A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

How can companies rebalance their supply chains to reduce their reliance on China? – The Case Study of Volkswagen

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Abstract

This academic thesis aims to explore strategies by which companies can reduce dependency on China in their supply chains by using Burberry, Procter & Gamble, and Volkswagen as case studies. We combined quantitative and qualitative analyses to understand what is driving China's significance, underlying awareness of rebalancing, associated risks, and effective approaches to reduce dependence. A survey and interviews were conducted to provide meaningful findings to support our recommendations and conclusions. The case studies highlighted several practical suggestions, including diversified supplier bases, off-and nearshoring and increased digital integration for risk management for more resilient global supply chains.

Keywords

Supply Chain, Strategy, China, Asian Brands, Marketing, Supply Chain Resilience, Strategy, Burberry, Procter & Gamble, Volkswagen, Decoupling, Diversification, Offshoring, Risk Management

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1. Group Part: Introduction

1.1. China's significance for global supply chains

The emergence of China as a global economic powerhouse has fundamentally altered the dynamics of international trade and supply chain management. In recent decades, China has transitioned from a closed economy to an economic giant, now ranking as the world's second-largest economy and a pivotal player in global supply chain networks.

This transformation has not only redefined the dynamics of international commerce but has also presented both opportunities and challenges for companies worldwide. Fueled by market-oriented reforms initiated in the late 20th century, China embarked on a journey that would see it evolve into the "Factory of the World". Its abundant labour force, access to raw materials, and strategic investments in infrastructure positioned it as an attractive destination for businesses seeking cost-effective production and global market access.

Moreover, turbocharged by its accession to the World Trade Organization in 2001, China's importance as a trading partner has rapidly increased with 14% of global exports coming from the country alone by 2022 (*Fig. 1*), valuing around 3,7 Tn. (Trillion) USD (World Bank 2023).

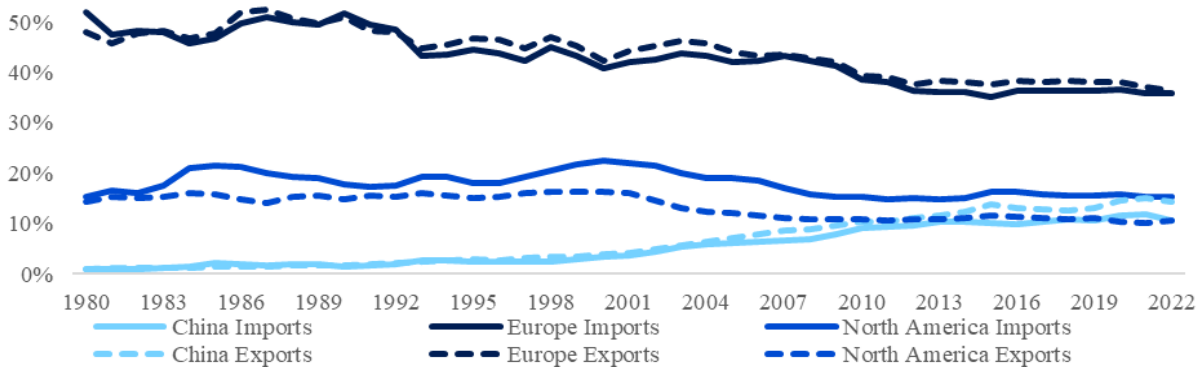

Figure 1: Percentage of Total World Exports and Imports by Region/Country – Own Work. Data Source: World Bank (2023)

Furthermore, since joining the WTO, China has arguably become one of the main beneficiaries of the increased globalization of supply chains, becoming the largest or second largest trading partner for some 80 countries (Kolodko 2023) and increasing the value of its exports (in USD) 13-fold since 2001 (*Fig. 2*).

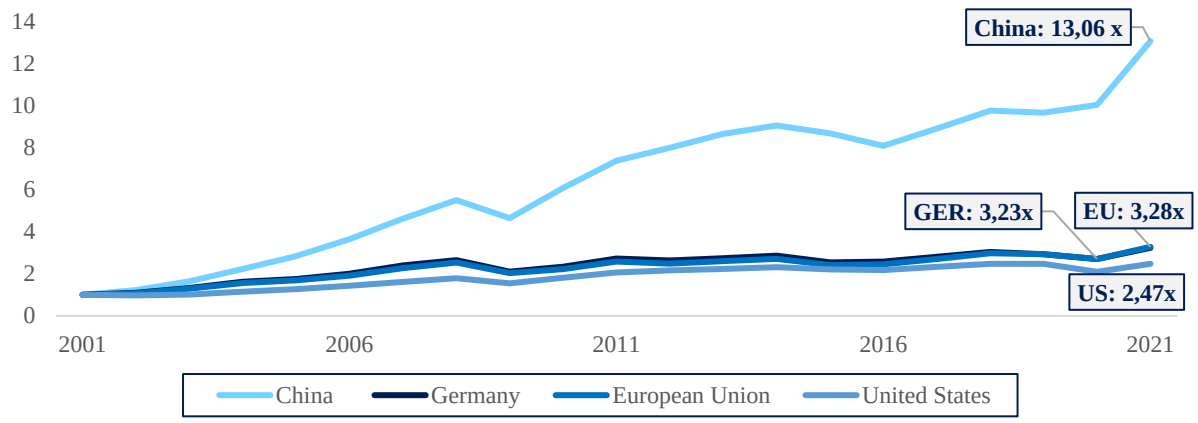

Figure 2: Percentage Growth in Exports of Goods and Services 2001-2021 (current USD. in Mio) – Own Work. Data Source: UNCTAD (2023)

Inevitably, the dominance of China has had several impacts on the global economy, with more specialized value chains resulting in reduced prices and costs for individual consumers and enterprises around the globe. Moreover, the simultaneous emergence of a strong Chinese consumer class has made the country one of the biggest markets and profit drivers for most global companies (Boston Consulting Group 2023). However, this increased interdependence with China resulted in globalized supply chains being more vulnerable to sudden disruptions as experienced during the Covid-19 pandemic.

Not only did China's mandatory lockdowns lead to numerous large disruptions to global production and shipping, but they also exposed the overreliance of certain supply chains on China. This dependency has become more pronounced over time, as various industries nowadays increasingly source a variety of parts and components across the value chain from China (*Fig. 3*).

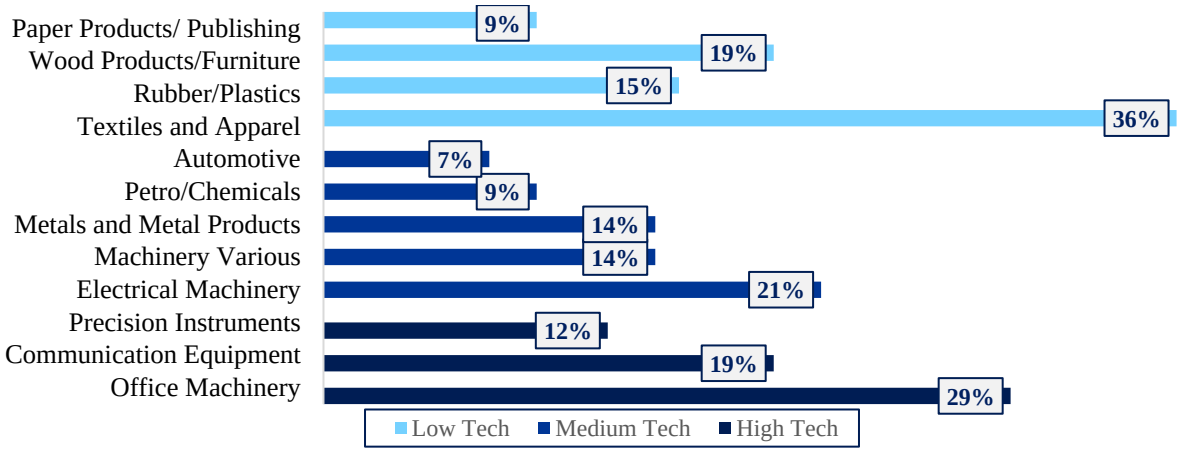

Figure 3: China's share of world exports of parts and components, by sector (%), 2002-2019– Adapted from Nicita & Razo.

Data Source: UNCTAD (2023)

Given the wide-ranging impact of supply disruptions on globally interconnected industries and the financial bottom lines of companies, policymakers and stakeholders are urging global companies to diversify their supply chains and explore alternatives to China for sourcing resources and production. Among those most notably, US (United States) Treasury Secretary Janet Yellen called for an overhaul of trade with China, suggesting instead so-called 'friend-shoring', shifting production and trade to geopolitical allies in the Indo-Pacific Region. (Duehren 2022).

Similarly, the European Parliament passed the Critical Raw Materials Act (CRMA) in November 2023 to increase domestic capacity for raw materials within the supply chain, to reduce the current reliance on China (European Commission 2023). The concern for the future resilience of critical supply chains among governments and executives particularly rose following Russia's invasion of Ukraine in 2022 (Dahlmann & Lovely). The US recently accuses China of “weaponizing” trade and consequently initiating efforts under the Indo-Pacific Economic Framework (IPEF) to diversify its sources of supply across and among allies in the region. These delicate geopolitical tensions between the US and China exacerbate the existing trade dispute between the two nations, with international companies facing heightened risks from counter-tariffs on their own products, components or critical raw materials. China, for

instance, restricted the export of rare earth metals such as graphite, a critical material in battery production, in 2023 (Randall 2023).

In the backdrop of global economic recovery post-pandemic, companies' supply chains therefore encounter various multifaceted challenges. The resurgence of the economy brings forth a notable increase in product variety, while external pressures such as evolving regulations, trade barriers, and fluctuating customer segments with keen service demands and sustainability expectations add to the complexity. Moreover, while geopolitical tensions introduce new uncertainties, companies also find it hard to decouple themselves from the Chinese market and production prowess, given its dominance not only in hardware but increasingly in software as well. For example, a representative of Apple stated in a local newspaper that China remained indispensable to its current supply chain, given that 151 of its 200 suppliers have a base in China (Tan 2023).

All in all, given the large difficulties concerning decoupling, companies should instead consider "de-risking" their supply chains. This necessitates a strategic imperative for companies to enhance their supply chain resilience, diversifying sourcing, manufacturing, and distribution channels, while also embracing sustainable practices to ensure long-term stability in the face of evolving geopolitical and economic landscapes.

1.2. Rationale for the study

This research is motivated by a critical issue in the world of global business. China has become a central player in international supply chains due to its cost-effective manufacturing and abundant skilled workforce. However, as companies increasingly relied on China, concerns arose about the stability and adaptability of this strategy. The reason for undertaking this thesis was the recognition that depending too heavily on China for supplies could lead to significant problems. Various factors, including major changes in the global economy, geopolitical tensions, and unforeseen events like the COVID-19 pandemic, highlighted the vulnerability of

supply chains tied mainly to one country. Our aim with this research is to answer why is it so problematic to rely excessively on China and why this issue matter so much in today's global business landscape. Making this possible by investigating this topic, we seek to provide a detailed understanding of the challenges associated with relying heavily on China for supplies. We also intend to offer practical advice to organizations looking to navigate these challenges effectively.

1.3. Research objectives and questions

The primary objective of this research is to explore how organizations can strategically adjust their supply chain structures to reduce their excessive reliance on China. To accomplish this, the study will undertake an in-depth analysis of three globally recognized firms, employing them as illustrative case studies. The core focus of this investigation is to address the overarching question and ultimately provide a thorough response to the research query: **"How can organizations rebalance their supply chains to mitigate their overreliance on China?"**. Centered around the examination of these three corporations, our research will be guided by four subsidiary questions designed to facilitate a more comprehensive exploration of the topic. These inquiries collectively pave the way towards a holistic response to the principal research question, enhancing the overall coherence of the study.

Question	Objective
Q1. What factors contribute to China's significance in global supply chains?	To dissect the elements that have driven China's ascendancy in the global supply chain arena, such as cost-efficiency, skilled labour, and market dynamics.
Q2. Have companies considered rebalancing their supply chains away from China?	Exploring whether companies have contemplated altering their supply chain strategies and gauging the degree of preparedness for supply chain rebalancing.
Q3. What are the main challenges and risks associated with overreliance in China in supply chains?	Examining the obstacles and vulnerabilities that have emerged due to overreliance on China will provide insights into the necessity for rebalancing.
Q4. What strategies can companies employ to rebalance their supply chains effectively?	The study will delve into the strategies, tactics, and best practices companies can adopt to reduce their dependency on China while ensuring supply chain resilience.

1.4. Significance of the research

We believe that the research conducted in this paper is significant as it not only contributes to existing literature on supply chain challenges involving China, but also as it introduces a new perspective to the emerging discussion on 'decoupling' and diversification. By combining managerial interviews, expert interviews, and quantitative data analysis from three different companies and industries, we seek to create a more comprehensive understanding of the challenges that Western companies experience in rebalancing their supply chains with China.

As a result, we have also sought to combine existing research areas related directly to the current state of supply chains, industry research, as well as research on innovative migration and diversification strategies across different industries. The aim is to provide some insights across the board by analyzing the innovation strategies of companies and industries in our three use cases and general research, and to show stakeholders what potential migration and diversification strategies might look like and what they entail. Given the current and future significance of this issue, particularly in the context of current macroeconomic and political developments, we believe the findings of our research to be very significant for policymakers and decision-makers in globally positioned firms alike.

2. Group Part: Literature review

2.1. Theoretical framework on supply chain management and global sourcing

Our exploration of transforming supply chains and reducing dependence on China commences with a thorough understanding of supply chain management and global sourcing strategies. This chapter provides a review of essential literature and industry insights that aid our comprehension of building resilient supply chains and introduces us to the strategies for recalibrating them. In "Supply Chain Management Strategy, Planning, and Operation" by Sunil Chopra and Peter Meindl, the core principles of supply chain management are examined (Chopra and Meindl 2007).

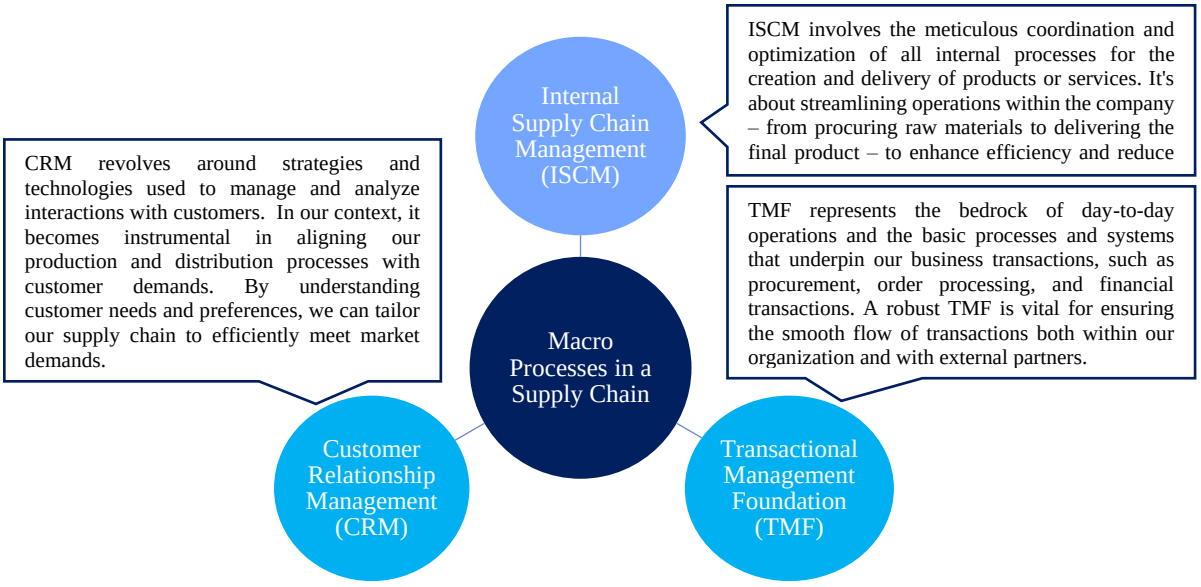

Figure 4 - Macro processes in a supply chain - Own Creation

These three concepts provide us with an understanding of internal and external dynamics. While Chopra and Meindl's work lays this essential theoretical groundwork, our thesis takes a step further. It aims to address the specific challenges of diversifying sourcing away from a single country, such as China and offers tailored strategies for businesses to successfully recalibrate their supply chains. The significance of fostering robust supplier relationships reverberates throughout this paper, as we recognize their instrumental role in establishing resilient supplier networks. These networks are pivotal for businesses aiming to transition away from overdependence on a single country or supplier. It's essential to note that while this resource provides invaluable foundational knowledge, it does not offer specific recommendations tailored to the challenges of diversifying sourcing away from one country. This gap forms a focal point for our Work Project, which aims to address this aspect of supply chain recalibration and provide specific strategies for businesses to successfully overcome this challenge.

