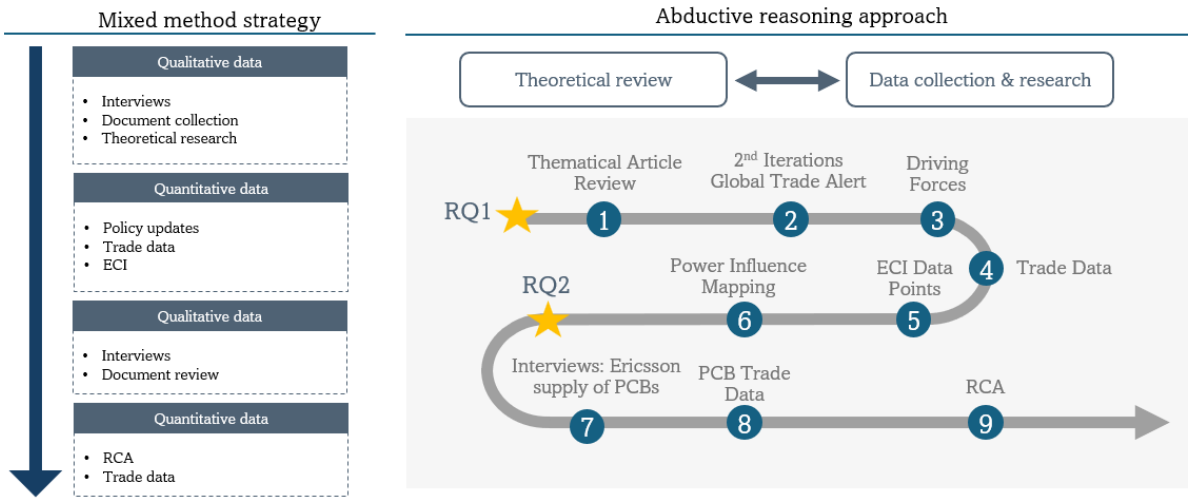

Figure 3.1:1 illustrates a simplification of the mixed method strategy.

3.2 Research strategy

This study adopts a mixed-methods exploratory research strategy grounded in a qualitative research design Bryman and Bell (2015). While the qualitative strategy is the primary method, it is strategically supported by quantitative analysis. This approach is particularly suitable given the study's aim to uncover patterns of geopolitical power and supply chain dependencies within the global PCB industry.

The research aligns with what Bryman and Bell (2015) defines as an exploratory sequential design, an iterative process beginning with qualitative exploration, followed by quantitative categorization resulting in an integrated analysis. Initially, qualitative data collection included interviews, observations, and the analysis of grey literature and official documents further explained in sections (3.3.1 and 3.3.2). The initial qualitative phase resulted in the

categorization of policy interventions into driving forces and as well as the categorization of market type. These qualitative categories were then quantified through secondary data sources, specifically the Global Trade Alert (GTA) database, to measure and compare national policy activity (3.3.4). This process represents a quantification of secondary qualitative data, by transforming it into measurable variables.

The study's priority decision as referred to in Bryman and Bell (2015), is the qualitative approach given that the study's theoretical foundation, case framing, and research questions are driven by qualitative concerns, while quantitative methods are used to reinforce, support and generalize the qualitative insights.

The sequence decision follows an iterative model of qualitative to quantitative. The study began by collecting qualitative data and data analysis (interviews and document analysis) which was followed by quantitative measurement (GTA-based policy activity, RCA, ECI indices, and trade data (both global trade and PCB industry specific). In the end, the study returned to a qualitative analysis of these figures through case-specific analysis of geopolitical leverage based on academic literature and quantitative findings. Finally, this process could be considered to align with the filling-the-gap strategy (Bryman and Bell, 2015), where qualitative insights helped identify under-researched geopolitical dynamics and build new quantitative measurements to explore and measure the extent of their application.

The research is also inspired by an abductive research approach, as described by Bryman and Bell (2015), where theoretical frameworks and empirical data have been developed in parallel through an iterative process.

3.3 Data collection

To fulfill the aim of this project, both primary and secondary data have been collected. Furthermore, the study employs both qualitative and quantitative data in a combined form to answer the study's research questions. Sources of data collection include interviews and observations with Ericsson, grey literature in the form of news articles and consultancy reports, trade data (import and export figures monetarily measured), policy instrument updates from online databases, economic complexity index's (ECI), PCB specific trade data (exports and imports of PCBs) and relative comparative advantage (RCA) data for jurisdictions in the global PCB industry. In the following sections, the researchers used a snowball sampling approach guided by a purposive sampling method (Bryman and Bell, 2015). Specifically, it was used by selecting interviewees based on their experience or role and collecting documents based on their relevancy for the project, (further explained in section 3.3.2) (Bryman and Bell, 2015). A table summarizing the collected data for each research question is included below (table 3.3:1).

Research question	Data type	Data collection	Data analysis

RQ1.1	Qualitative	News articles, consultancy reports, official documents collected by searching for keywords	Thematic analysis
RQ1.2	Quantitative	ECI trade, ECO technology from OEC trade data from WITS	Scatterplots and dependency mapping
RQ2.1	Quantitative	PCB industry trade figures from OEC	Charts and scatterplots
RQ2.2	Quantitative	Relative comparative advantage (RCA) from OEC	
RQ2.3	Qualitative	Ericsson supply sourcing and dependency on PCB from interviews	Cross comparison with findings from previous RQs

Table 3.3:1, overview of the data type and specific data collected to support each research question.

3.3.1 Data collection: Interviews, observations & literature study

The first data collection process included interviews and observations which sought to deepen the authors knowledge in the supply chain strategy and operations domain at Ericsson and collect input from key stakeholders to derive relevant problem formulation.

The first data collection process included an onboarding program consisting of multiple introductory trainings, quizzes and meetings with the Ericsson supervisor seeking to introduce the authors to Ericssons supply chain operations and related fields. In these early observations the authors took a primarily investigative role aiming to gain a broad contextual understanding of Ericsson supply chain operations and current strategies. Figure 3.3.1:1 provides an overview of the first observatory sessions where the researchers participated.

Observations		
Observation topic	Date	Duration
Introduction to Ericsson	2025-01-29	Full day
Ericsson supply introduction	2025-01-29	4h
Onboarding courses	2025-01-30	4h
Mandatory training videos	2025-01-31	2h

Figure 3.3.1:1, List of observatory sessions.

Next, the authors received the opportunity to book follow-up meetings with stakeholders whose employment roles were deemed relevant for the project description, hence the snowball sampling approach previously explained was used (Bryman and Bell, 2015). The interviews were conducted in a semi structured manner, given the authors the opportunity to present the project overview and description and subsequently ask investigative questions based on the

interviewee's thoughts and ideas (Bryman and Bell, 2015). Figure 3.3.1:2 provides an overview of the interviews seeking to cement the study's research questions and problem formulation. The first round of interviews resulted in a concrete problem formulation pushing the project to its next step.

Interviews		
Interview topic	Date	Duration
Team meeting and introduction	2025-01-30	1h
Supply chain management	2025-02-04	1h
Strategy & PMO manager intro & thoughts	2025-02-11	45min
Geopolitical analysis team introduction	2025-02-17	1h 30min

Figure 3.3.1:2, List of semi structured interviews conducted to cement problem formulation and research questions.

In addition, during the first data collection phase of this project, the authors embarked on the literature review process. Given the, at first, ambiguous purpose of the study, a broad base of articles was studied at first before the literature collection was narrowed down. Importantly, this studies literature section contains a considerable amount of grey literature, specifically consultancy reports, which is motivated by the inherent ambiguity of the problem formulation in question and the fact that previous research on the subject is limited.

3.3.2 Data collection: Document collection

The second data collection of grey literature such as news articles, consultancy or industry reports and official government documents aimed to provide data on which the first research question could be based. Hence, documents were collected with the purpose of identifying categories of commonly used policy interventions such as those defined in 2.2.1. Hereafter, the categories of comprised of different policy interventions will be referred to as driving forces. Moreover, this data collection section aimed to support the categorization of jurisdictions either bridging, transitioning or central (2.2.2). By previously mentioned limitations, the collection of documents was limited to Ericssons market areas (MANA, MELA, MOAI and MNEA). Hence, the data collection of documents aligns to a purposive data collection approach meaning that the authors have collected documents aligned to the problem formulation and purpose of the study (Bryman and Bell, 2015). Moreover, it can be argued the authors used a theoretical sampling approach since the document collection sought to categorize jurisdictions as bridging, transitioning or central as well as identify categories (driving forces) of commonly used policy interventions,

Before the document collection began, the authors formulated keywords which were used in search tools to find relevant data. The keywords included, but were not limited to, telecommunication, trade, defense, policy interventions, export and import restrictions and sanctions. These keywords were combined with the name of each jurisdiction to find relevant documents. Here, a snowball sampling approach, as described by Bryman and Bell (2015), was used to find data since the authors would find referenced documents in sources discovered in

the original search. A source was considered relevant if it included at least one of the keywords previously mentioned, indicating a purposive sampling method as well (Bryman and Bell, 2015). The data collection, i.e., searches for keywords, was conducted until data saturation was reached.

Articles considered relevant were continuously collected and included in tables segmented after which market area the searched for jurisdiction belonged to. The tables, which can be found in Appendix 2, included columns for source numbers, document headline, topic and link to source.

3.3.3 Data collection: Trade flow data

The third section of the studies data collection process retrieved data on the selected jurisdictions trade, classified as secondary data. Specifically, the nation's exports and imports for the year 2023 were collected. Trade data for both commercial services and commodities was included, since both types of trade figures result in trade leverage for a selected jurisdiction. The data was collected from the World Integrated Trade Solutions Database which sources trade data from the world bank. Due to the lags in reporting, the latest data available was from 2023.

3.3.4 Data collection: Driving forces, absolute and financial control

The next data collection part concerned the gathering of policy updates on the driving forces identified after data analysis see section 3.4.1. Furthermore, it sought out to collect data on what type of control, either absolute, or financial, that the jurisdictions most commonly use against each other. According to Ericsson (2025) absolute control is defined as hard bans of e.g. components or entities, and financial control as measures which do not impose hard restrictions but instead raise costs, e.g. import or export tariffs. The data analysis in section 3.4.1 resulted in the preliminary formulation of multiple driving forces, illustrated in Appendix 3. Next, to investigate the extent to which the selected jurisdictions use the driving forces the authors used the Global Trade Alert (GTA) database. The GTA database allows users to combine 66 different policy interventions in different bundles and subsequently apply the bundles on jurisdiction and note the number of policies updates related to the bundle and jurisdiction in question. To create bundles of policy instruments reassembling the driving forces identified (as will be further explained in data analysis section 3.4.1), the authors reviewed all 66 policy interventions defined on the GTA database and allocated appropriate policy interventions to the different driving forces. By doing so, the driving forces became quantitatively measurable. The review of policy instruments resulted in the final definition of six measurable driving forces defined and described in table 3.3.4:1. The driving forces are built up by 44 different policy interventions, each of which have been defined in Appendix 1. Since the driving forces were defined by the authors based on the results from the data collection of documents, and the definitions of each policy interventions to generate study relevant data which could be interpreted using theory, it can be argued that the authors used a theoretical sampling approach. This method is described by Bryman and Bell (2015) as a way

of discovering categories and their properties and their relationship to theory. Furthermore, the driving forces were assumed to employ either absolute, or financial control.

	Driving Force	Description	Policy Intervention
Financial Control	**Import restrictions**	Use of tariffs to penalize or discourage trade with specific nations or industries.	Import Tariff, Import Ban, Import-related nontariff, Import Licensing, Import Tariff Quota, Import Quota, Anti-subsidy, Safeguard
	State aid & Export incentives	Government funding to boost domestic sectors and undercut foreign competition. E.g. Measures to reduce dependence and bring production home	Financial Aid, In-Kind, State Loan, Tax or Social Reliefs, Trade Finance, State Aid nes, Other Export Incentives, Tax Based Export Incentives, Interest Payment Subsidies, Loan Guarantee, Capital Injection and Equity Stakes (inc. Bailouts), Financial Assistance in Foreign Market, Export Subsidy
	Public procurement and localization demand	Incentives for local manufacturing, demands on local production and regulations to increase companies to purchase locally	Public Procurement Localization, Production Subsidy, Local Content Incentives, Local Content Requirements, Local Value-Add Incentives, Local Supplier Requirements for Export, Localization nes, Public Procurement Access, Public Procurement Preference Margin, Local Operations Incentive, Public Procurement nes
Absolut Control	**Export restrictions**	Formal economic/legal restrictions, bans, or export license limitations.	Export Ban, Export Tax, Export Quota
	FDI Restrictions & Commercial transaction sanctions	Blocking or scrutinizing foreign investment in strategic sectors.	FDI: Entry and Ownership Rule, FDI: Treatment and Operation nes, FDI: Financial Incentives, Controls on Commercial Transactions and Investment Instruments, Trade Payment Measure
	Tech/Knowledge Control	Limiting access to intellectual property, R&D, or critical tech (via bans, export limits, etc.)	Export Licensing Requirement, Intellectual Property Protection, Export Related non-tariff Measure, Foreign Customer Limit

Table 3.3.4:1 The different driving forces, their definitions and the policy interventions included.

Once the driving force had been defined, the data collection process began. Like previously stated, policy updated for each driving force could be measured by counting the number of policy updates appearing for each driving force when searching for a jurisdiction together with the policy bundle representing the driving force in question. This resulted in table 3.3.4:2, illustrating the number of policy updates per jurisdiction and driving force.

Market	Import Restriction	State aid & Export incentives	Public procurement & localization requirements	Export Controls	FDI Restrictions & Screening	Tech/Knowledge Control
USA	245	2580	1167	5	58	68
China	62	965	25	32	22	31
EU	62	1599	34	20	3	21
India	228	90	142	56	1	19
Canada	17	496	42	3	2	0
UK	26	176	46	38	4	3
South Korea	12	60	5	7	0	1
Mexico	22	14	14	10	0	2

Taiwan	3	0	1	0	1	1
Japan	12	175	7	3	1	5
Brazil	237	172	98	2	0	5

Table 3.3.4:2, Number of policy updates per jurisdiction and driving force (GTA 2025)

The data collection process for absolute control was conducted by searching for all policy interventions categorized as absolute control in table 3.3.3:1. To determine the extent of which the nations use controls against each other, a 11x11 matrix (table 3.3.4:3) with the selected jurisdictions as rows and columns was created. By selecting one jurisdiction as implementing and the other as affected, and repeating the process until the complete table had been completed, it was possible to quantify the use of absolute and financial control.

		Affected jurisdiction										
		USA	China	EU	India	Canada	United	South	Mexico	Taiwan	Japan	Brasil
Implementing jurisdiction	**USA**		2001	1982	1813	1958	1787	1728	1833	8	1760	1650
	China	2636		2568	2330	2357	2434	2494	2278	3	2479	1962
	EU	1041	1117		737	563	1052	707	500	9	759	435
	India	363	339	379		240	309	286	206	2	294	255
	Canada	428	363	405	264		358	285	297	0	286	233
	UK	172	159	219	120	136		117	88	1	114	76
	S.Korea	61	71	69	50	51	58		48	0	60	45
	Mexico	47	34	42	22	31	17	25		0	17	38
	Taiwan	1	4	1	1	1	1	1	1		1	0
	Japan	152	164	171	105	109	139	146	98	0		57
	Brazil	424	432	443	302	320	359	282	338	127	352	

Table 3.3.4:3, Table of financial control with implementing jurisdiction and affected jurisdiction showing the number of policy updates related to policy interventions classified as financial control. How to read: U.S. has 2001 policy updates related to policy interventions classified as financial control since 2019 (GTA, 2025).

		Affected jurisdiction										
		USA	China	EU	India	Canada	United	South	Mexico	Taiwan	Japan	Brasil
Implementing jurisdiction	**USA**		107	57	40	26	34	27	25	6	27	28
	China	68		46	42	39	41	42	38	2	43	38
	EU	28	32		22	25	25	25	19	7	25	20
	India	54	54	65		51	63	39	35	0	43	39
	Canada	3	3	3	1		1	2	1	0	2	1
	UK	39	41	40	40	37		39	38	1	39	39
	S.Korea	7	7	6	6	4	3		7	0	8	4
	Mexico	12	2	3	1	1	1	2		0	2	3
	Taiwan	0	1	1	0	0	0	0	0		1	0
	Japan	4	7	5	5	4	4	5	4	1		4
	Brazil	7	7	7	5	4	6	7	6	0	5	

Table 3.3.4:4 Table of absolute controls with implementing and affected jurisdiction, showing the number of policy updates related to policy interventions classified as absolute control (GTA, 2025).

The time interval used for collecting the data in this section for all driving forces and absolute/financial controls was selected to range from 2019-01-01 to 2025-04-17. This time interval has been selected since it represents a period characterized by rhetoric indicating a protectionist trend.

3.3.5 Data collection: Economic complexity (ECI trade & tech)

Economic complexity (ECI) data was collected as secondary data from the OEC database. ECI trade and ECI technology scores were gathered for all jurisdictions. The reader is referred to section 2.3.3 for a definition of ECI trade and ECO technology.

3.3.6 Data collection: PCB industry specific trade data & key actors

To provide answers to RQ2 (How can patterns in driving forces, trade power, and economic influence affect Ericsson supply chain in a vital industry, such as the Printed Circuit Board industry?), the authors collected PCB specific trade data from the OEC database. The trade data consisted of export and import statistics for each jurisdiction as well as the industry total. The OEC allows users to visualize a single jurisdictions imports and exports and tits largest trading partners in terms of exports and imports. Here, it is noted that the OEC database only covers data accessible for publishing, indicating that there might exist discrepancies in comparison with other PCB industry reports. However, it was decided that PCB industry trade figures retrieved from the OEC webpage represent the global structure of the OCB industry. This was verified by triangulation as described by Bryman and Bell (2015). Table 3.3.6:1 shows the collected PCB specific trade data for all jurisdictions. Moreover table 3.3.6:2 shows the selected jurisdictions share of world export and imports of PCBs.

		USA	EU	China	Japan	UK	S. Korea	India	Mexico	Canada	Taiwan	Brazil
Purchasing jurisdiction	**USA**		121,7	773,0	191,0	21,3	147,0	25,0	99,9	150,0	535,0	0,0
	EU	116,5		3 115,3	104,1	65,7	143,6	90,7	15,3	12,1	281,3	0,0
	China	46,7	243,7		1 210,0	8,6	1 250,0	4,9	2,0	2,2	1 870,0	0,0
	Japan	17,3	4,2	721,0		1,1	65,2	0,3	0,0	0,0	182,0	0,0
	UK	29,9	62,1	198,0	4,7		2,5	5,5	0,0	7,1	9,6	0,0
	S. Korea	18,1	7,8	1 010,0	356,0	0,3		1,0	4,6	0,9	455,0	0,0
	India	10,1	10,8	960,0	9,9	1,1	75,4		0,7	0,7	81,2	0,0
	Mexico	228,0	11,4	1 880,0	25,7	0,0	212,0	12,8		4,2	98,2	0,0
	Canada	65,7	12,9	140,0	33,7	2,5	5,1	0,3	2,9	0,0	23,7	0,0
	Taiwan	20,7	2,4	2 010,0	716,0	0,6	668,0	0,0	0,5	0,9		0,1
	Brazil	2,0	5,0	267,0	1,7	0,1	23,6	0,0	7,7	0,4	21,6	

Table 3.3.6:1, table of export and import data for the selected jurisdictions in millions of USD, with the far-left column as the purchasing jurisdiction. How to read: the U.S. imports PCBs worth up to 773 million USD from China.

In addition to PCB specific trade data, the researchers used secondary data in the form of industry reports and annual reports do identify key suppliers of PCBS. This data was collected to support the second research question which seeks to map the complete PCB industry. The revenue of each major actor related to PCB components was extracted and regulated to USD using a year average currency exchange rate for 2023. The extracted revenue streams were synthesized to from a market overview illustrated by table 4.2.2:1. A list of the annual reports referenced are included in Appendix 7.

	PCB World trade			
	Exports	**%**	**Imports**	**%**
USA	911	1,9%	2 500	5,2%
EU	2 763	6,29%	6 419	13,4%
China	22 900	47,9%	5 470	11,4%
Japan	3 800	8,0%	1 360	2,9%
UK	174	0,4%	442	0,9%
S. Korea	3 460	7,2%	2 120	4,4%
India	167	0,4%	1 270	2,7%
Mexico	167	0,4%	2 720	5,7%
Canada	210	0,4%	326	0,7%
Taiwan	5 100	10,7%	3 490	7,3%
Brazil	0	0,0%	407	0,9%
ROW	8 148		21 276	

Table 3.3.6:2, data of world imports and exports of PCB components for the year 2023 (OEC, 2025).

3.3.7 Data collection: RCA and jurisdictional trade dependencies

As part of the data collection for the second research question data on each jurisdiction's relative comparative advantages (RCA) for the PCB industry were collected from the OEC database. For the EU, the RCA index was collected by taking the average of the total of each union members RCA.

3.3.8 Data collection: Interviews, mapping Ericsson supply chain

The final round of interviews was aimed at mapping Ericsson's supply chain and its use and sourcing strategy of the PCB component. Hence, this data collection part gave insights on Ericsson's global supply chain structure, including critical hubs and manufacturing facilities as well as Ericssons PCB sourcing strategy. All interviews were conducted in a semi structured manner, giving the interviewees the possibility to contribute with unique insights and hence also giving the author a possibility to include adjacent findings on Ericsson's supply chain in the project. Table 3.3.6:1 provides an overview of the second and final round of interviews.

Interviews		
Interview topic	Date	Duration
Ericsson Eco-system: Context and positioning	2025-02-27	50min
Ericsson Inbound: deep dive	2025-02-28	1h
Geopolitics team U.S. strategy	2025-02-28	1h
Team meeting, introduction to potential interviewees	2025-03-04	1h
Ericsson supply chain: manufacturing	2025-03-06	1h
Ericsson supply chain: manufacturing, follow up	2025-03-10	1h

Ericsson Sourcing: mapping and strategy	2025-04-03	1h
Ericsson supply chain: critical components	2025-04-07	1h
Ericsson supply chain: PCB industry and background	2025-04-09	1h
Ericsson Strategy Team Meetings	2025-02-03 – 2025-05-30	13 h

Table 3.3.6:1, Table of interviews with topic, date and duration included.

Interviewees were found using the purposive data collection method known as snowball data-sampling approach guided by a purposive method previously explained (Bryman and Bell, 2015). This approach gave the authors the ability to find interviewees with knowledge suitable for the project's purpose and ask to find new interviewees by asking for recommendations during interviews and meetings. All interviews began with a project specific introduction. Subsequently, the interviewees answered pre-determined questions tailored to the subject of the interview and the interviewee. Given the different subjects of the second-round interviews, it was not suitable to develop a one size fits all interview guide. Hence, interview specific research questions were formulated before every meeting.

3.4 Data analysis

In this section, it will be described how the authors interpreted and analyzed the collected data to create a solid empirical chapter that shows a clear connection and provides grounds which contribute to answering the study's research questions.

3.4.1 Document analysis

This section describes how the authors analyzed the data of documents described under section 3.3.2. The document analysis consisted of two parts, interpreting, analyzing and categorizing policy interventions used, and identifying plus analyzing examples of bridging, transitioning or central markets (2.2.1; 2.2.2).

Both parts of the document analysis were conducted continuously in a process in which both authors read all collected document sources one by one whilst allocating each in a matrix. The matrix included the six columns visible in figure 3.4.1:1. After each collected document had been read and analyzed it was labeled with a source number (final column) and letter A, B, C or D, indicating what market area the document had been originally collected in. Subsequently, the remaining columns were completed. These included the affected jurisdiction, what market type (bridging central or transitional), the driving force (interpreted result of the measure), measure (type of policy interventions used e.g. tariffs, export bans etc…), type of control (absolute or financial, as defined by Ericsson (2025)) and an example from a source underlining the findings. Additionally, if more than one document supported the information entered in one row, multiple sources could be entered in the final column. This process was iterated for all

document sources until it resulted in a complete table, shown in Appendix 3, where all nations had been characterized as either bridging, transitioning or central and a column of commonly used driving forces interpreted from the jurisdictions use of policy instruments.

Identifying driving forces & market type						
Jurisdiction	**Market type**	**Driving forces**	**Measure**	**Type of Control**	**Example**	**Source**

Figure 3.4.1:1, headline for table used to analyze the document collection.

The analysis of the related policy interventions and the subsequent definition of driving forces was guided by the theory introduction on the overarching definition of the term policy interventions in section 2.2.1 as well as the complete definitions (found in Appendix 1) of all policy instruments used to guide the definitions of data collection on the driving forces.

The characterization of markets as bridging, transitional or central was supported by trade data, namely imports and exports collected for each jurisdiction. For this study's purpose, it was deemed that the imports and exports of both commodities and commercial services should be used. This limitation was used since imports can imply a leverage power related to consumption, and a large export power can indicate leverage power related to manufacturing. Hence, both are used to support the market characterization since they can indicate the trade leverage of a jurisdiction. Additionally, the document analysis helped support market characterization by providing examples of news updates related to strategic policies regarding e.g. trade, technology or diplomatic relationships. Such examples were considered relevant if they indicated a jurisdictions stance as either bridging, transitioning or central based on the definitions presented in the power influence mapping frameworks in section 2.2.3. By interpreting such communications for each jurisdiction together with the subject's export and import data, the authors could draw conclusions on market characterization guided by the power influence mapping framework presented in section 2.2.3.

3.4.2 Analysis of driving forces and absolute/financial control

To generate empirical answers related to the first research question from table 3.3.4:2 of the policy updates collected for each driving force on each jurisdiction, the authors first divided (scaled) the data for each jurisdiction on all driving forces with the global domestic product (GDP) of the jurisdiction in question. By doing so, the results were generalized in with respect to the jurisdiction size. This resulted in a scaled research table which enabled the authors to compare the jurisdictions to one another regardless of the size.

A similar process was repeated for tables 3.3.4:3 and 3.3.3:4 illustrating the collected policy updates related to financial and absolute control. The tables were first scaled by dividing all values in one column with the affected jurisdictions GDP, i.e. the column for U.S. was divided by the U.S. GDP. In other words, the number of policy interventions affecting a jurisdiction was divided by that jurisdiction's GDP. This formula was based on the logic that in normal circumstances the policy updates characterized as financial and or absolutely are proportionate to the affected jurisdictions GDP. Hence, by scaling the tables using this logic, it is easy to

identify what jurisdictions are more prone to use the different types of controls Table 3.4.2:1 shows the GDPs used to reformate the collected data, and tables 3.4.2:2, 3.4.2:3 and 3.4.2:4 shows the scaled policy for the driving forces, financial control and absolute control measures.

Table of GDP										
USA	**China**	**EU**	**India**	**Canada**	**UK**	**S. Korea**	**Mexico**	**Taiwan**	**Japan**	**Brazil**
27,72	17,79	17,1	3,57	2,14	3,38	1,73	1,79	0,756	4,2	2,17

Table 3.4.2:1, Table of GDPs used per nation for 2023 in USD trillion (World Bank, 2025).

		Driving forces / GDP					
		Affected jurisdiction					
Implementing jurisdiction	Market	Tariff Pressure (impacted nation)	State aid and Export incentives	Public procuement and localisation requirements	Export Controls	Restrictions & Screening	Tech/Knowledge Control
	USA	8,8	93,1	42,1	0,2	2,1	2,5
	China	3,5	54,2	1,4	1,8	1,2	1,7
	EU	3,6	93,5	2,0	1,2	0,2	1,2
	India	63,9	25,2	39,8	15,7	0,3	5,3
	Canada	7,9	231,8	19,6	1,4	0,9	0,0
	U.K	7,7	52,1	13,6	11,2	1,2	0,9
	S. Korea	6,9	34,7	2,9	4,0	0,0	0,6
	Mexico	12,3	7,8	7,8	5,6	0,0	1,1
	Taiwan	4,0	0,0	1,3	0,0	1,3	1,3
	Japan	2,9	41,7	1,7	0,7	0,2	1,2
	Brasil	109,2	79,3	45,2	0,9	0,0	2,3
	Mean	7,7	52,1	7,8	1,4	0,3	1,2
	Stand	34,1	63,6	17,8	5,1	0,7	1,4

Table 3.4.2:2, Table of scaled vales of policy intervention updates of driving forces with the standard deviation and median calculated as described below.

		Financial control / GDP										
		Affected jurisdiction										
		USA	China	EU	India	Canada	U.K	S. Korea	Mexico	Taiwan	Japan	Brasil
Implementing jurisdiction	USA	0,0	112,5	115,9	507,8	915,0	528,7	998,8	1024,0	10,6	419,0	760,4
	China	95,1	0,0	150,2	652,7	1101,4	720,1	1441,6	1272,6	4,0	590,2	904,1
	EU	37,6	62,8	0,0	206,4	263,1	311,2	408,7	279,3	11,9	180,7	200,5
	India	13,1	19,1	22,2	0,0	112,1	91,4	165,3	115,1	2,6	70,0	117,5
	Canada	15,4	20,4	23,7	73,9	0,0	105,9	164,7	165,9	0,0	68,1	107,4
	U.K	6,2	8,9	12,8	33,6	63,6	0,0	67,6	49,2	1,3	27,1	35,0
	S. Korea	2,2	4,0	4,0	14,0	23,8	17,2	0,0	26,8	0,0	14,3	20,7
	Mexico	1,7	1,9	2,5	6,2	14,5	5,0	14,5	0,0	0,0	4,0	17,5
	Taiwan	0,0	0,2	0,1	0,3	0,5	0,3	0,6	0,6	0,0	0,2	0,0
	Japan	5,5	9,2	10,0	29,4	50,9	41,1	84,4	54,7	0,0	0,0	26,3
	Brazil	15,3	24,3	25,9	84,6	149,5	106,2	163,0	188,8	168,0	83,8	0,0
	Mean	6,2	9,2	12,8	33,6	63,6	91,4	163,0	115,1	1,3	68,1	35,0
	Stand	28,0	34,4	50,7	224,9	387,5	242,9	470,8	437,2	49,9	195,2	320,6

Table 3.4.2:3, table of scaled values of financial control measures and their mean and standard deviation calculated as described in the section below.

		Absolute control / GDP										
		Affected jurisdiction										
		USA	China	EU	India	Canada	U.K	S. Korea	Mexico	Taiwan	Japan	Brazil
Implementing jurisdiction	USA	0,0	6,0	3,3	11,2	12,1	10,1	15,6	14,0	7,9	6,4	12,9
	China	2,5	0,0	2,7	11,8	18,2	12,1	24,3	21,2	2,6	10,2	17,5
	EU	1,0	1,8	0,0	6,2	11,7	7,4	14,5	10,6	9,3	6,0	9,2
	India	1,9	3,0	3,8	0,0	23,8	18,6	22,5	19,6	0,0	10,2	18,0
	Canada	0,1	0,2	0,2	0,3	0,0	0,3	1,2	0,6	0,0	0,5	0,5
	U.K	1,4	2,3	2,3	11,2	17,3	0,0	22,5	21,2	1,3	9,3	18,0
	S. Korea	0,3	0,4	0,4	1,7	1,9	0,9	0,0	3,9	0,0	1,9	1,8
	Mexico	0,4	0,1	0,2	0,3	0,5	0,3	1,2	0,0	0,0	0,5	1,4
	Taiwan	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,2	0,0
	Japan	0,1	0,4	0,3	1,4	1,9	1,2	2,9	2,2	1,3	0,0	1,8
	Brazil	0,3	0,4	0,4	1,4	1,9	1,8	4,0	3,4	0,0	1,2	0,0
	Median	0,3	0,4	0,4	1,4	1,9	1,2	4,0	3,9	0,0	1,9	1,8
	Std.v	0,9	1,9	1,5	5,0	8,8	6,4	10,1	8,8	3,4	4,3	7,8

Table 3.4.2:3, table of scaled values of absolute control measures and their mean and standard deviation calculated as described in the section below.