In the book 'The New Supply Chain Agenda: The 5 Steps That Drive Real Value' by Reuben Slone, Paul J. Dittmann, and John T. Mentzer, we gain insights into how firms can unlock the true potential of supply chain excellence. The authors provide a sustainable approach to reducing inventory and costs while simultaneously enhancing customer-order fill rates (Slone,

Dittmann and Mentzer n.d.). The book is centered on a wealth of practical strategies derived from the experiences of some of the world's leading companies such as Whirlpool, which have conducted comprehensive audits of their supply chains, forming the bedrock upon which the recommendations in their book are built. Similarly, the structure of this Work Project is based on three distinct use cases from companies. The framework introduced within the book's title, encapsulated in the '5 Steps,' emerges as a highly pertinent blueprint for firms seeking to recalibrate their supply chains:

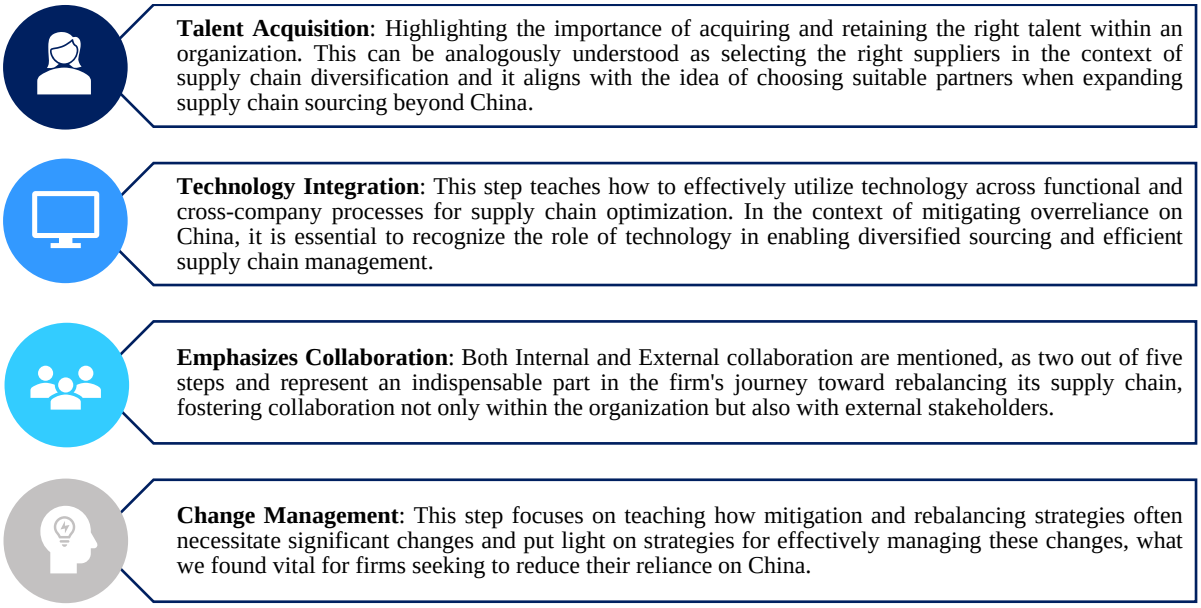

Figure 5: The Main 4 of the 5 Steps Framework – Adapted from (Slone, Dittmann and Mentzer n.d.)

Despite this resource provides a robust framework for enhancing supply chain performance, it may not extensively explore the nuances and challenges essential to specific firms to overcome to reduce overreliance on China within the global supply chain.

To understand the complex landscape of global value chains, particularly regarding their optimization strategies and vulnerabilities, the research conducted by McKinsey in their 2020 report titled "Risk, resilience, and rebalancing in global value chains" plays a pivotal role. This report delves into the details of global production networks and offers insights into strategies for enhancing cost-efficiency while uncovering hidden vulnerabilities (Risk, Resilience and

Rebalancing in Global Value Chains 2020). Notably, significant contribution of this material lies in the wealth of statistics it provides, which proved invaluable in shaping this paper. For example, McKinsey's report quantifies the impact of disruptions in the supply chain, translating the length of such disruptions into numerical terms, measuring revenue loss for firms as a percentage of EBITDA each year and encloses the planned post-COVID actions to build resilience across supply chain leaders, summarized in a survey of 605 business executives. This quantitative approach adds depth and precision to our understanding of the challenges posed by global value chains (Risk, Resilience and Rebalancing in Global Value Chains 2020). It focuses on risks stemming from exposure to profound shocks, including financial crises, terrorism, extreme weather events, and pandemics. In essence, this research serves as a comprehensive resource for navigating the complexities of global value chains comparing 23 industries, offering feasibility of potential geographic shift of their value chains across borders over the next five years, in a world marked by increasing uncertainty and disruption (Risk, Resilience and Rebalancing in Global Value Chains 2020).

2.2. Case studies and research on supply chain rebalancing

Previous research has examined how firms and industries rely on China, as well as how firms improve their supply chain agility by embracing Digital/Internet of Things (IoT) integration. For example, Wu's (2019) two case studies demonstrated how auto suppliers and makers improved their supply chain resilience and agility through enhanced digitalization. Similarly, Kern and Wolf (2019) highlighted the disparities between the digital evolution of the automobile supply chain in Germany and China, with regards to firms' incentives, practicability, and impediments. Notably, this case study explored the difficulties faced by lower-tier automotive suppliers in digitally integrating with their larger customers' supply chain tools. Importantly, other case studies such as the one by Ando and Hayakawa (2021) have shown, that import diversity of inputs had a significant impact in mitigating the harmful supply-side

effects of Covid-19 and other external shocks. Allowing firms to operate with higher levels of efficiency and resilience by pursuing a multisource strategy. While other reports, such as from Zenglein (2020) at Mercator Institute, have focused on mapping the interdependence between European companies and China as well as their efforts to rebalance their supply chains.

However, although such case studies already exist, we aim to enhance existing research by not only illuminating a singular company or industry, but rather by combining the analysis of multiple industries and companies. Analyzing the varying levels of vulnerability experienced by these companies about China and providing managers and policy makers with concrete recommendations based on these observations, aimed at achieving higher supply chain resiliency and reducing reliance on China.

2.3. Strategies for mitigating supply chain risks

Supply chains are complex networks that work together to bring products and services to market. However, their complexity makes them vulnerable to a wide range of disruptions, from geopolitical instability to natural disasters and labor disputes. Therefore, mitigating supply chain risk is essential to prevent further financial losses, improve a company's strategic flexibility and avoid potential reputational damage. (Maleki 2023). To achieve this, several strategies can be implemented to increase efficiency and reduce overreliance on main supply chain hubs such as China, thus mitigating substantial risks to global supply chains.

Figure 6 - Strategies for rebalancing supply chains - Own Creation

To mitigate the inherent risks associated with reliance on suppliers from a singular country, such as China, firms can strategically **diversify their supplier base** through **"multisourcing"**. Although Chinese suppliers are often chosen for cost efficiencies, lower basic wages, and

specialized capabilities, this concentration worsens the firm's vulnerability. Specifically, companies expose themselves to potential adversities like price fluctuations, inventory shortages, and poor quality. In response, broadening the company's supplier network allows it to spread risk across multiple sources, thereby reducing reliance on a single supplier. This diversification also gives the company greater negotiating leverage in managing prices, given available alternative sourcing channels (Liu, Lin and Hayes 2010).

Similarly, companies that not only source from multiple suppliers but also keep parts of their production lines domestic will be less affected by external shocks on their Chinese supply chains, such as tariffs. This "**nearshoring**" strategy offers the potential for increased bargaining power through risk distribution, improved geopolitical and economic stability, and greater innovation in quality. Furthermore, Chinese suppliers will aim to maintain equivalent quality standards to those of their customers' domestic markets to retain them (Liu, Lin and Hayes 2010). This decision may also be for more than strategic reasons: by keeping certain parts of production in the country, for example, companies can reduce distribution costs and maintain both local production and commercial scale. As illustrated by (Bardt, Röhl e Rusche 2022) this strategy has recently become more popular in the United States and Europe, as firms are transferring their primary and support activities closer to their home markets, instead of delegating them to other countries in pursuit of a competitive advantage. What is more, when companies have their production closer to their home country, it is easier to guarantee both ethical working conditions, sustainability requirements as well as ensuring that no part of the assembly line damages the brand's reputation (Pearce 2014).

Another possible strategy is to improve the selection and continuous evaluation of supplier partnerships through **"digital integration and automation"**. The main objective should be to align the company's goals, quality standards, and overall objectives with those of their suppliers to promote a perfect fit and a more **resilient partnership** (Shishodia, Verma and Dixit 2019).

Higher visibility on supplier's risk management and production allows firms to prevent potential disruptions to deliveries and quality issues. Furthermore, real-time evaluation enables companies to identify efficient suppliers and extent their partnership, promoting consistency, stability, and long-term success (Musa 2012).

In this case, improved **risk management** does not directly reduce a potential supply chain overreliance on China. Instead, it allows executives to better identify and monitor it. More specifically, risk management in this context depends on detecting and monitoring vulnerabilities to various China-related disruption scenarios. Digital tools enable this level of visibility and risk assessment, providing executives with real-time information regarding their network of producers and manufacturers. Consequently, optimizing operational processes and promoting greater supply chain resilience through faster responses to outside disruptions (Musa 2012). With one example by Hoek (2020) illustrating how companies with higher visibility were able to adapt their supply chains more quickly following the Fallout of Covid-19.

One more potential mechanism is to sign **risk-sharing contracts** with suppliers, where all the parties involved bear a ratio of risk regarding possible upcoming disruptions, increasing the incentives for a deeper collaboration in risk management. By having shared losses, both the manufacturer and its lower-tier suppliers are also incentivized to avoid any disruptions in their supply chain and thus foster its resilience (The University of York 2018). In this case, companies relying on Chinese suppliers could mitigate the risk from trade disputes.

Relocating entire assembly lines or parts of it outside China is a highly complex process, which not every industry or company can accomplish. Nevertheless, several alternatives to China are becoming more appealing for companies seeking to maintain their production **“offshore**”.

In Asia-Pacific, countries such as Vietnam are increasingly seen as a substitute. It has recently seen a major relocation of low-end manufacturing suppliers to the country, as it allows them to avoid US tariffs from the China-US trade war (Li 2019).

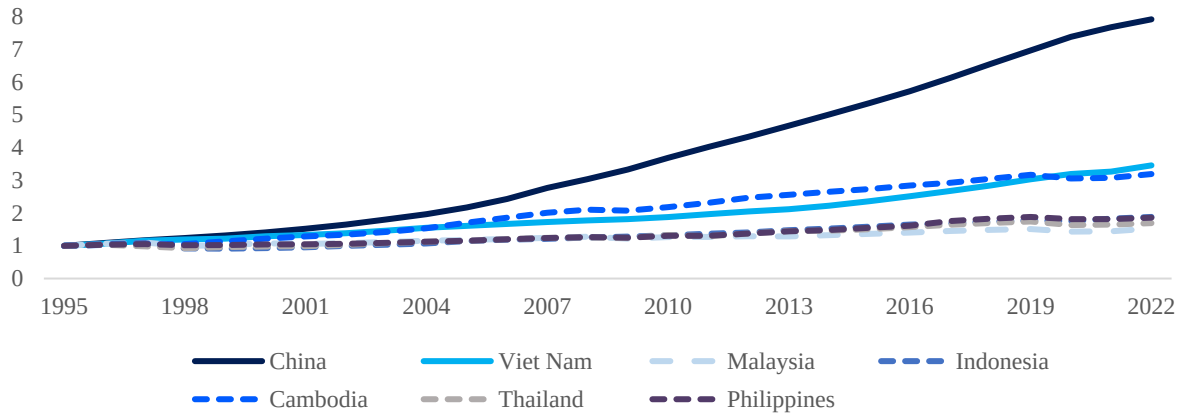

Figure 7 – Percentage Growth of GDP per person employed (Labour Productivity) 1995-2022 (constant 2017 PPP $)– Own Work – Data from The World Bank Data Center

In addition to similar economic indicators and a low-cost profile, the Vietnamese economy has experienced a significant increase in labor productivity in recent decades. As shown in *Fig. 7*, Vietnam had the second fastest growth in labor productivity between 1995 and 2022, growing by more than 300% over this period, second only to China, which grew by a factor of 8. Manufacturing in this country offers firms the opportunity to benefit from a young workforce, low labor costs and fewer government regulations. As such, Vietnam presents a solid alternative to China in the scenario where companies want to decrease their continued reliance on China. (The World Bank 2014). Besides Vietnam, other options have been explored to find alternatives to China and try to reduce the over need of this country as a crucial source of goods, producer, and manufacturer for several multinationals. Also, India has been indicated as a potential new player given its predicted growth potential, achieving the status of the world's second-largest economy by 2075. The importance given to the Indian market has been growing and it is currently the second biggest smartphone market around the world regarding shipments and sales, representing 12% of the global market.

3. Group Part: Methodology

As a guiding framework for this research journey, the combination of our quantitative and qualitative data analyses provided a well-rounded and data-driven perspective on the subject matter, enhancing the reliability and rigor of our findings. In this chapter, we introduce the research methods employed in our exploration of the subject. We emphasize the selection of quantitative and qualitative methods and discuss data collection strategies, including the use of interviews and surveys. Additionally, we will elaborate on the criteria that influenced the selection of the three case study companies. This segment of the study functions as a bridge connecting theoretical foundations to empirical investigation, ensuring alignment with research objectives, and facilitating a comprehensive approach to addressing the research question.

3.1. Data Collection Methods

3.1.1. Expert interviews

Our investigation involved in-depth interviews with industry experts and supply chain specialists. We engaged in conversations with professionals from renowned companies in the Automotive, FMCG, and Luxury sectors. These interviews added a qualitative layer to our analysis, allowing us to tap into the wealth of industry-specific knowledge and experience held by these experts. One of our primary objectives was to gain comprehensive insights to understand the historical dynamics of the supply chain and the reliance of firms on China. Additionally, we sought to glean insights into the forecasted industry trends based on the experts' profound knowledge and expertise. We aimed to uncover historical trends, patterns, and critical events that have shaped supply chain strategies and China's role within them. Furthermore, our discussions with these experts allowed us to tap into their collective knowledge to project and anticipate the evolving landscape of each industry. More in-dept details (interview questions) and takeaways can be found in the *Appendix*.

Name	Role Description	Industry
Elly Zwaal	Supply Chain Executive and Board Member as well as Independent Advisor, with 20+ years' experience in supply chain management at Unilever and Friesland Campina	FMCG
Associate Professor Catherine da Silveira	Associate Dean for International Affairs and Partnerships at Nova SBE, with 14+ years of executive experience at L'Oreal Group and Bull Portugal	Luxury
Anonymous*	Executive Board Member responsible for Contract logistics at a large Multinational logistics provider with +10Bn. USD in Revenue	FCMG, Luxury, Automobile
Anonymous*	Regional Director (Asia) at a large Multinational logistics provider with +10Bn. USD in Revenue	Automobile, FCMG

**These two experts asked us not to disclose their names or the name of the company in the report*

Table 1 – Expert Interviewees Description – Own Work

3.1.2. Quantitative survey (35 Responses)

In addition to expert interviews, we identified a select pool of industry professionals who possessed direct experience and knowledge relevant to our research objectives. The 35 participants were chosen from a wide spectrum of backgrounds and sectors, including retail, manufacturing, and business. We recognized the sensitivity of certain supply chain information, especially concerning reliance on specific countries like China, which some employees may not be permitted to disclose due to company policies. With this in mind, our survey questions were intentionally crafted, allowing respondents to comfortably provide insights without breaching any confidentiality constraints.

The survey was sent electronically to the chosen participants, ensuring easy access, and streamlined data collection. Once the survey responses were collected, our data analysis process involved examination in Excel, a versatile tool that allows us to distill the collected data into measurable information. The key initial steps to rectify any inconsistencies or errors in the dataset after importing the survey data into Excel, was data cleaning and validation, ensuring that all responses were accurately recorded. This allowed us to quickly generate relevant summaries of the dataset, breaking it down into various categories, such as industry, experience level, or geographic scope of operations, and ultimately draw meaningful conclusions. A more

thorough presentation of the questions, findings and data tables can be found in the appendix. The last question of the survey allowed for participants to contribute with comments and share insights about the main theme, the most relevant were the following:

Respondent ID	Industry	Comment
3	Manufacturing	My company is primarily a exporter to China (23%of our total sales), more than importer. Therefore, we see a great risk exposure to China from a supplier point of view. We are increasing our sales in Europe, America's, and India to compensate a gradual decrease of our sales to China.
6	Technology	We are mainly currently hoping for local (European) suppliers of hardware to be able to offer more of a competitive offering compared to their Chinese competition. Especially in terms of price. As supply chain issues during Covid-19 caused significant extra costs, we are very interested in more localized sourcing.
8	Manufacturing	Our company is still dependent on certain raw materials from China, which we are increasingly trying to source from other countries due to the supply disruptions we experienced during Covid-19.

Table 2 - Selected comments from the survey – Own Work

The survey yielded various valuable observations from executives in eight industries. For example, over 40% of respondents believed that a complete decoupling from China was not feasible for their company. Additionally, more than 55% stated that rebalancing their supply chain could potentially increase their costs (refer to appendix 10.6 for the figures).

3.1.3. Dataset collection and analysis

In pursuit of a comprehensive and industry-specific dataset for our thesis, we engaged in a meticulous and tailored process for the comparative analysis of case study companies. This involved collecting extensive information from key players in three distinct industries: automotive, FMCG, and Luxury.

When choosing the industries, firstly, we considered whether the firm operated in a joint venture, then, we focused on gathering indicators such as revenue, regional sales data, with a particular focus on the Asia-Pacific region, bottom-line income generated by China in terms of operating income, and whether supply chain risks related to China were mentioned in the firms' annual reports. We emphasized indicators like market share, revenue originating from Asia, and the proportion of supply chain reliance on China as these metrics allowed us to assess their competitive positioning, market penetration, and operational efficiency within fast-paced and

consumer-driven sectors. Luxury brands balance exclusivity with availability when building their strong brand image, making these indicators crucial for understanding fashion industry dynamics. Our data collection process involved delving into public companies financial, annual reports, and performance indicators, all of which were organized into a structured data set.

Subsequently, we embarked on a step-by-step examination of these industry-specific indicators, considering each industry's unique challenges and opportunities. For this process we used Excel, as a tool to help us organize data and apply analysis techniques to extract insights. This included creating pivot tables and charts to visually represent facts and to identify relationships between key indicators, ultimately to determine the significance of our findings. These steps allowed us to draw comparisons and discern industry-specific trends and patterns.

This way we could deliver suggestions for firms of our three use cases that align precisely with the unique dynamics of each industry, enhancing the relevance and applicability of our research findings (*Table 3* below). Bearing in mind that the total dataset per industry can be found in the Appendix, below is an overview of the number of selected companies (*Table 4*).

Industry	Variables collected
Automobile	Name, Type, HQ Country, Market Cap, No. of Employees, Revenue, EBIT, EBIT Margin, do they produce in China (binary), Are they operated in a joint venture (binary), Revenue from China/Asia-Pacific (% of total revenue), ***Vehicle Sales to China/Asia Pacific (in % of total vehicles),*** Does the Annual Report mention supply chain risks related to China (binary)
Luxury	Same main variables, ***Total No. of operated stores worldwide, Total No. of Operated Stores in Asia, Total No. of Operated Stores in China***
FCMG	Same main variables

*Variable in blue was industry specific

Table 3 – Dataset Variables Overview – Own Work

Industry	No. of companies	Avg. Percentage of Revenue from China/Asia-Pacific
Automobile manufacturer	9	16%
i. Autosuppliers	10	14%
FCMG	9	16%
Luxury	14	33%
Total	**42**	**20%**

Table 4 – Dataset Overview – Own Work

4. David-Alexander Harings Moya – Volkswagen's case study analysis

6.1. The landscape of Western automakers in China

Since its gradual opening to global markets, China has experienced unprecedented development to become the world's largest producer and market for passenger cars. This development has led to the country hosting almost all significant global original equipment manufacturers (OEMs), which are companies that design and manufacture the original components and systems used in vehicle production. Therefore, this includes not only foreign component manufacturers but also a growing number of domestic manufacturers spearheading innovation in the electric vehicle (EV) landscape (Wenten 2020). With just over 27 Mio. cars produced in 2022 and 23 Mio. cars sold in the same year, China has not only overtaken Germany as the world's second-largest exporter of cars (Bloomberg 2023), but nowadays also accounts for a third of global production (Wenten 2020).

As discussed by Wenten (2020), the vast size of the Chinese market, the attractive prospect of lower production costs and the necessity of strategic expansion for most established automakers, resulted in original equipment manufacturers (OEMs) agreeing to enter the market on the unique condition of local production in joint ventures (JVs) with state-owned enterprises (SOEs). In turn, this benefitted the local economy through the downstream transfer of technology, management skills and the establishment of various domestic research and development (R&D) centers (Paba 2022). As a result, nowadays almost all foreign carmakers and auto suppliers are producing and operating in China in the form of joint ventures, with the notable exception being Tesla (as shown in *Fig. 17*).

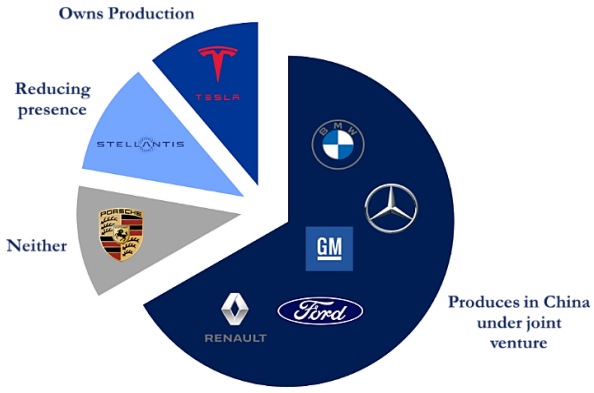

Figure 17 – Automobile Industry: Western Automakers producing under joint venture- Own Work- Source: Company Annual and Quarterly Reports (2022)

With the gradual easing of ownership restrictions from 2022, which previously imposed a maximum foreign ownership limit of 49%, now enabling foreign companies to attain up to 75% or even complete ownership, larger OEMs have a wider range of strategic options (Ministry of Commerce of the People's Republic of China 2021) (CNN 2021). In fact, some leading carmakers have recently explored the possibility of withdrawing or scaling back their Chinese operations and joint ventures. This includes Stellantis, which divested and terminated production activities in its joint venture with Dongfeng in 2022 (Bloomberg 2022). Only to then re-enter the market through a new joint venture, with the acquisition of 20% of Chinese EV maker Leapfrog (Stellantis 2023).

In contrast, other carmakers such as Volkswagen or BMW have consolidated their presence in China, increasing their stake in their joint ventures to as much as 75% (Sebastian 2022). Similarly, favorable market conditions and government support in the form of stimulus packages have encouraged many global suppliers such as Bosch, Continental, and Michelin to set up their own production and R&D facilities in the country. Taking the form of both joint ventures and wholly owned subsidiaries (Wenten 2020). Thus, creating the capital-intensive yet essential ecosystem for domestic car production that only a few select countries can offer. In contrast, other carmakers such as Volkswagen or BMW have consolidated their presence in

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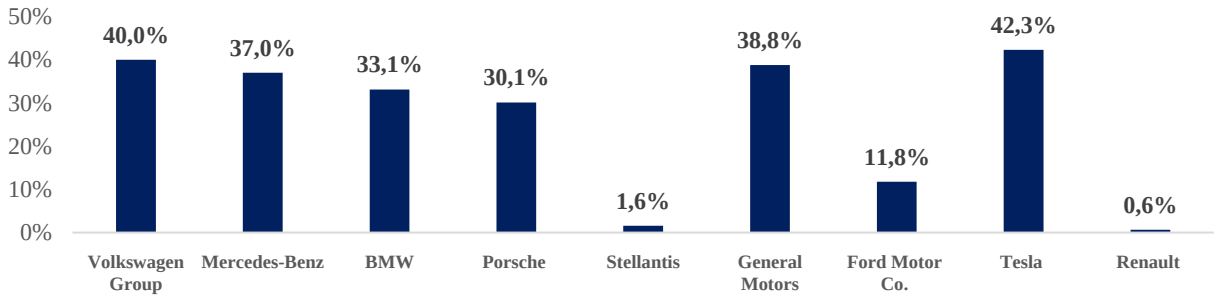


Figure 18 – Automobile Industry: Sales to China as a percentage of total vehicles sold per Company - Own Work- Source: Company Annual and Quarterly Reports (2022)

In addition, China is one of their key drivers of profitability and turnover (*Figure 19*):

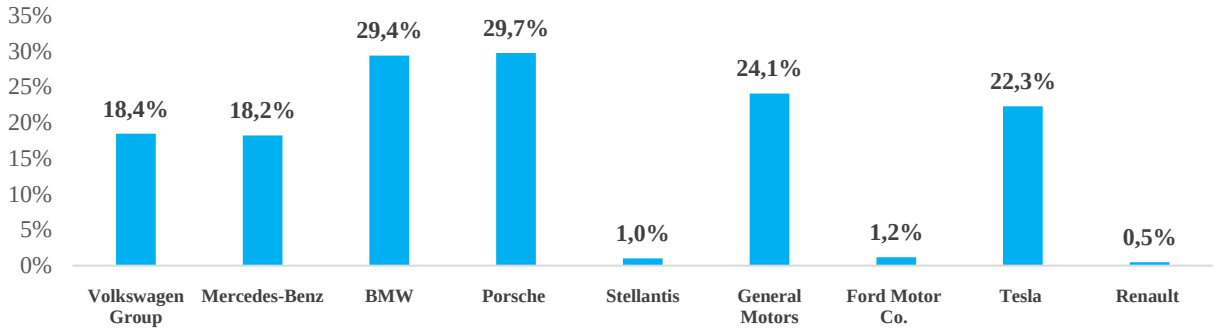


Figure 19 – Automobile Industry: Revenue from China/Asia-Pacific as Percentage of total Revenue - Own Work- Source: Company Annual and Quarterly Reports (2022)

In terms of embracing the Chinese car market, German manufacturers have been at the forefront of other Western companies. In 2022, German automakers, including Volkswagen and Mercedes-Benz, sold up to 40% of their productions in China and derived over 18% of their

revenues from the country. Notably, BMW and Porsche generated an even higher proportion, with almost a third of their total revenues coming from China. Similarly, US carmakers such as General Motors and the EV maker Tesla rely on China as one of their most important markets, while French carmakers have traditionally had a smaller presence there. Consequently, German and US auto suppliers have also embraced the Chinese consumer market, as shown in *Table 10* below:

Name	Type	HQ-Country	No. of Employees (Ths.)	Revenue in Bn. EUR	Produces in China?	Operating in a JV?	Revenue from China/Asia-Pacific (% of total revenue)
Continental	Auto supplier	Germany	199	39,4	Yes	Yes	12,0%
Schaeffler	Autosupplier	Germany	84	15,9	Yes	No	**22,7%**
Magna International	Auto supplier	Canada	168	36,0	Yes	Yes	10,3%
Michelin	Auto supplier	France	132	28,6	Yes	Yes	6,0%
Valeo	Auto supplier	France	110	20,0	Yes	Mixed*	15,9%
Lear	Auto supplier	USA	169	19,9	Yes	Yes	15,0%
Forvia	Autosupplier	France	150	25,5	Yes	Yes	**21,1%**
Goodyear	Auto supplier	USA	74	19,8	Yes	No	2,9%
Visteon	Autosupplier	USA	10	3,6	Yes	Yes	**22,0%**
BorgWarner	Auto supplier	USA	52	15,0	Yes	Mixed*	**21,4%**

**Mixed means that the company operates both in a joint venture and majority controls some of its plants in China*

Table 10 – Automobile Industry: Autosupplier Overview - Own Work - Sources: Company Annual Statements and Reports (2022)

Given the technological advances among Chinese car manufacturers and suppliers in the production of electronic vehicles (EVs) and their components (Teece 2019), Western car manufacturers have increasingly sought to partner with their Chinese counterparts and access the local technology ecosystem (Sebastian 2022). Subsequently, while most carmakers have adopted a localized approach to production and R&D, German carmakers in particular have moved towards an "in China, for the world" model. (Sebastian 2022).

For instance, German carmakers are expanding their local R&D capabilities and enhancing their software development, as exemplified by Mercedes Benz's recent establishment of a new China Tech Centre in Beijing (Mercedes Benz Group 2021). Although German car manufacturers, in

particular, continue to source the majority of their hardware components from non-Chinese companies such as Bosch or Qualcomm (Sebastian, 2022; Lüthje, 2022), China's dominance in the EV supply chain, both in terms of refining raw materials, manufacturing batteries and the technology stack, is driving Western automakers and suppliers to increasingly align their supply chain with the country (Sebastian 2022; McKinsey Global Institute 2020).

However, research on both the Chinese lithium supply chain (Na Zhou et.al., 2022) and the "semiconductor crisis" (Wu et.al. 2021; Frieske and Stieler 2022) has highlighted their vulnerability to external economic shocks, such as those experienced during the Covid-19 pandemic. With large-scale ripple effects impacting global car-manufacturing supply chains. In addition, China's prominence as a global manufacturing and distribution hub for automotive suppliers has also led OEMs to rely on Chinese-made auto parts outside the context of the regional Asian manufacturing market, both in the US and in Europe. (McKinsey Global Insitute 2020). These dependencies were particularly highlighted during COVID-19, when shutdowns in Hubei Province and a subsequent shortage of Chinese parts for assembly lines led to shutdowns in South America, Europe and Korea in 2020 (Xing 2022).

Overall, China's significance for Western Automakers has grown significantly over the years, not only due to the sheer size of the market and as a key driver of company profitability, but also increasingly as a local production and innovation hub, a location for key suppliers and, more alarmingly, as a major competitor in key growth technologies such as electric vehicles. Given this, Ola Kaellenius, CEO of Mercedes Benz, recently explained in an interview that decoupling from China, the world's second-largest economy, would make no sense and would be "unthinkable for almost all of the German industry" (Reuters 2023).