Next, to further enhance comparability between the jurisdictions on a single scale and illustrate the results more clearly, the scaled table was normalized by taking the median and standard deviation of each column representing a driving force and using the formula for normalization presented in Appendix 4, the median and standard deviation are presented as the last rows in figure 3.4.2:2. This resulted in a table with normalized values which were color coded to create the finalized heatmap for the driving forces presented in section 4.1.2 as table 4.1.2:3.

The scaled financial and absolute control matrices were normalized too using the same formula as in the previous section (Appendix 4). Here, it was decided to take the median and standard deviation of all controls affecting one jurisdiction, i.e. for means and standard deviation was calculated for each of the columns. The median and standard deviation are presented as the last rows in figure 3.4.2:3 and 3.4.2:4. They were subsequently used to normalize the values in their respective columns. The normalization resulted in the finalized tables presented in section 4.1.2.

Conclusively, the analysis in this section has been guided by theory section 2.2.2 which gives definitions of power and jurisdictions relationships. Specifically, the three tables of diving forces, absolute control and financial control presented in section 4.1.2 provides ground on which the authors can answer the first research question of to what extent the different jurisdictions use the driving forces and what other jurisdictions commonly are targeted by the jurisdiction absolute and or financial controls.

3.4.3 Analysis of ECI and export volume data

The analysis of ECI trade and ECI technology data (the data can be found in table 4.2.1:1) was done by creating two scatterplots. The first combined the ECI trade and ECI technology measurements to create a plot of four columns which is extensively described in section 4.1.3. This first scatterplot helps provide empirical results which supports conclusions related to the second sub question of research question one, namely how much leverage each jurisdiction holds related to OEC trade and technology measurements. The second scatterplot combines the ECI trade measurement with an index of how much one jurisdiction exports compares to the

others. The export index was developed by normalizing each jurisdiction's exports by taking the standard deviation and median of all selected jurisdictions export volumes in USD for 2023 for both commercial services and commodities and using the normalizing formula presented in Appendix 4 to derive a normalized value for each jurisdiction. By combining this index with the ECI trade index, a segmentation which helps interpret each nation's trade power in terms of volume and complexity was created. Together, the scatterplots clearly provide empirical support to the second part of the first research question. Furthermore, the analysis of the plots presented in section 4.1.3 is guided by the theoretical concepts presented in section 2.3.1 and 2.3.1 on Trade share dependencies and ECI measurements.

3.4.4 PCB specific trade data analysis

The analysis of PCB specific trade data seeks to provide empirical evidence supporting an analysis and a conclusion related to the first sub question of the third research question, namely what current structure of the PCB industry is in terms of trade concentration and regional dependencies. The data collected in table 3.3.6:2, showing the exports and imports of PCB components for the world's largest suppliers and consumers, was visualized by two pie charts (presented in section 4.2.3), one representing world imports and the other representing exports.

To further provide empirical answers supporting research question 2.1 the data on the world top exports and imports was disaggregated using table 3.3.6:1. By doing so, the authors were able to track the jurisdiction export and import dependencies. The disaggregation was undertaken only for the jurisdictions to which this study has been limited. For each one of the selected jurisdictions two pie charts were created. One to describe and visualize its import dependencies, i.e. the jurisdiction's largest suppliers of PCBs, and the other sought to describe and visualize export dependencies, i.e. the jurisdiction's largest buyers (customers). Consequently, this map provided a clear description of trade dependencies, in terms of both imports and exports. Moreover, it gave the authors the opportunity to identify geographical clusters of supply and demand.

The data-analysis method presented in the above section provided the authors with empirical data which has been interpreted in this studies analysis using the theoretical frameworks presented in section 2.3.1 and 2.2.2 tapered down an industry level.

3.4.5 RCA data analysis

Next, the data analysis of the RCA measurements was done by combining the RCA with both the average share of other jurisdictions import and other exports. Theory section 2.3.3 provides a thorough definition of RCA, and to Appendix 5, for a thorough definition of the mathematical formula used to calculate the RCA by the OEC. The average share of other jurisdictions imports was calculated by using the data from table 3.3.6:1 to find how large a share of others imports the focal jurisdiction stands for. In other words, it created a measure of how large of a supplier the focal jurisdiction is compared to the others. Calculations were conducted by taking the sum of all other jurisdictions imports from the focal one and dividing by the total number of jurisdictions minus one. This calculation resulted in an average of other imports limited only

to the selected jurisdictions in question. The same logic and calculations war applied to calculate the average share of other' exports. However, instead of measuring how large of a supplier the focal jurisdiction is, the average share of other's exports indicated the focal jurisdiction's consumption level (how large of a buyer it is). By combining each of these measurements with the RCA, two scatter plots were produced. The two scatterplots provided empirical evidence relating to the first and second sub questions of the second research question. The resulting empirical data has been analyzed and interpreted using theoretical sections 2.3.3 and 2.3.1 on RCA and trade share and dependencies.

3.4.6 Second round interview analysis

The last and final data analysis part consisted of interpreting and structuring the results from the final interview round. Here, the information was sifted by reviewing interview notes and matching the relevance to the data collected and analyzed in the sections above. Thus, this data analysis was guided by the purpose of the final sub question of the third research question namely to apply the findings from the previous data analysis sections to the case company and analyze the how those findings affect it. This was done by combining the data collected on the case company's supply chain, including sourcing, inbound supply and manufacturing related to the PCB components with the data from the previous sections. This final analysis was done from a supply chain perspective using the theory sections presented in sections 2.1.1, 2.1.2, 2.1.3 and 2.1.4. The sections provide important background theory from the perspective of supply chain disruptions, resilience, risk management and actions strategies.

3.5 Research quality

Given the nature of this study's research design which employs a mixed method approach, this section will introduce research quality criteria for both qualitative and quantitative research strategies. The following quality criteria will be addressed below validity, reliability, replicability, transparency and ethical considerations.

3.5.1 Validity

As explained in Bryman and Bell (2015), validity refers to the extent to which the research accurately captures and represents the concepts it is intended to measure. Several forms of validity have been decided to be relevant for this study.

Convergent validity as explained by Bryman and Bell (2015) was applied to strengthen the quantitative data collection regarding geopolitical policy interventions (i.e., the driving forces). While data on policy measures was extracted from the Global Trade Alert (GTA) database, an additional verification step was undertaken by consulting international news media and policy updates for selected jurisdictions. This cross-verification ensured that the coded data reflected policy activity that had real-world significance. For example, interventions by China and the United States in technology and investment sectors were triangulated using news reporting in e.g. The Financial Times, Reuters, and Politico. This process supports the internal consistency

and conceptual alignment between a real world observed phenomena and their quantitative representation.

External validity, as defined by Bryman and Bell (2015), relates to the generalizability of research findings beyond the specific context of the study. Given that the first research question investigates the structural features of global trade and jurisdictional use of power, the findings are inherently generalizable across sectors and industries. The macro-level patterns described in Chapter 4.1 such as trade concentration, policy leverage, and economic complexity, are not limited to the PCB sector and are applicable to broader discussions on global trade resilience.

Measurement validity refers to whether a measurement instrument or categorization process captures the intended conceptual phenomena that the research seeks to describe. In this project, the categorization and measuring of policy instruments such as export controls, localization, and foreign direct investment screening are based on theoretical definitions found in literature, as described in Chapter 2.2.1 and presented empirically in section 4.1.2. Nevertheless, measurement validity is potentially constrained by the qualitative interpretive approach used to define and group the policy intervention categories, i.e. the driving forces. It should be mentioned that some level of subjectivity from the authors was involved in the coding of policy updates, particularly when source material was ambiguous or when multiple policy instruments overlapped. This limitation is acknowledged and partially mitigated through iterative categorization cycles and researcher collaboration.

Moreover, to enhance the conceptual validity of the categorizations of driving forces as well ass a market type, an iterative feedback process was established with Ericsson. Data outputs and interpretations were continuously discussed with the company supervisor throughout the research process. This practical feedback loop allowed for refinement of assumptions, validation of patterns and contextualization of preliminary findings.

3.5.2 Reliability

Reliability refers to the consistency and stability of the research process, particularly whether the study could be repeated with similar results. The quantitative aspects of this study, including trade data collection from the World Integrated Trade Solution (WITS) and policy extraction from the GTA database, follow a clear and systematic approach. These sources are public and structured allowing for a high degree of repeatability in future studies using the same approach.

However, the qualitative document analysis that guided the construction of the driving forces is more interpretive and therefore less consistently repeatable. The categorization of interventions involved some extent of the authors judgment as mentioned in the previous section, particularly in selecting which policy actions to categorize and in determining the market classification. This interpretive method introduces a risk of bias, especially in the first sub question of research question one, where the document sample was extensive and required selective segmentation. While steps were taken to improve consistency, such as joint review sessions, some subjectivity remains left inherently to the approach.

Finally, all sources used to collect secondary data for this project have been assessed based on objectivity and where possible, the ownership structure of the sources have been examined to reflect on potential biases. However, no biases were identified.

3.5.3 Replicability

Replicability concerns whether another researcher using the same methods would arrive at the same results. According to Bryman and Bell (2015), this is particularly relevant for quantitative studies. The trade data and GTA-based intervention tracking are in theory replicable, as both datasets are publicly accessible and the procedures for extraction and transformation are documented. However, replicability may be reduced due to the interpretive nature of the qualitative data selection in section 3.4.1 on the data analysis of collected documents. The vast scope of policy documents and grey literature introduces variability, as different researchers might select slightly different material or categorize it differently.

Furthermore, due to the dynamic nature of policy updates in databases like GTA, the exact same snapshot of data might not be available in future collections, which could affect the replicability of the numeric policy updates related to the driving forces. However, the method and logic for building the driving force indicators are clearly described, allowing the overall structure of the study to be replicated even if precise numeric values vary.

3.5.4 Transparency

Transparency refers to the openness with which the research process is documented and presented. Bryman and Bell (2015) emphasizes that transparency in methodology increases trustworthiness, especially in qualitative research. Throughout this study, every major step in data collection, coding, and analysis has been documented and described in the methodology chapter. Trade data sources are fully cited, categorization procedures are described in 3.4.1 and data processing logic is explained clearly in section 3.5 on data analysis.

3.5.5 Ethical Considerations

Ethical considerations in this study are guided by principles given by Bryman and Bell (2015). First, the study did not involve any collection of personal or sensitive data from human subjects. All interviewees were employees of the case company acting in their respective professional roles and their insights were collected in a non-intrusive manner with verbal consent. Participation was voluntary, and interviewees were made aware of the academic purpose of the study. Second, the use of company-specific supply chain data was carefully managed to avoid jeopardizing confidentiality. While the research benefited from insights into the case company’s structure and strategy, no sensitive information has been disclosed.

4. Empirical parts

This study's empirical chapter seeks to answer research questions 1.1, 1.2, 2.1 and 2.2 by synthesizing empirical findings on Power influence mappings (bridging, transitioning or central, driving forces and trade leverage), the PCB industry (industry overview, global trade mapping and RCA & supply-demand dependencies) and Ericssons supply chain (Geographical footprint, Supply chain and Sourcing strategy related to PCB components).

4.1 Trade leverage: Power influence mapping

This empirical section employes summarizes the study's empirical findings which aims to answer RQs 1.1 and 1.2. First it sums findings from the document collection and analysis section and combines it with export import data to characterize the selected jurisdictions as either bridging, transitioning or central. Second, it illustrates the findings related to the jurisdictions use of driving forces and their sympathy towards either absolute or financial control measures. Finally, it comprises findings on ECI technology, ECI trade and export volumes to assess the jurisdictions trade leverages.

4.1.1 Identifying bridging central or transitional markets

The following section summarizes the empirical findings from the study of news articles, consultancy reports, and other sources. Below, the jurisdictions outlined in the study limitations are categorized as bridging, transitional, or central actors, following the definitions provided under section 2.2.3. To support and further underline the segmentation, financial data on imports and exports of both services and goods has been collected. The trade figures support the segmentation by drawing on the theory of trade dependencies presented in section 2.3.1. Together, the document findings and trade data provide solid grounds to support the classification of market types.

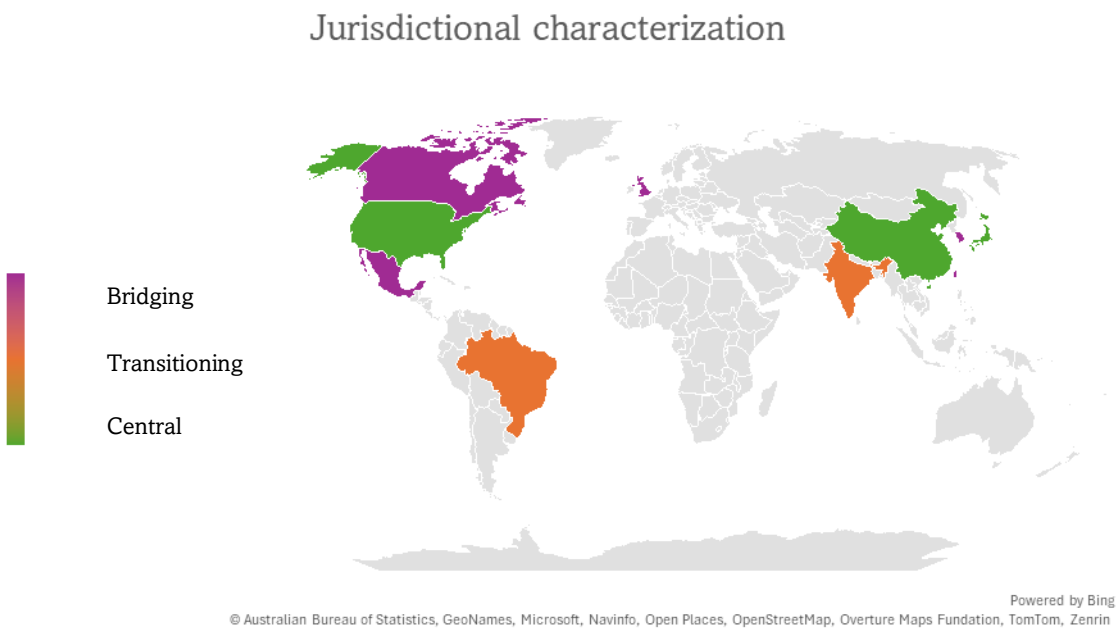

Figure 4.1.1:2 Each jurisdiction's characterization as either bridging, transitioning or central (2.2.3)

Jurisdictional Typologies	
USA	Central
China	Central
EU	Central
India	Transitioning
Canada	Bridging
United Kingdom	Bridging
South Korea	Bridging
Mexico	Bridging
Taiwan	Transitioning
Japan	Central
Brazil	Transitioning

Table 4.1.1:2, Summary of market characterization as bridging, transitioning or central.

USA

The U.S. is classified as a central actor. Imports amount to 3.9 trillion USD and exports to 3 trillion USD, accounting for 12% and 9% of global imports and exports. This marks the U.S. as the world's largest consumer market, making many export-heavy economies, including China and Mexico, highly reliant on U.S. demand. At the same time, the U.S. is dependent on the import of critical goods, such as semiconductors and medical products, revealing mutual dependencies embedded in global supply chains. Beyond trade volumes, the U.S. asserts influence through policy, tariffs, and global rule-setting. For example, threats to impose tariffs on chips, pharmaceuticals, and automobiles Source 18A, Appendix 2 illustrate their capacity

to shift global trade dynamics. As explained in section 2.3.1, the US's trade leverage enhances its negotiating power, confirming its classification as a central market.

China

China is also categorized as a central actor. With imports of 3.1 trillion USD and exports of 3.8 trillion USD, accounting for 10% and 12% of global trade, China maintains a substantial surplus reflecting manufacturing strength. China's export power is balanced by dependency on foreign demand, especially from U.S. and EU markets, while many jurisdictions rely on Chinese goods, rare earth materials, and industrial components, creating a two-sided dependency. Empirical examples, such as Chinese investments in international port infrastructure Source 27C, Appendix 2, underlines Beijing's control over critical trade routes. China's push for a domestic innovation ecosystem (Source 25C, Appendix 2), combined with its strong technological base (Source 1C, Appendix 2), further reinforces its position as a central market in the global system

India

India demonstrates characteristics of a transitioning market. Imports total 920 billion USD and exports 768 billion USD, representing 3% and 2% of global trade. India's export portfolio is heavily weighted toward commercial services (44% of exports, compared to a global average of 24%), indicating existing service strengths with potential growth in merchandise exports. While India depends on high-tech imports, global firms increasingly see India as an alternative manufacturing hub, balancing inbound and outbound dependencies (Ericsson, 2025). Empirical findings highlight India's efforts to position itself as a global manufacturing center thought its efforts to attract FDI (Source 10C, Appendix 2), amidst growing geopolitical conflicts between China and the US, in combination with increased global security awareness of Chinese products that raises global interest for new, low-cost manufacturing sites. Examples of investments include Apple's iPhone production expansion (Source 16C, Appendix) and Ericsson's historical manufacturing investments (Ericsson, 2025). Conclusively, India's moderate to high trade figures, together with its strategy to attract FDI and manufacturing shows that it is a market with potential and emerging influence, which corresponds to the definition of a transitioning defined in power influence mapping under section 2.3.1.

European Union

The EU is identified as a central actor. Imports and exports stand at 4 trillion USD and 4.3 trillion USD respectively, each accounting 13% of global trade, marking it as one of the largest trade blocs worldwide. EU consumption powers exporters globally, while its industries depend on imported energy, raw materials, and advanced components, creating complex mutual dependencies. Empirical examples found in this study show how EU uses its leverage to implement policies and laws that compete on a global scale. Empirical findings from Source 8C, (Appendix 2) gives examples of how the EU invests in the union's competitiveness to increase trade resilience amidst tariff wars with the US. Furthermore, the EU has recently introduced a bundle of laws enabling policy interventions such as reciprocal tariffs, called the

coercion toolbox (Source 32B, Appendix 2). Additionally, given that the EU is a consortium of different markets with alternating industries capabilities it is possible for the EU to launch collaborative bets such as the EU Chips act, which major tech industry actors in the EU now call to renew (Source 15B, Appendix 2). Conclusively, EU's centralized power along with its cemented position within global trade supports its characterization as a central market.

Japan

Japan records 1 trillion USD in imports and 920 billion USD in exports, representing 3% of global imports and exports. Empirical findings show an effort to increase manufacturing of high value goods illustrated by findings from sources 29C, 30C and 31C (Appendix 2) which also highlights that Japan is expanding its global alliances and integrating into global value chains to strengthen its international leverage. Empirical findings from source 32C (Appendix 2) exemplifies Japan's balancing act in US–China rivalry, reinforcing its role as a major rule-setter. Taken together, these factors confirm that Japan is accurately classified as a central actor.

United Kingdom

The UK is classified as a bridging actor, with imports at 1.2 trillion USD and exports at 1.1 trillion USD, accounting for 4% and 3% of global trade. While trade volumes are substantial, the UK's capacity to align with both U.S. and EU blocs is critical, creating bilateral dependencies where it relies on European markets post-Brexit while maintaining strong transatlantic ties. Empirical findings (Source 32A, Appendix 2) show that the UK is leveraging its position to negotiate the lifting of U.S. tariffs, while outreach efforts to the EU for post-Brexit trade resets further highlight its bridging role (Source 26B, Appendix 2). These dynamics support the UK's characterization as a bridging actor.

South Korea

South Korea posts 790 billion USD in imports and 754 billion USD in exports, representing 3% and 2% of global trade. As an export-heavy economy, South Korea relies on overseas demand, positioning it as both a dependent supplier within regional and global networks. Source 35C (Appendix 2) exemplifies South Korea as a global pivotal state, meaning that it is evolving as a more dominant and powerful actors in the region, while findings from sources 33C & 34C, (Appendix 2) illustrate its ability to negotiate with multiple blocs, balancing between U.S. and Chinese spheres. These dynamics confirm South Korea's classification as a bridging actor, though some evidence suggests it is displaying transitional characteristics.

Taiwan

Taiwan registers 422 billion USD in imports and 486 billion USD in exports, accounting for 1% and 2% of global trade. Taiwan's small size contradicts its global significance: it depends on raw material imports while the world relies heavily on its semiconductor and electronics exports, creating asymmetric dependencies centered on advanced industries. Empirical findings from sources 33A & 34A (Appendix 2) highlight Taiwan's pivotal role in connecting global tech supply chains between the US, China, and beyond, while its geographic importance

in global shipping adds further weight (Source 36C, Appendix 2). Together, these factors clearly support Taiwan's classification as a bridging actor. Empirical findings through Sources 33A and 34A (Appendix, 2) underlines how Taiwan's dominance in semiconductors and advanced industries connects global technology and AI sectors between e.g. the U.S. and China. Empirical findings from source 36C (Appendix 2) points to Taiwan's strategically important geographical positions in terms of trade routes connecting global markets. These combined factors clearly support Taiwan's classification as a bridging actor in global trade and geopolitical networks.

Brazil

Brazil records 333 billion USD in imports and 384 billion USD in exports, representing 1% of global trade flows. While Brazil exports agricultural goods and commodities globally, it depends on imports of advanced technology and industrial inputs, reflecting a structural dependency in high-tech sectors while it strengthens its external ties. Empirical findings from sources 30B & 31B, (Appendix 2) illustrate Brazil's willingness to attract foreign investment and expand trade deals with China and the US, whilst also exemplifying Brazil reliance on agricultural goods such as soybeans. The multilateralist approach is supported by source 29B, (Appendix 2) which shows Brazil recent engagement to increase international ties and collaborations. These elements collectively support the conclusion that Brazil is an early transitional market since it is shifting its strategic position and attempting to increase its influence through collaborations and diplomatic ties mentioned.

Canada

Canada's 718 billion USD in imports and 706 billion USD in exports account for 2% of global trade each, reflecting strong integration into North American networks. Canada's export reliance on U.S. markets and its dependency on manufactured goods imports create interlinked trade dependencies, both regional and global. Empirical findings highlight that Canada links North America with broader international markets through increasing interest in multilateral trade agreements, exemplified by Canadas recent outreach to the EU amidst tariff conflicts with the US, found in source 25B, (Appendix 2). Moreover, source 35A, (Appendix 2) illustrates that Canada is committed to increase economic ties by diversifying trade agreements to increase resilience within trade. Together, these findings indicate that Canada takes on the role as a bridging actor as it is centering itself as link between global trade blocks.

Mexico

Mexico's imports total 692 billion USD and exports 645 billion USD, covering 2% of global trade. As a key player in North American supply chains, Mexico's economy relies heavily on U.S. demand, while it increasingly seeks to diversify outward to partners like the EU, broadening its bilateral dependencies. Empirical findings exemplified by source 37A (Appendix 2) underlines that Mexico is pivotal piece in North American trade relations in part because of its large trade flow with the US. Additionally, source 36A (Appendix 2) supports the hypothesis that Mexico might reach out further, in this case to the European union and thus

broaden its trade ties. These points support Mexico's classification as a bridging actor in global trade networks.

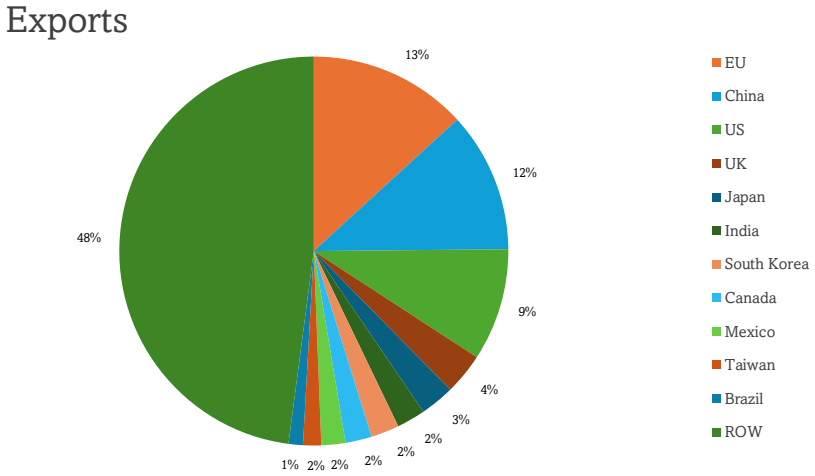

Figure 4.1.1:1 Each jurisdiction's share of world export in 2023 (WTO, 2025)

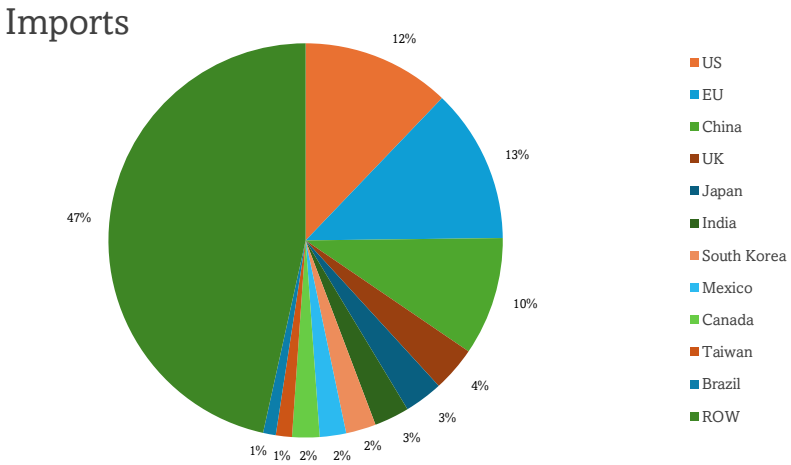

Figure 4.1.1:2 Each jurisdiction's share of world imports in 2023 (WTO, 2025)

4.1.2 Driving Forces

To address RQ1 on the driving forces and policy instruments shaping current market areas, this section presents empirical findings from the Global Trade Alert (GTA) database. Jurisdictions' use of strategic trade measures is, as previously mentioned, categorized into six main groups, further grouped under two overarching forms of control: absolute control and financial control. As defined by Ericsson (2025), absolute control refers to hard interventions like bans on goods or technologies, while financial control includes softer instruments such as tariffs and subsidies that influence trade behavior through incentives. See table 4.1.2:1 for detailed descriptions of the driving forces.

Driving Force	Description	Policy Intervention

Financial Control	**Import restrictions**	Use of tariffs to penalize or discourage trade with specific nations or industries.	Import Tariff, Import Ban, Import-related nontariff, Import Licensing, Import Tariff Quota, Import Quota, Anti-subsidy, Safeguard
	State aid & Export incentives	Government funding to boost domestic sectors and undercut foreign competition. E.g. Measures to reduce dependence and bring production home	Financial Aid, In-Kind, State Loan, Tax or Social Reliefs, Trade Finance, State Aid nes, Other Export Incentives, Tax Based Export Incentives, Interest Payment Subsidies, Loan Guarantee, Capital Injection and Equity Stakes (inc. Bailouts), Financial Assistance in Foreign Market, Export Subsidy
	Public procurement and localization demands	Incentives for local manufacturing, demands on local production and regulations to increase companies to purchase locally	Public Procurement Localization, Production Subsidy, Local Content Incentives, Local Content Requirements, Local Value-Add Incentives, Local Supplier Requirements for Export, Localization nes, Public Procurement Access, Public Procurement Preference Margin, Local Operations Incentive, Public Procurement nes
Absolut Control	**Export restrictions**	Formal economic/legal restrictions, bans, or export license limitations.	Export Ban, Export Tax, Export Quota
	FDI Restrictions & Commercial transaction sanctions	Blocking or scrutinizing foreign investment in strategic sectors.	FDI: Entry and Ownership Rule, FDI: Treatment and Operation nes, FDI: Financial Incentives, Controls on Commercial Transactions and Investment Instruments, Trade Payment Measure
	Tech/Knowledge Control	Limiting access to intellectual property, R&D, or critical tech (via bans, export limits, etc.)	Export Licensing Requirement, Intellectual Property Protection, Export Related non-tariff Measure, Foreign Customer Limit

Table 4.1.2:1 presents the different driving forces, their definitions and the policy interventions included.

As explained in section 3.3.2 of this report, each nations utilization of the driving forces was measured by collecting updates of policy instruments for the driving forces defined in table 4.1.2:1. This section will provide an explanation of how to interpret the heatmap seen in figure 4.1.2:5. The full explanation of how the heatmap was constructed can be found in sections 3.3.4 and 3.4.2.

As shown in the normalized heatmap in Table 4.1.2:5, jurisdictions like India and China apply absolute controls more intensively relative to other tools, whereas Canada and Brazil lean more heavily on financial control mechanisms. While normalization enables cross-jurisdictional comparison, a focus on internal prioritization, identifying which tools dominate within a single jurisdiction, might reveal different patterns. This dimension offers an opportunity for future research.

The United States scores highly in FDI restrictions (+2.55) and public procurement & localization requirements (+1.92), reflecting its strong focus on national security and boosting domestic production. In 2024, the Committee on Foreign Investment in the United States (CFIUS) expanded its authority over foreign real estate investments (Torres Trade Law, 2024), part of a broader trend of increased scrutiny toward foreign, especially Chinese, investment. As Markus (2025) notes, the U.S. aims to prevent China from gaining control over critical technologies, infrastructure, and sensitive data. Upstream, the U.S. also restricts investment in Chinese military-linked firms and may expand sanctions under the International Emergency Economic Powers Act (IEEPA) (Torres Trade Law, 2024). The U.S.'s elevated FDI restriction

score may also be influenced by the exclusion of jurisdictions like Russia from the dataset, if included, the EU's score would rise dramatically, altering the normalization. By contrast, the U.S. shows only slightly above-average use of import restrictions (+0.03) and technology/knowledge controls (+0.87), indicating these tools are less central in its overall policy mix but are still considerable compared to the other jurisdictions.

China shows above-average use of FDI restrictions (+1.35) and technology/knowledge controls (+0.37), with near-median levels across other categories, suggesting a balanced yet assertive approach. Its elevated tech control score reflects recent export restrictions on dual-use technologies and bans on minerals like gallium, germanium, and antimony to the U.S. (Baskaran & Schwarts, 2024). China also sanctioned 10 U.S. firms by adding them to its "unreliable entity list" over arms sales to Taiwan, barring them from trade and investment in China (Global Times, 2025). These patterns signal a preference for absolute control mechanisms, aimed at shielding strategic sectors and reinforcing self-sufficiency (Groenewegen-Lau & Laha, 2023).

India ranks among the top users of absolute control tools, with high scores for export controls (+2.79), technology controls (+2.91), and import restrictions (+1.65). Its 2020 National Security Directive on the Telecom Sector (NSDTS) restricts foreign suppliers, primarily Chinese, on national security grounds. India also manages the SCOMET list, regulating exports of sensitive dual-use items (Department of Atomic Energy, 2025). In 2024, the Directorate General of Foreign Trade (DGFT) eased export rules for 36 such items to facilitate intra-company transfers (Roa, 2024). Technology and import restrictions also apply to IT products, aimed at strengthening domestic production and reducing foreign dependence (Bhardwaj, 2023).