6.2. Introduction to Volkswagen

Founded in 1937 and headquartered in the German city of Wolfsburg, Volkswagen AG (VW) is the world's second-largest car manufacturer in terms of vehicles produced and the largest in

terms of turnover (Statista, 2022). Under the umbrella of the Volkswagen Group, it unites a portfolio of 9 car brands, which sell their vehicles in 153 countries and produce up to 250,000 cars per week in 72 plants globally (Volkswagen Group, 2022). With a turnover of more than 279 Bn. EUR in 2022 and 675,000 employees worldwide (Volkswagen, 2022), the car manufacturer is also of great importance to the German economy. With 270,000 employees in Germany alone, the company is the country's largest employer and makes an estimated contribution of up to 2.7% to the German GDP (Georgievski & Alqudah, 2016).

The German carmaker was also one of the first Western OEMs to enter the Chinese market and established a joint venture as early as 1978 (Wenten, 2020), with the success of this partnership quickly becoming a turning point in the company's history. Since entering the market, the Volkswagen Group has taken the leading market position, with 15% in 2022, and continually expanded its presence there. Nowadays it operates alongside its joint-venture partners up to 33 manufacturing plants, with around 90,000 employees (Volkswagen, 2022). As well as 7 R&D centres and more than 12 R&D partnerships, with the company planning to greatly expand its research capabilities in the country in the future (*Fig.* 19). As seen in *Fig. 19* below, German carmakers have continuously increased in the country over the last decade.

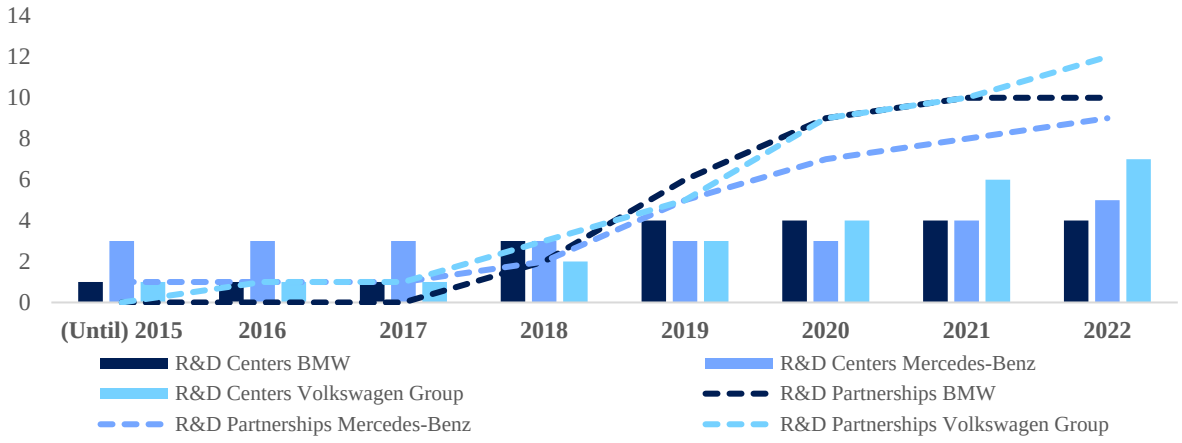


Figure 19 – Automobile Industry: Number of R&D Centers and Partnerships in China by Company- Adapted from (Sebastian 2022) - *Source: Company Annual and Quarterly Reports (2022)*

Moreover, the Chinese market has dominated both Volkswagen's top and bottom lines. With more than 40% of passenger vehicle sales (Volkswagen Group 2022) and at least half of its annual profits, which reached 22 Bn. EUR. in 2022, stemming from the country (White and Nillson 2023). Given its large presence and market significance, former Volkswagen CEO Herbert Diess even called China "Volkswagen's second home" (Bloomberg 2022).

This dependence on profitability, which was highlighted in particular at COVID-19, has led the company to increase its investment in China. Announcing up to 4 Bn. EUR worth of investment in 2022 alone (Volkswagen Group 2022). In accordance with this strategy, Volkswagen has increased its controlling majority in the latest joint venture with JAC to produce EVs from 50% to a controlling majority of 75%. (Paba 2022). However, this increased involvement in China has also led to rising pushback from German policymakers, who take a very critical view of such reliance by Germany's largest company (Miller 2022).

6.3. Supply chain analysis

Volkswagen's supply chain, like that of any other carmaker, is highly complex and multifaceted, involving different production stages and various levels of suppliers. Volkswagen's supply chain can be divided into *internal manufacturing*, which includes final assembly and production at Volkswagen Group's sites, and the *external multi-tier supply chain*, which consists of various layers of suppliers of critical modules and raw materials.

In the case of Volkswagen, *internal manufacturing* refers to and encompasses all supply chain steps carried out in Volkswagen's production plants as well as those of its JV partners, producing currently in 121 production sites on all continents except Oceania (Volkswagen Group 2022). Production concentrates in the hubs of Europe and Asia-Pacific, which account for 49% and 37% of production respectively (Volkswagen Group 2022). With 49 internal production sites producing components such as engines, transmissions, batteries, or steering systems (Volkswagen Group 2021). Given the company's willingness to maintain greater

control over its internal supply chain and globalized production under the "one. PRODUCTION" plan, there are significant supply chain linkages between the different VW hubs (as seen in *Figure 20* below).

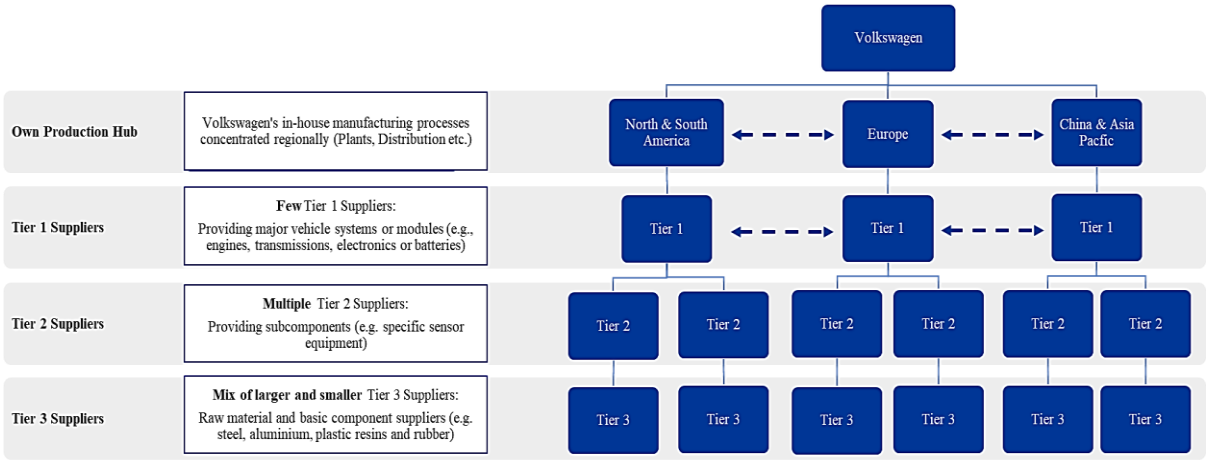


Figure 20 – Volkswagen Supply Chain Simplified - Own Work – Source: Company Presentations and Wu (2019)

In contrast, the *external supply chain* is much more complex. It includes over 59 Ths. (Thousand) suppliers, ranging from raw material providers to component manufacturers (Volkswagen Group 2023). Tier 1 suppliers also have globalized and interconnected production lines through strong collaboration ties with usually one carmaker (*Fig. 20* above). Such linkages provide greater production flexibility and efficiency, but also increase the carmakers exposure to external regional shocks along its supply chain.

6.4. China's role in the Volkswagens supply chain

In terms of supply chains, most carmakers traditionally follow a regional production hub model, in which manufacturing and sourcing are concentrated geographically (McKinsey Global Institute, 2022). For Western carmakers, China mainly being the manufacturing hub for the Asia-Pacific Region in their global value chain (GVC) (Hertenstein und J.Williamson 2018). However, contrary to other European carmakers, German OEMs generally only offshored the production of intermediate components, while they kept other stages of the production such as the final assembly and R&D, strictly domestic (Fana und Villani 2022). This has changed over

the last two decades, with an increasing share of localized assembly and the emergence of a strong Chinese automobile industry ecosystem.

Nevertheless, as we learned from an interview with a board member of a major logistics company, the supply chains of Volkswagen and other German carmakers find themselves in an increasingly complex situation. Although there is growing competition in China, VW is required to maintain local supply chains due to various factors that make market withdrawal impractical. These complex factors influencing VW's operations can be delineated into supply-affecting elements—like cost-effective labour and a robust supplier ecosystem—and demand-affecting aspects. Notably, the high demand for EV/High-technology cars by Chinese consumers is intricately linked to the availability of raw materials, manufacturing expertise, and technological prowess. This symbiotic relationship not only fuels demand but also propels further technological advancement within the local industry (*Figure 21*, below). This chapter explores the intricate dynamics of China's importance to VW's supply chain and its implications.

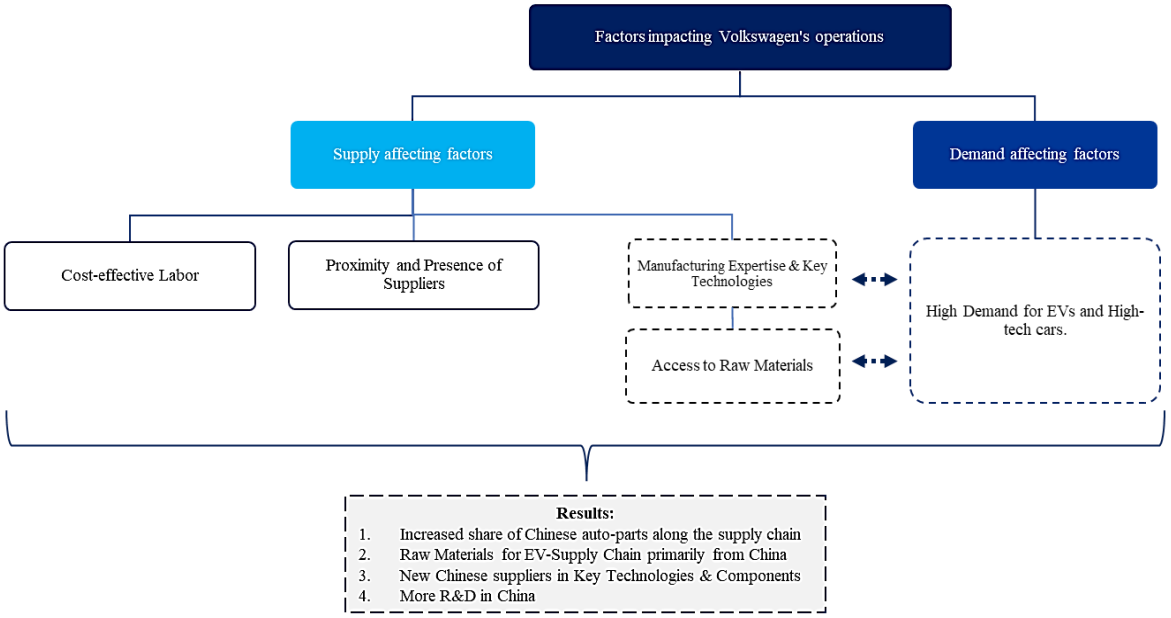


Figure 21 – Factors Impacting Volkswagen's Operations - Own Work

a) **Presence of cost-effective labour and proximity to key suppliers:** With car manufacturers having moved to China, automotive suppliers also followed suit. This has resulted in a significant rise in the proportion of car components originating from the country, owing to its lower production costs and strength as a manufacturing base. Volkswagen still primarily relies on traditional non-Chinese suppliers such as Bosch, Continental, and Qualcomm for most of their hardware components in internal combustion engines (Sebastian 2022). However, it is worth noting that many of these suppliers also depend on China within their own supply chains (ibid.). Moreover, the highly competitive and labour-intensive nature of the industry, with 85% of car costs made up of components and labour, still leaves most carmakers reliant on low-cost production hubs (Campbell, Sugiura and White). Consequently, it is estimated that more than 7% of the world's automotive components are exported from China. This has challenged previously regionalized value chains in automotive production networks, with OEMs in other parts of the world increasingly reliant on imported Chinese parts. In 2018, for instance, China exported 44 Bn. USD worth of auto parts, including 17 Bn. USD to North America and 8 Bn. USD to the EU (McKinsey Global Insitute 2020). Furthermore, the large, interconnected supplier ecosystem required to produce at this scale is found in only a few places in the world, making it difficult to shift production regionally without incurring additional costs. The result being an increased share of Chinese auto-parts across VWs and other carmakers supply chains.

b) **High demand for EV and other high-tech vehicles by Chinese consumers:** Through proactive state policies and industrial regulations, Chinese policy makers were able to set the right conditions for the unprecedented development and ownership of EVs by domestic manufacturers (Yeung 2019). Moreover, generous subsidies, stricter regulations, and an increased focus on sustainability have driven demand for EVs in China to some of the highest levels in the world (ibid.). With China being responsible for almost 40% (1.23 Mio.) of

worldwide EV production by 2017 (ibid.). Moreover, Chinese consumers can currently choose between 298 available EV models, which represents 62% more than in Europe (Sebastian 2022). However, the rise of these domestic manufacturers in a key growth market, which benefits from strong government incentives, threatens the established position of western OEMs and their joint ventures (Teece 2019).

With established German carmakers severely lagging in EV-market share in China (ibid.). One of the main reasons why Chinese EV manufacturers have been so successful, in addition to government support, has been their dominant access to the necessary raw materials, as well as their manufacturing expertise and domestic advancement in key related technologies such as batteries. This demonstrates the intricate relationship between *external supply-chain factors* and those on the *supply side*. As EV-technology becomes increasingly important in the future, Volkswagen is thus faced with the need to maintain its supply chains to and from China. However, this also opens opportunities for the company to leverage its position in the market to learn from and export the local technological capability.

c) **Access to Raw Materials:** China dominates the supply chain for electric vehicles, accounting for around 78% of global battery cell production capacity (Sebastian 2022) and approximately 41% of semiconductor manufacturing capacity worldwide (McKinsey Global Insitute 2020) (Frieske and Stieler 2022). Furthermore, China's access to raw materials is particularly significant, as it accounts for 95% of global rare earth exports. As a result, VW's increased exposure to China and the increased competition in the EV sector from emerging local brands are forcing Volkswagen to look for Chinese suppliers.

Given that the country dominates the refining and production of EV supply chain components, as shown in *Fig. 22* below. This new increasing dependency on China in Volkswagen's global supply chain is therefore manifested both in the country of origin of traditional components and in the selection of new suppliers.

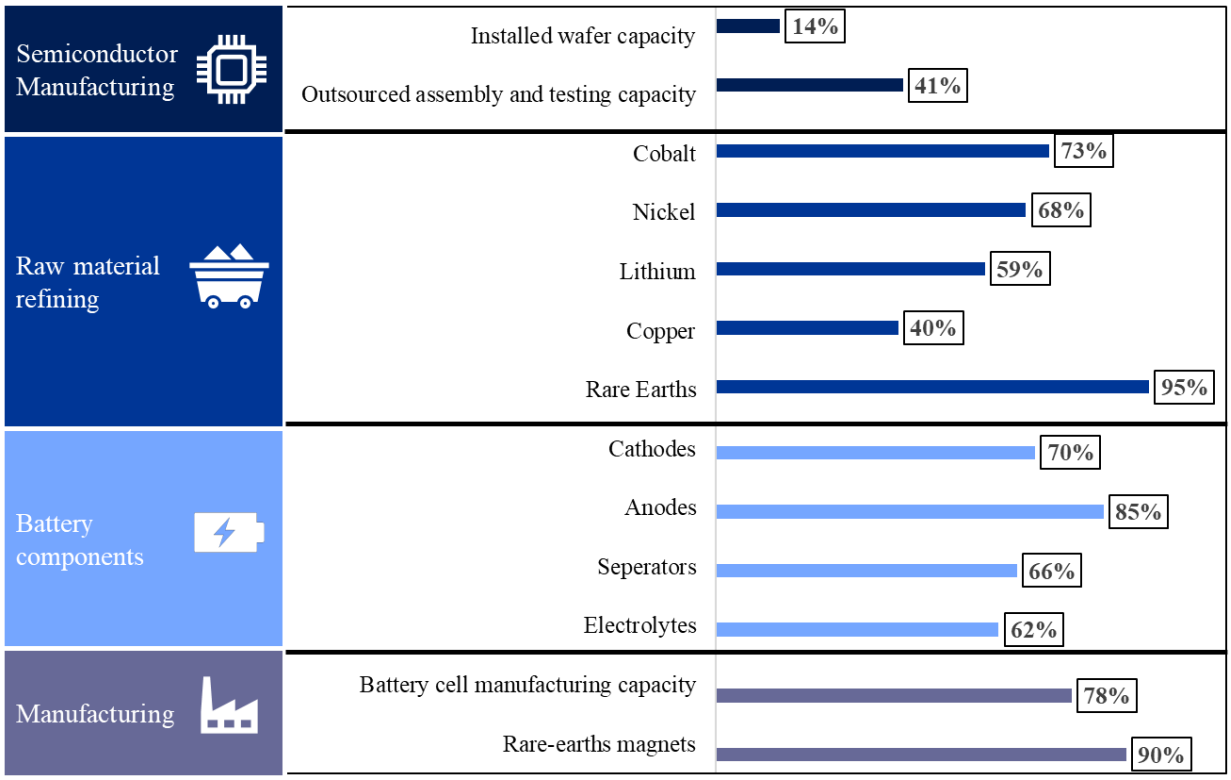


Figure 22 – Percentage of components and raw resources coming from China- Adapted from (Sebastian 2022) - *Source: McKinsey (2023), Statista (2020) , Bardt et al. (2022)*

d) **Manufacturing Expertise & Development of Key Technologies:** Volkswagen has entered several new partnerships with Chinese suppliers, such as battery manufacturer CATL, which is reversing the previous trend by building factories in Germany to serve its customer's localized production. (Sebastian, 2022). While hardware component supply chains are slowly adapting, China's dominance in the EV sector and its strong technology ecosystem is attracting OEMs to locate parts of their supply and value chain in China that were previously reserved for their domestic headquarters (Sebastian, 2022). This applies both to R&D and specifically to software development, which German car manufacturers have not previously outsourced to China for fear of intellectual property leakage. Now they are reversing this trend and investing heavily in their software development presence in China. With the result that domestic Chinese Tier 1 suppliers of key components and technology are playing a more prominent role in Volkswagen's supply chain.

e) **Increased R&D in China:** For its part, Volkswagen's software arm Cariad is aiming to double its number of engineers in China to 1,200 by 2023. (White & Nillson, 2023). Based on the approach "in China, for the world", former CEO of Volkwagen Group China, Stephan Wöllenstein, said in 2021, that he was exploring whether China-developed autonomous driving and software products could find uses in Europe (Sihan 2021). Given Volkswagen's strong commitment and dependence on the Chinese market at various levels, the company is increasingly having to redefine its future strategies to both contain the expansion of Chinese EV brands into its core markets, catch up in the development of key technologies and maintain its current market position in China.

6.5. Challenges and risks associated with VW's overreliance on China

As stated in Volkswagen's annual reports, the company itself has identified several risks and opportunities associated with its presence in China and the increasing exposure of its supply chain to the country (Volkswagen Annual Report 2022). These various risks, ranging from regulation and supply chain sourcing to exceptional cases such as Covid-19 and the Russian Invasion of Ukraine, illustrate both the company's vulnerability and a call to action for management.

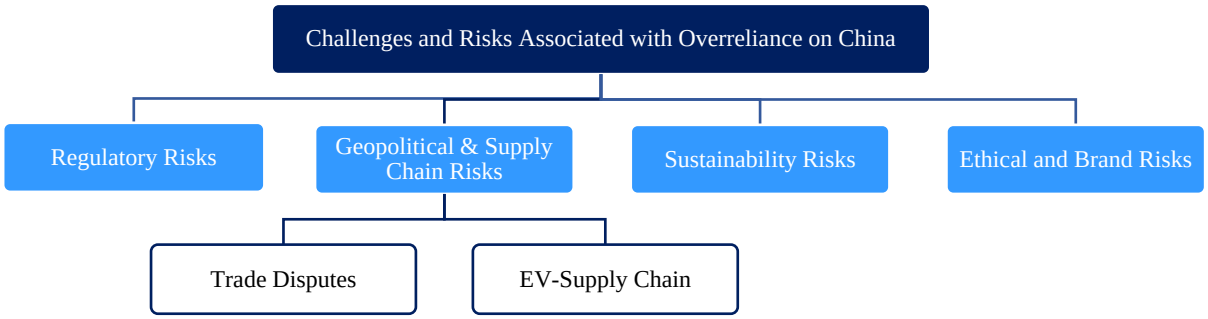


Figure 23 - Challenges and Risks for Volkswagen - Own Creation

a) Regulatory risks: Overreliance on a single market like China can expose Volkswagen to various regulatory risks. China frequently updates its regulations related to the automotive industry, emissions standards, and safety requirements (Teece 2019). Specifically, when it

comes to EV requirements and government incentives, China has frequently altered its policies (Yeung 2019). Additionally, although ownership rules regarding joint ventures have been relaxed, they could be subject to change in the future. Such alterations in regulations can impact product design, manufacturing processes, and market access for foreign automakers such as Volkswagen (Lüthje 2022). Similarly, China has enacted over the last years several policies that could restrict the export of technologies, with a focus on AI and autonomous driving (Sebastian 2022). This could pose a significant risk for automakers as cross-border data transfers become increasingly important. Furthermore, due to heightened scrutiny of economic and data-security relations with China, lawmakers in the EU and US may introduce new regulations and sanctions that could harm car manufacturers (Sebastian 2022). Therefore, Volkswagen will need to consider this growing exposure, as adapting to these changes can be both costly and time-consuming.

b) Geopolitical & supply-chain risks: Relying heavily on Chinese suppliers for critical components and materials can pose risks, especially if there are disruptions in the supply chain. Natural disasters, labour strikes, or other unforeseen events can disrupt the flow of essential parts, impacting production across Volkswagens production lines in other regions as seen during Covid-19. For example, EU-wide production losses due to a lack of Chinese parts amounted to 2.4 million vehicles in the main crisis months of March to May 2020 (corresponding to 13% of total production in 2019) ((Ando and Hayakawa 2021). Diversifying the supply chain geographically can help mitigate these risks, but overreliance on a single market given economic considerations may make such diversification challenging. For example, given the fierce cost competition between automotive suppliers and the labour-intensive production processes, China has long been at an advantage due to its relatively lower production costs and well-scaled industrial sector (Lüthje 2022). However, both Japanese and US car manufacturers have started to nearshore a proportion of their procurement and

production to reduce this dependency (ibid.). Something, German carmakers have found more difficult given the lack of regional alternatives (ibid.).

b.2.) Trade disputes: Ongoing trade tensions and disputes between major economies, including the U.S. and China, can and are leading to tariffs and trade barriers (Leoni, Qureshi und Parcels 2023). Such trade wars can negatively impact Volkswagen's profitability and competitiveness, especially if tariffs are imposed on automotive imports and exports. For example, China's announcement of possible retaliatory tariffs on the export of rare earths in 2023 could also have an impact on Volkswagen's EV production (Reuters 2023). An overreliance on China makes Volkswagen therefore particularly vulnerable to trade disputes and geopolitical tensions.

b.3.) The EV-Supply Chain (Chips, Batteries and Rare Metals): The Covid-19 pandemic exposed vulnerabilities in global supply chains, including semiconductor shortages. These shortages can disrupt automotive production, as modern electric vehicles rely heavily on advanced chips for various functions. As the world is largely dependent on Asian semiconductor suppliers, disruptions in the supply of these chips can significantly affect their production capacity and profitability. For example, in the first quarter of 2021, Volkswagen plants in Europe and Mexico were affected by semiconductor shortages, resulting in 100,000 fewer vehicles being produced (Frieske and Stieler 2022). As a result, Volkswagen had to both deepen relationships with semiconductor manufacturers and increase their strategic inventories (ibid.). Similarly, China dominates the manufacturing of EV-batteries as well the refining of necessary raw-earth metals, leading to a high dependency by foreign automakers and their suppliers on all tiers of the supply chain (shown in the *Fig. 24* below).

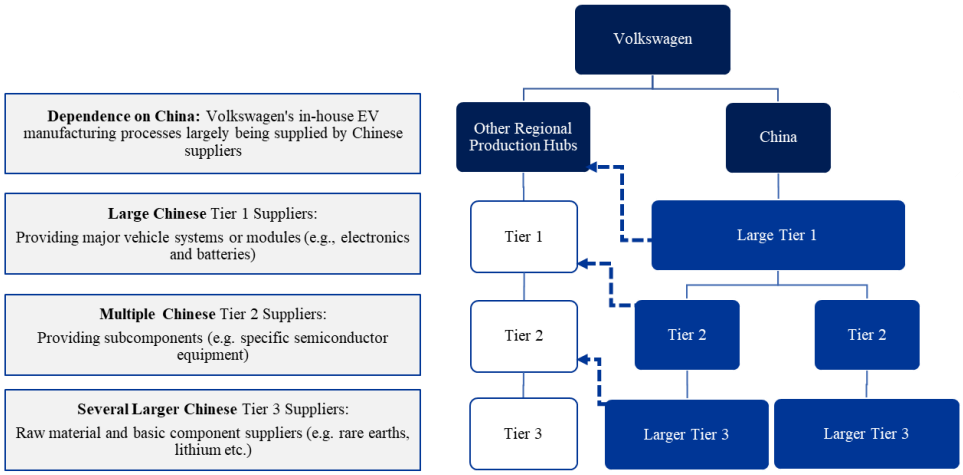


Figure 24 – Volkswagen EV-Supply Chain dependency - Own Work

c) Sustainability: With policy makers and consumers alike pushing for more eco-friendly products, Volkswagen is under pressure to both achieve a more sustainable supply chain and develop innovative technologies for lower-emission vehicles (Volkswagen Group 2022). New EU regulations, for instance, require a 30% reduction in CO2 emissions from heavy commercial vehicles by 2030 compared to the current benchmark. (ibid.) Hence Volkswagen needs to closely adapt its future product offering and focus on the latest mobility technologies, such as electric drivetrains (EVs) (ibid.). To build a more sustainable supply chain and avoid potential financial penalties, Volkswagen must also consider new innovative strategies in the areas of recycling to achieve more locally and circular production (Santos and F.Proenca 2022).

d) Ethical and Brand Risks: Volkswagen, like any multinational corporation, must adhere to ethical and corporate social responsibility standards. Overreliance on China can expose the company to ethical risks related to labour practices, environmental concerns, and human rights issues. For instance, there have been allegations in the past of forced labour by Muslim Uyghur workers in one of the company's joint venture car plants in Xinjang (Deutsche Welle 2023). These accusations leading to strong condemnation of the company by German and EU policy makers. Any negative publicity or scandals related to unethical behavior in China, such as labour rights violations or environmental issues, can harm Volkswagen's brand reputation

globally. Volkswagen is particularly vulnerable, having already suffered from a major pollution scandal dubbed 'Dieselgate' in 2014, which cost the company an estimated 32 Bn. EUR in fines and potentially more in brand value. (Deutsche Welle 2022). Moreover, given Volkswagen's strong connection to Germany as one of the brand's selling points, a stronger association by consumers with China could change this perception. While other car manufacturers such as Porsche are more thorough in cultivating their "Made in Germany" image (Miller 2021).

In conclusion, while China is a major and growing market for Volkswagen, overreliance on this market poses several risks, including regulatory changes, supply chain vulnerabilities, trade disputes, chip shortages, and ethical concerns. To mitigate these risks, Volkswagen may need to diversify its market presence and supply chain while ensuring compliance with local and international regulations and ethical standards.

6.6. Strategies recommended for Volkswagen to rebalance its supply chain

Volkswagen is acutely aware that it needs to address the challenges to its supply chain and more importantly regarding its growing dependence on China. While EU-lawmakers have increasingly called for a “decoupling” from China, industry leaders such as Mercedes Benz CEO Ola Kaellenius, have stated this to be impossible for the German automotive giants (Reuters 2023).While companies have started to prepare for “total exit” scenarios in the wake of the Russian invasion of Ukraine, it is worth noting that German industry's involvement with China is much more significant than with Russia. This raises the question of whether a decoupling at such a level would even be economically feasible in the event of a worst-case external shock. In contrast, it is much more feasible for companies to analyse the weak links in their supply chain and to "de-risk" these. Which, as discussed in our expert interviews with members of the logistics industry, has been a long-running debate among executives anyway, accelerating in the wake of Covid-19 and heightened geopolitical tensions.

Based on our findings, literature research, and expert interview we formulated the following strategies for VW to address its growing supply chain reliance on China (*Fig. 25* below).

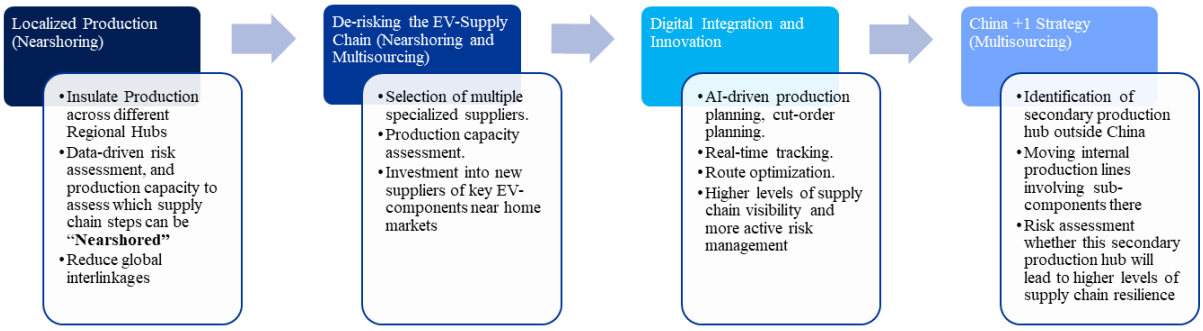


Figure 25 – Volkswagen Strategy Recommendations - Own Work

1) Localized China Strategy: export technology and produce components locally - In the case of VW, the management is trying to tread a fine line: On the one hand, it needs to protect its supply chain outside China from potential parts shortages. On the other hand, it needs to achieve local circular economies in its regional production hubs. VW's new strategy is therefore being touted as "in China, for China", a plan to localize production in the country to hedge against supply chain shocks and potential trade disputes (White and Nillson 2023). At the same time, the company is expanding its research and development presence there to capitalise on the country's technological lead and potentially export it "backwards" to its other markets in the key paradigm shifts outlined by Teece (2019): electric vehicles, autonomous driving vehicles and connected cars. The advantage of this strategy is that Volkswagen can compete with its emerging local rivals and defend its market share in its most important market. However, the ability of the company to leverage its data insights could be hampered by data regulations on both the Chinese and EU/US sides. In a related development, Volkswagen and other German carmakers are also increasing their number of partnerships and joint ventures in the country. While this may increase their exposure to the country to some extent, it can also act as a safeguard against domestic Chinese regulations.