Canada's highest score is in state aid & export incentives (+2.83), reflecting a strong reliance on financial control mechanisms. This is evident in trade support programs such as those administered by the Canada Border Services Agency (CBSA, 2025). A 2023 Earnst & Young Canada report noted that discretionary government incentives for capital expansion and job creation increased by 47% between 2019 and 2021 (O'Riordan, F. & Gazizov, K. (2025). Compared to its use of other tools, Canada favors government aid and export support over restrictive trade measures like tariffs or bans. While Brazil stands out for its high use of import restrictions (+2.98) and public procurement & localization requirements (+2.09), particularly in the agriculture sector (GTA, 2025). For example, it raised import tariffs by 25% on 11 product categories (Kinch & Guerra, 2024). Like Canada, Brazil applies financial controls more heavily than absolute ones, focusing on economic policy instruments rather than hard trade restrictions.

The UK shows relatively high use of export controls (+1.92) and FDI restrictions (+1.27), largely driven by the Russia–Ukraine conflict (GTA, 2025). These trends align with the UK's national security posture, supported by the National Security and Investment Act 2021 (NSIA), which empowers the government to review and block foreign acquisitions that pose risks

(Tzinova et al., 2022). In contrast, the UK's use of tariffs and state aid remains average or below, indicating a more targeted application of hard power tools.

The EU applies its driving forces at moderate levels. State aid & export incentives score slightly above the global median (+0.65), while export controls (–0.05) and technology controls (0.00) remain neutral. EU interventions are often coordinated across member states, such as joint Huawei bans, signaling a collective but cautious approach (Kroet, 2024). State aid peaked during the COVID-19 pandemic and declined slightly thereafter, though 2023 levels remained 43% above pre-crisis levels (European Commission, 2025).

Other jurisdictions remain around or below the median. South Korea applies moderate export controls (+0.52) but scores below average in financial tools like state aid (–0.27) and public procurement (–0.28). Mexico shows a modest profile, with slightly above-average tariffs (+0.13) and export controls (+0.82), but below-median scores on state aid (–0.70) and tech controls (–0.08), reflecting its tariff-based trade strategy within North American supply chains. Taiwan's standout score is in FDI restrictions (+1.47). While other categories are near or below average, Taiwan applies absolute control mechanisms more prominently than financial ones. Its high FDI score may partly result from the low number of restrictions in comparative jurisdictions, Taiwan has one registered FDI restriction, while many others have none.

Market	Import Restriction	State aid & Export incentives	Public procurement & localization requirements	Export Controls	FDI Restrictions & Screening	Tech/Knowledge Control
USA	0,03	0,64	1,92	-0,24	2,55	0,87
China	-0,12	0,03	-0,36	0,08	1,35	0,37
EU	-0,12	0,65	-0,33	-0,05	-0,15	0,00
India	1,65	-0,42	1,79	2,79	0,00	2,91
Canada	0,01	2,83	0,66	0,00	0,92	-0,87
UK	0,00	0,00	0,32	1,92	1,27	-0,24
South Korea	-0,02	-0,27	-0,28	0,52	-0,39	-0,46
Mexico	0,13	-0,70	0,00	0,82	-0,39	-0,08
Taiwan	-0,11	-0,82	-0,36	-0,27	1,47	0,07
Japan	-0,14	-0,16	-0,34	-0,13	-0,06	-0,03
Brazil	2,98	0,43	2,09	-0,09	-0,39	0,76

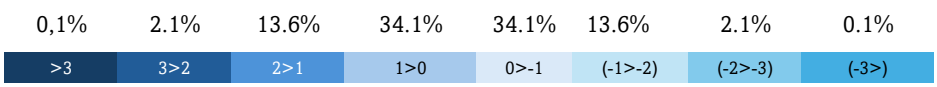

Figure 4.1.2:3. Heatmap showing the normalized application of strategic trade policy tools across jurisdictions. The figure illustrates the extent to which each jurisdiction applies six key driving forces. The bottom color scale shows the percentiles used to segment the heat map.

Bilateral Relations

This section evaluates the bilateral financial control matrix, where each cell captures the degree to which an implementing jurisdiction (row) applies financial or absolute control measures toward a target jurisdiction (column). Values are normalized relative to global patterns, positive

scores indicate above-average use of control against a specific partner, while negative scores reflect below-average use. See figure 4.1.2:2 for the scale.

Financial Control

The matrix enables an assessment of how jurisdictions strategically allocate financial controls across bilateral relationships. For example, in Table 4.1.2:4, the U.S. score of 3.00 toward China means the U.S. exerts significantly more financial pressure on China than most other jurisdictions do, i.e., "U.S. → China" vs. "EU → China," "India → China," etc.

Results show the U.S. and China as the most frequent global users of financial control, applying pressure across many partners. China's consistently high scores may reflect either an overemphasis from normalization or a genuinely broad use of state-directed economic tools. In contrast, jurisdictions like Taiwan, South Korea, and Mexico show minimal bilateral leverage of financial control. These findings complement the previous analysis by indicating not only how much control is applied, but also where it is directed.

High scores in table 4.1.2:4 typically reflect increased government subsidies or support aimed at boosting domestic production or exports (GTA, 2025). While these measures are not direct trade restrictions, they create indirect effects by reducing reliance on imports, thereby limiting export opportunities for foreign suppliers. This is particularly impactful when the jurisdiction is a major importer. For example, the EU's moderate financial control, especially toward China (1.56) and the U.S. (1.12), is partly reflected in its 2023 anti-subsidy investigation into Chinese Electric Vehicles, leading to approved tariffs (Featherstone, 2024).

Looking closer at bilateral patterns, the U.S. applies high financial control toward key economies: China (3.00), India (2.03), Canada (2.11), the UK (2.20), and Brazil (2.26). This reflects a broader U.S. strategy of using tariffs, sanctions, and regulatory measures to shape global trade, particularly in relation to China. The elevated bilateral score toward China illustrates ongoing geopolitical tensions and is reinforced by domestic industrial policies such as the CHIPS Act, Inflation Reduction Act (IRA), and Infrastructure Investment and Jobs Act (IIJA) aimed at reducing reliance on foreign suppliers. U.S. manufacturing investment in electronics surged from $25 billion in 2022 to nearly $100 billion in 2023 (Department of the Treasury, 2023). As part of this strategy, the CHIPS Program Office introduced national guardrails to prevent companies receiving CHIPS funding from expanding semiconductor production in jurisdictions of concern, such as China, thereby limiting the transfer of advanced technologies and constraining China's capacity to advance its own capabilities (Howell et al., 2023). Similarly, the high bilateral score toward Canada can be linked to U.S. support for reshoring and subsidizing domestic production in sectors where Canada has traditionally played a key supplier role, such as energy (GTA, 2025).

China displays high financial control across nearly all jurisdictions, with top scores toward the U.S. (3.18), India (2.71), Canada (2.75), Brazil (2.71), the EU (1.56), and the UK (2.68). This widespread pressure reflects Beijing's extensive use of subsidies and trade incentives, which may disadvantage competing jurisdictions by distorting global market conditions (GTA, 2025;

Rotunno & Ruta, 2024). A 2024 IMF working paper found that Chinese subsidies significantly boost exports and suppress imports, particularly through support in upstream industries like steel, which in turn amplifies export competitiveness in downstream sectors such as automotive manufacturing. These state-led export incentives, combined with selective tariffs, create a diffuse form of financial pressure that impacts multiple jurisdictions simultaneously (Groenewegen-Lau & Laha, 2023).

India shows moderate scores toward China (0.29) and the U.S. (0.25), with lower scores elsewhere. Canada maintains modest financial control but shows positive leverage toward China (0.33), the U.S. (0.33), and Brazil (0.23). Brazil also applies its highest financial pressure toward China (0.44), the U.S. (0.33), and India (0.26). The UK maintains neutral financial control (0.00) across most economies, while other jurisdictions like South Korea, Mexico, Taiwan, and Japan show either neutral or negative bilateral scores.

Financial Control

AFF / IMP	USA	China	EU	India	Canada	UK	South Korea	Mexico	Taiwan	Japan	Brazil
USA		3,00	2,03	2,11	2,20	1,80	1,78	2,08	0,19	1,80	2,26
China	3,18		2,71	2,75	2,68	2,59	2,72	2,65	0,05	2,67	2,71
EU	1,12	1,56		0,77	0,51	0,90	0,52	0,38	0,21	0,58	0,52
India	0,25	0,29	0,18		0,13	0,00	0,00	0,00	0,03	0,01	0,26
Canada	0,33	0,33	0,21	0,18		0,06	0,00	0,12	-0,03	0,00	0,23
UK	0,00	-0,01	0,00	0,00	0,00		-0,20	-0,15	0,00	-0,21	0,00
South Korea	-0,14	-0,15	-0,17	-0,09	-0,10	-0,31		-0,20	-0,03	-0,28	-0,04
Mexico	-0,16	-0,21	-0,20	-0,12	-0,13	-0,36	-0,32		-0,03	-0,33	-0,05
Taiwan	-0,22	-0,26	-0,25	-0,15	-0,16	-0,38	-0,35	-0,26		-0,35	-0,11
Japan	-0,03	0,00	-0,06	-0,02	-0,03	-0,21	-0,17	-0,14	-0,03		-0,03
Brazil	0,33	0,44	0,26	0,23	0,22	0,06	0,00	0,17	3,34	0,08	

Table 4.1.2:4, Bilateral financial control matrix showing normalized scores of policy interventions. Each cell represents the extent to which the implementing jurisdiction (row) applies financial control measures, such as subsidies, tariffs, or procurement requirements, targeting the affected jurisdiction (column).

Absolute Control

The normalized absolute control matrix in table 4.1.2:5 illustrates how jurisdictions employ hard control measure such as export restrictions, FDI screening, and technology bans toward one another. The results reveal a highly asymmetric pattern: only a few jurisdictions, notably the United States, China, India, and the United Kingdom, apply widespread absolute control, with most of their scores exceeding 1, while most jurisdictions exert limited or selective influence.

The United States scores highest in absolute control toward China (3.01) and Taiwan (2.36), followed by India (1.98), the EU (2.02), and Brazil (1.41). The high score against China is

primarily due to FDI restrictions and Tech/Knowledge Control, where the U.S. has actively deployed hard power mechanisms, especially in the form of export controls on high-tech components such as the national guardrails from the CHIPS Act. This has further spilled over to Taiwan, where in 2024, the U.S. Government implemented new export controls targeting semiconductor and additive manufacturing technologies (Bureau of Industry and Security, 2024). The broad impact across jurisdictions reflects the overarching nature of certain U.S. policies, which often affect multiple markets simultaneously. For instance, the Department of Commerce launched an investigation into copper imports, evaluating whether they pose a national security risk, which can result in tariffs, import quotas, or export bans across multiple markets (The White House, 2025).

Further reinforcing this trend, in January 2025, the U.S. Department of Commerce announced additional export controls on AI model weights, advanced chips, and data center operations abroad policies intended to curb China's access to sensitive U.S.-origin technologies. These restrictions followed the Bureau of Industry and Security's (BIS) broader push to secure the global semiconductor supply chain and prevent adversaries from obtaining tools that could strengthen military capabilities, facilitate the development of weapons of mass destruction (WMD), or support mass surveillance. Although these controls formally exclude allies like the EU, UK, Japan, and Canada, they often produce significant indirect effects. For example, while the EU represents around 30% of global semiconductor imports, over 80% of global exports originate in the APAC region, of which China alone accounts for 40% (OEC, 2025)

China applies high levels of absolute control toward the U.S. (2.57), Brazil (2.00), South Korea (2.01), and India (2.08), primarily through export licensing requirements, export bans, and restrictions on commercial transactions and investment instruments (GTA, 2025). Much of this activity stems from escalating geopolitical tensions, particularly with the U.S., where measures include the Unreliable Entity List, export restrictions on rare earth metals and dual-use technologies, and sector-specific sanctions targeting the defense industry. This framework began with the adoption of China's Export Control Law in October 2020, granting the government authority over exports of goods, technologies, and services tied to national security. It was followed by the Anti-Foreign Sanctions Law (AFSL) in June 2021, which enables Beijing to impose countermeasures in response to foreign sanctions. These tools have since been used to sanction companies such as Lockheed Martin and Northrop Grumman for their involvement in U.S. arms sales to Taiwan, resulting in asset freezes and commercial restrictions. Boeing Defense and other large U.S. firms have also been added to the Unreliable Entity List and subjected to similar penalties.

Toward India, China's controls focus more on export licensing and quotas, particularly in sensitive sectors like drones and rare earth materials. While actions toward Brazil, South Korea, Japan, and India are not always direct, they are often impacted by broader supply chain restrictions. For example, China is the primary supplier of critical inputs like graphite, and restrictions on such exports, though not always explicitly targeted, can significantly affect dependent jurisdictions (OEC, 2025).

The UK demonstrates high levels of absolute control toward India (1.97), Brazil (2.06), and Mexico (1.97). This is primarily driven by ongoing export bans on pharmaceuticals, which stem from persistent drug shortages dating back to the pandemic. As of 2025, the UK is experiencing its worst medicine shortages in four years (Campbell, 2025). These specific jurisdictions show slightly elevated scores due to the UK's expanded export control regime introduced under (GOV.UK, 2024), which added new restrictions on emerging technologies such as quantum computing, semiconductors, and additive manufacturing. However, many jurisdictions in the West, including the EU and the U.S., are exempt from these.

India also ranks high in absolute control, especially toward the UK (2.75), Canada (2.50), and the EU (2.34). This reflects India's 2020 National Security Directive on the Telecom Sector (NSDTS), which banned vendors deemed "untrusted sources," notably targeting Chinese firms (NSDTS, 2020). In addition, India imposes export taxes on essential raw materials such as iron and rice to safeguard domestic supply, particularly in sectors like textiles, chemicals, minerals, and food production (GTA, 2025).

The EU exhibits moderate but broadly distributed levels of absolute control, with Taiwan (2.75) as an outlier. This is partly due to Taiwan's relatively small GDP, which amplifies the normalized score. Many of the restrictions affecting Taiwan, such as export controls on dual-use goods and licensing requirements related to semiconductors, quantum technologies, and additive manufacturing, also impact other jurisdictions, including the U.S. and China. These measures are primarily enforced through national-level policies in member states such as the Netherlands and Germany.

Other jurisdictions, including South Korea, Japan, Canada, Brazil, Taiwan, and Mexico, show consistently average to below-average scores across most bilateral relations. This indicates a more restrained or selective approach to absolute control.

Absolute Control

AFF / IMP	USA	China	EU	India	Canada	UK	South Korea	Mexico	Taiwan	Japan	Brazil
USA		3,01	2,02	1,97	1,17	1,40	1,15	1,14	2,36	1,06	1,41
China	2,57		1,58	2,08	1,86	1,72	2,01	1,97	0,79	1,95	2,00
EU	0,88	0,75		0,96	1,12	0,98	1,03	0,76	2,75	0,95	0,94
India	1,98	1,41	2,34		2,50	2,75	1,84	1,78	0,00	1,95	2,06
Canada	-0,17	-0,12	-0,12	-0,23		-0,14	-0,29	-0,38	0,00	-0,33	-0,18
UK	1,35	1,02	1,35	1,97	1,76		1,84	1,97	0,39	1,73	2,06
South Korea	0,00	0,00	0,00	0,06	0,00	-0,05		0,00	0,00	0,00	0,00
Mexico	0,21	-0,15	-0,12	-0,23	-0,16	-0,14	-0,29		0,00	-0,33	-0,06
Taiwan	-0,29	-0,18	-0,20	-0,28	-0,21	-0,19	-0,40	-0,44		-0,39	-0,24
Japan	-0,13	0,00	-0,04	0,00	0,00	0,00	-0,11	-0,19	0,39		0,00
Brazil	0,00	0,00	0,04	0,00	0,00	0,09	0,00	-0,06	0,00	-0,17	

Table 4.1.2:5 displays the normalized bilateral scores indicating the degree to which each implementing jurisdiction (row) applies absolute control measures, such as export bans, FDI screening, and technology restrictions, on the affected jurisdiction (column).

4.1.3 Trade Leverage of Jurisdiction

This section presents the empirical analysis of trade leverage for selected jurisdictions by examining two scatterplots based on economic complexity indicators. The first compares the Economic Complexity Index in Trade (ECI Trade) with total export volume index, providing insight into how sophisticated and large-scale national export profiles are. The second compares ECI Trade with ECI Tech, capturing the alignment between trade structure, technological innovation capacity and knowledge centration. These figures offer complementary views on a jurisdictions position within global value chains and help clarify dimensions of structural trade power in response to RQ1.

ECI Trade vs Export Volume

The first scatterplot in figure *4.1.3:1* map jurisdiction according to their ECI Trade scores and export volume index. This comparison offers insight into how knowledge-intensive a jurisdiction's export structure is, and whether that complexity is supported by significant global market engagement in terms of trade volume. The scatterplot has been institutively divided into four quadrants and the Export volumes have been normalized.

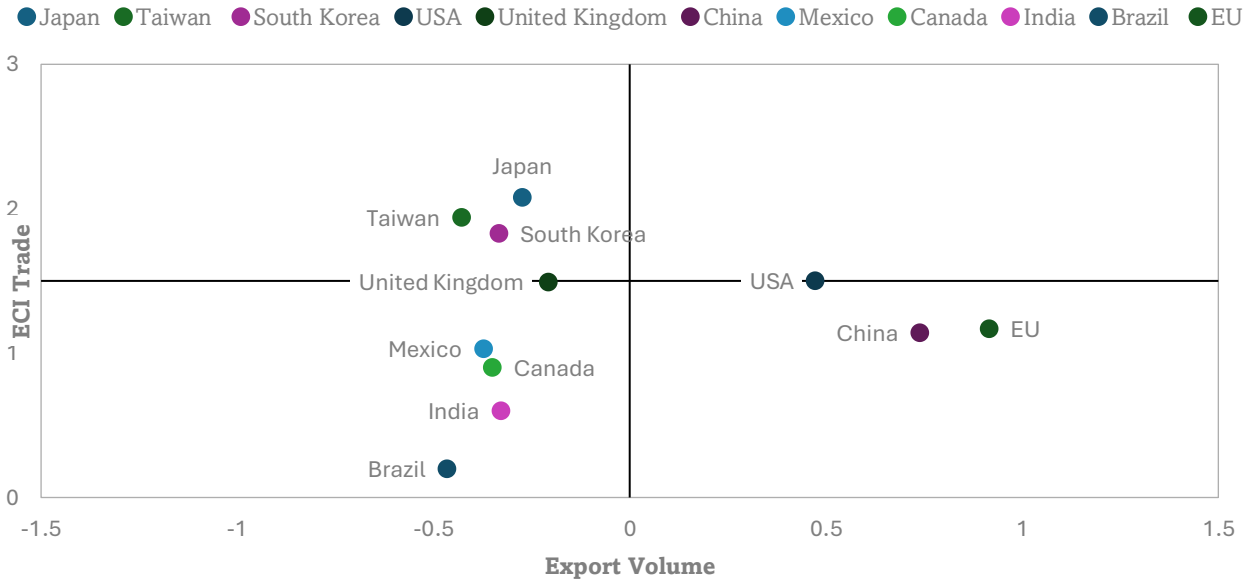

Figure 4.1.3:1 ECI trade and export volume index. Export volume index is each nation's exported volumes under 2023 normalized. To complete the normalization, the standard deviation and median were calculated based on the exports from the jurisdictions selected in this project (OEC, 2025;WTIS, 2025).

Jurisdictions located in the upper-right quadrant of the plot demonstrate both high export complexity and volume. These actors combine a sophisticated and diversified export industry indicated by high ECI trade indices in combination with high export volumes indicating magnitude in global trade. These jurisdictions are seen as leaders in the global value chain,

where they demonstrate both scale and depth in production capabilities, innovation infrastructure and global competitiveness. In contrast, the upper-left quadrant includes jurisdictions with high ECI Trade but lower export volumes. This quadrant may indicate a specialized but limited export flow. The lower-right quadrant captures jurisdictions with high export volume but low ECI trade, indicating large export trade flows of commodities with less complexity such as raw materials and basic manufacturing. These economies are vulnerable to commodity price cycles and external control of supply chains as a low ECI trade score usually indicated production of common commodities. Lastly, jurisdictions in the lower-left quadrant exhibit both low export complexity and low trade volumes, indicating relatively limited leverage in global trade.

Only the U.S. is found in the upper-right quadrant, scoring 1.5 in ECI Trade, whilst also showing large export flow volumes underlined by an export volume index of 0.47.

China and the EU are located within the lower-right quadrant. China, with an ECI Trade of 1.14 and export volume index of 0.74, exhibits moderate export complexity with the second to largest export figure. The EU, scoring 1.17 in ECI Trade, also illustrates a moderate to highly diverse export flow with the largest comparable export index of 0.92.

Japan, South Korea, Taiwan, and the United Kingdom are found in the high-complexity, low-volume upper-left quadrant. Japan, with an ECI Trade score of 2.08 and export index of -0.27, exhibits leading capabilities within trade complexity (ECI trade), coupled with a moderate to low export index in comparison to the rest of the jurisdictions. South Korea (ECI Trade 1.83 and export volume index -0.33) and Taiwan (1.94 & -0.43) both indicate specialized and sophisticated export flows, although with lesser export volumes as compared to the other jurisdictions. The United Kingdom, with an ECI Trade of 1.49 and export index of -0.21, shows a moderate to high ECI trade figure, indicating some specialty and sophistication, but with a lower export volume index.

India, Brazil, Mexico and Canada fall into the lower-left quadrant reflecting both low ECI Trade and low export volumes. India (0.6 & -0.33) and Brazil (0.2 & -0.47) represent economies with limited global engagement in sophisticated and diversified trade. Mexico and Canada score marginally better, with Mexico scoring of 1.03 in ECI trade and -0.37 in the export volume index and Canada 0.9 and -0.35.

ECI Trade vs ECI Tech

The second scatterplot in figure *4.1.3:2* compares ECI Trade with ECI Tech to explore whether the sophistication of a jurisdictions export structure is supported by domestic innovation capabilities. This comparison helps distinguish economies that not only produce complex goods but also innovate in the underlying technologies. Capturing both what it exports and the knowledge base underpinning that production helps distinguish between economies that are structurally aligned, where technological capabilities reinforce export sophistication, and those where innovation capacity is either underutilized or externally sourced. Like in the previous

paragraphs, jurisdictions are allocated into a scatterplot within four quadrants, however, no values are normalized in the following section.

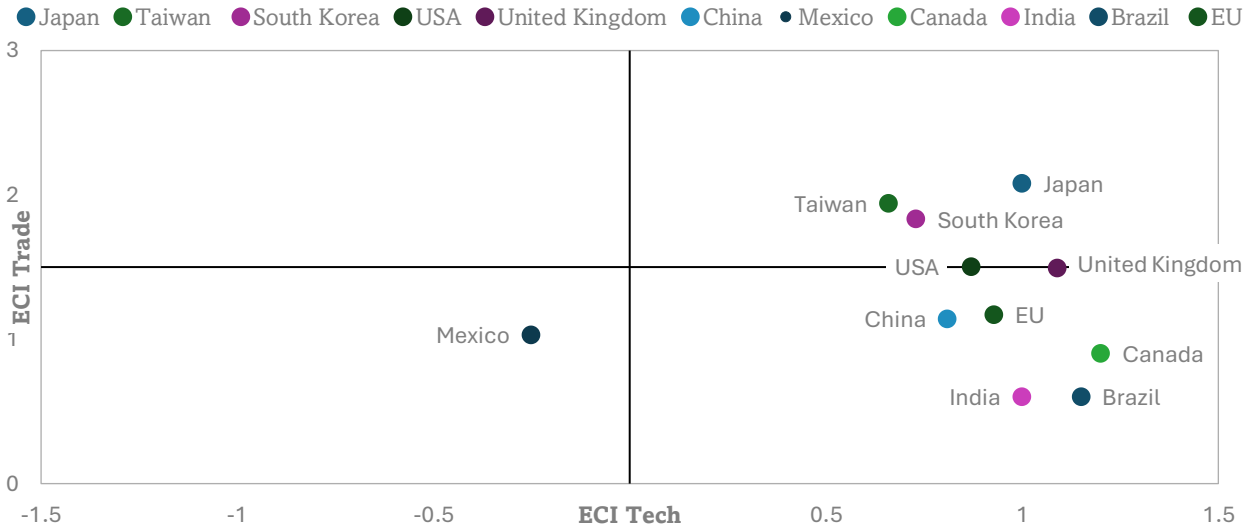

Figure 4.1.3:2 ECI technology and ECI trade combined (OEC, 2025).

The upper-right quadrant includes jurisdictions with both high trade complexity and high technological intensity. These jurisdictions exhibit coherent economic models where exports are supported by innovative ecosystems indicated by patent filings. These jurisdictions are likely innovation leaders or advanced manufacturing hubs. In the upper-left quadrant are jurisdictions with high trade complexity but lower innovation intensity, indicating a reliance on licensed technologies with lower innovation capabilities. The lower-right quadrant includes actors with lower trade complexity but strong innovation, indicating capabilities in technologies yet to be commercialized. Lastly, jurisdictions in the lower-left quadrant show both low complexity in trade and limited technological development, indicating a stalled innovation ecosystem.

In the upper-right quadrant, we observe Japan, South Korea, Taiwan, the United States, and the United Kingdom. Japan (ECI Trade 2.08, ECI Tech 1.00) leads ahead with a diversified and sophisticated manufacturing base supported by innovation capabilities, indicating continuity in the jurisdictions position. South Korea (1.83, 0.73) and Taiwan (1.94, 0.66) also demonstrate strong synergy between sophisticated production and technological specialization, although with a slightly lower manufacturing and trade capacity than the leader. The United States (1.5, 0.87) combines a broad export base with a moderately high innovation capability, indicated by the ECI trade index. The United Kingdom (1.49, 1.09) shows a similar alignment although it clearly leads the ECI tech measurement, indicating a very strong innovation output reinforcing an already diverse export structure.

China and EU fall into the lower-right quadrant of low trade complexity but high innovation output. China (ECI Trade 1.14, ECI Tech 0.81) has built significant trade power but lags in technological innovation development relative to its sophistication and diversity of its

manufacturing output. EU shows an equal position to China with an ECI Trade score of 1.17 but surpasses it when it comes to innovations with commercial potential exemplified by an ECI tech of 0.93. It is worth noting that since the ECI tech measurement is based on data related to patent filings, this may cause nations with alternative innovation protection strategies to score unproportionally low. Canada, India and Brazil appear in the same quadrant. Canada (0.9, 1.20) shows a research-driven economy where technological strength is not yet fully commercialized through exports. India (0.6, 1.00) follows a similar pattern, suggesting a growing innovation base that has yet to be translated into diversified, knowledge-intensive trade. Brazil follows closely with an ECI trade of 0.2 and ECI tech of 1.15. While the ECI Tech score seems disproportionately high, potentially due to specific patent clusters or data variability, the overall position suggests a limited alignment between innovation and trade. Further investigation would be needed to understand whether Brazil's innovation output is sector-specific, under-utilized, or not adequately connected to its export economy.

Finally, Mexico is positioned in the lower-left quadrant, with moderate to low ECI trade and moderate to low ECI Tech (1.03, -0.25). This position indicates a very low intensity innovation ecosystem, but a marginally more advantageous position in its trade complexity.

4.2 The PCB industry

4.2.1 Industry overview and key actors

The global printed circuit board (PCB) Market is estimated to grow with a 4-6% CARG until 2025 (Beroe, 2023). Consumer electronics, computer, and telecommunications sectors collectively represent around 70% of the global PCB demand, driven by ongoing technological innovation, miniaturization, and growing need in emerging markets. As illustrated in Figure 4.2.1:1 the PCB manufacturing industry is most predominantly within the Asia Pacific (APAC) region where China accounts for 50% of the global production in 2018, followed by Taiwan and South Korea with 12.6%, and 11.6% (Dubey & Dubey, 2021). It is estimated that around 90% of the global PCB production is concentrated in the APAC region, where the top 10 suppliers account for less than 50% of the global market and the top 18 account for just under 50% as seen in Figure 4.2.1:2.

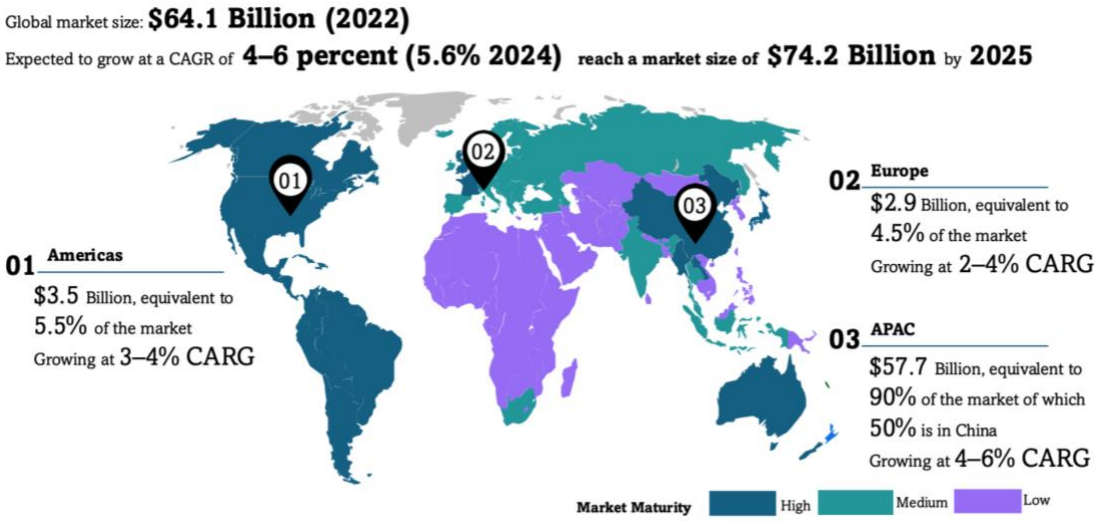

Figure 4.2.1:1 illustrates the global PCB market by region, presenting the growth rate and the percentage of the global market from 2022 (Beroe, 2023).

The regional concentration of the PCB industry poses both strengths and weaknesses, especially as reshoring strategies in jurisdictions like the United States face challenges due to capital intensive and complex nature of PCB manufacturing (Beroe, 2023). These strategies are further complicated by trade restrictions and limited domestic production capabilities, which make collaboration with experienced overseas manufactures challenging.

Despite reshoring strategies, the North American market has faced challenges in establishing themselves. According to Beroe (2023), while APAC continues to expand, North America's PCB market shows signs of strain. According to IPC, PCB bookings in North America fell by 19% year-over-year and 22% month-over-month in October, suggesting that recessionary pressures and weakening demand are significantly affecting regional performance. Meanwhile, supply-demand imbalances globally have resulted in higher supplier power, as net demand (90%) outpaces net supply (85%–90%), contributing to increased input costs and price changes of 3–5%. Market rivalry is intensifying, and buyer power remains moderate, with limited leverage due to the fragmented supplier base and rising costs across raw materials, labor, and logistics. The price movement, limited supply of raw materials, and supply-demand gap are all factors that have resulted in a low-medium negotiation leverage.

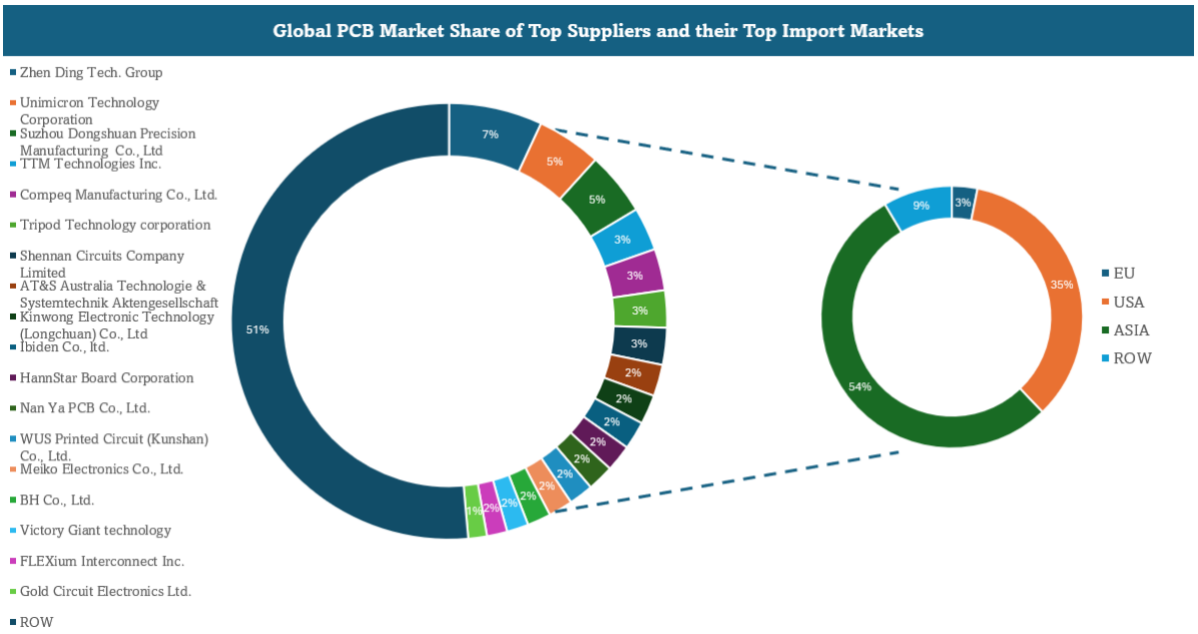

Figure 4.2.1:2 represents the 18 larger manufacturers of PCB in terms of market share calculated on the global PCB market size in 2023, and the regions which they supply (The printed Circuit Report, 2023).

The leading PCB suppliers are shown in Figure 4.2.1:2 including the headquarters of each top supplier, revealing a clear geographic concentration in the Asia-Pacific (APAC) region. Notably, one of the larger players, TTM Technologies are headquartered in the United States. However, despite its strong operational presence in North America, a significant portion of its manufacturing has been concentrated in the APAC region (The printed Circuit Report, 2023).

As of 2024, Sanmina operated approximately 11.56 million square feet of manufacturing space globally, with 4.48 million square feet in APAC and 5.71 million square feet in North America, indicating that around 39% of its production capacity is in the APAC region. TTM Technologies, meanwhile, reported a total global manufacturing footprint of 7.53 million square feet, of which 5.55 million square feet, or about 74%, is based in APAC. Only 1.99 million square feet (26%) is in North America, including both the United States and Canada.

Figure 4.2.1:3 further illustrates the distribution of production capacity among these top suppliers, showing where their operations are geographically focused. It is evident that APAC not only dominates global PCB supply but also plays a central role in demand, with its influence extending across major markets, including the United States.

Supplier	Market Share [%]	HQ
Zhen Ding Tech. Group	7%	Taiwan
Unimicron Technology Corporation	5%	Taiwan
Suzhou Dongshuan Precision Manufacturing Co., Ltd	5%	China
TTM Technologies Inc.	3%	U.S.
Compeq Manufacturing Co., Ltd.	3%	Taiwan
Tripod Technology corporation	3%	Taiwan
Shennan Circuits Company Limited	3%	China
AT&S Australia Technologie & Systemtechnik Aktengesellscha	2%	Austria
Kinwong Electronic Technology (Longchuan) Co., Ltd	2%	China
Ibiden Co., ltd.	2%	Japan
HannStar Board Corporation	2%	Taiwan
Nan Ya PCB Co., Ltd.	2%	Taiwan
WUS Printed Circuit (Kunshan) Co., Ltd.	2%	China
Meiko Electronics Co., Ltd.	2%	Japan
BH Co., Ltd.	2%	South Korea
Victory Giant technology	2%	China
FLEXium Interconnect Inc.	2%	Taiwan
Gold Circuit Electronics Ltd.	1%	Taiwan

Figure 4.2.1:3 illustrates the top PCB suppliers, market share, and headquarters location. The table identifies the geographic distribution of key players and their origin (The printed Circuit Report, 2023).

4.2.2 Global Trade Mapping: Concentration and trade flow of PCBs

This section presents an empirical mapping of the global PCB industry. Its purpose is to identify key supply and demand actors among the jurisdictions selected for this study. By doing so, it reveals the structure of trade dependencies and regional supply can demand clusters. This directly contributes to answering Research Question 2.2 in section 1.5, which concerns identifying trade patterns and dependencies in the global PCB market.

Concentrated export: East Asia's Dominant Role

Figure 4.2.2:1 reveals a concentration of PCB exports in a small number of jurisdictions, most notably China, Taiwan, Japan, and South Korea. China alone accounts for approximately 47% of global exports, underlining its dominance in upstream production. Taiwan and Japan follow with shares of 11% and 8%, respectively, reinforcing East Asia's centrality in the global production of advanced electronic components.

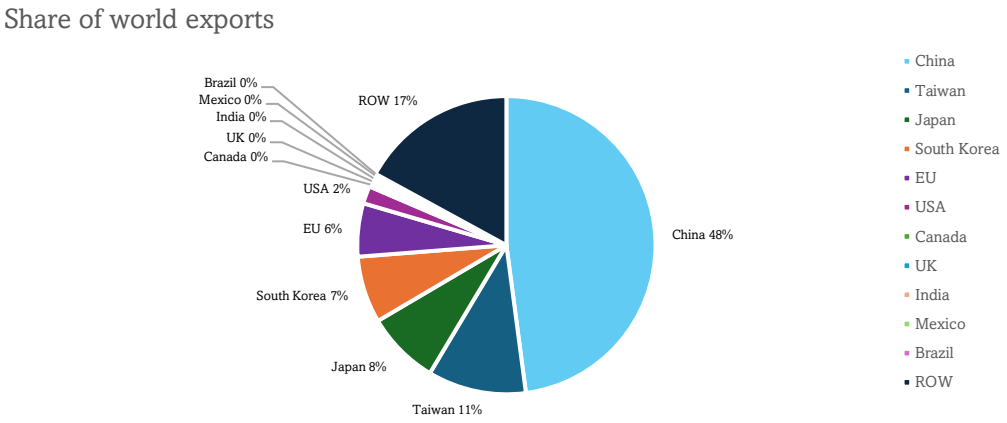

Figure 4.2.2:1 Jurisdiction's share of global export figures (OEC, 2025).

The disaggregation in Figure 4.2.2:2 further illustrates the customer dependencies of these key suppliers. For China, around 13.6% of its PCB exports go to the EU, with other sizable shares going to the U.S. and other jurisdictions within the APAC region. This reflects a diverse export portfolio and confirms that a large part of the world relies on Chinese manufacturing for electronics input.

Japan, contributing 8% of world exports, primarily exports to China, Taiwan, South Korea, U.S. and the EU. As illustrated by figure 4.2.2:2 these jurisdictions stand for 31.8%, 18.8%, 9.4%, 5.0% and 2.7% of the imports respectively. This trade pattern suggests Japan's tight integration within regional supply chains, whilst still maintaining intercontinental customers in the U.S. and EU. Similar patterns are observed for Taiwan and South Korea. From figure 4.2.1:2 it is seen that Taiwan sells its majority to China (36.7%), followed by USA, South Korea, EU and Japan with 10.5%, 8.9%, 5.5% and 8.9 % respectively. South Korea follows the same trend with primary export destinations being China and Taiwan, with 36.1% and 19.3 %. They are followed by Mexico (6.1%), U.S. (4.2%) and EU (4.2%).

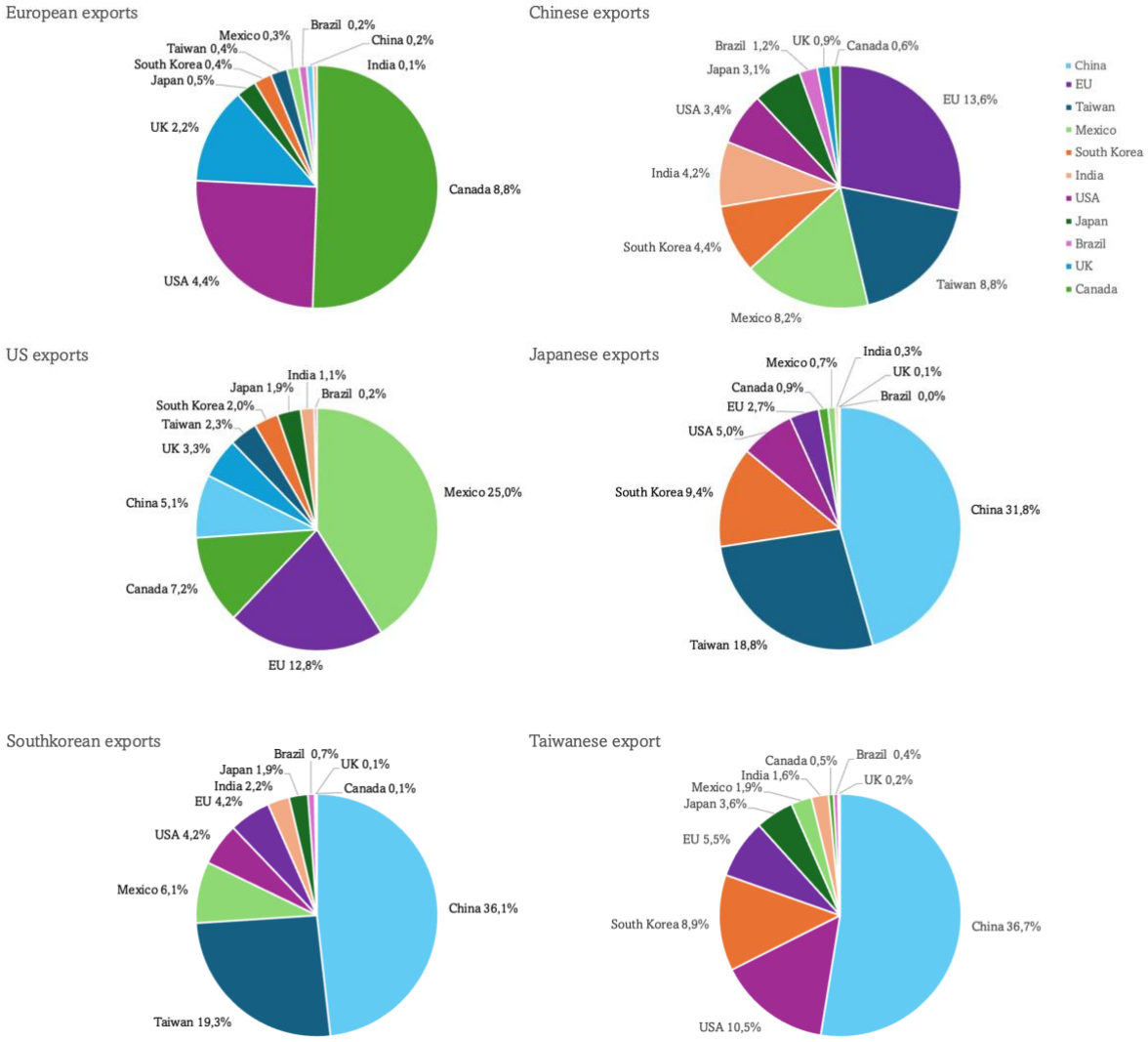

Figure 4.2.2:2. The above charts shows the disaggregation of the world export share for each jurisdiction in figure 4.3.1:1. Note that export will not sum to 100% as this study has been limited to a specified selection of jurisdictions (OEC, 2025).

Dispersed Demand: Import Structures and Dependencies

On the demand side, the analysis of import data from figure 4.2.2:3 shows that while production is concentrated in East Asia, consumption is globally dispersed, with demand centers located in both Asia and the West. The EU emerges as the largest importer of PCBs, accounting for approximately 13.4% of global imports. However, it exports only 6.4%, making it a net importer. The supplier breakdown of EU imports from figure 4.3.1:4 further reveals that nearly 48.5% originate from China, followed by Taiwan, USA, Japan, and South Korea making up 4.4%, 2.2%, 1.8% and 1.6% respectively. This indicates a strong reliance on East Asian suppliers and a significant structural dependency in the EU's PCB value chain.

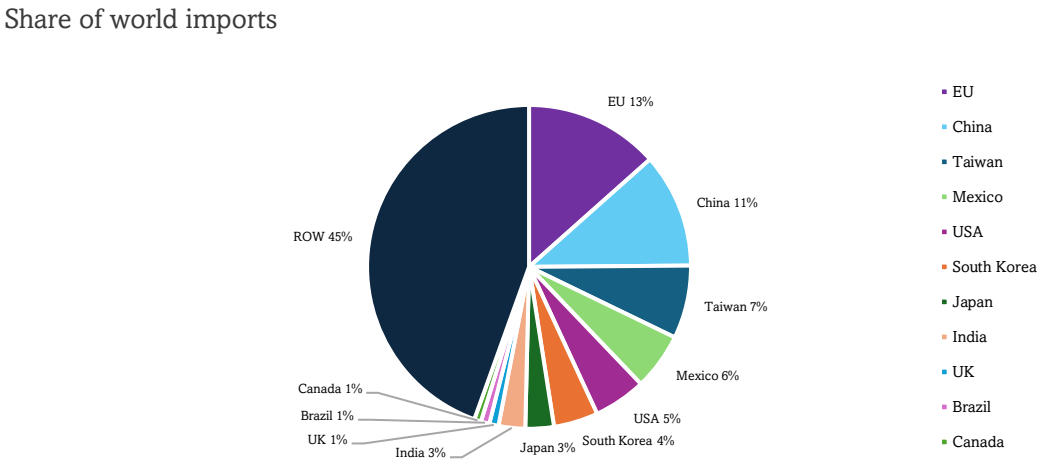

Figure 4.2.1:3 Jurisdiction's share of global world imports (OEC, 2025)

The United States also stands out as a net importer. Despite representing just 1.9% of global exports, it accounts for 5.2% of global imports. Like the EU, the U.S. sources a substantial share of its imports from China (30.9%), but its supply base is slightly more diversified, with import from Taiwan (21.4%), Japan (7.6%), Canada (6.0%), South Korea, EU and Mexico (4.0%). This reflects the US's position as a major electronics consumer and assembler, with limited domestic PCB production capacity and a high reliance on imported inputs.

China appears not only as the dominant exporter but also as a significant importer, whose purchases accumulate to 11% of the total world imports. It both exports large volumes of PCB to global markets and imports specific PCB products, often from Taiwan (34.2%), South Korea (22.9%) and Japan (22.1%), for further processing and assembly.

Taiwan and Mexico emerges as middle-tier importers with Taiwan importing 7% and Mexico 6% of global imports. Taiwan's imports reinforce the global trend of East Asian dependency sourcing 57.6% of its imports from China and 20.5% and 19.2% from Japan and South Korea respectively. Mexico's import statistics further underline the trend with imports of 69.1% from China and 3.6% from Taiwan. However, whilst relying on Asian manufacturing, Mexico sources 8% of their PCBs from USA.

Japan and South Korea contributes to purchases of 3% and 4% of global imports, in addition to being top exporters, also visibly maintain a moderate level of imports, typically sourced from neighboring countries. Japan's largest sources include China (53%), Taiwan (13.4%) and South Korea (4.8%). South Koreas top source as similarly, China (47.6%), Taiwan (21.5%) and Japan (16.8%). This suggests regional loops in PCB trade and the existence of specialized interdependence within East Asia. Both nations participate in multi-stage production processes, importing inputs and re-exporting processed outputs, which reflects a high level of regional value chain integration.

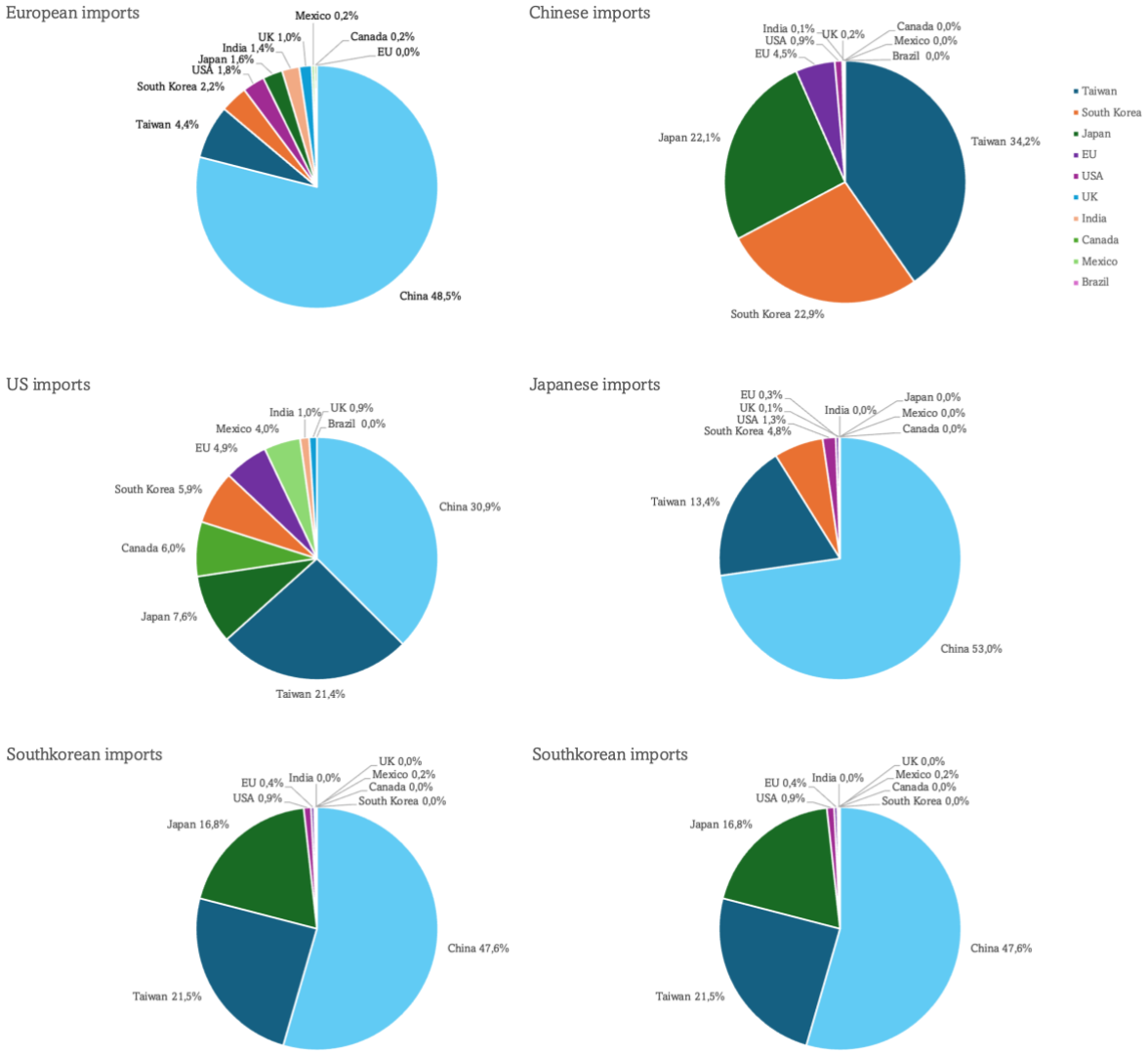

Figure 4.2.2:4. The above charts shows the disaggregation of the world import share for each jurisdiction in figure 4.2.1:3. Note that export will not sum to 100% as this study has been limited to a specified selection of jurisdiction (OEC, 2025)s.

The combined mapping of exports and imports paints a picture of global trade asymmetries in the PCB sector**.** Manufacturing remains concentrated in the Asian hemisphere, especially within China and its regional neighbors, while demand is spread between East Asia, North America, and Europe. Western economies such as the EU and U.S. stand out as net importers, heavily dependent on a relatively small group of East Asian suppliers, particularly China.

4.2.3 RCA and supply-demand dependencies

To understand the jurisdiction's position in the PCB value chain, this section presents two scatterplots that combine the RCA measurement with two trade-based dependency metrics. These figures help assess which nations not only produce PCBs competitively but also act as critical suppliers or buyers within the ecosystem. Furthermore, this help reveal the relative specialization of a jurisdiction and its absolute role in the global supply chain. A high RCA combined with high export volumes indicates both competitiveness and scale, positioning a

jurisdiction as a key supplier. Conversely, low RCA alongside high import volumes can signal strategic dependency and limited domestic production capacity.

The first scatterplot in Figure 4.2.3:2 measures RCA in combination with the average share of imports, indicating how much a jurisdiction supplies others. The second scatterplot in Figure 4.2.3:3 combines RCA with an average share of exports, indicating how much a jurisdiction consumes from others.

	RCA	Av. Share of imports (Big Suppliers)	Av. Share of exports (Big Buyers)
USA	0,23	*4%*	*17%*
EU	0,34	*3%*	*13%*
China	3,17	*49%*	*12%*
Japan	2,34	*7%*	*1%*
UK	0,19	*0%*	*1%*
South Korea	2,53	*7%*	*3%*
India	0,18	*0%*	*1%*
Mexico	0,13	*1%*	*5%*
Canada	0,17	*1%*	*2%*
Taiwan	4,75	*11%*	*5%*
Brazil	0,0064	*0%*	*#N/A*

Figure 4.2.3:1. Overview of RCA, Av Share of imports and Av Share of exports scores for the selected jurisdictions.

RCA and supply side demand (Average share of imports)

As mentioned, the first scatterplot in figure 4.2.3:2 shows RCA on the x-axis in combination with average share of other jurisdictions' imports from the jurisdiction on the y-axis. The x-axis will show how specialized or competitive a jurisdiction is in PCB exports while the y-axis reflects how important that jurisdiction is to others and how much the other jurisdictions rely on it. This relationship reveals the alignment or divergence of specialization (RCA) and supply relevance (avg. share of imports).

Jurisdictions in the upper-right quadrant with high RCA and import shares are considered core strategic suppliers – both specialized and globally relied upon. Jurisdictions in the upper-left quadrant show high export flows but with limited RCA, showing jurisdictions that area not specialized to the same extent as the first quadrant but still manage to supply a notable portion of other jurisdictions imports. A low RCA combined with a high share of other jurisdictions imports may also occur in globally diversified export economies, where the relative share of PCBs in the export portfolio is small despite high absolute export volumes. In such cases, RCA may understate a jurisdictions strategic importance in the PCB supply chain. Therefore, combining RCA with import reliance metric allows for a better understanding of a jurisdiction's trade power, revealing actors who may be central to global supply chains despite not appearing specialized in relative terms. A high RCA combined with a low share of global PCB import reliance as in the lower-right column, may indicate a jurisdiction that specializes in specific, often advanced, areas of PCB manufacturing. These jurisdictions may serve niche markets or produce technologically intensive boards for critical sectors such as aerospace, automotive or defense. Although their export volumes may be limited their strategic role can

be significant in segments where quality, precision or security standards are paramount. Finally, the low-left quadrant shows neither a significant specialization nor a large supply influence.

Chinas position in the matrix shows a clearly dominant position in the high specialization and high supply upper-right quadrant. With an RCA of 3.17 and average import share of 49%, China is not only the world's most competitive PCB producer but also the largest supplier of most jurisdictions.

Taiwan falls into the lower-right quadrant, with RCA scores of 4.75 and an average import share of 11%. Taiwan's position reaffirms its standing as a critical actor with specialization in the PCB industry whilst underlining its importance in global supply chains.

Japan and South Korea shows moderate to strong RCA positions compared to the other jurisdictions with South Korea marginally ahead (2.53) compared to Japan's (2.43). However, both constitutes a smaller share of the other jurisdictions imports compared to the China and Taiwan, indicated by an average Japanese import share of 7% and South Korean of 7%. The U.S. sits far left in the distribution of all jurisdictions and reveals an RCA score of 0.23 whilst contributing to around 4% of the average share of imports, indicating a moderate to low supplier role compared to the other jurisdictions.

Further left, and lower in the lower-left quadrant is the EU displaying an RCA score of 0.34 and average import share of around 3%. This indicates a limited specialty in manufacturing and only moderate supplier influence. The rest of the jurisdictions, UK, India, Canada and Brazil, show lower RCA and average share of imports as compared to the EU, placing them even further down and left in the plot. These low figures show that the jurisdictions neither hold a specialization advantage, nor are they considerable suppliers to the other jurisdictions. Although, Mexico stands out with a low RCA of 0.13 and average import share of 1%, indicating some activity as a supplier in the PCB industry.

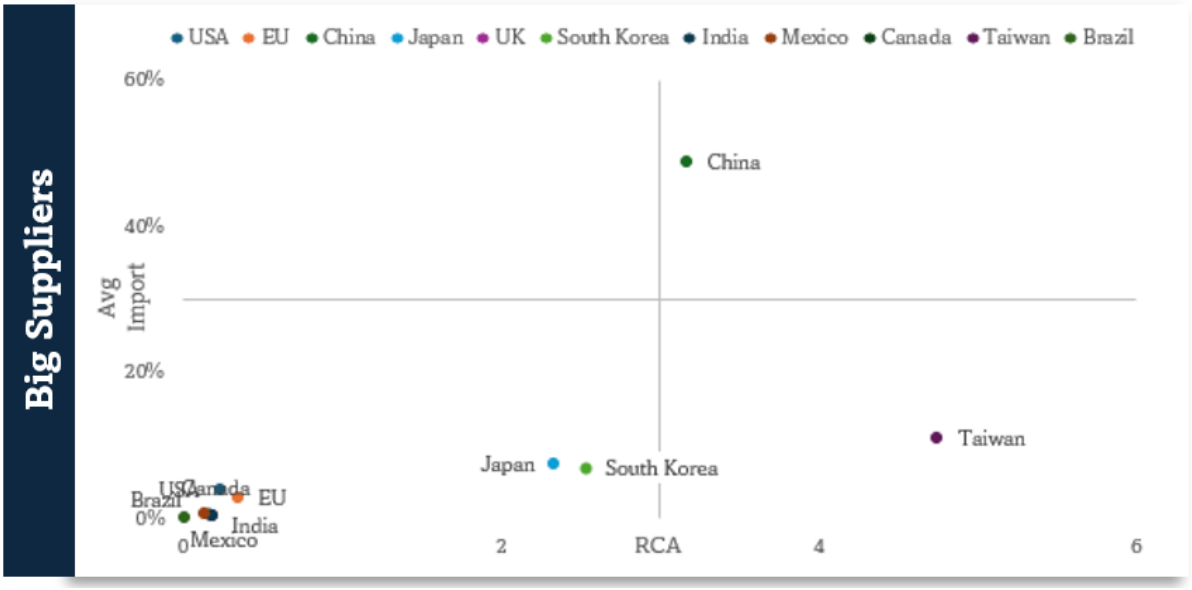

Figure 4.2.3:2. Scatterplot of relative comparative advantage (RCA) and average share of jurisdictions imports (Avg Imports), specifically for the PCB-industry.

RCA and demand side relevance (Average share of Exports)

The second scatterplot uses the same RCA scores but compares them against each jurisdiction's share of global demand, as an importing economy. The second measurement serves as an index for how much each jurisdiction consumes from others. Plotting RCA against the share of global PCB exports going to a jurisdiction offers a complementary demand side perspective to the supply side analysis. While RCA versus export share highlights which jurisdictions are key suppliers, the second dimension helps identify where global demand is concentrated, revealing jurisdictions that may not be major producers but still exert strategic importance through their consumption.

Jurisdictions in the top right quadrant are seen as highly specialized in exporting PCBs but also a large consumer, indicating a vertically integrated tech economy where high internal demand is supported by both domestic production and imports. Jurisdictions in the top left quadrant with low RCA but high import shares can be seen as a strategically dependent consumer, lacking domestic competitiveness. Meanwhile, those in the bottom right quadrant may be highly competitive exporters but with limited domestic demand, playing a pure supplier role. Conclusively, the lower-left quadrants illustrate jurisdictions with both low RCA and low average share of exports, indicating limited actions in the PCB industry.

The U.S. and the EU are both situated in the low specialization high demand upper-right quadrant. Whilst the EU has a low RCA of just 0.34 it consumes 13% of other jurisdictions' exports, whilst the U.S. with an RCA of 0.23, absorbs 17%. This dependence highlights the need for foreign PCB imports for both the U.S. and EU. Comparatively, China sits close to the origo of the plot, indicating a balanced positions in terms of RCA and average share of exports. With an RCA of 3.17 and average share of exports amounting to 12%, China acts as both a significant supplier and producer whilst also being one of the major buyers given its high average share of exports. This finding is in line with China's role as a global electronics manufacturing hub.

Taiwan appears in the high RCA low export share lower-right quadrant. Taiwans' high RCA of 4.75 is combined with an average share of other jurisdictions exports amounting to 5%. Taiwans position with the highest RCA and moderate share of exports indicates a production focused role with low dependence on external suppliers of PCBs.

South Korea and Japan are catching up in terms of average export scores of 3% and 1% respectively, albeit with noticeably lower RCA scores. However, both jurisdictions are still considered production focused with a relatively high RCA and little dependence on the foreign supply of PBCs and located in the lower-left quadrant. Mexico is found in the same section of the plot. It shows a moderate to high share of global exports amounting to 5% coupled with a noticeably low RCA of 0.13, indicating a reliance on foreign PCBs.

Finally, jurisdictions such as Canada, India, Brazil and the UK remain considerably far left and down in the lower RCA modest demand quadrant. These jurisdictions do not consume notable quantities of exports, nor do they exhibit traits of comparative advantages.

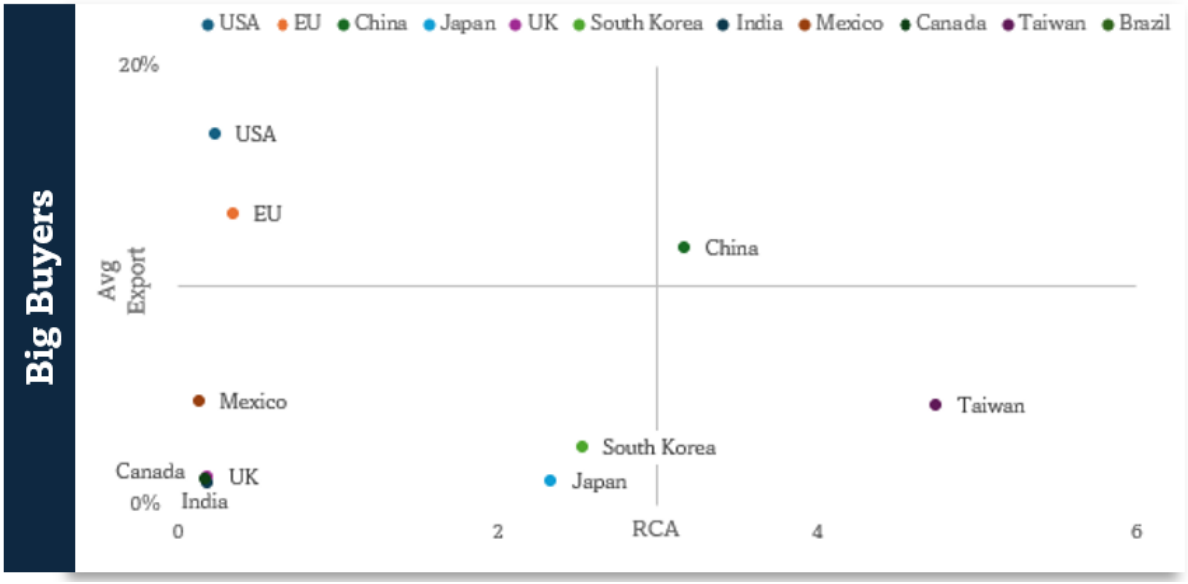

Figure 4.2.3:3. Scatterplot of relative comparative advantage (RCA) and average share of jurisdictions exports (Avg Exports).