2) De-risk EV-supply chain: Investing in domestic alternatives - Given the future demand for electric vehicles and China's dominance in the required supply chain, Western car manufacturers will need to find alternative, ideally domestic, sources for the required components. However, there are significant constraints on raw materials, particularly from a sustainability perspective. OEMs should focus therefore on hardware components, especially semiconductors and batteries. Some promising initiatives have already emerged, most notably the Swedish battery start-up Northvolt. (Volkswagen Group). Northvolt aims to produce e-batteries as an alternative in Europe and has already received a 1.4 Bn. USD investment from Volkswagen in 2021, in addition to 55 Bn. USD in orders from European car manufacturers (ibid.). European policymakers have also taken notice and have enacted policies seeking to support the development of a domestic industry (Bardt, Röhl und Rusche 2022). However, private companies such as Volkswagen play a crucial role through their investments and close supplier partnerships. Therefore, Volkswagen should redouble its efforts to promote reliable EV-supply chains (Schade, Haug und Berthold 2022).

3) Innovation: Digitalization and Recycling - Volkswagen could use digitalization to create circular economies and promote greater efficiency in local production and consumption. As Wu (2019) points out, the use of the Internet of Things (IoT) enables large companies to achieve even greater efficiency in on-demand production. Especially when integrated across partners and suppliers, the synchronization enabled allows for a far-reaching reduction in waste and inefficiency. Existing initiatives by competitors such as BMW have seen them set up a closed loop in China, to reuse raw materials such as nickel, lithium, and cobalt. They have also digitally integrated their recycling partners to gain further visibility (BMW 2022). Similarly, Volkswagen is already aiming to digitize its supply chain further. This enables them to identify external threats to its supply chain earlier and leverage synergies across the Group. The procurement division for instance could aim to standardize transactions and manage inventory

levels in real time, reducing transaction costs. This could be achieved through the integration of external software such as Catena-X or in-house development (Volkswagen Group 2022). While VW has already started various digital integration projects, the emergence and increasing availability of AI tools in supply chain software could increase the potential benefits and efficiency of such instruments. This argument featuring prominently in our expert interviews on the future of supply chain management, as well as inventory and route planning. Other carmakers, for example, are aiming to further connect their suppliers and partners digitally in China to improve the efficiency of their internal and external component production. Therefore, the use of digital integration, and in particular the increased use of AI and automated software systems, can significantly reduce supply chain dependencies.

4) Multisourcing: China +1 Strategy - Volkswagen should consider investing in the upstream sector outside China and building "fortresses" in terms of local circular economies in its various regional production centres. This means that the company should leverage its considerable influence on suppliers and increasingly move some of the necessary production lines abroad, with the help of digitalization and other innovative technologies that enable cost reduction (Sebastian 2022). This is a key topic of discussion in various industries, as highlighted in our expert interview with the Director of Asia for a major logistics company. This multi sourcing strategy, known as **"China+1",** sees companies moving parts of their more exposed supply chains to an additional hub outside of China. Countries such as Vietnam, Indonesia and India are particularly under consideration. Apple, for instance, has recently started to move parts of its supply chain to China (Liu e Reed 2023). While other carmakers such as BMW, already source some of their EV-components from multiple suppliers. However, this strategy doesn't work for all industries, as it often requires a supplier ecosystem to make it financially viable, which not every country can offer due to the large need for capital investments.

5. Group Part: Recommendations and Implications

5.1. Practical recommendations for companies to rebalance their supply chains

To better understand the key risk mitigation strategies and associated drivers of China's importance to international companies, we used specific weights in our calculations, listed in the Appendix, to combine our quantitative data with the qualitative findings mentioned in our methodology and literature. These analyses were based on the survey findings, company dataset and expert interviews we conducted (*Appendix 10.6*).

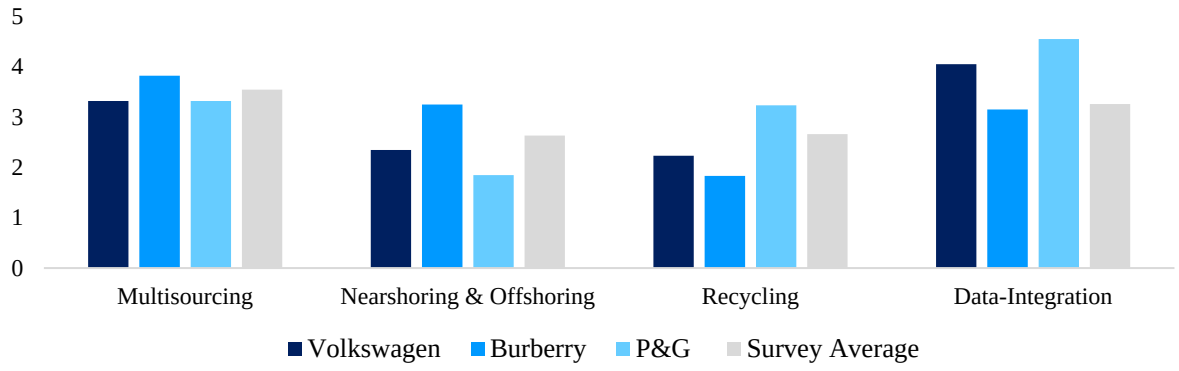


Figure 26: Mitigation Strategies – Own Creation

For Burberry, *Fig. 26* shows that the most relevant strategies were multisource, nearshoring and offshoring. Similarly, as shown by P&G, recycling can be effective for companies in dynamic industries such as FMCG. While data integration is an effective solution for companies with more complex multitiered supply chains such as P&G and Volkswagen.

Regarding risk analysis, our findings correlated with those of previous research, showing that the most relevant exposure for companies such as Volkswagen and Burberry was economic risk, due to their high dependence on the Chinese sales market and sensitivity to labor costs. Another commonality for all three firms were their relatively high exposure to geopolitical risks, with specification to the US-China Trade War. Lastly, supply chain risks like Covid-19, high reliance on Chinese suppliers and sustainability & brand risk were also relevant for all firms, but mainly to Volkswagen.

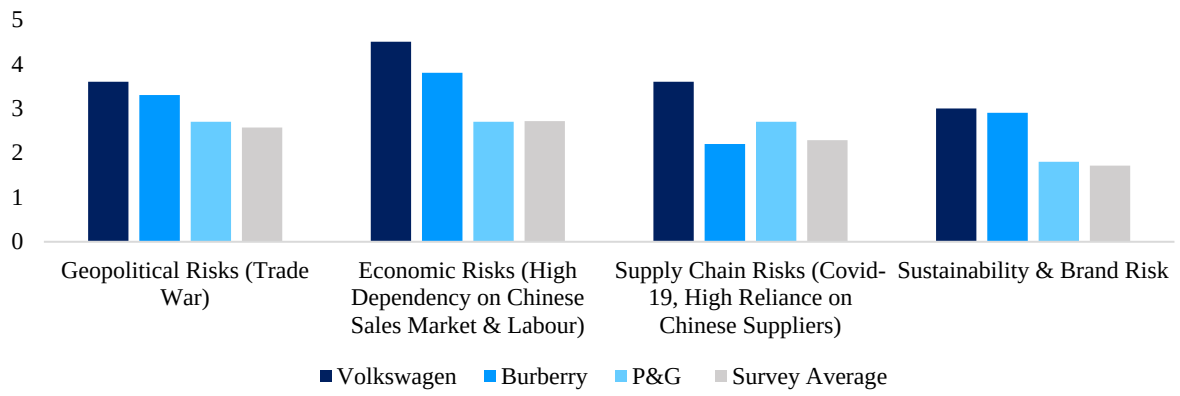


Figure 27: Supply Chain Risks in relation to China – Own Creation

Finally, when examining the factors contributing to China's success, market size and growth were identified as the most significant by all the companies analyzed. Access to raw materials and the regulatory environment were also seen by Volkswagen and the survey average as relevant advantages for the Chinese supplier market. Lastly, cost-effective manufacturing and access to skilled labor were again commonly seen as key reasons to keep producing in China.

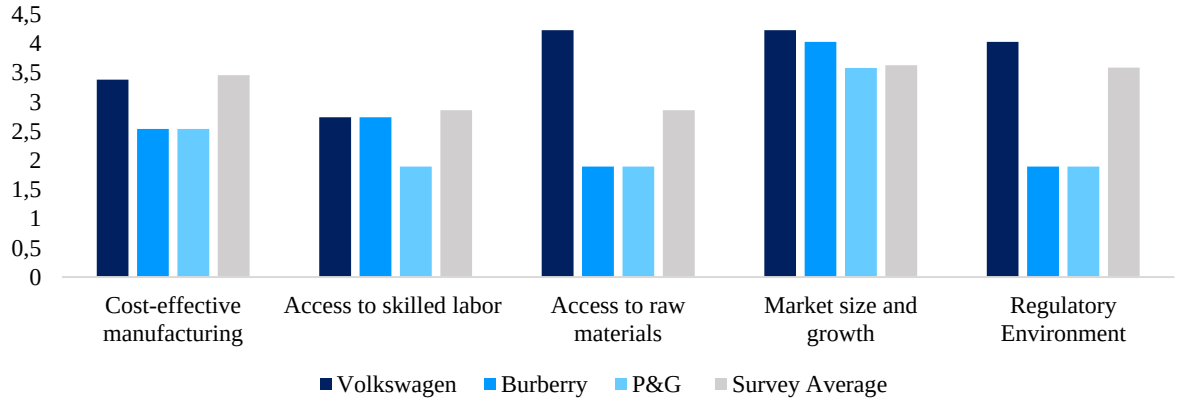


Figure 28 - China's significant success factors - Own Creation

5.1.1. Burberry

Using the Burberry case study, we make a strong recommendation for companies in the luxury fashion industry: the strategic imperative to maintain a diversified network of suppliers. This approach, when successfully implemented, offers multifaceted advantages, aligning with the contemporary dynamics of a global marketplace. Firstly, diversification stands as a cornerstone for resilience, in today's turbulent landscape. Swift adaptability, such as shifting production or

sourcing to unaffected areas, ensured business continuity. Moreover, for luxury fashion brands like Burberry, the proximity of sourcing and production locations to major markets carries immense significance. This is not a mere logistical consideration but rather a strategic choice rooted in market responsiveness. This principle extends its relevance to industries such as electronics and automotive, where speed-to-market can make or break a product's success. The close production with major markets brings another substantial benefit - the mitigation of currency exchange rate risks. In a globalized world, currency fluctuations can significantly impact pricing and profitability, therefore, businesses should aim to shield themselves from the currency exchange turmoil that plagues international trade, thereby ensuring pricing stability and financial predictability. Lastly, companies are well-advised to anchor their sourcing and production in regions known for economic and political stability when selecting a new supplier or production hub. This move insulates them from disruptive uncertainties that can reverberate through the supply chain. Geopolitical stability is imperative, and it finds relevance not only in the luxury fashion industry but also in sectors like pharmaceuticals and technology, where supply chain disruptions could lead to dire consequences. In conclusion, the diversification of supplier networks is not just a strategic preference; it's a business imperative rooted in the contemporary demands of a dynamic global marketplace. It offers a resilient shield against disruptions, the agility to respond to market dynamics, and the ability to secure currency stability.

5.1.2. Procter & Gamble

About Procter & Gamble’s case study, there are a few factors that must be kept in mind when firms want to rebalance their supply chains having a special focus in visibility and end-to-end integration. One take away from this firm’s example should be to diversify the supplier base and avoid depending on one single supplier. This will spread the existent risk and prevent disruptions when one of the existent suppliers has a problem or fails to deliver. Another vital

aspect is to guarantee a continuous evaluation on the quality standards that suppliers should keep and regularly monitor and audit their performances. For instance, P&G has distributed their operations in countries like Philippines, Thailand, Vietnam and Malaysia, but also have located the Global Business's Headquarters and their Innovation Centre in Singapore. The crucial decision is to progressively cut the emphasis given to Greater China and explore the other markets available. The FMCG giant has also shown a lot of examples of supply chain visibility which, among all its core characteristics, has been the most impactful one in its operational excellence and should serve as an example. The brand made a strategic alliance with EY and has developed its branded *Integrated Work Systems* (IWS) which encourages full ownerships and visibility from everyone but also promotes zero losses. Also, this underlines the importance of strategic alliances that promote crucial values like ownership and commitment to efficiency. P&G's best practice also includes developing contingency plans for multiple scenarios and ensuring collaboration between the entire supply chain, procurement and risk management. The company's promotion of supplier commercial and contractual flexibility enables constant adaptation to changing market conditions and a good quality relationship with suppliers. Additionally, compliance with government regulations in specific markets such as China helps to avoid future compromises in the supply chain and product delivery. Overall, P&G's supply chain strategy aims to increase efficiency by eliminating wastage and outdated processes, but also to use automation and digital transformation to better control the entire production line and have end-to-end integration, which allows the company to be more self-sufficient and resilient.

5.1.3. Volkswagen

Based on the analysis of the Volkswagen use case, companies in capital-intensive and regionally concentrated industries that are dependent on China's sales market or supply chain hub need to consider two aspects. How to maintain their competitive position in the Chinese

market, whilst also at the same time sufficiently insulating their other geographical business units from supply shocks. Therefore, companies should strive to localise production while using digital tools to enable circular economies. Given the capital intensity and scale requirements of the automotive industry, companies looking to move production outside of China may find it easier to nearshore some production steps given the potentially high costs of supply chain disruption. A McKinsey report, for example, estimates that external supply shocks otherwise could risk up to 24-40% of the affected company's EBITDA (McKinsey Global Insitute 2020). Furthermore, organisations should contemplate investing in domestic substitutes for crucial technologies, via collaborations with suppliers and direct investments. Besides, they must follow a multi-source approach to decrease their reliance on specific countries and suppliers. Additionally, exploring entry into high-growth markets, such as India, through local partnerships can facilitate a diversification of their share of Asian markets.

6. Group Part: Conclusion

6.1. Summarize the main findings and contributions of the research

Drawing insights from the Burberry, Procter & Gamble, and Volkswagen case studies, we distill practical recommendations to guide businesses in navigating the complex terrain of supply chain rebalancing. From the Burberry case study we learned that the strategic imperative for luxury fashion businesses lies in upholding a diversified network of suppliers through “multisourcing”. Our robust recommendation is anchored in the multifaceted advantages this approach offers. Diversification ensures resilience, agility, and the ability to respond to market dynamics. Proximity to major markets mitigates currency exchange risks, while anchoring sourcing and production in economically and politically stable regions insulates businesses from disruptive uncertainties. Embracing the 'Made in' authenticity resonates with sustainability aspirations, enhancing brand image and consumer trust. The Procter & Gamble model exemplifies the importance of visibility and end-to-end digital integration. Companies seeking

to rebalance their supply chains should diversify their supplier base to spread risks. Continuous evaluation of supplier quality standards and performance monitoring is vital. Moreover, strategic distribution in markets such as the Philippines, Thailand, Vietnam, and Malaysia, along with a diminished focus on Greater China, contributes significantly to enhancing supply chain resilience, where the implementation of supply chain visibility, strategic alliances, contingency planning, and flexible business practices emerges as pivotal drivers for reducing dependence on China. From the Volkswagen Case Study, we may infer that companies facing significant dependencies on China must balance maintaining competitive positioning. Localization of production, leveraging digital tools for circular economies, and a multi-source approach to decrease reliance on specific countries and suppliers are recommended. Investments in domestic substitutes for crucial technologies, collaborations with suppliers, and exploration of entry into high-growth markets such as India through local partnerships contribute to diversifying share in Asian markets. The path to supply chain rebalancing necessitates a holistic approach, incorporating diversified networks, strategic localization, and robust risk management practices. These recommendations offer a blueprint for companies to navigate the complexities of global supply chains and secure a resilient and adaptable future.