4.3 Case company: Ericsson

This section introduces Ericsson as the focal firm for the case study analysis, providing an overview of its geographic market footprint, supply chain configuration, and sourcing strategy for printed circuit boards (PCBs). The aim is to contextualize Ericsson's global exposure to trade-related risks and illustrate how geopolitical dynamics intersect with firm-level operational dependencies. Some details have been intentionally shortened or omitted due to confidentiality considerations.

4.3.1 Ericssons geographic footprint

Ericsson's markets are divided into five key market areas: North America (MANA), Europe and Latin America (MELA), Northeast Asia (MNEA), the Middle East and Africa (MMEA), and Oceania, India and Australia (MOAI), where North America is Ericsson's most significant market, with the United States alone contributing to approximately 25–30% of the company's global revenue. The region is at the forefront of technological adoption, with strong demand for 5G, cloud-native networks, and software-defined solutions. Europe and Latin America together account for a substantial portion of Ericsson's income, forming the MELA market area. In Europe, demand is more evenly spread and supported by EU subsidies, which help sustain investments across member states despite relatively lower sales volumes (Ericsson,

2025). Latin America shows steady growth in both 4G and 5G deployment, although adoption rates vary across countries.

Northeast Asia (MNEA), which includes technologically advanced markets like Japan and South Korea, contributes to around 15–20% of Ericsson's revenue. These regions are global leaders in 5G deployment and digital innovation, enabling the development and integration of solutions such as the Internet of Things (IoT). While MOAI region (covering India, Oceania, and Australia) demand is primarily shaped by the need for reliable, large-scale network infrastructure. India is a particularly important market, where dense populations and diverse conditions create high demand for commercially tested and rigid 4G and expanding 5G networks. Finally, MOAI accounts for around 15% of global revenue.

Lastly, the Middle East and Africa (MMEA) region is still largely driven by 4G technology, although 5G is gaining traction, particularly in the Gulf states. The focus here is on expanding connectivity in underserved areas, with sales from this market contributing to approximately 10–15% of Ericsson's global revenue.

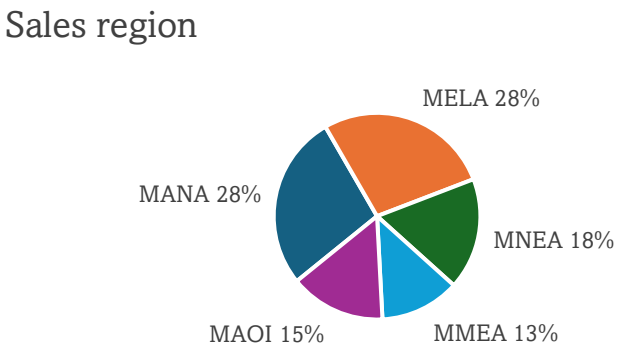

Table 4.3.1:1, Share of annual sales disaggregated based on market areas (Ericsson, 2025).

4.3.2 Ericsson Supply chain

Ericsson Group Supply responsibilities within the product life cycle begins with a new product introduction (NPI) phase, which is the process of sourcing and finalizing the product design of a new or emerging product at Ericsson (Ericsson, 2025). Once a product is deemed ready, the product life cycle continues to the next step, namely, inclusion in the product portfolio and hence large-scale sourcing and manufacturing. First, components are shipped to a component hub, managed by a logistics service provider (LSP), in Europe, Asia or America. After components have passed through an inbound supply hub, they are forwarded to an Ericsson production/manufacturing location. Ericsson manufacturing locations are either an electronic manufacturing site (EMS) or Ericsson Supply sites (ESS) and are located across the globe. ESS are commonly centered on new introduction of product (NPI) manufacturing, which requires both technical manufacturing capabilities and knowledgeable personnel. EMS facilities are not owned by Ericsson but run through joint ventures with a partner. The EMSs are commonly focused on larger scale manufacturing of tested products in batches.

As mentioned before, NPI batches are commonly manufactured and tested at ESS sites, this is often a strategic choice since NPI batches may include technologies which Ericsson wants to shield from the market. Hence, the sites possess knowledge in terms of personnel and manufacturing capabilities which are not easy to relocate since it would require substantial and lengthy investments in personnel and equipment, plus multiple years of learning by operating activities (Ericsson, 2025). Next, when products leave the EMS or ESS site, they are guided through a network of supply hubs before they reach the final distribution step. Following the supply hubs, products are transported using local company logistics managed in 100+ countries.

4.3.3 Ericsson Sourcing: PCB purchasing structure and strategy

This section presents Ericssons sourcing strategy and outlook of the PCB component. Furthermore, it attempts to briefly describe Ericssons technical dependency on PCBs and its technological and commercial specifications passed down to suppliers.

According to Ericsson (2025), a clear majority of the Company's PCBs are sourced from the APAC region. Moreover, Ericssons PCB sourcing strategy is guided by its high-technology products. Technology intense products translate into advanced capabilities for the sourced PCBs. Consequently, this limits the supplier based and thus increases Ericssons dependence on fewer suppliers that can deliver to Ericsson technology requirements in a commercially feasible way. In this context it is important to add that commercial criteria are not only tied to costs but can include logistical aspects such as the ability to deliver volatile and uncertain volumes.

5. Analysis

This section presents an analysis structured in accordance with the inherent layout of this report: it begins with a global overview of trade, followed by a tapered down analysis of the PCB on a global industry level and lastly, it will analyze the findings from Ericssons perspective. Firstly, it addresses Research Question 1.2 "*How much trade and financial leverage do different jurisdictions hold based on OEC measurement indexes, their global trade/import ratios and capital markets?"* by examining how different actors deploy trade and financial leverage, and how these efforts are shaped by evolving alliances and constraints. Moreover, this study's analysis part will extensively seek to answer the final sub question of the second research question "*RQ2.3 How is the case company and other network equipment manufacturers supply chain affected by the geopolitical patterns and leverages identified in RQ1?"* by conducting an analysis based on supply chain disruption, risk management and resilience theory.

5.1 A global perspective - critical patterns in jurisdictions

This section presents a comparative analysis of jurisdictional power in the global trade system, structured around five dimensions (see *Figure 5.1:1*). Drawing on the integrated framework developed in Figure 1.2:1, the analysis ties together theoretical foundations from 2.2 *Power-influence and actor typologies* (Baldwin, 2013; Christie et al., 2025; Farrell & Newman, 2019; Boyles, 2022) and 2.3 *Trade leverage* (Christie et al., 2025; Farrell & Newman, 2019; OEC,2025; Barney, 1991), apart from 2.3.3 *Relative comparative advantage* and with the empirical evidence from 4.1 *Power influence mapping*, offering a view of how power is constructed, exercised, and constrained across jurisdictions on a global level. A summary of the analysis is presented in *Figure 5.1:2.*

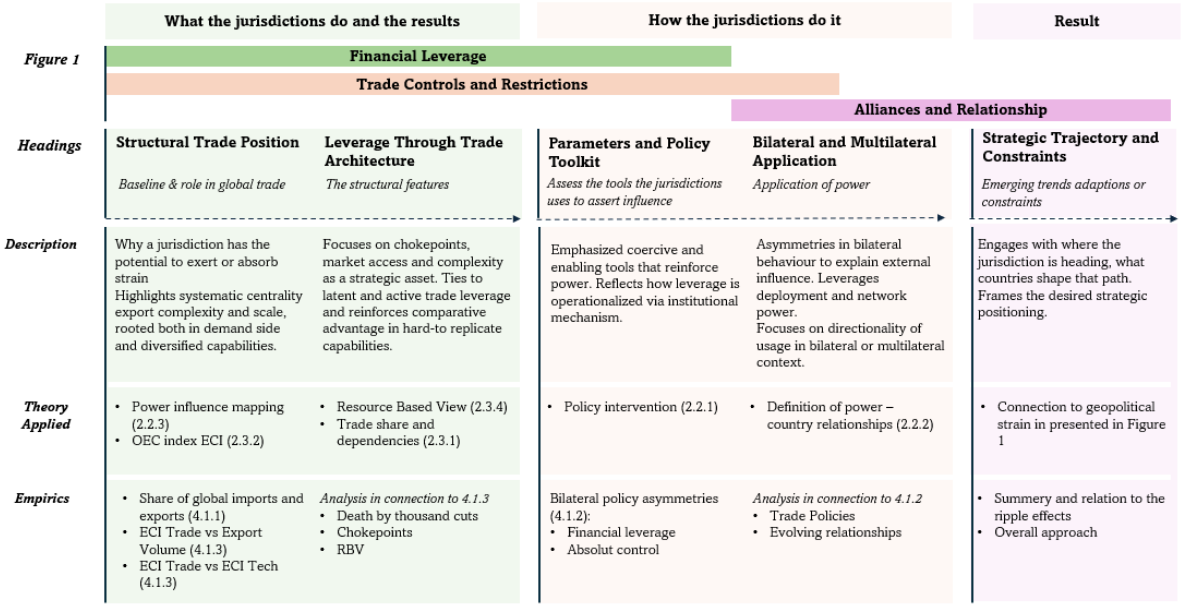

Figure 5.1:1 presents how the five different dimensions fit into Figure 1.2:1 and how these are connected to the relevant empirics and theories needed to answer RQ 1.2. The five dimensions span from structural positioning in global trade to the strategic trajectory. The first two columns examine what jurisdictions do and the resulting leverage. The next two columns analyse how jurisdictions implement power, through the tools and parameters of policy, and their bilateral or multilateral application. The final column evaluates the resulting trajectory.

The first lens "*Structural Trade Position*" establishes a jurisdiction's role in the global economy by examining its market characterization (bridging, transitional or central), trade volume, Economic Complexity (ECI Trade), and technological depth (ECI Tech). While this primarily reflects Trade Policy, it also signals potential to leverage economic resources.

The second dimension, "*Leverage Through Trade Architecture",* focuses on how jurisdictions convert complexity and capabilities into strategic influence. Here, the Resource-Based View (RBV) and theories of chokepoints are applied to uncover how trade structure supports latent or active leverage. It reflects both Trade Policy and leverage through connecting resources and capabilities to trade share and dependencies between jurisdictions.

The "*Parameters and Policy Toolkit*" identifies the specific instruments jurisdictions use to exert influence. It directly operationalizes the Parameters concept from Figure 1.2:1, illustrating the interaction between declared policy aims and available enabling tools. This dimension anchors both Trade Policy and Financial Leverage. However, the financial leverage aspect has as previously mentioned been excluded from this study. Secondary implications for relational behavior depend on unilateral, bilateral, or multilateral usage which is covered more in depth in the next dimension.

Following this, the "*Bilateral and Multilateral Applications of Leverage*", shifts focus to how tools are applied and the power asymmetries for relational behavior depending on unilateral, bilateral, and multilateral relations. The dimension highlights Evolving State Relationships as jurisdictions deploy targeted economic pressure, secure compliance, or buffer themselves against rival influence. This section also captures retaliatory dynamics and co-regulatory behavior.

Finally, "Strategic *Trajectory and Constraints*", reflects on the direction each jurisdiction is heading. Grounded in Figure 1.2:1, it considers emerging shifts in industrial strategy, policy recalibration, or alliance formation, linking strategic ambition to capacity. This section synthesizes all three levels, however with a primary focus on positioning and evolving relationships.

	What the jurisdictions do and the results		How the jurisdictions do it		Result
	Structural Trade Position	**Leverage Through Trade Architecture**	**Parameters and Policy Toolkit**	**Bilateral and Multilateral Application**	**Strategic Trajectory and Constraints**
U.S.	Central, supply & demand, downstream integration	Demand-side dependency and supply-side control	Secured upstream production via economic interdependence	Bilateral strategy with multilateral ripple effects	Influence through systemic entanglement
China	Central, upstream integration, moderate complexity	Structural leverage, via scale, critical minerals	Assertive absolute control with export bans and tech control	Bilateral pressure, multilateral corridors	Creates dependency via structural enmeshment
EU	Central, high volume, moderate complexity	Regulatory power through cumulative standards	Moderate preference for regulation over coercion	Multilateral coalitions, limited bilateral force	Standard setting and legalistic resilience
India	Transitioning, low complexity, service oriented	Limited leverage, lacks embedded complexity	High control and defensive industrial policies	Bilateral control, limited systemic outreach	Industrial ambition misaligned with regulation
Japan	Central, high complexity, upstream strength	Latent leverage via upstream chokepoints	Stable, rule based trade networks and systematic trust	Neutrality, alliance balancing and systematic importance	Silent influencer, upstream dominance
South Korea	Bridging, high complexity, low volume	Latent but underutilized structural power	Minimal, stability over leverage	Alliance balancing, minimal unilateralism	Reactive posture, policy minimalism
Taiwan	Transitioning, strategically critical, high complexity,	Passive leverage through irreplaceable roles	Restrained due to geopolitical sensitivity	Strategic alignment, network relevance	Defensive posture, rising geopolitical attention
UK	Bridging, high tech potential, modest volume	Relies on norm diffusion and indirect influence	Absolut controls, legislative alignment	Targeted bilateral control	Strategic recalibration, domestic resilience
Brazil	Transitioning, low complexity, commodity based	Converting resources into political capital	Financial tools, defensive positioning	Bilateral and multilateral trade frameworks	Balancing commodity with ambitions for autonomy
Canada	Bridging, high tech, low complexity	Rational leverage via innovation ties	Incentives, internal resilience rather than external coercion	Multilateral entrenchment, stabilize market access	Reduction in single market dependencies
Mexico	Bridging, low complexity, regional integration	Geographic leverage via nearshoring	Low intervention, underused strategic tools	Bilateral deference, low global influence	Compliant, integrated platform, not self directing

Figure 5.1:2 illustrates the strategic trade behaviour of selected jurisdictions across five dimensions. It highlights the variation in how jurisdictions apply, operationalize, and project trade influence, ranging from embedded chokepoint leverage and policy tool deployment to their role in shaping supply chain dynamics and long-term geopolitical positioning.

5.1.1 United States

Structural Trade Position: The United States plays a central role in global trade (2.2.3 and 4.1.1), combining a high Economic Complexity Index (ECI Trade: 1.5) with a substantial export volume index (0.47). Positioned in the upper-right quadrant of Figure 4.1.3:1, indicating export complexity and global trade engagement. While the U.S. does not lead in export flows it ranks second largest globally at 12% of total imports, giving it considerable leverage as few jurisdictions can afford exclusion from the U.S. market. However, this influence is reciprocal as the U.S. remains dependent on critical imports, exposing supply-side vulnerabilities (4.1.1). These interdependencies have prompted policy responses such as tariff threats, reflecting a strategy of trade regulation through market access and defensive control.

Despite strong trade complexity, the U.S. underperforms in ECI Tech (Figure 4.1.3:2), indicating a disconnect between innovation capacity and export output. This likely reflects intellectual property rights concentration, private-sector-led R&D, and outsourcing of innovation-heavy manufacturing to allies like Taiwan, Japan, and South Korea. As a result, U.S. complexity stems more from downstream application and systemic integration than upstream integration.

Leverage Through Trade Architecture: This configuration of the U.S. ECI indexes aligns with the RBV (2.3.4), where rare, valuable, and hard-to-substitute capabilities underpin trade power. The U.S.'s high ECI Trade score reflects this embedded complexity, combining advanced

technological capacity with its hard to substitute consumption markets, enhancing systemic influence across both dense and sparse trade networks. This blend of demand-side dependency and supply-side control enables what Farrell and Newman (2019) define as both "chokepoint effects" and "death by a thousand cuts": in dense networks, minor restrictions ripple through interconnected chains, while in sparse systems, the U.S. can serve as a critical bottleneck for strategic goods and technologies.

Parameters and Policy Toolkit: Recent tariff threats aimed at reducing U.S. import reliance reflect a broader strategic shift, aligning with global trends (4.1.1). As shown in Figure 4.1.2:2, this turn is accompanied by elevated use of strategic tools, such as the CHIPS Act and Inflation Reduction Act, designed to secure upstream production, boost domestic innovation, and reduce exposure to geopolitical rivals. Financial instruments like CFIUS expansion and IEEPA-linked sanctions are increasingly deployed not just defensively, but to proactively shape global market access. This policy mix restructures supply chains by incentivizing reshoring while imposing national security guardrails that restrict access to advanced U.S. technologies. As illustrated in Figures 4.1.2:3 and 4.1.2:4, these interventions are concentrated where economic interdependence intersects with strategic priorities, closely aligned with the "parameters" dimension of Figure 1.2:1, where financial policy serves as a tool of geopolitical influence.

Bilateral and Multilateral Application: The U.S. applies a high-intensity bilateral strategy, using asymmetric financial and absolute controls across key partners. Figure 4.1.2:3 highlights concentrated pressure on China, Brazil, the UK, Canada, and India, most notably China, where sanctions, FDI restrictions, and export controls target upstream chokepoints in semiconductors and AI, to disrupt downstream technological and industrial capabilities (4.1.2). The elevated score toward Canada reflects U.S. reshoring policies in important sectors like energy and recent export controls, though aimed at China, have triggered pre-emptive compliance in allied jurisdictions. While prominent policies target a handful number of jurisdictions, the extraterritorial reach of U.S. regulations creates ripple effects across global supply chains. This reflects a layered strategy: by targeting upstream choke points, the U.S. shapes downstream access and behavior, reinforcing its agenda-setting role through unilateral tools that generate multilateral impact.

Strategic Trajectory and Constraints: When mapped onto the "Geopolitical Strain on the Globa Market" in Figure 1.2:1, the U.S. activates all four power levers: alliances, trade controls, financial intervention, and industrial localization. It places particular emphasis on financial and relational instruments over outright bans, reflecting a strategic preference for influence through systemic entanglement rather than disruption. While predominantly unilateral or bilateral in execution, these measures often generate multilateral ripple effects, as allied jurisdictions pre-emptively align with U.S. policy to maintain access. The U.S. strategic trajectory is thus one of coordinated dominance: using a mix of embedded consumption power, regulatory leadership, and targeted intervention to shape the behavior of global markets without relying solely on coercion.

5.1.2 China

Structural Trade Position: China stands as a central actor in global trade (2.2.3; 4.1.1), accounting for 12% of global exports and 10% of imports. Positioned in the lower-right quadrant of Figure 4.1.3:1, it combines high export volume (0.74) with moderate trade complexity (ECI Trade: 1.14), reflecting a large-scale but mid-tech industrial base. While China's manufacturing strength supports global supply chains, it also depends heavily on external demand creating a two-sided dependency (4.1.1). Simultaneously, many jurisdictions rely on Chinese goods, rare earth minerals, and intermediate components (4.1.2). This interdependence is constituted by a gap between China's export structure and innovation base, as indicated by its low ECI Tech score. The discrepancy suggests that while China is a key producer, it remains reliant on foreign innovation inputs, an imbalance it seeks to correct through domestic innovation and value chain upgrading strategies (4.1.1).

Leverage Through Trade Architecture: From an RBV perspective (2.3.4), China possesses valuable but less rare capabilities, limiting its leverage through product complexity. However, its scale grants systemic influence. As Farrell and Newman (2019) argue, chokepoints can stem from volume in sparse networks, not just complexity. China's deep integration in supply chains, especially in critical minerals, creates structural leverage. Its influence aligns with the "death by a thousand cuts" model, where control over many mid-tech goods enables dispersed leverage across dense networks, shaping dependencies while shielding its own market.

Parameters and Policy Toolkit: Empirical data in 4.1.2 confirm a strategy of calibrated assertiveness, however mostly in absolute control. China scores relatively high in FDI screening (+1.35) and technology/knowledge controls (+0.37), signaling protection of domestic innovation ecosystems (4.1.1). These tools are not used indiscriminately but are used to manage exposure while expanding strategic influence and to assert sovereignty over strategic sectors. This can be seen through the unreliable entity list and export bans on minerals.

Bilateral and Multilateral Application: China operates across unilateral, bilateral, and multilateral fronts, using economic corridors to expand global influence. Though scoring low on general financial control (Figure 4.1.2:3), it ranks among the highest in bilateral financial pressure, leveraging subsidies and trade incentives, especially in upstream sectors like steel, to distort competition and boost downstream industries like automotive. This reflects a broad-spectrum strategy rooted in embedded industrial policy. China also exerts high absolute control toward the U.S., India, Brazil, and South Korea (Figure 4.1.2:4). These measures target sectors tied to national security, including U.S. defence firms linked to Taiwan. Collectively, this forms a bilateral pressure model that relies less on formal alliances and more on targeted friction and entanglement within global supply chains.

Strategic Trajectory and Constraints: China's use of targeted subsidies and infrastructure investments, exemplified by Belt and Road port acquisitions, reflects a strategy of turning trade interdependence into geopolitical dependency. By leveraging export dominance, China entrenches long-term supply ties and fosters asymmetric dependencies, even in non-complex

sectors. China activates three of the four key levers from Figure 1.2:1 but relies less on formal alliances than the U.S. Instead, it builds influence through structural enmeshment rather than ideological alignment, what some analysts describe as a "non-aligned dependency model".

5.1.3 European Union

Structural Trade Position: The European Union holds a structurally central position in global trade (2.2.3; 4.1.1), representing 13% of global exports and imports. With an export volume index of 0.92 and an ECI Trade score of 1.17, it sits in the lower-right quadrant of Figure 4.1.3:1, reflecting high trade engagement with moderate complexity. In Figure 4.1.3:2, the EU also appears in the lower-right quadrant, showing strong innovation capacity (ECI Tech: 0.93) not yet fully translated into a rare or highly diversified export mix. This highlight asymmetry between research output and commercial integration points to constraints in commercialization or a continued reliance on open trade networks.

Leverage Through Trade Architecture: From an RBV perspective (2.3.4), the EU's ECI Trade score reflects valuable but replicable competencies, unlike other jurisdictions with concentrated chokepoint dominance. While the EU lacks hard chokepoints, its structural leverage stems from internal diversification and regulatory embeddedness, not rare sectors. Rather than disrupting trade at single nodes, the EU shapes global behaviour through cumulative regulatory standards, soft chokepoints like data protection, granting influence via access to its internal market. This aligns with Farrell and Newman's "death by a thousand cuts" model, enabling non-coercive but systemic trade influence.

Parameters and Policy Toolkit: The EU maintains a cautious policy mix. Its financial controls are moderate but targeted, including state aid and localization incentives and it is restrained in its use of hard control (Figure 4.1.2:2). This reflects its foundational preference for norm-enforcing, multilateral behavior. Rather than deploying chokepoints or unilateral sanctions, the EU exerts influence through regulatory export and institutional leadership.

Bilateral and Multilateral Application: The EU's recent adoption of a "coercion toolbox", including tariffs, export licensing, and stricter FDI screening, marks a subtle shift toward selective protectionism (4.1.1). While overall intervention remains limited, actions like the anti-subsidy investigation into Chinese EVs reflect readiness to use hard tools when industrial policy or security is at stake (4.1.2). Still, the EU's leverage rests largely on multilateral alignment and regulatory coalitions, such as joint Huawei bans and coordinated state aid under the EU Chips Act. Bilaterally, it applies moderate financial pressure through trade remedies and subsidy probe, reflecting a reactive approach that counters external distortions while preserving systemic stability, distinguishing its model from the more assertive strategies.

Strategic Trajectory and Constraints: The EU's influence stems from its role as a global standard-setter, rooted in supply chain embeddedness and regulatory centrality rather than exclusionary tools. While internal complexity and fragmented governance limit agility, they offer sectoral depth and legitimacy. In Figure 1.2:2, the EU primarily activates financial intervention, industrialization, and regulatory levers, rarely resorting to unilateral bans or hard

controls. Its approach remains multilateral and legalistic, though recent moves signal a growing willingness to expand its toolkit to safeguard internal resilience and strategic competitiveness.

5.1.4 India

Structural Trade Position: India is a transitioning actor in global trade (2.2.3; 4.1.1), positioned in the lower-left quadrant of Figure 4.1.3:1 with low ECI Trade (0.6) and export volume (–0.33). While it accounts for 3% of global imports and 2% of exports, its leverage is limited by a low-complexity export structure and high dependence on imported high-tech goods (4.1.1). Its ECI Tech score (4.1.3:2) underscores relative innovation leverage. This configuration highlights India's asymmetrical trade reliance, where it is strong in services and moderately high in innovation base but relatively low in advanced exports, indicating aspirations to raise its capabilities in advanced manufacturing by inducing an innovation eco system.

Leverage Through Trade: *Architecture*: Despite its ambitions as a transitioning actor, the jurisdiction does not yet occupy a central hub within trade or innovation networks. From a RBV perspective (2.3.4), this low diversity and rarity in India's trade portfolio suggest that current industrial capabilities lack the embeddedness and complexity required for geopolitical leverage. The low ECI score signals missing intangible assets, such as institutional R&D capacity or scalable innovation ecosystems, that are crucial for transitioning from production to value-added leadership.

Parameters and Policy Toolkit: This structural constraint; mentioned in the previous paragraph, is offset by India's extensive use of absolute control measures. As shown in table 4.1.2:3, India ranks among the highest in export controls (+2.79) and technology controls (+2.91). These measures reflect a defensive strategy aimed at shielding domestic industries and building internal capabilities. Moreover, Indias favoritism of absolute control measures if further underlined by the NSDTS laws which excludes foreign, particularly Chinese, vendors from critical infrastructure.

Bilateral and Multilateral Application: India's trade behavior reveals a tension between aspiration and strategy (4.1.1). While it aims to position itself as a global manufacturing hub it continues to rely on restrictive interventions such as export bans, local content mandates, and import controls (Figure 4.1.2:4). This strategy reflects industrial sovereignty logic and activates the "parameters" lever in Figure 1.2:1, yet may undermine its attractiveness as a low-friction production base. Bilaterally, India applies absolute controls in sectors like pharmaceuticals and telecom, but lacks the financial tools to project systemic leverage, as seen in its near-neutral scores in Figure 4.1.2:3. As such, India's current posture is shaped more by defensive autonomy than proactive influence, revealing a disconnect between industrial ambitions and strategic execution.

Strategic Trajectory and Constraints: Viewed through Figure 1.2:1, India primarily activates the levers of industrial localization, national security regulation, and import/export controls, while largely avoiding formal financial interventions or multilateral norm-building. This inward-facing approach reflects a sovereignty-oriented strategy focused on shielding domestic

industries from external vulnerabilities. However, India lacks the structural trade position and financial instruments needed to translate this into sustained external influence. Its current posture is best described as defensive autonomy, leveraging hard restrictions to preserve domestic space, but without the embedded complexity or relational depth required for broader systemic impact. Ultimately, there is a misalignment between India's domestic industrial strategy and its global trade posture, weakening its ambitions as a transitioning actor seeking greater geopolitical leverage (4.1.1).

5.1.5 Japan

Structural Trade Position: Japan is characterized as a central actor (2.2.3; 4.1.1), reflecting its advanced industrial capabilities and enduring role as a rule-setter in regional and to some extent global trade. It accounts for 3% of global exports and holds an ECI Trade score of 2.08, placing it in the upper-left quadrant of Figure 4.1.3:1, a position denoting high export complexity but modest trade volume. While Japan's share of global imports is similarly limited, its geopolitical influence stems from its upstream role as a key supplier of advanced intermediate goods. With an ECI Tech score of 1.00, Japan also appears in the upper-right quadrant of the ECI Trade vs. ECI Tech plot (Figure 4.1.3:2), demonstrating strong alignment between innovation and export structure.

Leverage Through Trade Architecture: From the RBV, Japan's high ECI scores indicate a stock of rare, valuable, and hard-to-replicate capabilities that translate into strategic advantage. These are not only economic but geopolitical, allowing Japan to act as a silent influencer by shaping standard and supporting allies through supply chain reliability. Japan's 2019 export restrictions on semiconductor materials to South Korea exemplify its ability to exercise policy interventions when national security is at stake. This move aligns with Farrell and Newman's "chokepoint" logic, wherein control over critical nodes in sparse trade networks enables outsized influence. Section 4.1.1 exemplifies Japan's course to its embeddedness in other jurisdictions value chains.

Parameters and Policy Toolkit: Despite these strengths, Japan applies trade policy tools conservatively (4.1.2). It scores below average across all six strategic driving forces, including absolute and financial control. This reflects a longstanding strategy of embedding itself in stable, rules-based trade networks and promoting systemic trust, rather than relying on coercive leverage.

Bilateral and Multilateral Application: Japan's bilateral control scores further support this interpretation. With near neutral overall values confirming its limited use of direct pressure, this underscores a strategy of stability and deterrence rather than assertiveness. Furthermore, it suggests that leverage is not always exerted through frequency or visibility of control but can also stem from latent capacities and reputational capital rooted in systemic importance (4.1.2). This multi-lateral posture of stability and neutrality is further underlined by findings from section 4.1.1 showcasing Japan's ability to act as intermediary channel between the East and West.

Strategic Trajectory and Constraints: Viewed through the Figure 1.2:1, Japan's strategy reflects subtle leverage, anchored in its alliances and balancing bilateral relations. It rarely deploys hard tools but holds latent chokepoint power in critical upstream sectors like semiconductors. By underutilizing financial and absolute controls, Japan reinforces its role as a stable, rules-based actor. Its influence lies in shaping standards, anchoring supply chains and projecting power through embedded control.

5.1.6 South Korea

Structural Trade Position: South Korea holds a strategically ambivalent position in global trade, classified as a bridging actor with deep structural integration but limited assertive leverage (2.2.3; 4.1.1). Accounting for 3% of global imports and 2% of exports, it is moderately sized yet highly complex, with an ECI Trade score of 1.83. However, its low export volume index (–0.33) places it in the high-complexity, low-volume quadrant (Figure 4.1.3:1), highlighting a structural asymmetry: it produces rare and diversified goods, but at a scale that limits its geopolitical weight. With an ECI Tech score of 0.73, South Korea ranks in the upper-middle quadrant for trade sophistication and technological capacity in Figure 4.1.3:2.

Leverage Through Trade Architecture: From a Resource-Based View (RBV), South Korea's high ECI scores reflect significant latent power, rooted in knowledge-intensive, hard-to-replicate production capabilities. However, this potential remains underutilized, as it has not been transformed into systemic leverage via trade volume or coercive tools. As a bridging actor, South Korea straddles U.S.-led and China-centric trade systems, relying on multilateral entanglement and deep supply chain integration (4.1.1). Its centrality in sectors underscores its embedded power, yet its strategic application of this is limited. South Korea, therefore, holds considerable structural importance but exercises minimal geopolitical influence.

Parameters and Policy Toolkit South: Korea's use of policy instruments is among the most restrained. Unlike jurisdictions like e.g. the U.S. or China, South Korea appears to prioritize systemic stability over leverage. However, this restraint should not be mistaken for incapacity. Following Japan's 2019 export restrictions on high-tech materials, South Korea mobilized subsidies and supply chain reorganization to reduce dependence, an example of reactive industrial policy rooted in strategic urgency rather than routine application.

Bilateral and Multilateral Application: South Korea's role is shaped by alliance-balancing and avoids initiating unilateral measures, instead relying on existing security alliances, trade agreements, and multilateral platforms to maintain a favorable position in global value chains. This balancing act reinforces its reputation as a rule-following state and bridging actor. However, data from section 4.1.1 illustrates South Koreas ability to assert dominance when provoked.

Strategic Trajectory and Constraints: When viewed through Figure 1.2:1, South Korea exhibits a reactive but capable posture, anchored in industrial strength yet shaped by cautious policy. The restraint from policy interventions stems from its dependence on global demand and foreign tech ecosystems. However, its swift deployment of semiconductor subsidies following

Japan's export curbs illustrates a capacity to recalibrate when strategic autonomy is at risk. South Korea's trajectory reflects a tension between deep structural embeddedness and policy minimalism, suggesting latent leverage that could become more assertively deployed under mounting external pressure, pushing to more transitional characteristics.

5.1.7 Taiwan

Structural Trade Position: Taiwan holds a strategically critical yet geopolitically vulnerable position in global trade. Although classified as a transitioning actor (2.2.1;4.1.1), its high ECI Trade score (1.94) and 2% export share reflect specialization that suggests passive leverage through irreplaceability in global value chains (4.1.1). In Figure 4.1.3:2, Taiwan's high trade complexity contrasts with moderate innovation capacity, represented in its ECI Tech score (0.66), indicating deep integration in fabrication and assembly without fully internalizing upstream innovation, such as patent generation and core IP development. This imbalance presents structural risk, as Taiwan's leverage depends on roles in production networks it does not fully govern.

Leverage Through Trade Architecture: This reflects a RBV, where rare, non-substitutable capabilities, like Taiwan's chip fabrication, generate passive leverage (4.1.1). Yet such leverage also invites risk. As Farrell and Newman (2019) note, control over critical nodes in sparse value chains can make states geopolitical targets. Taiwan's position has drawn export controls from the U.S. and EU and compliance pressures on firms like TSMC, while China's countermeasures, rare earth restrictions and subsidies, aim to reduce dependence on Taiwan, underscoring how its centrality is contested from both sides of the U.S.–China rivalry (4.1.2).

Parameters and Policy Toolkit: From a driving forces perspective (4.1.2), Taiwan's policy profile is notably restrained, indicating limited use of coercive instruments, a finding reinforced in both bilateral control matrices. This restraint is likely linked to Taiwan's geopolitical sensitivity, particularly its contested sovereignty and economic interdependence with China.

Bilateral and Multilateral Application: Despite its limited hard power, Taiwan is not strategically inert. It actively pursues strategic divergence alignment with U.S. and EU interests, moves that reflect a relational power strategy and reinforce its role as a geopolitical bridge in global tech ecosystems (4.1.2). While formal diplomatic recognition is limited, Taiwan sustains practical bilateral and multilateral ties through economic partnerships and integration into global production networks, combining unilateral vulnerability with networked relevance consistent with its transitional classification.

Strategic Trajectory and Constraints: Viewed through Figure 1.2:1, Taiwan exercises passive structural power, leveraging its centrality in critical value chains, particularly semiconductors, while applying minimal financial or absolute controls. This restraint reflects institutional limits and geopolitical sensitivity, especially in relation to China. However, moves like stricter FDI screening and ICT decoupling suggest a shift toward a more defensive posture. Taiwan's strategy remains grounded in avoidance of escalation, but it is increasingly shaped by the need to preserve strategic autonomy within a rapidly polarizing global order. Its trajectory will likely

depend on whether it can convert embedded complexity into more active, though constrained, policy leverage.

5.1.8 United Kingdom

Structural Trade Position: The UK holds a distinctive position in the geopolitical trade landscape as a bridging actor (2.2.3;4.1.1) with moderate global export and import shares at 3% and 4% respectively. Its influence stems from strategic alignment between Atlantic and European blocs, enhancing its position in multilateral trade dynamics (4.1.1). Empirically, the UK's ECI Trade score of 1.49 places it in the middle-left quadrant of Figure 4.1.3:1, suggesting a high level of sophistication in exports, albeit with modest trade volume. While its ECI Tech score of 1.09 is among the highest, it highlights a latent technological capability not fully reflected in export structures.

Leverage Through Trade Architecture: From a Resource-Based View, the UK holds an abundance of underutilized capabilities, technological, institutional, and relational, suggesting potential for influence through knowledge-based assets and institutional design rather than coercion or scale. Its high ECI Tech score reinforces this latent strategic depth. Yet without the trade density of central powers, it cannot unilaterally shape norms or supply chains, relying instead on norm diffusion and indirect leverage.

Parameters and Policy Toolkit In terms of policy instrumentation, the UK shows elevated scores in export controls (+1.92) and FDI screening (+1.27), reflecting a deliberate focus on absolute control tools over financial mechanisms. These interventions, reinforced by legislation such as the National Security and Investment Act, where the exclusion of Huawei and the expansion of critical tech restrictions signals strategic realignment.

Bilateral and Multilateral Application The bilateral control matrices further reveal the UK's selective pressure points: high absolute control scores toward India (+1.97), Brazil (+2.06), and Mexico (+1.97) reflect both historical colonial ties and recent strategic recalibrations, particularly in pharmaceuticals. Conversely, its neutral to low financial control scores in bilateral relationships underscore a restrained application of economic incentives and favoring hard regulation.

Strategic Trajectory and Constraints: When viewed through Figure 1.2:1, the UK positions itself at the intersection of assertive policy use and shifting alliances. It employs tools like export controls and FDI screening to safeguard national interests but stops short of broad economic coercion. Rather than projecting systemic trade dominance, its strategy prioritizes domestic resilience and standard-setting authority. This aligns with what may be described as a "panopticon-lite" model, leveraging regulation, innovation, and information asymmetries to exert influence indirectly. Its evolving role is less about structural centrality and more about norm-setting and strategic flexibility across competing blocks.

5.1.9 Brazil

Structural Trade Position: Brazil is a transitioning actor in global trade, moving from a position of limited influence within the global trade to greater influence through selective policy interventions and evolving trade alliances (2.2.3; 4.1.1). Positioned in the lower-left quadrant of the ECI Trade vs. Export Volume matrix, Brazil's low ECI Trade (0.2) and modest export share (~1%) reflect continued reliance on commodity-based trade. It's equally low ECI Tech score underscores limited integration into innovation-driven sectors, revealing a structural gap between its geopolitical aspirations and its capacity to lead through technological complexity.

Leverage Through Trade Architecture: In RBV terms, Brazil leverages its natural resource base and selectively builds industrial capacity, pursuing a trajectory from resource dependence to greater autonomy. While limited in complexity, this strategy aims to convert physical assets into political capital through development and value chain upgrading. Its low export volume and complexity position as a transitioning actor, yet ongoing efforts signal active contestation for increased regional and global relevance.

Parameters and Policy Toolkit: Despite structural limitations, Brazil actively relies on strategic policy tools, particularly import restrictions (+2.98) and localization requirements (+2.09), favoring financial controls over absolute measures. This reflects a developmentalist strategy aimed at shielding key sectors while fostering internal demand and regional value chains. Rather than pursuing confrontation or decoupling, Brazil uses unilateral tools for defensive repositioning, though its limited complexity and centrality constrain its ability to shape global norms.

Bilateral and Multilateral Application: Importantly, Brazil's diplomatic re-engagement, noted in the empirical findings of section 4.1.1, represents an attempt to shift from unilateral to bilateral and multilateral trade frameworks, particularly through increased cooperation with China and the U.S and attempting to increase its influence though collaborations. For instance, recent trade dialogues and investment pacts highlight a deliberate effort to build bridge alliances, not just resource-based dependencies. This is also illustrated in Figure 4.1.2:3 where its bilateral use of the driving force *FDI Restrictions & Commercial transaction sanctions* remains modest.

Strategic Trajectory and Constraints: Brazil's evolving role mirrors the dynamics outlined in Figure 1.2:1, where jurisdictions activate specific policy parameters to navigate geopolitical strain. In Brazil's case, this includes leveraging state support, bilateral outreach, and trade controls in pursuit of increased economic sovereignty and reduced technological dependence. While Brazil currently lacks the structural depth to impose system-wide trade influence, its policy activism and diplomatic realignment suggest a trajectory of contested transition, balancing commodity dependence with ambitions for strategic autonomy.

5.1.10 Canada

Structural Trade Position: Canada is classified as a bridging actor (2.2.3; 4.1.1), positioned between U.S.-led alliances and broader multilateral frameworks. With 2% of global exports and imports, it plays a stable yet secondary role in global trade networks. Its ECI Trade score of 0.9 and export volume index of –0.35 place it in the lower-left quadrant of Figure 4.1.3:1, suggesting modest engagement in complex and diversified trade. However, in the ECI Trade vs. ECI Tech plot (Figure 4.1.3:2), Canada appears in the lower-right quadrant, indicating a innovation capacity that is not yet fully reflected in its export structure, pointing to a gap between upstream R&D and downstream commercialization.

Leverage Through Trade Architecture: From an RBV perspective (2.3.4), Canada's leverage stems from knowledge-based assets, as reflected in its high ECI Tech score (1.20). Yet this potential remains underutilized due to low ECI Trade and export volume, indicating limited translation into complex, diversified exports. Canada's trade influence is relational rather than proprietary rooted in institutional reliability and alignment with U.S. and multilateral partners. Rather than controlling chokepoints, its value lies in amplifying shared innovation and regulatory ecosystems.

Parameters and Policy Toolkit: Canada relies heavily on financial policy tools, scoring +2.83 in state aid and export incentives (4.1.2), suggesting a preference for internal economic resilience rather than external coercion. Programs administered through the Canada Border Services Agency and investment promotion frameworks support domestic firms and industrial capacity. This toolkit reflects a defensive industrial strategy aimed at stabilizing domestic firms rather than reshaping global supply chains.

Bilateral and Multilateral Application: Canada's trade relations reflect selective asymmetry and multilateral entrenchment. While its heavy export reliance on the U.S. creates downstream vulnerabilities, this is counterbalanced by efforts to diversify, such as recent outreach to the EU amid tariff disputes. This reflects a broader strategy to stabilize market access through institutional redundancy and rule-based cooperation. Though Canada rarely wields unilateral leverage, the bilateral financial control matrix shows that Canada does exert moderate financial pressure on jurisdictions such as China (2.75), but this pressure is generally defensive, focused on reinforcing regulatory sovereignty.

Strategic Trajectory and Constraints: When viewed through Figure 1.2:1, Canada activates the levers of financial intervention and regulatory alignment while avoiding hard controls or unilateral measures. Its posture has traditionally been defined by stability and embeddedness in U.S.-led frameworks. However, rising geopolitical uncertainty, especially trade friction with the U.S., has prompted a gradual shift aiming to reduce its exposure to single-market dependencies. This trajectory suggests a move from passive rule-preserving toward adaptive resilience, where credibility, legal predictability, and alliance-building serve as its primary tools of leverage in a contested global order.

5.1.11 Mexico

Structural Trade Position: Mexico, classified as a bridging actor (2.2.3; 4.1.1), connects U.S. and Latin American markets through its USMCA integration. With 2% of global trade, it holds a key position in North American value chains. Yet its ECI Trade (1.03) and ECI Tech (–0.25) place it in the lower-left quadrant of both scatterplots (figures 4.1.3:1 and 4.1.3:1), reflecting a low-tech, low-complexity export structure.

Leverage Through Trade Architecture: From an RBV perspective (2.3.4), Mexico's capabilities are valuable but easily replicated, making its leverage more geographic than technological. Still, its strategic location grants indirect influence: amid U.S.–China tensions, Mexico has become a key nearshoring hub. This passive embeddedness reflects relational power shaping trade flows not through chokepoints, but by serving as a critical link in regional supply chains.

Parameters and Policy Toolkit: Policy-wise, Mexico remains a low-intensity actor in Figure 4.1.2:2 showing below-median scores and bilateral data reveal consistently negative or neutral scores. Mexico neither deploys significant subsidies nor restricts critical exports or investments. While this minimizes geopolitical friction, it also reflects underutilized tools for industrial upgrading or strategic positioning.

Bilateral and Multilateral Application: Mexico partially activates market access and production levers but shows limited unilateral or multilateral engagement. Its strategy is largely bilateral and deferential, aligning with U.S. regulations rather than pursuing independent influence. Possessing low power–medium influence, Mexico enables others' strategies, especially the U.S., without shaping global trade norms itself.

Strategic Trajectory and Constraints: When viewed through Figure 1.2:1, Mexico primarily activates the levers of production access and geographic positioning, with limited use of financial or absolute controls. Its strategy is shaped by regulatory alignment with the U.S., rather than autonomous geopolitical maneuvering. Policy engagement across the "parameters" dimension remains low, reflecting reliance on embedded trade roles over deliberate leverage. Mexico's trajectory is defined more by external supply chain shifts than internal strategic direction. Its value lies in serving as a compliant, cost-efficient platform for industrial routing, integrated, but not self-directing.

5.2 PCB view of trade pattern & supply chain implications

Building upon the global trade patterns analyzed in section 5.1.1, this section deeps into the niche dynamics of the PCB (Printed Circuit Board) industry. The aim is to assess how geopolitical structures and jurisdictions' leverage tools affect trade flows in a strategically vital industry. By merging the macro-level insights from section 5.1.1 with the empirical findings presented in section 4.3, we can analyze and discuss how the identified tensions manifest within an industry of documented importance for telecommunication actors. This analysis draws on theoretical perspectives outlined by presented by Bednarski et al. (2023) and Tukamuhabwa et

al. (2015) in sections 2.1.1 to 2.1.3 to evaluate how actors manage supply chain risks, build resilience, and respond to disruptions. It also connects to 2.1.4 by highlighting how supply chain redesign, product strategy, and technological integration play growing roles in firm-level responses to geopolitical disruption.

The global PCB trade is structurally characterized by a concentrated supply and dispersed demand. As outlined in section 4.2.2, China alone accounts for approximately 49% of global PCB exports, with Taiwan, Japan, and South Korea collectively comprising another 30%. This indicates a high upstream production dependency on East Asia. Such concentration, as seen in broader trade patterns, reinforces the chokepoint dynamics discussed in section 5.1.1 where jurisdictions that also apply absolute control mechanisms (e.g., export bans or tech sanctions) hold disproportionate influence over global supply chains. Furthermore, it illustrates how knowledge and information in a specific industry can accrue to a certain node or nodes which can be geographically condensed giving the jurisdictions in control of that node or reginal area, such as China, large leveraging capabilities in the PCB industry (2.3.1). This reflects Farrell & Newmans argument that infrastructural entanglement further reinforces chokepoint control even when physical production is outsourced. From a risk perspective, it can be interpreted that this concentrated architecture can raise the exposure to global disruptions, such as the geopolitical disruptions described in section 2.1.1, especially when combined with jurisdictional willingness to coercive control.

Additionally, from and RBV perspective, Barney (2019) stipulates that hard to replicate or well-organized resources such as Taiwan and Chinas export capabilities in advanced manufacturing industries, gives power to influence jurisdictions dependent on their exports. Clearly, for Taiwan and China, the PCB industry illustrates such projection influence. Yet their leverage differs: China exerts coercive leverage via active controls, while Taiwan holds passive leverage through irreplaceability and specialized production. While firm-level fragmentation in the PCB industry reduces the systemic importance of any single company, it paradoxically reinforces the geopolitical leverage of central jurisdictions like China and Taiwan due to geographic production clustering. For foreign buyers, it underscores the need for jurisdictional diversification outside the region in question. Together these dependencies heighten the risk of single-point disruptions caused by geopolitical events such as those described in 2.1.1 by Rasshyvalov et al. (2024). Consequently, such events will affect jurisdictions which rely on imports of PCBs from one of the jurisdictions. In terms of SCRM strategy typologies introduced by Roscoe et al., (202) in section (2.1.3), China represents a proactive but coercive actor given its use of policy interventions and investments in domestic innovation capabilities, whereas Taiwan represents a passive actor with high embedded power stemming from its integration value chains for advanced technology components.

Japan, Taiwan, and South Korea, while top exporters, also act as critical links in supply chains. These actors possess high ECI Trade scores and are heavily integrated into both Chinese and Western PCB ecosystems (4.2.2). According to 4.2.3, their RCA scores are also high, and their average export shares position them well above the global threshold. Their strategic geography

and production complexity position them as bridging actors in supply chains. However, they also rely on upstream inputs especially from China, placing them in a vulnerable interdependent position. From a theoretical standpoint (2.1.1 and 2.1.2), it can be deduced that these jurisdictions can be subject geopolitical disruptions stemming from their partial reliance on China within their upstream PCB value chain. Both Japan and South Korea hold latent chokepoint power but often refrain from assertive policy use, choosing reactive and stability seeking strategies instead. In Taiwan's case the passive leverage it holds through advanced technologies where a large majority of global PCB players have localized their headquarters, exemplifies a form of structural centrality that invites external pressure from both the U.S. and China. Additionally, as findings from section 4.2.3 indicate, Taiwan possesses specialized knowledge for manufacturing of advanced PCBs required in for example the telecommunication industry. Consequently, these findings further increase Taiwan's leverage within advanced technology. Functionally, these states appear to operate in a reactive SCRM posture, with limited integration of policy instruments in their trade strategies to preempt risk despite high embeddedness.

China's dominance in both upstream PCB exports and its demonstrated willingness to utilize absolute controls (as seen in its restrictions on gallium and germanium exports) exemplifies a classic case of supply chain vulnerability. The previous analysis section, 5.1 further exemplify that China is prone to use absolute controls against both trade partners and foes. This fact poses a risk for consumers of PCBs given Chinas majority control of in the industry. According to section 4.2.3, China also holds a high RCA score in PCB production, and its average export share is well above the average threshold, further underlining its embeddedness in global value Chains. This illustrates not only China's comparative advantage but also its embedded role in global production networks. From the perspective of 2.1.1, where Rasshyvalov et al. (2024) explains that tensions between states may cause disruptions, we conclude that highly concentrated supply chains are structurally fragile and prone to both natural and geopolitical shocks. The combination of control tools and structural centrality suggests China could act as a potential point of failure. Supply chain risks here include forced export disruptions, politically motivated delays, and retaliatory restrictions on strategic components. Clearly it can be argued that in the light of such risks, proactive risk management strategies (2.1.3) could provide considerable advantages for actor's contingent on Chinese PCB exports. This supports Chinas profile, where its leverage stems not from rare complexity, but from control over high volume supply points within sparse trade networks.

Looking at the demand side, the EU and the U.S. together account for nearly 18.6% of global PCB imports (4.2.2), while contributing only modestly to exports (6.3% and 1.9% respectively). According to section 4.2.3, both jurisdictions fall above the global average in terms of import share and below it in export share, placing them in structurally dependent positions. This imbalance reflects a trade dependency that aligns with section 2.1.3 and 2.1.1 on supply chain risk management and supply chain disruptions: jurisdictions with heavy reliance on imports of strategic components from politically assertive suppliers with high geographical concentration are more exposed to supply chain risks such as disruptions. This is exemplified by the EU's

high reliance on China (48.5% of its PCB imports), which creates risks such as politically driven supply freezes or redirection of supply flows given Chinas recorded willingness to employ absolute controls. However, the EU's moderately diversified supplier base shows evidence of supplier diversification strategies which in turn could be classified as proactive approaches explained in section 2.1.3. Moreover, the EUs regulatory capabilities may allow it to indirectly shape industry standards and resilience funding mechanisms, particularly via the EU Chips Act and increased domestic production incentives. In terms of the supply chain risk management approaches presented in 2.1.3, the EU shows a pivot towards a proactive strategy indicated by actions such as its interest to attain diversified trade partnerships in the light of e.g. U.S. tariff threats.

The United States presents a different resilience profile. As noted in section 5.1.1, it scores high on localization and public procurement policies (4.1.2), suggesting a strong push for reshoring or friend-shoring strategies. Yet, section 4.3.1 shows the U.S. remains highly dependent on imports from East Asia (China 30.9%, Taiwan 21.4%). Additionally, section 4.2.3 indicates that the U.S. has a low RCA score in PCB trade of 0.23 and ranks below the global average in import share and significantly below average in exports. This reinforces the view that it remains structurally dependent on external producers. Notably, when compared to key PCB producers such as China (3.17), Taiwan (4.75), Japan (2.34), and South Korea (2.53), the U.S. lags significantly RCA, underscoring the limitations of its domestic production base. This gap is not only a matter of scale but reflects a deeper concentration of knowledge, tacit expertise, and industrial ecosystems in East Asia. Such knowledge intensity is difficult to replicate in the short term, particularly in an industry characterized by high entry barriers, long supplier qualification cycles, and tight integration between design and fabrication. The U.S. has faced challenges in re-establishing PCB production, not only due to cost disadvantages but also because of a decade-long erosion of technical capabilities, fragmented supply ecosystems, and the migration of skilled labor and specialized equipment abroad.

From a theoretical outlook, the U.S. shows signs of adhering to a proactive strategy as explained in section 2.1.3, where it is building capabilities to withstand future disruptions. However, its illustrated dependencies and lagging RCA position reflect that its industrial recovery remains in the early stages. The reshoring of such a knowledge-intensive segment will likely require sustained investment, cross-agency coordination, and long-term supply chain partnerships, beyond short-term policy incentives. U.S. action to induce domestic manufacturing capabilities and to limit foreign dependency reassembles a proactive supply chain risk management approach taken from a jurisdictional perspective (2.1.3)

India presents a contrasting profile. As section 4.2.3 shows, it lacks significant RCA in PCB trade, and both its import and export shares are well below global averages, reflecting marginal participation. Nevertheless, India exhibits some of the highest levels of absolute controls (4.1.2) and demonstrates an ambition to build domestic production capacity (4.1.1). From the standpoint of 2.1.2, it can be argued that India fits in an early phase of resilience formation, seeking to build domestic capabilities in global trade before establishing its own dependence

in other jurisdictions value chains. Although it is currently shielded from global supply chain shocks, it lacks capabilities to enter a global manufacturing value chain within the PCB industry. Additionally, from the PCB industry standpoint, it could be argued that India's lack of a trade agreement and its other policy interventions exhibiting Absolut control against China, may hinder a potential entry into the PCB industry, given the previously disclosed fact that the global capabilities of PCB manufacturing capabilities are cantered in China.

From a theoretical standpoint, it can be argued that India's ambitions as a transitional market, to boost domestic product and increase exports, can be negatively affected by its own domestic trade strategies of employing policy interventions resulting in absolute control. This aligns with the broader pattern identified in section 5.1.4, where India's sovereignty-driven policy approach may deter FDI and prevent integration into complex global value chains, particularly in industries like PCBs where ecosystem participation is essential. The disconnect between Indias domestic ambitions and its foreign trade strategy can result in a limited response time when hit with disruptions, labelling it as a reactive jurisdiction (2.1.3).

Finally, Mexico and Canada, as smaller importers with moderately low RCA scores (4.2.3), reflect proximity-based supply models aligned with U.S. demand. Their import and export shares are around or below the global average, indicating mid-tier involvement. They demonstrate resilience through regional integration. While they do not control upstream chokepoints, their position within NAFTA/USMCA supply routes provides stability through regional trade agreements. From the risk management perspective of 2.1.3, they qualify as jurisdictions with proactive strategies to reduce their reliance on East Asia. Their main vulnerabilities lie in their dependence on U.S. policy continuity and the lack of high specialization, with limits response and recovery actions as explained under theory section 2.1.3. Canada and Mexico's geographic proximity may position them as future PCB production hubs under U.S. friend-shoring strategies, but current technological gaps and limited policy engagement suggest they remain facilitators rather than leaders. Additionally, given Mexico's positioning as the U.S. largest trading partner as well as its acting as a gateway to the U.S. market because of tariff threats, it can be deduced that Mexico has the potential to scale manufacturing capabilities within the PCB industry close to large customer markets, thus potentially becoming a future reshoring hub. Furthermore, country of origin effects and corporate HQ location (e.g., U.S. firms operating through Mexico) will shape how far these actors can move up the value chain. This can be seen in 4.2.1 where two of the largest American PCB manufactures have their headquarters situated in California, while most of their manufacturing site have their country of origin (CoO) primarily located in the APAC region when comparing manufacturing square feet. The resilience posture is predominantly reactive, with geographic redundancy being favored over functional or technological redundancy.

Conclusively, regional concentration is centered in East Asia. Western jurisdictions are, despite different resilience strategies, dependent on Chinese exports of PCBs. From theory it is confirmed that resilience in the PCB industry is unevenly distributed. Few actors holding significant resource, resilience efforts in the future need a proactive resilience strategy, tailored

to each jurisdiction's structural position, policy mix, and potential for technological autonomy. Moreover, the PCB industry exemplifies the growing importance of designing products and supply chain networks for resilience. Firms like Ericsson must consider design-for-resilience strategies (2.1.4) by reconfiguring PCB sourcing to avoid jurisdictions at risk of future export restrictions, modularizing components for flexibility, and embedding geopolitical scenario planning into product lifecycle management. The use of AI, digital twins, and supply chain intelligence systems, using global trade indexes such as RCA, ECI, and policy heatmaps as a baseline, could further aid firms in predicting disruption points and switching suppliers, marking a transition from tactical reaction to systemic resilience design. However, the technical integration of AI is beyond this thesis and is left up to further research.

Cross Sectoral and Jurisdictional Ripple Effects

Disruptions in the PCB industry carry high escalation risks and can trigger cascading effects across multiple critical sectors. Given that PCBs are foundational to electronic functionality, their absence or delay directly threatens operational continuity in industries with tight integration and limited substitution options. Telecommunication firms, for instance, rely on highly complex, multi-layered PCB architectures to support network equipment, routers, and mobile infrastructure, making them especially vulnerable to supply shocks (Ericsson, 2025). Similarly, the defense sector requires trusted and often domestically sourced PCBs for mission-critical systems where traceability and security are non-negotiable, compounding risks when geopolitical controls limit access to verified suppliers. In the automotive sector, the shift toward electrification and digitalization has dramatically increased PCB content per vehicle, particularly in electric vehicle (EV) platforms, battery management systems, and advanced driver assistance systems (ADAS). A disruption in upstream PCB supply could therefore stall production lines, delay innovation rollouts, and trigger second-order effects across component and software suppliers. This illustrates that PCB chokepoints are not only trade issues but systemic risks, with the potential to reverberate across high-dependency industries and magnify geopolitical disruptions into operational crises.

In parallel, ripple effects unfold across jurisdictions due to the interdependent nature of PCB value chains. For example, a policy intervention or export restriction in China or Taiwan not only affects direct importers like the U.S. and EU, but also downstream partners in jurisdictions like Mexico or Canada that assemble final products using East Asian PCB inputs. Jurisdictions embedded as intermediaries, such as South Korea or Malaysia, may find themselves squeezed between conflicting export regulations from strategic blocs. Moreover, U.S. export controls on high-tech components often trigger preemptive alignment among allied producers, such as Japan and the Taiwan, compounding disruption even in the absence of formal restrictions. Thus, the PCB supply chain exhibits systemic interdependence, where chokepoints in one geography can induce parallel constraints across others, not through physical disruption alone, but through regulatory mimicry, supply flow redirection, or sudden demand surges as jurisdictions scramble for alternatives. This dual-layered vulnerability, cross-sectoral and cross-

jurisdictional, amplifies the strategic relevance of PCB resilience planning in a fragmented global trade environment.

Inside-Out vs Outside-In perspective

Traditional supply chain strategies often begin with internal priorities, evaluating current vendors, known markets, and contractual dependencies, before layering on external risk considerations. However, this approach can prematurely limit strategic flexibility by anchoring planning in the status quo. In contrast, this report applies a jurisdiction-first approach: analyzing global trade architecture, policy behavior, and structural capabilities across jurisdictions before mapping implications onto firm-level operations. This *outside-in framework* can help enable early identification of geopolitical bottlenecks, emerging regions, and jurisdictional shifts; providing companies with a broader decision space before operational constraints are locked in.

For firms operating in knowledge-intensive industries like PCBs, where supplier ecosystems are geographically concentrated and not easily relocated, this lens is especially vital. It allows strategy teams to explore alternative development zones, anticipate jurisdictional shifts, and build resilience by understanding not just *who their suppliers are*, but *where their exposure lies*, and *why*. Importantly, many geopolitical pressures do not manifest as traditional technical or functional requirements but rather as administrative non-technical requirements. Going forward, firms may benefit from integrating geopolitical jurisdictional analysis into early-stage product design and vendor selection planning, adopting a "design for supply chain management" perspective rather than focusing solely on design for manufacturing (DfM). Even more holistically, a "design for lifecycle management" approach may be required, particularly in businesses like Ericsson's, where value creation spans not only production and delivery, but also installation, managed services, and return, repair, and spare parts logistics over the product's entire use phase. In this way, jurisdictions must be treated not only as markets or risk factors, but as strategic variables in lifecycle planning.

5.3 Firm level analysis, Ericsson

Building on the previous analysis of geopolitical patterns in 5.1 and specific supply chain vulnerabilities related to the PCB industry in 5.2, this section turns the focus to Ericsson. As previously mentioned, Ericsson is a globally active industry leader within the telecommunications industry. By applying empirical insights from section 4.3 on Ericsson and using theoretical insights from section 2.1.4, this part explores how the risks presented in section 5.2 affects Ericssons supply and what strategies might mitigate the presented risks.

Given Ericsson's global footprint and its dependence on advanced electronics, the firm is structurally exposed to the geopolitical vulnerabilities embedded in the PCB industry. With core revenue streams concentrated in the EU, Latin America, and the United States, together accounting for approximately 55–60% of its income, Ericsson is positioned within jurisdictions that are net importers of PCBs and exhibit limited domestic production capacity (as shown in

section 4.3.1). These markets rely heavily on PCB imports from China and Taiwan, the two largest global exporters of PCBs.

This supply structure presents dual-layered risk. First, China, while dominant in scale (49% of global PCB exports), is classified as a high-risk supplier due to its demonstrated willingness to use absolute control mechanisms such as export restrictions and industrial retaliation (section 5.1.2; 4.1). Second, Taiwan, though politically aligned with Ericsson's core markets, introduces a different type of risk, concentration and uniqueness. Taiwan holds an RCA of 4.75 and a high ECI Trade score, which reflects its specialization in advanced PCB manufacturing. These capabilities are not easily substitutable, meaning Taiwan functions as a near-monopoly in specific PCB subsegments critical for telecom infrastructure.

For Ericsson and other network equipment manufacturers, this creates a single-source dependency scenario for certain strategic components, such dependencies can increase the risk for disruptions as explained in section 2.1.3 by Wagner & Bode (2005). If geopolitical tensions between China and Taiwan escalate, or if Taiwan's industrial base is disrupted, Ericsson may lack viable second sources for specialized PCB inputs. This problem is escalated by the knowledge concentration in Taiwanese manufacturing ecosystems, which includes tacit know-how, co-located suppliers, and long-established qualification processes. This too aligns with the risks of dependency on one region explained by Wagner & Bode (2005) in section 2.1.3 which in turn may cause disruptions such as those described by Bednarski et al. (2023) and Rasshyvalov et al. (2024) in section 2.1.2 of this report.