6.2. Restate the research question and hypothesis

Our study aimed to address the central research query: **"How can organizations rebalance their supply chains to mitigate overreliance on China?".** Additional subsidiary questions included China's significance to global supply chains (Q.1), whether companies considered rebalancing away from China (Q.2), the main challenges and risks related to overreliance on China (Q.3), and what strategies companies can employ to mitigate these risks. Our hypothesis posited that complete decoupling from China is unfeasible. Instead, companies would need a combination of strategies to de-risk their supply chains from industry-specific issues. In conclusion, utilizing a mix of quantitative and qualitative research, we answered not only all

subsidiary questions but also the central research query. Findings highlighted factors contributing to China's global supply chain significance, rooted in cost and quality efficiency due to skilled labor and specialized sourcing. Companies prioritizing a "balanced supply chain" considered rebalancing away from China, recognizing its frequent mention in their risk assessments. Challenges included vulnerability to trade disputes and government instabilities when overly reliant on the Chinese market. Mitigation strategies emphasized moving production closer, adopting multisourcing, enhancing visibility through digital automation, and continual risk assessment. Despite limitations, the study successfully addressed all questions, affirming the central focus on supply chain rebalancing.

6.3. Limitations

Based on the timeframe and scope of the master's thesis, several limitations in regards of the literature review, methodological research as well as the complexity of the subject matter impact our study. Firstly, although there is an abundance of existing research on supply chain interconnectedness and resilience in a globalized world, academic research on the reliance of specific industries on China or company use-cases is very limited. Also, there is little academic discussion on the relatively new concept of 'de-coupling' or de-risking of supply chains and the associated mitigation strategies, which can be very company specific. In addition, due to the broad scope of our thesis, we covered three different industries in our use cases. This limited our ability to provide in-depth details on each industry's supply chain, as well as the interconnectedness and role of lower-tier suppliers, as seen in the textile and automobile industries. Regarding our methodological research and findings, we were limited by the small number of respondents in our industry survey (n=35). This restriction is due to the nature of our survey, which targets industry professionals and those working at companies with supply chains to China. The constructed dataset we used for our study consisted of approximately n=42 companies. Due to the lack of information from private companies, we focused on public

companies in selected industries in North America and Europe. This reduced the number of corporations included in the dataset. As some industries, such as luxury goods, are secretive about sensitive data such as the percentage of components sourced from specific suppliers and their origin, information is also limited. Additionally, obtaining accurate supply chain and sales data from China can be a laborious process. Similarly, the limited academic discussion may stem from the issue's novelty and sensitivity, hindering executives' openness, especially in listed companies with a significant China presence. Many declined interviews, reflecting the political scrutiny. Some only agreed to be interviewed if their personal details and company name were withheld. Future studies should therefore ideally seek to work with companies to obtain more up-to-date and relevant supply chain data on China.

8.4. Suggestions for future research

Future research on this topic could expand upon the commonalities identified across the industries in our findings and explore these further. One possible avenue is to narrow the scope by focusing on a specific industry and delving into it supply chain reliance to China with more detail. Alternatively, researchers could explore further in-depth use cases of companies that are heavily dependent on China. In this respect, potential research could employ scenario analysis to examine the impact of decoupling or de-risking on supply chains to and from China, allowing the impact of different mitigation strategies to be quantified. As mentioned in some of our expert interviews, the integration of artificial intelligence into automated IoT applications for supply chain management could be another notable area of investigation. Whereas this paper primarily examines supply chain overdependence from a Western perspective, future research could also analyze the structural changes in the supply chain of high-tech sectors. For example, high-tech Chinese companies setting up production facilities in Europe establish an inverse supply chain dependence. Such an investigation would provide valuable insights into the broader discussion on supply chain dynamics.

7. References

- Accenture. 2023. "Supply Chain Disruption." *Supply chain networks of the future must have resilience and sustainability at their heart.*
- Ando, Mitsuyo, and Kazunobo Hayakawa. 2021. “Does the import diversity of inputs mitigate the negative impact of Covid-19 on global value chains?” *The Journal of International Trade & Economic* 31 (2): 299-320. doi:https://doi.org/10.1080/09638199.2021.1968473.
- Bardt, Hubertus, Klaus-Heiner Röhl, and Christian Rusche. 2022. "Subsidizing Semiconductor Production for a." *Econst Voice* 37-58. doi:https://doi.org/10.1515/ev-2022-0007.
- Bloomberg. 2022. *Stellantis to Sell China Automotive Assets After Jeep Move* . 10 19. https://www.bloomberg.com/news/articles/2023-10-19/stellantis-sells-assets-in-china-to-local-partner-dongfeng.
- —. 2023. *The US Hasn’t Noticed That China-Made Cars Are Taking Over the World.* 01 26. https://www.bloomberg.com/news/articles/2023-01-26/how-china-is-quietly-dominating-the-global-car-market.
- —. 2022. *Volkswagen Pulls Out All the Stops to Address China Challenges.* 06 30. https://www.bloomberg.com/news/articles/2022-06-30/volkswagen-pulls-out-all-the-stops-to-address-china-challenges#xj4y7vzkg.
- BMW. 2022. "BMW annual report." *BMW press releases.* https://www.press.bmwgroup.com/global/article/detail/T0410919EN/bmw-group-report-2022?language=en.
- Boston Consulting Group. 2023. *Revisiting the China Opportunity.* June 9. https://www.bcg.com/publications/2022/revisiting-the-china-opportunity.
- Bradsher, Keith. 2022. *NY Times.* https://www.nytimes.com/2022/03/15/business/covid-china-economy.html.
- Campbell, Peter, Eri Sugiura, and Edward White. 2022. *Carmakers quietly cut ties with China in supply chain shake-up.* 12 December. https://www.ft.com/content/d88955d4-2bc8-476e-9cdb-882ca3c3b10d.
- —. 2022. *Carmakers quietly cut ties with China in supply chain shake-up.* December 12. https://www.ft.com/content/d88955d4-2bc8-476e-9cdb-882ca3c3b10d.
- Carsten, Paul. 2016. *Foreign business fears further curbs with China's online rules* . https://www.reuters.com/article/us-china-internet-idUSKCN0VW106.

- Chopra, Sunil, and Peter Meindl. 2007. *Supply Chain Management: Strategy, Planning and Operation.* Pearson.
- Cincinnati Business Courier. 2019. "P&G recognizes top suppliers." February 7.
- CNBC. 2023. "India is a ‘slow trundling elephant’ but a viable alternative to China, says veteran investor David Roche." October.
- CNN. 2021. *China to remove limits on foreign investment in passenger car manufacturing.* December 27. https://www.cnbc.com/2021/12/27/china-to-remove-foreign-investment-limit-passenger-car-manufacturing.html.
- Dahlmann, Abigail, and Mary Lovely. 2023. "US-led effort to diversify Indo-Pacific supply chains away from China runs counter to trends." *PETERSON INSTITUTE FOR INTERNATIONAL ECONOMICS.* September 6. Accessed November 20, 2023. https://www.piie.com/blogs/realtime-economics/us-led-effort-diversify-indo-pacific-supply-chains-away-china-runs-counter.
- Deutsche Welle. 2023. *Volkswagen: 'No evidence' of violations at Xinjiang plant.* 2 28. https://www.dw.com/en/volkswagen-china-no-evidence-of-violations-at-xinjiang-plant/a-64842661.
- —. 2022. *VW pays millions in 'Dieselgate' settlement in Britain.* 5 26. https://www.dw.com/en/vw-pays-millions-in-dieselgate-settlement-in-britain/a-61936459.
- Duehren, Andrew. 2022. "Janet Yellen Calls for Trade Overhaul to Diversify From China." *The Wall Street Journal*, July 19. https://www.wsj.com/articles/yellen-calls-for-friend-shoring-trade-to-diversify-from-china-11658200959.
- European Commission. 2023. "Commission welcomes political agreement on the Critical Raw Materials Act." *European Commission.* November 13. https://ec.europa.eu/commission/presscorner/detail/en/ip_23_5733.
- Fana, Marta, and David Villani. 2022. "Decomposing the Automotive Supply Chain: Employment, Value Added and Occupational Structure." *Structural Change and Economic Dynamics* 62: 407-419. doi:https://doi.org/10.1016/j.strueco.2022.04.004.
- Financial Times. 2023. "Why China ‘de-risking’ brings its own business risks." October 11.
- Frieske, Benjamin, and Sylvia Stieler. 2022. “The “Semiconductor Crisis” as a Result of the COVID-19 Pandemic and Impacts on the Automotive Industry and its Supply Chains.” *World Electric Vehicle Journal* (MDPI) 13 (189): 1-14. doi:https://doi.org/.

- Georgievski, Bojan, and Anas Alqudah. 2016. "The Effect of the Volkswagen Scandal." *Research Journal of Finance and Accounting* 7 (2): 54-57. https://www.researchgate.net/publication/292615368_The_Effect_of_the_Volkswagen_Scandal_A_Comparative_Case_Study.
- Group, Volswagen. 2021. "Group Management Report." *Production.*
- Hertenstein, Peter, and Peter J.Williamson. 2018. "The role of suppliers in enabling differing innovation strategies of competing multinationals from emerging and advanced economies: German and Chinese automotive firms compared." *Technovation* 70-71: 46-58. doi:https://doi.org/10.1016/j.technovation.2018.02.008.
- Hinrich Foundation Case Study. 2017. "P&G's 30-year contribution to China through FDI." 14.
- Hoek, Remko Van. 2020. "Responding to Covid-19 Supply Chain Risks." *Logistics* 4 (0023). doi:doi:10.3390/logistics4040023 .
- J.Zenglein, Max. 2020. *Mapping and Recalibrating Europe's Economic Interdependence with China.* Berlin: MERICS: Mercator Institute for China Studies.
- Kampton, Tahreem, Jasmine Tan, and Becky Chen. 2023. *Navigating the path to recovery amidst continuing challenges and uncertainties: Working Capital Index China Report 2023.* JP Morgan.
- Kern, Johannes, and Pascal Wolf. 2019. "Case study contribution to the OECD TIP Digital and Open Innovation Project." *OECD TIP Digital and Open Innovation project* 4-23. https://www.researchgate.net/profile/Johannes-Kern/publication/348189852_The_digital_transformation_of_the_automotive_supply_chain_-an_empirical_analysis_with_evidence_from_Germany_and_China_Case_study_contribution_to_the_OECD_TIP_Digital_and_Open_Innovat.
- Kolodko, Grzegorz W. 2023. "China and the Rebalancing of Globalisation." Chap. 7 in *China's Development and the Construction of the Community with a Shared Future for Mankind*, by L.Wang, 607-619. Social Sciences Academic Press. doi: https://doi.org/10.1007/978-981-19-7423-6_79.
- Leoni, Zeno, Mariam Qureshi, and Sandra Watson Parcels. 2023. "Sanctions when sanctions fail: Decoupling and US Policy towards china." In *The Routledge Handbook of the Political Economy of Sanctions*, by Ksenia Kirkham. New York: Routledge. doi:10.4324/9781003327448.
- Li, Shaomin. 2019. "The Relocation of Supply Chains from China and the Impact on."

- Liu, Qianer, and John Reed. 2023. "Apple moves towards India-made iPhone batteries in push away from China." December 6.
- Liu, Shuguang, Jun Lin, and Karen Hayes. 2010. “An agile and diversified supply chain: reducing operational risks.”
- Lund, Susan; Manyika, James; Woetzel, Jonathan; Barriball, Ed. 2020. *Risk, Resilience and Rebalancing in Global Value Chains.* McKinsey.
- Lüthje, Boy. 2022. "Foxconnisation of Automobile Manufacturing? production Networks and Regimes of Production in the Electric Vehicle Industry in China." Chap. 12 in *Economic and Social Upgrading in Global Value Chains*, by C.Teipen et. al., 311-333. Springer Nature Pagrave Macmillan. doi:https://doi.org/10.1007/978-3-030-87320-2.
- McKinsey & Company. 2022. "What is supply chain?" *What is supply chain?*, august 17: 6.
- McKinsey Global Insitute. 2020. *Risk, resilience, and rebalancing in global value chains.* McKinsey Global Institute, 67. https://www.mckinsey.com/capabilities/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains.
- Mercedes Benz Group. 2021. *Daimler invests in New Tech Center China.* https://group.mercedes-benz.com/company/locations/tech-center-china.html.
- Miller, Joe. 2021. *Porsche rules out Chinese factory as it hails cachet of ‘Made in Germany’.* 02 13. https://www.ft.com/content/d71660bf-ae2b-41b3-af99-1485b805c812.
- —. 2022. *Volkswagen and China: the risks of relying on authoritarian states.* 03 16. https://www.ft.com/content/7fe10b69-bc19-4aff-9b46-e0233e00c638.
- Ministry of Commerce of the People's Republic of China. 2021. "Special Administrative Measures for the Access of Foreign Investment." *National Development and Reform Commission of the Peoples Republic of China.* December 12. https://www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202112/t20211227_1310020.html.
- Morrison, Wayne M. 2019. *China’s Economic Rise: History, Trends, Challenges, and Implications for the United States.* Congressional Research Service.
- Musa, S. Nurmaya. 2012. "Supply Chain Risk Management: Identification, Evaluation and Mitigation Techniques." June.
- Na Zhou, Hui Su, Qiashong Wu, Shougeng Hu, DEyi Xu, Danhiu Yang, and Jinhua Cheng. 2022. "China's lithium supply chain: Security dynamics and policy

countermeasures." *Resources Policy* (Elsevier) 78: 1-12. doi:https://doi.org/10.1016/j.resourpol.2022.102866.

- Nicita, Alessandro, and Carlos Razo. 2021. *China: The rise of a trade titan* . April 27. https://unctad.org/news/china-rise-trade-titan.
- Paba, Sergio. 2022. "The Chinese automotive industry at a turning point. An Overview." *DEMB Working Paper Series* (University of Modena and Reggio Emilia, Department of Economics Marco Biagi and CSCC (Centro Studi sulla Cina Contemporanea)) (198): 1-59. doi:https://dx.doi.org/10.25431/11380_1290004.
- Pearce, John A. 2014. "Why domestic outsourcing is leading America's reemergence in global manufacturing."
- PwC. 2023. https://www.pwc.com/gx/en/about/pwc-asia-pacific/building-rebalanced-and-resilient-supply-chains.html.
- Randall, Chris. 2023. "China places export tariffs on graphite." *electrive*, October 20. https://www.electrive.com/2023/10/20/china-places-export-tariffs-on-graphite/.
- Reuters. 2023. *Cutting ties with China is 'unthinkable': Mercedes-Benz CEO Ola Kaellenius.* 04 30. https://economictimes.indiatimes.com/news/international/business/cutting-ties-with-china-is-unthinkable-mercedes-benz-ceo-ola-kaellenius/articleshow/99879491.cms.
- —. 2023. *VW ready to deal with China metal curbs; chipmakers play down fallout.* July 7. https://www.reuters.com/business/vw-ready-deal-with-china-metal-curbs-if-needed-chipmakers-play-down-fallout-2023-07-06/.
- Roy, Ananya Sinha. 2021. *Supply Chains: Diversifying in ASEAN Countries.*
- Sáenz, María Jesus, and Elena Revilla. 2014.
- Santos, Liane Pinho, and Joao F.Proenca. 2022. “Developing Return Supply Chain: A Research on the Automotive Supply Chain.” *Sustainability* 14: 1-24. doi:https://doi.org/10.3390/.
- Schade, Wolfgang, Ines Haug, and Daniel Berthold. 2022. *The future of the automotive sector: Emerging battery value chains in Europe.* European trade institute.
- Sebastian, Gregor. 2022. *The Bumpy Road Ahead in China for Germany's Carmakers.* Berlin: Mercator Institute for China Studies. https://merics.org/sites/default/files/2022-10/MERICS_China_Monitor_No79-Automotive-RD-in-China_EN_0.pdf.
- Shishodia, Anjaki, Priyanka Verma, and Vijaya Dixit. 2019. “Supplier evaluation for resilient project driven supply chain.” March.