From a Supply Chain Risk Management (SCRM) perspective, Ericsson's and its competitor's exposure aligns with a proactive posture, it is embedded in a global supply network that remains vulnerable to shocks. However, it indicates a willingness to explore sources outside the geographical risk parameters of the APAC region. Roscoe et al., (2020) in section 2.1.3 suggests that this exposure should be approached by reverting to proactive strategies such as those suggested by Celestin & Sujatha (2024) in section 2.1.4, namely dual sourcing, engaging in co-investment with suppliers or pushing for modular product design. However, the fragmented nature of the PCB industry and the knowledge asymmetries concentrated in East Asia make reshoring or relocating these capabilities difficult in the short term.

The fragmented structure of the global PCB industry, where even the largest firms hold no more than 7% market share, creates localized resilience but systemic fragility**.** The presence of many small suppliers can enhance redundancy within jurisdictions, as the failure of any single firm is unlikely to halt jurisdictional output. However, since network equipment manufacturers rely on a small circle of vendors capable of fulfilling advanced technical PC B requirements, a jurisdictional redundancy does not translate to an industry or firm level advantage given the limited vendor base. Moreover, the redundancy that exists is still geographically concentrated in East Asia, meaning it does not translate into global resilience. Buyers like Ericsson, which depend heavily on imports from China and Taiwan for complex telecom-grade PCBs, face exposure due to limited jurisdictional diversification. The fragmented supplier landscape also makes it difficult to assess supplier risk.

This structural setup is especially acute in Taiwan, whose firms specialize in high-density and IC substrate PCBs: components that are critical for telecom infrastructure but not easily substitutable, as reflected in Taiwan's exceptionally high RCA (4.75) and ECI Trade scores. For Ericsson, this implies a potential single-source dependency for key PCB subcomponents in terms of regions, with no clear second source outside Taiwan (and China). In the event of geopolitical escalation or disruption, Ericsson's and other network equipment manufacturers supply chain could face serious operational consequences, regardless of localized supplier redundancy within Taiwan itself.

Meanwhile, the fragmentation of low-margin PCB segments creates strategic pressure for jurisdictions to consolidate capabilities into high-value niches. This aligns with China's value chain upgrading efforts and Taiwan's reliance on firms like TSMC to anchor technological leadership. However, such specialization increases concentration risk for global buyers, as knowledge intensity and supplier relationships become increasingly centralized in a few non-substitutable ecosystems. For firms like Ericsson, this makes resilience a matter not just of inventory or contracts, but of strategic alignment with long-term geopolitical and technological shifts.

Beyond East Asia, India and Mexico represent emerging nodes of strategic interest in Ericsson's supply architecture, each aligning differently with upstream and downstream levers. India, while structurally constrained by low export complexity, is actively positioning itself as an alternative manufacturing hub. However, India's use of policy interventions create tension between its geopolitical aspirations and operational reliability. India, while located in the APAC region and well-positioned to benefit from proximity to high-tech supply chains, has yet to realize substantial knowledge spillovers from this environment. Despite its ambition to become a global manufacturing hub, India's domestic structure and interventionist policies, such as export restrictions and localization mandates, have inhibited the deep integration and technology diffusion needed to support high-complexity sectors like PCBs. This tension between geopolitical positioning and structural readiness weakens its credibility as a frictionless upstream source.

In contrast, Mexico's role is less proactive but deeply embedded within North American production networks. While Mexico lacks upstream chokepoint control, it offers downstream production flexibility, and over time, knowledge spillovers from U.S. tech ecosystems could enhance its strategic value. For Ericsson, these jurisdictions could offer distinct but complementary mitigation pathways, Mexico through long-term capacity building within PCB manufacturing, and India through immediate geographic and regulatory alignment in combination with investments such as those mentioned for Mexico.

The following section connects to the three levers presented in Figure 1.2:1. Each is examined through an upstream and downstream lens, distinguishing between Ericssons position as a downstream buyer embedded in Western market and its upstream dependencies on high risk and high specialization suppliers in the APAC region.

Strategic Relationships: Upstream Risk, Downstream Exposure

Ericsson operates within a dense web of global trade relationships, with downstream exposure tied to demand in the U.S., EU, and Latin America, regions accounting for over half its revenue but lacking domestic PCB capacity. Upstream, Ericsson relies heavily on Taiwan and China for advanced PCB components. Taiwan presents a concentration risk due to its near-monopoly in telecom-grade PCBs and tacit knowledge networks, while China's dominance is coupled with demonstrated use of coercive policy tools. These asymmetrical upstream dependencies make Ericsson vulnerable to geopolitical disruptions and amplify the strategic importance of supplier alignment across jurisdictions.

To mitigate upstream risks tied to dependencies particularly in Taiwan and China, Ericsson could adopt proactive SCRM strategies such as dual sourcing or co-investment with alternative suppliers, even if only for partial redundancy. Given Ericsson's downstream reliance on the U.S. and EU markets, it may also benefit from lobbying for resilience, using its position as a key digital infrastructure provider to shape regulatory conditions that facilitate diversification or reduce exposure to politically sensitive inputs. (Bednarski et al., 2023) emphasizes that such strategies may increase resilience whilst Alam et al. (2024) adds that they can increase financial performance.

Trade Leverage: Knowledge Dependency Without Substitutability

Ericsson's trade leverage is structurally constrained. It lacks control over chokepoints but is deeply embedded in high-tech ecosystems that demand precision and regulatory compliance. The firm's reliance on Taiwanese and Chinese advanced PCB components, which are non-substitutable due to high RCA and ECI Trade scores, highlights a downstream bottleneck risk. While Ericsson benefits from embedded trade in services and software integration, its upstream exposure to concentrated capabilities in East Asia limits strategic trade maneuverability. Without direct access to alternative production bases for complex PCBs, Ericsson cannot easily translate its global footprint into resilient supply autonomy.

The lack of substitutable sources for advanced PCBs points to a need for product design for resilience (2.1.4). Ericsson can adopt modular product architecture that allows for later-stage customization based on available components, minimizing the bottleneck risks posed by upstream suppliers. Additionally, technology integration, including digital twins and predictive analytics, can enhance tactical supply chain agility, allowing Ericsson to preemptively adapt routing or component allocation in response to emerging trade restrictions.

Supplier Leverage: Limited Levers in Fragmented Ecosystems

Despite operating in capital-intensive, innovation-driven markets, Ericsson has limited leverage over its upstream suppliers. The PCB industry is highly fragmented, and no single buyer holds dominance, reducing Ericsson's ability to influence pricing or sourcing conditions. This is exacerbated by regional vendor clustering in East Asia, where co-located capabilities and regulatory frameworks constrain Ericsson's bargaining power. While the firm may apply

contractual pressure downstream, its upstream financial influence remains weak. Without long-term co-investments or strategic partnerships, Ericsson faces high switching costs and limited capacity to financially steer its supply base.

Given the limited PCB supplier base suitable for Ericsson, proactive supplier leverage could be increased through strategic investment in local suppliers or reshoring of niche production capacities (2.1.4). Where full localization is not feasible, supply chain redesign strategies such as dual capability manufacturing, balancing internal and external capacity across jurisdictions could help distribute risk. Lobbying through industry consortia may also be effective in promoting aligned subsidy policies or export credits in core markets, indirectly improving Ericsson's supplier leverage.

6. Conclusions and implications for further research and practice

This section synthesizes the findings from this project in brief conclusion whilst adding potential future directions for research and managerial implications for the case company in question.

6.1 Conclusion

This study has shown that geopolitical leverage in global trade is increasingly exercised through a combination of relational ties, trade structures, and financial interventions. These levers rooted in upstream control, downstream dependencies, and institutional asymmetries have become vital indicators of power in an era of fragmented globalization. By integrating economic complexity (ECI), revealed comparative advantages (RCA), and policy intervention data, the analysis suggests that it is possible to quantify not only who holds leverage, but how that leverage is applied and where vulnerabilities lie.

Through the synthesis of trade data, ECI indexes, RCA values, and normalized policy metrics, this study demonstrates how geopolitical leverage can be quantitatively tracked across jurisdictions. This framework not only helps identify where power is concentrated today but also offers a forward-looking tool for firms to anticipate supply chain risks and policy-driven disruptions. Furthermore, this offers a replicable framework to monitor shifts in market power, policy behavior, and structural exposure over time.

In the PCB industry, East Asia has established itself as the dominant production hub through manufacturing ecosystems, tacit knowledge accumulation, and upstream integration. This has resulted in a global supply architecture where a few jurisdictions possess rare capabilities, while demand-heavy regions like the U.S. and EU remain structurally dependent due to delayed reshoring efforts.

Despite efforts from dependent jurisdictions to diversify supply chains through nearshoring and industrial policy (e.g., the U.S. CHIPS Act or EU's strategic autonomy push), relocation of knowledge-intensive manufacturing remains difficult. Moreover, the PCB industry is not only capital-intensive but highly path-dependent, with tacit know-how and supply ecosystems cemented in East Asia. Hence, the asymmetries in the global PCB market stem from a combination of geographic concentration of a fragmented industry, industrial specialization, and uneven policy capabilities across jurisdictions. Taiwan exemplifies the East Asian dominance by exhibiting high levels of knowledge concentration and hard to replace capabilities in advanced PCB subsegments backed by high RCA and ECI Trade scores while China leverages scale, upstream control over raw materials, and a growing arsenal of absolute and financial control tools. Taiwan's dominance in upstream ecosystems, has emerged as a new form of chokepoint leverage. For Ericsson, these jurisdictions represent chokepoints with limited redundancy and high switching costs. The analysis in section 5.2 confirms that neither

firm-level sourcing autonomy nor regional redundancy mitigates this exposure. As this study shows, even passive power, if embedded in knowledge-intensive and structurally condensed industry networks, can reshape global trade behavior.

At the same time, emerging economies such as India and Brazil lack the technological maturity or policy coherence needed to meaningfully enter high-complexity segments. India is strategically positioned in the APAC region and actively pursuing FDI to establish itself as a manufacturing hub but has yet to realize knowledge spillovers or internal capacity in high-tech PCB production, possibly due to policy inconsistency and limited ECI Tech development. As India exemplifies, the study reveals a consistent gap in several emerging jurisdictions between industrial aspirations and the policy strategy required to realize them. This misalignment constrains their ability to attract foreign investment or integrate into high-tech value chains, reinforcing the importance of policy coherence in geopolitical strategy. Mexico, by contrast, has emerged as a nearshoring alternative for lower-tech assembly and shows early signs of relational and resource leverage through U.S.-anchored supply chains. However, without concurrent investments in knowledge infrastructure, its role is unlikely to extend into strategic upstream segments such as manufacturing of advanced PCB components.

Crucially, jurisdictions differ in their ability and willingness to apply trade leverage. China, for example, actively uses export controls to reinforce its position, while others, like the U.S., respond with policy incentives but lack immediate manufacturing capacity. Industry fragmentation further deepens these asymmetries since many suppliers exist locally within dominant regions and global production remains concentrated. This entails that the concentration is not dependent on one firm alone and that global production will remain concentrated independent of if one firm prevails. Furthermore, this imbalance between concentrated supply and dispersed demand underpins the geopolitical vulnerabilities and persistent asymmetries in the PCB industry.

Empirically, the heatmaps and bilateral matrices provide a thorough view of which jurisdictions apply pressure, where and how. By tracking normalized interventions ranging from state aid to export controls, one can not only categorize jurisdictions behavior but also identify emerging friction zones or cooperative corridors. When combined with ECI and RCA metrics, this framework offers firms an explanatory lens for evaluating supply chain sustainability under geopolitical strain. One of the central takeaways of this study is the value of adopting an *outside-in perspective* when managing geopolitical supply chain risks. Rather than beginning with existing suppliers, firms should first evaluate jurisdictions based on geopolitical behavior, industrial capabilities, and subsequently assess future potential. Doing so enables more informed, flexible decisions and reduces the risk of locking into fragile or politically exposed regions too early.

For Ericsson, the implications are clear: proactive strategies must receive extensive investments to ensure supply chain resilience. This includes multi sourcing, modular product design and long-term strategic lobbying. Unaltered, Ericsson's dependency on a limited set of high-risk upstream suppliers will continue to jeopardize operational stability, especially if

geopolitical tensions further disrupt East Asian trade flows. For firms like Ericsson, the findings underscore the need to complement supply chain risk management with proactive alignment to geopolitical trends, especially when supply dependencies intersect with jurisdictions prone to leverage trade tools for strategic gain. Mapping such exposure using RCA, ECI, and policy heatmaps can serve as a baseline for real-time geopolitical risk dashboards.

Ultimately, jurisdictions seeking to host knowledge-intensive industries must align industrial strategy with long-term capability development. As demonstrated, it is not proximity alone that creates leverage, but the rare, embedded knowledge ecosystems that define modern chokepoints.

6.2 Implications for further research

This section presents directions for further research which can be considered as subsequent steps to expand or depend on this study's aim and purpose. Here, the authors present three domains in which future research could be directed.

During the first phase of this study, it became apparent that current day literature on supply chain resilience from the perspective of geopolitical disruptions is arguably insufficient. Searches for literature in the field were to a considerable extent fruitless, and the theoretical frameworks presented in section two were thus developed by synthesizing scholarly articles and consultancy reports. Hence, this study calls for further research into possible supply chain actions during geopolitically uncertain times. Specifically, research could be guided towards Product Lifecycle Management for Geopolitical aspects, a field that virtually did not exist during the literature research of this project.

Next, as is seen in section 1 of this study, the background research resulted in a framework illustrated by figure 1.2:1. As previously mentioned the framework is built up by four pillars: export and import controls, alliances and partnerships and financial leverage. Due to time constraints financial leverage was excluded from this study. Therefore, it is suggested that future research may add such an approach to coming projects in adjacent fields.

Finally, this study has possibly laid the foundation for how researchers may quantify the qualitative research field of geopolitics. This project embarked on a sequential and iterative research process clearly described in section 3 of this report. Consequently, the authors of this report call for further development of the basic structure presented in this report, possibly by using a similar approach to case companies in other industries or analyzing more jurisdictions.

6.3 Implications for practice

This section presents the authors own thoughts and ideas on what actions can be taken to enhance Ericssons situation in the context of this project.

Implications of jurisdictional leverage

A key managerial insight from this study is the dynamic nature of jurisdictional leverage. Jurisdictions transitioning from low to high leverage, such as India, with its expanding industrial policy and FDI ambitions, offer firms the possibility of early-mover advantage. Engaging through strategic partnerships or co-investment during this formative stage can yield long-term sourcing alternatives. However, such jurisdictions often come with short-term operational drawbacks: policy volatility, institutional misalignment, and regulatory unpredictability may delay supplier qualification and compliance. Downstream, these markets may gain strategic weight, but the benefits are tempered by heightened reputational and operational risks as regulatory environments evolve.

In contrast, jurisdictions shifting from high to lower leverage, such as Taiwan under growing geopolitical strain, present a more acute strategic dilemma. Taiwan maintains a significant upstream advantage in high-complexity PCB manufacturing, underpinned by top-tier RCA and ECI Trade scores. Yet its contested political status and exposure to geopolitical tensions render it increasingly vulnerable to disruption. This creates a narrowing de-risking window: a period in which firms can still benefit from Taiwan's unmatched capabilities, but should concurrently develop alternative sourcing options, modular design strategies, or jurisdictional diversification to mitigate rising exposure. The challenge is not wholesale exit, but strategic recalibration managing the trade-off between technological advantage and geopolitical risk as they converge within the same supply node.

For Ericsson, whose upstream sourcing is concentrated in the opposing jurisdictions to its import regions, resilience demands more than diversification it requires geopolitical foresight. This means evaluating not just current supplier capabilities, but the direction of jurisdictional leverage: where control is consolidating, where instability is emerging, and how national strategies align with long-term reliability. By adopting an outside-in perspective, Ericsson can better understand what to monitor, where to anticipate risk, and when to act, especially as jurisdictions transition between states of high and low leverage.

To highlight the need for geopolitical foresight, this project has shown an increased willingness among jurisdictions to impose hard bans on products and components originating from certain locations. Hence, Ericsson and other actors must track component origin operationally to sift components based on geopolitical requirements. Since the contextual environment is changing rapidly to alarming levels of restrictions, it is the opinion of the authors that actors able to automize sifts of critical components in this way will capitalize financially. Consequently, this implication involves origin tracking of components from sourcing and onwards. Furthermore, throughout the report it has been clear that from a product life cycle management perspective managers should prioritize geopolitical resilience by planning for geopolitical contingencies already during the conceptualization phase of a new product.

DATA

To operationalize the insights from this study, firms like Ericsson can develop data-driven dashboards that visualize jurisdictional leverage and policy activity over time. By integrating

historical and real-time data on trade leverage, financial interventions, and absolute control tools, such dashboards can feature heatmaps that flag emerging risks, supporting strategic planning. Furthermore, by tracking the previously mentioned four elements and integrating these indicators into a unified dashboard, firms can monitor how jurisdictions are evolving and anticipate leverage transitions before they constrain supply strategies. Managers should also actively promote cross-functional data collection across procurement, strategy, and compliance units. This not only sharpens internal awareness but builds the foundation for long-term resilience planning, especially in industries like PCBs, where shifting supplier geographies is both time-consuming and technically complex.

Appendix

Appendix 1 Policy interventions

Here, a table with definitions for all policy interventions used in this report, explained in *2.2.1*, 3.3.2 and 3.4.1 is provided. The table gives a brief description of the policy intervention.

Capital injection and equity stakes (including bailouts)	Governments infuse capital into domestic companies for equity stake	(Twin, 2023; Banton, 2020,)
State loan	Monetary loans put out by a jurisdiction to front domestic industry, discriminating against foreign entities	(Shobit, 2023)
Financial grant	Purely monetary interventions that seek to benefit a domestic project, technology, or manufacturing	(Segal, 2024)
In-kind grant	Contributions provided by governments, that are not of a financial nature, e.g. land	(The Grants hub, 2025)
Production subsidy	A government payment to domestic producers to encourage production and reduce costs	(OECD, 2021)
Interest payment subsidy	Interventions that ease the financial pressure of debt for entities eligible to pre-determined requirements	(Code of federal regulations, 2025)
Loan guarantee	Promises by governmental agencies to serve as security for loans that domestic entities in a certain field want to apply for	(Kagan, 2023)
Tax or social insurance relief	Interventions to reduce tax burdens on individuals or businesses or resolve outstanding tax debts	(Investopedia, 2024)
State aid, nes	Interventions like financial grants are limited to and motivated by reasons of general economic development	(European commission, 2013)
Export subsidy	Subsidies employed by governments to achieve export objectives	(UN trade and development, 2022)
Other export incentive	All other incentives, either financial or not, that motivate exports to foreign markets	(Kenton, 2024)
Tax-based export incentives	Promotes domestic entities on foreign markets by giving tax grants to companies that commit to export a certain good or service	(Kenton, 2024)
Export tax	A tax imposed on goods as they leave the country, often used to generate revenue or control domestic supply	(Piermartini, 2018)
Export ban	A prohibition on the export of specific goods to foreign markets, typically for reasons such as national security or control domestic supply	(AgripolicyKit, 2024)
Export quota	A government-imposed limit on the quantity of a specific good that can be exported from a country within a given period	(Dictionary.com, 2015)
Import ban	Outright bans that inhibit sales of certain products on the implementing jurisdiction	(Kenton, 2024)
Import tariff	Taxes imposed by one jurisdiction on goods and services imported from another to influence trade, raise revenue or protect competitive advantage	(Nevil, 2025)

Intellectual property protection	Legal rights that protect creations of the mind, such as inventions, literary and artistic works, designs, and symbols, names, and images used in commerce	(WIPO, 2022)
Controls on commercial transactions and investment instruments	Actions jurisdictions take to limit financial investments to protect domestic industry	
FDI: Entry and ownership rule	Regulatory frameworks and measures restricting foreign ownership and investments in domestic companies	(Anti-Subsidy measures, 2025)
FDI: Treatment and operations, nes	Measures affecting the treatment and operational conditions of foreign direct investments not elsewhere specified, including regulations on profit repatriation, licensing, and other operational aspects	(OECD, 2019)
FDI: Financial incentive	Rules on financial incentives with harmful measures prohibiting financial benefits to foreign entities	(OECD, 2024)
Trade payment measure	Policies regulation payments for international trade transactions, including controls on currency exchange, transaction approvals, or payment delays	(WTO, 2018)
Export licensing requirement	Licensing required on exports of products with certain characteristics and destinations	(Reuters, 2018)
Import licensing requirement	Ensuring that imported goods or services comply with pre-determined criteria	(OECD, 2005)
Export-related non-tariff measure, nes	Non tariffs interventions with economic, pricing or quantity impact inhibiting trade of some goods or services	(Non-tariff measures, 2019)
Import-related non-tariff measure, nes	Everything but the above stated measures that impact on the economy, quantity or price of goods or services in international trade	(Non-tariff measures, 2019)
Foreign customer limit	Interventions that inhibit foreign customers from buying certain goods	(O'Keeffe, 2022)
Public procurement localization	Policies requiring government procurement to prioritize locally produced goods or services to support domestic industries	(OECD, 2017)
Public procurement preference margin	A percentage advantage given to local suppliers in public procurement bids, allowing them to win contracts even if their bids are higher than those of foreign competitors	(OECD, 2017)
Public procurement access	Rules governing foreign suppliers' access to public procurement markets, which can include restrictions or conditions for participation	(WTO, 2016)
Public procurement, nes	Other public procurement measures not elsewhere specified, including access restrictions and conditions	(OECD, 2017)
Import tariff quota	Inhibits imports by limiting the monetary import of a specific product	(Investopedia, 2024)
Import quota	A government-imposed limit on the quantity of a certain good that can be imported into a country over a specified period	(Wikipedia, 2015)
Safeguard	A policy allowing jurisdictions to impose import pressures temporarily to protect domestic industries from foreign goods	(WTO, n.d.)

Anti-subsidy	Investigation to determine whether to impose restrictions on a foreign entity or product with unfair competitive advantages from subsidies	(Anti-subsidy measures, 2025)
Trade finance	Actions that raise a jurisdictions export through loans guaranteed by banks or export credit agencies to foreign entities	(Ita, 2025)
Financial assistance in foreign market	Monetary investments from jurisdictions seeking to cement a domestic company's operation in foreign markets	(Supply Chain Resilience initiative, 2025)
Local content requirement	Regulations requiring a certain percentage of a product's inputs to be sourced domestically, aiming to promote local industry	(OECD, 2019)
Local content incentive	Benefits or subsidies provided to firms for meeting local content thresholds, encouraging the use of domestic inputs	(OECD, 2019)
Local supply requirement for exports	Policies mandating exporters to source a portion of input from domestic suppliers, aiming to boost local industries	(OECD, 2019)
Local value-added incentive	Incentives rewarding firms for adding value domestically in the production process, such as through manufacturing or assembly	(OECD, 2019)
Local operations incentive	Policies offering benefits to firms establishing or maintaining operations within the country, such as tax breaks or grants	(OECD, 2019)
Localization, nes	Other measures encouraging or requiring localization not elsewhere specified, including various policies aimed at promoting domestic industry participation	(OECD, 2019)

Appendix 2 MANA MELA MNEA MOAI

This section presents the tables of the data type *grey literature* collected for RQ1.1. Four tables of articles, one for each of Ericssons market areas will be provided. Each table contains a source number, source headline, topic, affected industry or sector, and link. The tables are labeled with MANA A, MELA B, MNEA C and MOAI D where the letter indicates what table is referenced in the text.

MANA, A

MANA A				
NR	**Source headline**	**Topic**	**Affected industry or sector**	**Link**

1	President Donald J. Trump Encourages Foreign Investment While Protecting National Security	Keep foreign investments into critical technology out of US, related to Chinese ownership	Foreign investments	https://www.whitehouse.gov/fact-sheets/2025/02/fact-sheet-president-donald-j-trump-encourages-foreign-investment-while-protecting-national-security/
2	NATIONAL RESILIENCE STRATEGY	Strategies for national resilience including supply chain	Technology, manufacturing, advanced industries	https://bidenwhitehouse.archives.gov/wp-content/uploads/2025/01/National-Resilience-Strategy.pdf
3	America Has a National Security Strategy. Where Is Its National Competitiveness Strategy? | ITIF	Push for US strategy does become global innovation leader	Advanced industries	https://itif.org/publications/2025/01/21/america-has-a-national-security-strategy-where-is-its-national-competitiveness-strategy/
4	Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People's Republic of China (PRC)	Restrict US technology capabilities to spill over into China	Advanced industries	https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3158-2022-10-07-bis-press-release-advanced-computing-and-semiconductor-manufacturing-controls-final/file
5	Commerce Implements New Multilateral Controls on Advanced Semiconductor and Gas Turbine Engine Technologies	Export control on vital goods for innovation and defense	Advanced industries	https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3116-2022-08-12-bis-press-release-wa-2021-1758-technologies-controls-rule/file
6	Revisions to the Entity List	Nations added to the Entity list	Technology, defense	https://www.federalregister.gov/documents/2024/08/27/2024-19130/revisions-to-the-entity-list

7	Commerce Control List: Implementation of Controls on Advanced Technologies Consistent with Controls Implemented by International Partners	Export control on technology related to national security concerns	Advanced industries, technology	https://www.regulations.gov/document/BIS-2024-0020-0001
8	China Is Rapidly Becoming a Leading Innovator in Advanced Industries | ITIF	Embrace national power capitalism to spur American innovation	Advanced industries	https://itif.org/publications/2024/09/16/china-is-rapidly-becoming-a-leading-innovator-in-advanced-industries/
9	The U.S. Department of State International Technology Security and Innovation Fund - United States Department of State	International security and innovation fund	Advanced industries	https://www.state.gov/the-u-s-department-of-state-international-technology-security-and-innovation-fund/
10	The United States and Vietnam Mark the First CSP Anniversary by Launching Semiconductor Workforce Development and Public Policy Workshops - U.S. Embassy & Consulate in Vietnam	Alliance for the development of semiconductors	Advanced industries	https://vn.usembassy.gov/the-united-states-and-vietnam-mark-the-first-csp-anniversary-by-launching-semiconductor-workforce-development-and-public-policy-workshops/?
11	Free Trade Agreements | United States Trade Representative	Trade agreements with different nations	Trade-multilateral	https://ustr.gov/trade-agreements/free-trade-agreements
12	Treaties in Force: Supplemental List of Treaties and	Could be used to understand	Trade-multilateral	https://www.state.gov/wp-content/uploads/2023/0

	Other International Agreements	market structure		6/TIF-Supplement-Report-2023.pdf
13	Outcomes of Current U.S. Trade Agreements - United States Department of State	US trade agreement outcomes	Trade-multilateral	https://www.state.gov/division-for-trade-policy-and-negotiations/outcomes-of-current-u-s-trade-agreements
14	Agreement on Indo-Pacific Economic Framework for Prosperity - United States Department of State	Economic framework for prosperity	Trade-multilateral	https://www.state.gov/ipef-24-1011-prosperity
15	Indo-Pacific Economic Framework for Prosperity Agreement Relating to a Fair Economy	Indo-pacific prosperity agreement	Trade-multilateral	https://www.state.gov/ipef-24-1012-fair
16	IPEF Supply Chain Agreement /7	Establish secure supply chain by identifying key goods origin	Technology, advanced industries	https://www.state.gov/wp-content/uploads/2025/02/24-224-IPEF-Supply-Chains-Agreement.pdf
17	African Growth and Opportunity Act	African Growth and Opportunity Act	Trade-bilateral	https://agoa.info/about-agoa.html
18	Trump says he will introduce 25% tariffs on autos, pharmaceuticals and chips | Reuters	Tariff threat on automotive, technology and pharmaceutical s	Advanced industries, technology, automotive	https://www.reuters.com/business/autos-transportation/trump-auto-tariff-rate-will-be-around-25-2025-02-18/
19	Taiwan's Investment Relocation in Response to the New Dynamism of Geopolitical	Taiwan moving close to the US. Investing in the APEC countries	Advanced industries	https://taiwaninsight.org/2025/02/05/taiwans-investment-relocation-in-response-to-the-new-dynamism-of-geopolitical-uncertainties/

	Uncertainties – Taiwan Insight			
20	China says Taiwan seeks to give away chip industry to US | Reuters	Chinese - Taiwanese tensions on advanced industries	Advanced industries	https://www.reuters.com/technology/china-says-taiwan-seeks-give-away-chip-industry-us-2025-02-26/
21	US Commerce Department pushes ahead with ban on China Telecom - DCD	Ban on Chinese telecom	Telecommunication	https://www.datacenterdynamics.com/en/news/us-commerce-department-pushes-ahead-with-ban-on-china-telecom/
22	Exclusive: US ordered TSMC to halt shipments to China of chips used in AI applications | Reuters	US order halt on TSMC shipments to China in AI domain	Advanced industries	https://www.reuters.com/technology/us-ordered-tsmc-halt-shipments-china-chips-used-ai-applications-source-says-2024-11-10/
23	Addressing the Threat to National Security from Imports of Copper – The White House	On actor outside the us control 50% of the processing of copper	Technology, advanced industries	https://www.whitehouse.gov/presidential-actions/2025/02/addressing-the-threat-to-nationalsecurity-from-imports-of-copper/
24	Defending American Companies and Innovators from Overseas Extortion and Unfair Fines and Penalties – The White House	Investigate agreements with Spain Italy and the Mexico-Canada-USA agreement.	Advanced industries, technology	https://www.whitehouse.gov/presidential-actions/2025/02/defending-american-companies-and-innovators-from-overseas-extortion-and-unfair-fines-and-penalties/
25	Biden's Cyber Ambassador Urges Trump Not to Cede Ground to Russia and China in Global Tech Fight | WIRED	Middle ground will pick western technology due to data privacy concerns & and the lure of FDI investments	Advanced industries, technology	https://www.wired.com/story/nathaniel-fick-us-cyber-ambassador-exit-interview/

		for clean supply chains		
26	China rejects spying concerns from Costa Rica leader over 5G network | Reuters	Costa Rica bans Chinese telecom and taking a step towards western allies	Telecommunication	https://www.reuters.com/technology/cybersecurity/china-rejects-spying-concerns-costa-rica-leader-over-5g-network-2023-12-07/
27	Tuvalu breaks ground on first undersea telecommunications cable | The Australian Infrastructure Financing Facility for the Pacific (AIFFP)	US infrastructure investments in telecom and ICT in foreign nations	Telecommunication	https://www.aiffp.gov.au/news/tuvalu-breaks-ground-first-undersea-telecommunications-cable
28	Tracking China's Control of Overseas Ports	Possibility to use some ports for military actions	Infrastructure	https://www.cfr.org/tracker/china-overseas-ports
29	Exclusive: Trump prepares to change US CHIPS Act conditions, sources say | Reuters	make sure recipients of the grant are using the money for manufacturing in the US	Advanced industries	https://www.reuters.com/technology/trump-prepares-change-us-chips-act-conditions-sources-say-2025-02-13/
30	Japan seeks tariff reprieve after Donald Trump questions long-standing defense pact	Trade, tariffs and US-Japan relationships	Trade-bilateral, defense	https://www.ft.com/content/cc44d549-8c7d-4dbd-9eb7-3afce77210ea
31	Beyond the border: You're briefing on US-Mexico commerce - Atlantic Council	US-Mexican interdependency increasing	Tade-bilateral	https://www.atlanticcouncil.org/content-series/beyond-the-border/beyond-the-border-your-briefing-on-us-mexico-commerce/

32	US removes tariffs on UK steel and aluminum, and cuts car rate to 10%, as Trump unveils trade deal - follow live - BBC News	US retracts tariffs as trade deal has been negotiated	Trade-bilateral	https://www.bbc.com/news/live/cn91dxzv4pnt
33	Taiwan becomes 7th largest U.S. trading partner in 2024 - Focus Taiwan			https://focustaiwan.tw/business/202503090011?
34	The Evolution of Taiwan's Trade Linkages With the U.S. and Global Economies			https://www.wita.org/wp-content/uploads/2021/10/2021-taiwan-trade.pdf?
35	Diversifying Canada's trade and investment opportunities			https://www.international.gc.ca/gac-amc/campaign-campagne/trade-diversification-commerce/index.aspx?lang=eng&
36	Mexico: The Missing Piece in the EU's Transatlantic Outlook |			https://ecipe.org/blog/mexico-missing-piece-eu-transatlantic-outlook/?utm_source=chatgpt.com
37	US hit its highest-ever trade total with any nation in 2024: $840B with Mexico - Freight Waves			https://www.freightwaves.com/news/us-hit-its-highest-ever-trade-total-with-any-nation-in-2024-840b-with-mexico?utm_source=chatgpt.com

MELA, B

MELA B				
NR	**Source headline**	**Topic**	**Affected industry or sector**	**Link**
1	Germany to bar Chinese companies' components from core parts of its	Germany bans chines companies Huawei & ZTE	Telecommunication	https://apnews.com/article/germany-china-huawei-zte-ban-5g-networks-

	5G networks | AP News			fc969a68958f4a4b928ce0f8a1c32087
2	Donald Trump sparks race for trade deals to counter US tariffs	Insecurity after trumps inauguration sparks EU to seek trade deals	Trade-bilateral	https://www.ft.com/content/f33f3d35-3f49-4a48-97dd-fcddd3b02e32
3	EU-Mercosur Trade Agreement	Mercosur agreement focusses to BOOST trade SECURE supply chains and FIGHT climate change	Trade-multilateral	https://ec.europa.eu/commission/presscorner/api/files/attachment/880030/Factsheet EU-Mercosur Trade Agreement - Key facts.pdf
4	Europe's 'super-regulator' role is under threat	The Trump administration's challenge to EU's tech governance and regulatory autonomy.	Technology, Data	https://www.ft.com/content/ce0d64b5-192e-48ae-a219-041874b580f2
5	Silicon Valley fights EU tech rules with backing from Donald Trump	US tech companies, with Trump administration support, opposing EU's stringent	Technology	https://www.ft.com/content/3e75c36e-d29e-40ca-b2f1-74320e6b781f
6	US-EU tariff clash imperils $9.5 trillion of business, AmCham warns	The potential economic impact of escalating US-EU tariff disputes.	Technology, Energy	https://www.reuters.com/business/us-eu-tariff-clash-imperils-95-trillion-business-amcham-warns-2025-03-17/

7	EU prepares to hit Big Tech in retaliation for Donald Trump's tariffs	US tech companies, with Trump administration support, opposing EU's stringent	Technology	https://www.ft.com/content/7303e57e-67ca-477a-8d00-8d5213f7120c?utm_source=chatgpt.com
8	EU leaders vow to make bloc more competitive in face of Trump threat	Push from EU members to increase blocks competitiveness	Technology	https://www.theguardian.com/world/2024/nov/08/eu-summit-trade-policy-economic-growth
9	Central Europe's economies should reform to respond to slowing trade growth	Highlights economic risks in Central Europe	Trade	https://www.reuters.com/markets/europe/central-europes-economies-face-risks-slowing-trade-tariffs-imf-warns-2025-03-11/
10	What challenges face the EU in first round of Trump tariffs?	The EU's response to new US tariffs under President Trump.	Trade	https://www.reuters.com/world/europe/what-challenges-face-eu-first-round-trump-tariffs-2025-03-10/
11	EU must brace for impact of Trump wrecking ball on global trading system	The potential disruptive effects of Trump's trade policies on the global trading system and the EU.	Trade	https://www.theguardian.com/business/2025/mar/09/eu-must-brace-for-impact-of-trump-wrecking-ball-on-global-trading-system
12	European markets soar as Germany moves to lift 'debt brake' and raise defense spending	Germany's decision to increase defense spending and its positive impact on European markets.	Defense	https://www.theguardian.com/politics/2025/mar/05/european-markets-soar-as-germany-lifts-debt-brake-to-raise-defence-spending

13	‘Merz spurt’ will see Europe CEOs rethink US pivot	European CEOs reconsidering US investments in light of Germany's economic policies under Friedrich Merz.	Technology, advanced industries	https://www.reuters.com/breakingviews/merz-spurt-will-see-europe-ceos-rethink-us-pivot-2025-03-07/
14	Ericsson ready to take advantage of Trump's tech policies, CTO says in Davos	Ericsson's CTO discusses leveraging favorable U.S. tech policies under the Trump administration.	Telecommunication	https://www.reuters.com/business/media-telecom/ericsson-ready-take-advantage-trumps-tech-policies-cto-says-davos-2025-01-23/
15	Semiconductor firms call for EU Chips Act 2.0	Semiconductor companies urge the EU to enhance support for chip design, materials, and equipment.	Advanced industries	https://www.reuters.com/technology/semiconductor-firms-call-eu-chips-act-20-2025-03-19/
16	EU and China launch mechanism to facilitate industrial data flows	EU and China establish a system to streamline cross-border industrial data transfers.	Technology, data	https://www.reuters.com/markets/eu-china-launch-mechanism-facilitate-industrial-data-flows-2024-08-28/
17	Computer chip group SEMI says EU needs assertive industrial policy	Calls for assertive EU policies in regard to advances chips	Advanced industries	https://www.reuters.com/technology/computer-chip-group-semi-says-eu-needs-assertive-industrial-policy-2024-12-02/

18	Spain calls for EU to forge China policy without US	The EU enforces the Digital Markets Act against major U.S. tech companies, facing potential U.S. retaliation.	Trade	https://www.ft.com/content/65abc8b2-d290-490c-b143-3f98e116124e
19	EU trade relations with United States	Overview of the extensive trade and investment relationship between the EU and the U.S.	Trade	https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/united-states_en
20	The Win-Win in EU-US Digital Services Trade	Analysis of the mutual benefits of open digital services trade between the EU and the U.S.	Technology	https://ecipe.org/publications/openness-strength-eu-us-digital-services-trade/
21	ICT Beyond Borders: The Integral Role of US Tech in Europe's Digital Economy	Examination of U.S. technology's critical role in Europe's digital infrastructure and economy.	ICT, Technology	https://ecipe.org/publications/the-role-of-us-tech-in-europes-digital-economy/
22	EU and US continue strong trade and technology cooperation at a time of global challenges	The EU's initiatives to bolster cybersecurity across member states.	Trade, Technology	https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1827
23	EU companies top US and China counterparts in R&D investment growth, breaking decade-long trend	EU invests in digital innovation hubs	Technology	https://ec.europa.eu/commission/presscorner/detail/en/ip_24_6440

24	EU and U.S. have much work to do on trade tensions, EU trade chief says	EU trade chief emphasizes the need to address ongoing trade tensions with the U.S.	Trade	https://www.reuters.com/world/europe/eu-us-have-much-work-do-trade-tensions-eu-trade-chief-says-2025-03-14/
25	Canada seeks stronger EU trade ties in face of Trump tariffs | Reuters	Canada seeks trade agreements during evolving US conflicts	Trade	https://www.reuters.com/world/americas/canada-seeks-stronger-eu-trade-ties-both-regions-threatened-by-trump-tariffs-2025-02-08/
26	Brexit, Bridges, and Barriers: Where Next for EU-UK Relations? | Carnegie Endowment for International Peace	UK is ready to seek new trade agreements	Trade-bilateral	https://carnegieendowment.org/research/2025/01/brexit-bridges-and-barriers-where-next-for-eu-uk-relations?lang=en&center=europe
27	Korea should look to EU amid intensifying US-China trade tensions: experts	Korea should look to EU amid intensifying US-China trade tensions: experts	Trade-bilateral	https://www.koreaherald.com/article/10425958
28	Brazil: Europe's bridge to the global south | ECFR	Brazil is situated between powerful trade blocks and can enjoy both sides	Trade-multilateral	https://ecfr.eu/publication/brazil-europes-bridge-to-the-global-south/
29	Brazil's President Confronts a Changing World | The New Yorker	Outlining Brazil's presidential ambitions to increase diplomatic ties	Trade, International diplomacy	https://www.newyorker.com/news/the-lede/brazils-president-confronts-a-changing-world?

30	China resumes Brazilian soy imports from 5 suspended firms ahead of Lula visit, source says | Reuters	Brazil's reliance on Brazil for Soy exports	Agriculture, trade	https://www.reuters.com/sustainability/climate-energy/china-resumes-brazilian-soy-imports-5-suspended-firms-ahead-lula-visit-source-2025-05-08/
31	Microsoft to make $2.7 billion cloud, AI investments in Brazil | Reuters	Microsoft investment exemplifying	Technology	https://www.reuters.com/technology/microsoft-make-27-billion-cloud-ai-investments-brazil-2024-09-26/
32	Q&A regarding the Anti-Coercion Instrument - European Commission	EU toolbox to respond to nonmember interference	Trade	https://policy.trade.ec.europa.eu/enforcement-and-protection/protecting-against-coercion/qa-regarding-anti-coercion-instrument_en

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MOAI D				
Source NR	**Source headline**	**Topic**	**Affected industry or sector**	**Link**
1	Embracing an intelligent future: 2023 China Mobile Southeast Asia Cooperation Conference	Sout east Asia digital economy development	Technology	https://www.telecomreview.com/articles/reports-and-coverage/7309-embracing-an-intelligent-future-2023-china-mobile-southeast-asia-cooperation-conference
2	Embracing an Intelligent Future: 2023 China Mobile Southeast Asia Cooperation Conference	EU seeks new trade partnerships amidst US tariff chaos	Trade-bilateral	https://www.ft.com/content/97eefe5b-24f8-4a30-9b2e-e89ef6e606e3
3	EU and India target trade deal this year	EU INDIA to push larges trade agreement of	Trade-bilateral	https://www.ft.com/content/de28d0aa-c1ed-471d-949a-b668845f34ca

		its Kind in 2025		
4	India-EU trade talks: tariffs, market access, regulatory clashes in focus | Reuters	Free trade deals between the EU and India	Trade-bilateral	https://www.reuters.com/world/india/india-eu-trade-talks-tariffs-market-access-regulatory-clashes-focus-2025-02-27/
5	India and EU agree to conclude a long-pending free trade agreement by the end of this year | AP News	India & EU to sign trade agreement by the end of 2025	Trade-bilateral	https://apnews.com/article/india-eu-modi-ursula-von-der-leyen-309ab4795ad0206b66fe20bef5ca9a92
6	EU will ask India to cut tariffs on cars, wine to boost ties, reduce reliance on China | Reuters	EU asks India to cut tariffs on selected goods	Trade, Automotive	https://www.reuters.com/markets/eu-will-ask-india-cut-tariffs-cars-wine-boost-ties-reduce-reliance-china-2025-02-26/
7	India–Middle East–Europe Economic Corridor - Wikipedia	India middle eastern corridor to bolster economic development thought connectivity and integration between Asia, the Persian Gulf and Europe	Trade-multilateral	https://en.wikipedia.org/wiki/India%E2%80%93Middle_East%E2%80%93Europe_Economic_Corridor

8	India's exports face pressure from US, EU trade policies, govt official says | Reuters	India facing tariffs from EU and US	Trade-trilateral	https://www.reuters.com/world/indias-exports-face-pressure-us-eu-trade-policies-govt-official-says-2025-03-04/
9	Modi and Trump outline defense partnership plans, including F-35 fighter jets | AP News	India is diversifying itself from Russian arms by deepening collaboration with US	Defense	https://apnews.com/article/modi-trump-india-us-defense-stealth-aircraft-1aae9a3945a209d910d6169b1f73f5bb
10	India's manufacturing incentives progress amid efforts to cut China imports | Reuters	India wants to cut import from China and boost domestic manufacturing	Manufacturing	https://www.reuters.com/world/india/indias-manufacturing-incentives-progress-amid-efforts-cut-china-imports-2024-09-25/
11	India plans laptop import curbs to boost local manufacturing, sources say | Reuters	India to impose restrictions on laptop imports to boost domestic manufacturing	Technology	https://www.reuters.com/technology/india-plans-laptop-import-curbs-boost-local-manufacturing-sources-say-2024-10-18/
12	India’s geopolitical rise in context: Regional implications - Atlantic Council	India is taking the center as the strategic ally for the west. Increased geopolitical importance	Trade, manufacturing, technology	https://www.atlanticcouncil.org/blogs/southasiasource/indias-geopolitical-rise-in-context-regional-implications/
13	India - Market Challenges	India country commercial guide, market overview	Trade	https://www.trade.gov/country-commercial-guides/india-market-challenges

14	India's Strategic Role in Global Trade: Navigating Challenges and Capitalizing on Opportunities . - Trade Knowledge Exchange	India is acting cautiously to protect national interests, which inhibits free trade. Looking to divest and diversify from China.	Trade, manufacturing, technology	https://www.trade-knowledge.net/commentary/indias-strategic-role-in-global-trade-navigating-challenges-and-capitalising-on-opportunities/
15	The environmental and economic impacts of India's emergence as the global manufacturing hub | Humanities and Social Sciences Communications	Shift of global manufacturing to Southeast Asia	Manufacturing	https://www.nature.com/articles/s41599-024-04356-9
16	Trade in Transition 2025: India	There are opportunities for India to become a leading manufacturer	Manufacturing	https://impact.economist.com/projects/trade-in-transition/country-india/
17	Eight Factors to Consider When Leveraging India's Strategic Position	India is emerging as a potential hub for the APAC region	Trade, logistics	https://www.forbes.com/councils/forbesbusinesscouncil/2024/07/31/eight-factors-to-consider-when-leveraging-indias-strategic-position/
18	Are India and China About to Be Friends Again? | TIME	India and China to strengthen communication and collaboration	Collaboration	https://time.com/7175644/india-china-ladakh-deal-rapprochement/

19	India's Finance Minister backs increasing Chinese direct investment | Reuters	Finance minister back investments from China	Foreign investments	https://www.reuters.com/markets/asia/indias-finance-minister-backs-increasing-chinese-direct-investment-2024-07-23/
20	EU-India relations: Time for a new boost?	Opportunities to deepen EU India collaboration	Trade-bilateral	https://www.europarl.europa.eu/RegData/etudes/BRIE/2025/769496/EPRS_BRI%282025%29769496_EN.pdf
21	US pushes India to lower tariffs, buy more defense products for fair new deal | Reuters	US China to sign bilateral trade pact in 2025	Trade-bilateral	https://www.reuters.com/world/us-commerce-chief-says-indias-high-tariffs-call-rethinking-ties-2025-03-07/?utm_source=chatgpt.com
22	India's three trade deals in the offing	EU UK favorable to invest in China. India will have tougher negotiations with the US	Foreign investments	https://www.ft.com/content/6411d48f-80bf-4a6a-8156-db87d34cbf8d
23	India's Digital Trade Policy	India is one of the countries driving the large increase of internet users in low-income countries	Technology	https://www.cfr.org/article/great-disconnect-indias-digital-trade-policy
24	Embracing an Intelligent Future: 2023 China Mobile Southeast Asia Cooperation Conference	India - UAE comprehensive economic partnership agreement	Trade-bilateral	https://www2.deloitte.com/content/dam/Deloitte/in/Documents/about-deloitte/in-Deloitte-UIBC-India-UAE-CEPA-noexp.pdf

25	Key outcomes of the second EU-India Trade and Technology Council | Shaping Europe's digital future	Partners (India and Bahrain) commitments to strengthen supply resilience.	Technology, Telecommunication	https://digital-strategy.ec.europa.eu/en/news/key-outcomes-second-eu-india-trade-and-technology-council
26	India seeks parliament's nod to spend additional $5.9 billion in 2024/25 | Reuters	Potential that India might grant 5.9B USD to update its telecom network	Telecommunication	https://www.reuters.com/world/india/india-seeks-parliaments-nod-additionally-spend-59-bln-202425-2025-03-10/

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Source NR	**Source headline**	**Topic**	**Affected industry or sector**	**Link**
1	China Is Rapidly Becoming a Leading Innovator in Advanced Industries | ITIF	Future technology leadership	Advanced industries	https://itif.org/publications/2024/09/16/china-is-rapidly-becoming-a-leading-innovator-in-advanced-industries/
2	What the 20th Party Congress Report Tells Us About China's AI Ambitions – The Diplomat	Future technology leadership	AI	https://thediplomat.com/2022/11/what-the-20th-party-congress-report-tells-us-about-chinas-ai-ambitions/
3	Civil-military fusion	World's leading tech military by 2049	Defense	https://2017-2021.state.gov/military-civil-fusion/

4	A Policymaker's Guide to China's Technology Security Strategy | ITIF	Chinas technology security strategy	Technology	https://itif.org/publications/2025/02/18/a-policymakers-guide-to-chinas-technology-security-strategy/
5	S.Africa's MTN teams up with China Telecom, Huawei on 5G, AI | Reuters	Chine external technology collaboration on African continent	Telecommunication	https://www.reuters.com/business/media-telecom/safricas-mtn-teams-up-with-china-telecom-huawei-5g-ai-2024-11-26/
6	China signs electricity, infrastructure deals with Chad and Senegal | Reuters	Chine external technology collaboration on African continent	Infrastructure	https://www.reuters.com/world/china-signs-electricity-infrastructure-deals-with-chad-senegal-2024-09-04/

7	Countering China's Growing Influence at the International Telecommunication Union | The Heritage Foundation	Increase US investments in emerging technologies to prevent China from sustaining the advantage	Telecommunication	https://www.heritage.org/global-politics/report/countering-chinas-growing-influence-the-international-telecommunication
8	Researchers raise concerns about DeepSeek chatbot's connection to Chinese telecom | AP News	Chine external technology collaboration on African continent	AI	https://apnews.com/article/deepseek-china-generative-ai-internet-security-concerns-c52562f8c4760a81c4f76bc5fbdebad0
9	China tells telecom firms to phase out foreign chips in blow to Intel, AMD - WSJ | Reuters	Phase out foreign chips, does that include TSMC	Advanced industries	https://www.reuters.com/technology/china-tells-telecom-carriers-phase-out-foreign-chips-blow-intel-amd-wsj-2024-04-12/

10	From 5G to AI: The ICT deals in Uruguay-China accords - Americas	Chinese technology collaboration on African continent	Telecommunication	https://www.bnamericas.com/en/analysis/from-5g-to-ai-the-ict-deals-in-uruguay-china-accords
11	Xi calls for China, Thailand to beef up ties to fight global uncertainties | Reuters	Chinese technology collaboration on African continent	Technology	https://www.reuters.com/world/asia-pacific/chinas-xi-meets-thai-prime-minister-with-trade-online-scams-focus-2025-02-06/
12	China's Collaboration Propels Uganda's Internet Revolution: A Tale of Technological Transformation | Development Watch Centre	Chine external technology collaboration on African continent	Telecommunication	https://www.dwcug.org/chinas-collaboration-propels-ugandas-internet-revolution-a-tale-of-technological-transformation/

13	House of Huawei: Q&A About China Tech Rivalry with Eva Dou - Barron's	Huawei is bouncing back after us sanctions	Telecommunication	https://www.barrons.com/articles/huawei-trump-china-new-restrictions-e5259280
14	China says Taiwan seeks to give away chip industry to US | Reuters	Potential investment from TSMC in intel, TSMC to increase manufacturing in USA	Advanced industries	https://www.reuters.com/technology/china-says-taiwan-seeks-give-away-chip-industry-us-2025-02-26/

15	Sweden's Ericsson denies exiting China market despite 5G equipment competition from Huawei, geopolitical tensions SOUTH CHINA POST	Chine external technology collaboration on African continent	Telecommunication	https://www.scmp.com/tech/big-tech/article/3255210/swedens-ericsson-denies-exiting-china-market-despite-5g-equipment-competition-huawei-geopolitical
16	Exclusive: Inside the US push to steer Vietnam's subsea cable plans away from China | Reuters	Vietnam is torn between the US and CHINA, example of how a seemingly small market is centered and in the center of attention	Technology	https://www.reuters.com/business/media-telecom/inside-us-push-steer-vietnams-subsea-cable-plans-away-china-2024-09-17/

17	China Intensifies Push to 'Delete America' From Its Technology - WSJ	Running since 2022 and backed by statements from the last decade	Technology, advanced industries	https://www.wsj.com/world/china/china-technology-software-delete-america-2b8ea89f
18	China's $3.6bn mega port in Peru rings alarm bells in Washington	Improve trade and cut out Mexico as a stop on trade routes with China	Infrastructure	https://www.thetimes.com/world/latin-america/article/china-megaport-peru-chancay-belt-and-road-xflkbwlnv
19	China builds space alliances in Africa as Trump cuts foreign aid | Reuters	China invests to enhance space infrastructure after US withdrawal from Africa	Advanced industries	https://www.reuters.com/investigations/china-builds-space-alliances-africa-trump-cuts-foreign-aid-2025-02-11/

20	China trade surge poses challenge for Trump's South America influence | Reuters	Close L. American - Chinese ties in trade, China increasing its soft power in L. America	Infrastructure	https://www.reuters.com/world/chinas-trade-dominance-south-america-tempers-trumps-influence-2025-03-03/
21	The world according to Xi	Chinese strategic direction on innovation within tech and manufacturing	Technology, Advanced industries	https://www.economist.com/leaders/2023/03/23/the-world-according-to-xi
22	The Delusion of Peak China America Can't Wish Away Its Toughest Challenger	China declining in financial dominance but increasing in manufacturing?	Manufacturing	https://www.foreignaffairs.com/china/delusion-peak-china-united-states-evan-medeiros

23	Trump announces Taiwanese chip giant's $100 billion investment in U.S. - CBS News	Chinese technology collaboration on African continent	Technology	https://www.cbsnews.com/news/tsmc-taiwan-semiconductor-chips-trump-100-billion/
24	China's Evolving Fortress Economy	Chinas strategy for security in trade, manufacturing, energy, technology and innovation	Manufacturing, technology, energy	https://ucigcc.org/wp-content/uploads/2024/07/2024_wp5_goodrich_v1-FINAL-2.pdf
25	The center for strategic translations	Xi Jinping's national strategy for security and innovation	Technology	The center for strategic translations
26	How Innovative Is China in Semiconductors? | ITIF	Analysis of technological advancements and supply chain gaps.	Technology	https://itif.org/publications/2024/08/19/how-innovative-is-china-in-semiconductors/

27	Tracking China's Control of Overseas Ports	China building "sea roads" for trade and increasing activity and investments in global trade and ports	Infrastructure	https://www.cfr.org/tracker/china-overseas-ports
28	South Korea, China, Japan agree to promote regional trade as Trump tariffs loom | Reuters	South Korea, Japan and China agrees to deepen trade contacts under tariff threat.	Trade	https://www.reuters.com/world/asia-pacific/south-korea-china-japan-agree-promote-regional-trade-trump-tariffs-loom-2025-03-30/
29	Japan, China, South Korea meet at geopolitical 'turning point in history' | Reuters			https://www.reuters.com/world/asia-pacific/japan-china-south-korea-meet-geopolitical-turning-point-history-2025-03-22/

30	Invest in Japan: Japan takes poll position in Global Supply Chains			https://www.reuters.com/plus/invest-in-japan-japan-takes-poll-position-in-global-supply-chains
31	Japan's exports expand in March as US tariffs feared to hit economy broadly | Reuters			https://www.reuters.com/world/japan/japans-exports-expand-march-ahead-us-tariffs-2025-04-17/
32	Japan’s Effectiveness as a Geo-Economic Actor: Navigating Great-Power Competition			https://www.iiss.org/publications/adelphi/2022/japan-effectiveness-as-a-geo-economic-actor/

33	South Korea to approach trade talks with US 'cautiously', industry minister says | Reuters			https://www.reuters.com/world/asia-pacific/south-korea-approach-trade-talks-with-us-cautiously-industry-minister-says-2025-04-26/
34	South Korea, China, Japan agree to promote regional trade as Trump tariffs loom | Reuters			https://www.reuters.com/world/asia-pacific/south-korea-china-japan-agree-promote-regional-trade-trump-tariffs-loom-2025-03-30/
35	South Korea as a global pivotal state			https://www.brookings.edu/articles/south-korea-as-a-global-pivotal-state/
36	Crossroads of Commerce: How the Taiwan Strait Propels the Global Economy			https://features.csis.org/chinapower/china-taiwan-strait-trade/

Appendix 3 Analysis matrix

Table of the analyzed data collected in section 3.4.2, i.e. market and driving force categorization.

Identifying driving forces & market type						
Jurisdiction	**Market type**	**Driving forces**	**Measure**	**Type of Control**	**Example**	**Source**

US	Central	Investment restrictions on foreign actors	**Measure**	Financial control	Commitment from allies to refrain from FDI in China grants fast track on US market	1A
US	Central	Incentives for domestic production	Industry dominance	Financial control	A shift from "Marketist" approach to a "producers" approach	(1A),3A, 9A, 29A
US	Central	Control of advanced technology	Export control	Absolute control	Restrict shipment of semiconductors to China	4A,5A
Vietnam (USA)	Bridge	Bilateral trade and knowledge relationships	Alliance Investment	Financial control	US-Vietnam collaboration on semiconductors	10A
APAC (USA), Australia	Bridge	Trade alliance	Collaboration agreement	Financial control	Indo-Pacific Economic Framework for Prosperity Agreement Relating to a Fair Economy	14A,15A, 27A
APAC (USA)	Bridge	Trade alliance	Collaboration agreement	Financial control	Indo-Pacific Economic Framework for Prosperity	16A
US (Japan)	Central	Import restrictions to protect domestic industry	Import tariffs	Absolute control	Japan seeking revocation of tariffs	18A, 24A, 30A, 6B, 9B, 10B, 4C

Taiwan	Bridge	Investment restrictions on foreign actors	Alliance Investment	Absolute control	Investments outside of China to appeal to the US. E.g. investments in Germany	19A, 20A,
Taiwan (USA)	Bridge	Control of advanced technology	Export ban	Absolute control	US ordered TSMC to halt shipments to China of chips	14C
US	Central	Import restrictions to protect domestic industries	Import controls	Financial control	Researchers link DeepSeek's blockbuster chatbot to Chinese telecom banned from doing business in US	21A, 26A, 7C, 8C, 16C
Developing countries (US)	Bridge	Investment for domestic production		Financial control	Previous US cyber ambassador pusher for investments in technology development	25A

US	Central	Foreign direct investments	Investment regulation	Absolute control	Silicon Valley fights EU tech rules with backing from Donald Trump	4B, 5B
EU	Central	Export, import and financial measures	Import and export measures	Financial control	EU prepares to hit Big Tech in retaliation for Donald Trump's tariffs	7B, 10B , 11B, 13B, 4C
EU	Central	Deregulation	Financial aid, Government loans, ease of restrictions	Financial control	EU plans one single rulebook to make European startup more competitive	8B, 9B, 11B, 13B, 12B, 23B
EU	Central	Control of advanced technology	Financial investments	Financial control	European markets soar as Germany moves to lift 'debt brake' and raise defense spending	12B
EU	Central	Investment for domestic production + control of advanced technology	Financial aid, financial investments	Financial control / Absolute control	Semiconductor firms call for EU Chips Act 2.0	15B, 17B

EU	Central	Trade agreement	Collaboration agreement	Financial control	EU and China launch mechanism to facilitate industrial data flows	16B
EU	Central	Trade agreement	Trade agreement	Financial control	Insecurity after trumps inauguration sparks EU to seek trade deals	18B, 3B, 2B, 27B, 28B
EU	Central	Control of advanced technology + trade alliance	Trade agreement	Absolute control	US and EU to continue strong alliance in technology during uncertain time	22B
Canada (EU)	Bridge	Trade agreements	Trade agreement	Financial control	EU will ask India to cut tariffs on cars, wine to boost ties, reduce reliance on China	25B 2D 3D, 6D, 20D

China	Central	Investments for domestic production + controls of advanced industries	Production incentives, import & export controls	Financial control / Absolute control	The Company That Defines U.S.-China Tech Rivalry Isn't Going Anywhere: Huawei	1C, 2C, 4C, 13C, 25C
China	Central	Investments for domestic production + controls of advanced industries with military applications	Financial investments	Financial control / Absolute control	The U.S. government must adopt a clear-eyed view of China's technology security strategy by recognizing China is temporarily lagging in some sectors	3C, 4C, 25C
Africa (Senegal, S.A, Chad (China)	Bridge	Trade agreement	Collaboration agreement	Financial control	China signs electricity, infrastructure deals with Chad and Senegal	5C,6C, 12C, 19C, 27C

China	Central	Investments for domestic production + controls of advanced industries	Production incentives, import & export controls	Absolute control / financial control	China tells telecom provider to phase out foreign chips by 2027	9C, 17C, 25C
Latin America (Uruguay, Peru (China)	Transition	Trade agreement	Collaboration agreement	Financial control	China enter commercial agreements with Uruguay	10C, 20C, 27C
Asia (Thailand, Vietnam (China)	Transition	Trade agreement	Collaboration agreement	Financial control	China enters collaboration agreement with Thailand for digital economy and electric vehicles	11C, 16C, 18C, 27C

Indian	Transitio n	Increase trade thought import tariff ease	Import tariffs	Financial control	India is opposed to EU's proposal to impose high tariffs of 20% to 35% from January 2026 on high-carbon goods including steel, aluminum and cement.	4D, 5D, 8D, 13D, 25D
India	Transitio n	Alliance in technology and defense	Financial investment s	Financial control	India signs deal to buy F35s from US	9D, 21D
India	Transitio n	Ease on FDI restrictions	FDI regulation	Absolute control	India to attract FDI in manufacturin g through financial investments	10D, 11D

India	Transitio n	Ease on FDI restrictions	Import restrictions, trade agreements	Financial control	India is entering into trade agreements and introducing import restrictions on Chinese goods,	14D, 16D, 18D, 19D
India, EU, USA, UK	Transitio n	Trade agreement	Trade agreement	Financial control	India is entering into trade agreements with US EU UK	21D, 25D, 26B

Appendix 4 Normalization formula

Formula used to calculate normalization in methodology sections, 3.3 on data analysis.

$$x_{Noramlized} = \frac{x - \eta(x)}{\sigma(x)}$$

- x denoted the original value.
- η is the median function of the series of original values $(x_1 \dots x_n)$. For the calculations in this report, the MEDIAN () formula in excel was used.
- σ is the standard deviation of the series of values $(x_1 \dots x_n)$. For those calculations, the STDV () formula in excel was used.

Appendix 5 RCA calculations

Here, the formula used by OEC to calculate the PCBs industry RCA is provided.

$$RCA_{Ai} = \frac{\frac{X_{Ai}}{\sum_{j \in P} X_{Aj}}}{\frac{X_{Ai}}{\sum_{j \in P} X_{Wj}}} \geq 1$$

- P is the set of all products (with $i \in P$)
- X_{Ai} is the country A's exports of products i
- X_{Wi} is the worlds exports of product i
- $\sum_{j \in P} X_{Aj}$ is the country A's total exports (of all products j in P)
- $\sum_{j \in P} X_{Wj}$ is the worlds total exports (of all products j in P)

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