- Sihan, Feng. 2021. . ***大众集****团如何下好先手棋？(How does the Volkswagen Group make a good first move?).* http://www.xinhuanet.com/auto/2021-01/22/c_1127011712.htm.
- Slone, Reuben, Paul Dittmann, and John Mentzer. n.d. *The new supply chain agenda – The Five Steps That Drive Real Value.*
- Statista . 2022. *Revenue of leading automakers worldwide in 2022.* https://www.statista.com/statistics/232958/revenue-of-the-leading-car-manufacturers-worldwide/.
- Statista Research Department. 2022. https://www.statista.com/statistics/744071/manufacturing-labor-costs-per-hour-china-vietnam-mexico/.
- Stellantis. 2023. *Stellantis to Become a Strategic Shareholder of Leapmotor with €1.5 Billion Investment and Bolster Leapmotor's Global Electric Vehicle Business.* October 26. https://www.stellantis.com/en/news/press-releases/2023/october/stellantis-to-become-a-strategic-shareholder-of-leapmotor-with-1-5-billion-investment-and-bolster-leapmotor-s-global-electric-vehicle-business.
- Tan, CK. 2023. "China vows to curb decoupling as U.S. adds supply chain safeguards." *Nikkei Asia*, November 29. https://asia.nikkei.com/Politics/International-relations/US-China-tensions/China-vows-to-curb-decoupling-as-U.S.-adds-supply-chain-safeguards.
- Teece, David. 2019. "China and the Reshaping of the Auto Industry: A Dynamic." *Management and Organization Review* (Cambridge University Press) 15 (1): 177-199. doi: 10.1017.
- The University of York. 2018. "The Effects of Risk and Reward Sharing on Quality Performance."
- The World Bank. 2014. "Skilling up Vietnam: Preparing the workforce for a modern market economy."
- Volkswagen Group. 2023. "Group Sustainability Report 2022."
- Volkswagen Group. 2021. "Production and Locations."
- Volkswagen Group. 2022. *Volkswagen Annual Report* . Wolfsburg: Volkswagen. https://annualreport2022.volkswagenag.com/_assets/downloads/entire-vw-ar22.pdf.
- Volkswagen Group. 2022. *Volkswagen Group at a Glance: Leading the Transformation.* Annual Shareholder Presentation 2022, Wolfsburg: Volkswagen

Group. https://uploads.vw-mms.de/system/production/files/cws/036/443/file/d0879113d18413d69027e176a2e16886c4ec9388/2022_VW_Group_at_a_glance.pdf?1683628406.

- —. 2021. *Volkswagen invests a further €500 million in sustainable battery activities with Northvolt AB.* 9 6. https://www.volkswagen-newsroom.com/en/press-releases/volkswagen-invests-a-further-500-million-in-sustainable-battery-activities-with-northvolt-ab-7246.
- Wenten, Frido. 2020. "The Automotive Industry in China: Past and Present." In *New Frontiers of the Automobile*, by Alex Covarrubias V. and Sigfrido M. Ramírez Perez, 279-300. Cham: Palgrave Studies of Internationalization in Emerging Markets. doi:https://doi.org/10.1007/978-3-030-18881-8_11.
- White, Edward, and Patricia Nillson. 2023. *Can Volkswagen win back China?* Financial Times. 23 05. https://www.ft.com/content/afad4566-6404-483e-934f-c905507bf1d0.
- World Bank. 2023. *Economic Policy & Debt: National accounts: US$ at current prices: Expenditure on GDP.* https://data.worldbank.org/indicator/NE.EXP.GNFS.CD?locations=CN.
- Wu, Xiling, Caihua Zhang, and Wei Du. 2021. "An Analysis on the Crisis of “Chips shortage” in Automobile industry - Based on the Double Influence of Covid-19 and Trade Friction." *Journal of Physics: Conference Series* (IOP Publishing) 1-5. doi:10.1088/1742-6596/1971/1/012100.
- Wu, Yi. 2019. *Achieving Supply Chain Agility: Information System Integration in the Chinese Automotive Industry.* Bejing: Palgrave Macmillan. doi:https://doi.org/10.1007/978-3-319-98440-7.
- Xing, Yuqing. 2022. "China and global value chain restructuring." *China Economic Journal* 15 (3): 310-329. doi:https://doi.org/10.1080/17538963.2022.2117198.
- Yeung, Godfrey. 2019. "‘Made in China 2025’: the development of a new energy vehicle industry in China." *Area Development and Policy* (Routledge) 4 (1): 35-59. doi:https://www.tandfonline.com/action/showCitFormats?doi=10.1080/23792949.2018.1505433.

8. Appendix

8.1. Expert interviews: questions, summaries and main takeaways

Below is a summary of the main takeaways from our expert interviews. Full transcripts for all four interviews are available on request.

Name	Main Takeaways
Elly Zwaal	**Dynamic nature of retail industry:** • The retail industry's dynamism is explored, revealing how companies adapt strategies based on understanding demand locations and identifying key suppliers. **Digital transformation as a key player:** • Digital transformation emerges as a pivotal force, reducing dependence on manual labour, enhancing efficiency in production and services, and minimizing errors. **Mitigation strategies for overreliance on Chinese Market:** • Six strategies, including multisourcing, nearshoring, partnerships, inventory management, risk mapping, and automation, are highlighted to mitigate the risks associated with overreliance on the Chinese market. **Evolution of sustainability and social media roles:** • Insights from Elly Zwaal emphasize the evolving roles of sustainability and social media in shaping company reputations, influencing information spread, and affirming decisions in supply chain management.
Catherine da Silveira	**Material Scarcity Challenges:** • Luxury brands face challenges in sourcing high-quality materials, leading to a strategic response to secure suppliers and exclusive contracts. **Strategic Reorganization and Shift in Sourcing:** • The complexity of luxury supply chains prompts a strategic reorganization, with a noticeable shift in sourcing to countries like Portugal and Romania, known for higher safety standards. **Ethical Scrutiny in Labeling Practices:** • Luxury brands engage in nuanced labeling practices, shipping items for final touches in Europe to claim the "made in Italy" label, inviting ethical scrutiny despite legal compliance.

Anonymous Board Member of multinational logistics firm	**Covid-19 Impact on Supply Chains:** • Quick responses during the pandemic led to discussions on heavy reliance on China, prompting strategies like China +1, multisourcing, and nearshoring. **Challenges and Opportunities in Nearshoring:** • Nearshoring to countries like Mexico and India is considered, particularly in the fashion industry. Concerns exist about the sustainability of low-price products. **Integrated Logistics and Automation:** • Customers prioritize integrated logistics, while automated systems connect stakeholder information for efficient deliveries in what's termed as automated logistics. **Risk Management in Logistics:** • The logistics industry integrates AI for high visibility and risk management, utilizing scenario analysis for simulations. **Automobile Industry Dynamics:** • The EV supply chain challenges the automobile industry, with innovation potentially altering dynamics as Chinese suppliers invest in European production facilities. **Global Shifts in Supply Chain Strategies:** • China +1 and China +2 are acknowledged realities. Countries like Vietnam, Mexico, Korea, Japan, Thailand, and India are seen as beneficiaries of nearshoring, each with its challenges. **Interconnecting Asia-Pacific Ecosystem:** • Proposals to interconnect the Asia-Pacific ecosystem with fewer links to China are explored as a potential solution to dependence concerns in the automobile industry.
Anonymous Asia Director of multinational logistics firm	**Supply Chain Management Considerations:** • P&G and Burberry need to balance strong local demand and the necessity to send supplies while managing their supply chains. **China's Economic Significance and Government Support:**

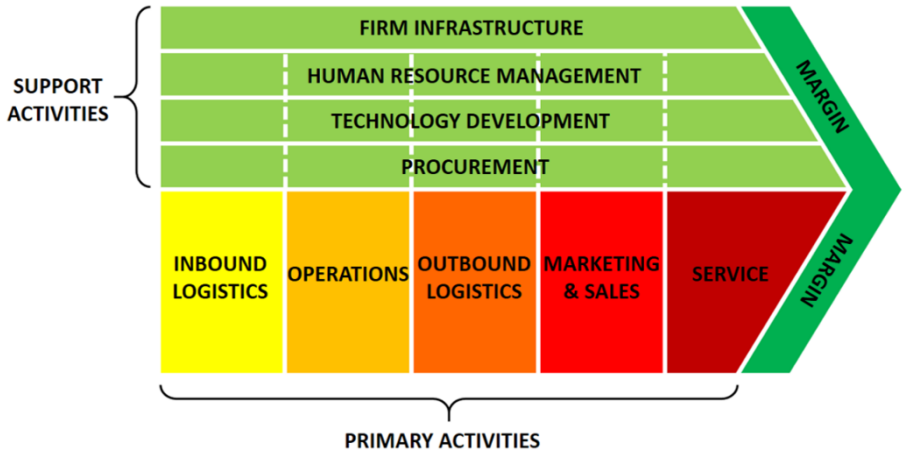
	• China, as the largest trading partner for many countries, has achieved scale and production per capita. The government's investments in infrastructure, supportive policies, and incentives have attracted numerous companies to establish a presence in China. **COVID-19 Impact and Policy Consistency Concerns:** • COVID-19's impact on Western perceptions was discussed, highlighting the continuity of Chinese production during the pandemic. Confidence in Chinese policymaking has wavered due to the emergence of the Omicron variant and other policy decisions, affecting economic factors and policy consistency. **Shifts in Industries and Global Supply Chains:** • Industries like the garment sector have moved to Vietnam, Bangladesh, and Pakistan, while China's unique OEM ecosystem around original automobile makers remains. Despite companies like Samsung moving production to Vietnam, the reliance on Chinese subcomponents and raw materials is still high for European or Western companies. **Executives' Concerns and Geopolitical Tensions:** • Executives' express confidence in supply chain functionality but harbor concerns about potential geopolitical tensions and associated problems.

Expert Interview Questions

1. Introduction and Industry Background:
    - Can you share more about your experience and the sector you work in?
    - How would you quantify the efficiency and resilience of your company's supply chain network, particularly in terms of its reliance on China as a sourcing destination?
2. Geographic Scope and Dependence:
    - Can you provide some insights into the geographic scope of your company's operations, particularly about China? Where does it depend on the most?
    - From your perspective, is China important to your company's supply chain? If yes, at which point of the supply chain exactly: cost savings, scale of production, or another factor?
3. Changes Over Time:

- How has the importance of China in your supply chain changed over time?
- Are there any specific factors that have affected your company's reliance on China in the supply chain, such as the pandemic or historical shifts in suppliers? If yes, how have these factors influenced your supply chain decisions?

4. Factors Contributing to China's Significance:
    - In your opinion, what are the most important factors contributing to China's significance in global supply chains?
    - How do these factors influence your company's strategic decisions?
5. Challenges and Opportunities in Diversification:
    - What challenges or opportunities do you foresee in the process of diversifying your supply chain away from China?
    - Which mitigation strategies do you think are the most promising in rebalancing supply chains from China? (multisource, reshoring, innovation in the supply chain such as new materials/recycling)
6. Value Chain Positioning:
    - Where on the value chain would you characterize your Chinese suppliers to be? (You may want to show a picture or explain the value chain)



Complementary Questions:

1. Supply Chain Resilience:
    - How would you describe the overall resilience of [industry] supply chains, particularly in the context of the challenges posed by the COVID-19 pandemic?
    - In your opinion, what were the key vulnerabilities exposed in [industry] supply chains during the pandemic?
2. Impact of the Pandemic:

- How has the pandemic influenced the dynamics of [industry] supply chains, especially concerning the reliance on China as a key manufacturing hub?
- Can you highlight any specific disruptions or bottlenecks experienced by [industry] supply chains due to the pandemic?

3. Diversification Strategies:
    - What are some effective strategies that [industry] businesses can employ to diversify their supply chains and reduce dependency on a single geographic region, such as China?
    - Are there notable examples or best practices within the [industry] for successfully implementing supply chain diversification?
4. Technology and Innovation:
    - How can technology and innovation play a role in enhancing the agility and responsiveness of [industry] supply chains, particularly in times of global disruptions?
    - Are there emerging technologies that you see as particularly impactful for [industry] supply chain management?
5. Collaboration and Partnerships:
    - To what extent do collaborative efforts and partnerships within the [industry] contribute to supply chain resilience and risk mitigation?
    - Are there examples of successful collaborations within the [industry] that have proven effective in navigating supply chain challenges?
6. Regulatory Considerations:
    - How do global regulatory changes or geopolitical shifts impact decision-making around supply chain diversification for [industry] companies?
    - Are there specific regulatory challenges or opportunities that [industry] businesses should be mindful of in their supply chain strategies?
7. Adapting to Change:
    - In your experience, how have [industry] companies adapted their supply chain strategies in response to changing global dynamics, and what lessons can be drawn from these adaptations?
    - Are there fundamental shifts in mindset or approach that you believe are necessary for [industry] businesses to proactively address supply chain challenges?
8. Sustainability and Ethical Considerations:

- To what extent do sustainability and ethical considerations influence decision-making in [industry] supply chain management, and how might these considerations impact diversification efforts?
- Are there specific sustainability practices that can align with efforts to reduce dependency on China within the [industry]?

Expert Interview 1: **Interview Summary with Elly Zwaal**

It allowed us to have a deeper understanding of how dynamic the retail industry works and how companies re-think their strategies and actions. The two main things that firms try to assess when defining strategies, understanding where demand is located and who and where are the key suppliers in the market. A key player in the market is and will continue to be digital transformation since automation grants to be less dependent on manual labour, be more efficient on production but also on services and will avoid repeated errors. Overall, there were 6 possible strategies mentioned to mitigate the risk of being over reliant on the Chinese market: 1) Multisourcing; 2) Nearshoring and Offshoring; 3) Partnerships – divide and conquer; 4) Inventory management – stock or just in time; 5) Risk Mapping; and 6) Automation. The interview ended exploring how sustainability and social media have been developing roles which affects companies' reputation and foster faster spread of information and affirmation of certain decisions.

All in all, Elly Zwaal provided several meaningful insights of how factors have been evolving and how do they affect supply chain management.

Expert Interview 2: **Interview Summary with Catherine da Silveira**

To start with the supply chain within luxury sector, we might mention a few obstacles mentioned by industry expert, Associate Professor Catherine da Silveira. Today, a new challenge has emerged for luxury brands, manifesting as a scarcity of high-quality materials. In response, an intriguing trend has gained traction, compelling these brands to acquire suppliers

and enter into exclusivity contracts. This strategic move not only ensures meticulous control over material quality but also addresses pressing environmental concerns. Notably, Profesor Catherine highlighted instances of luxury brands acquiring suppliers to secure unique materials, emphasizing the urgency fueled by the dwindling availability of specific resources, such as leather from particular goat breeds in India.

The complexity of supply chains has become a contemporary challenge, prompting luxury brands to strategically reorganize their sourcing strategies. Catherine astutely pointed out a discernible shift towards countries like Portugal and Romania—nations known for upholding higher safety standards despite the associated elevated costs. This strategic pivot is further evidenced by the resurgence of production in Europe, indicating a conscientious effort to regain control over the supply chain. An intriguing revelation emerged concerning labeling practices within the industry. To claim the coveted "made in Italy" label, some luxury brands engage in a nuanced process. Items manufactured in Asia are shipped to Europe for the final finishing touches, allowing brands to affix the European label. While this practice adheres to legal standards, it invites ethical scrutiny, as the last touchpoint becomes the determinant for the origin label, overshadowing the substantial portion of production occurring elsewhere.

Expert Interview 3: **Interview Summary with an anonymous board member of large multinational logistics company:**

Our discussion started on how during the Covid-19 crisis, many companies prioritized a quick response to prevent shortages of products. Two perspectives emerged: one from the supply side and one from the demand side. Their focus was on reacting to the situation. He mentioned that discussions about the heavy reliance on China were already taking place, but the pandemic accelerated these talks. This led to the adoption of strategies such as China +1, multisource, and nearshoring. Political instability and geopolitical tension between the US and China, IP issues,

and increasing labour costs in the south and west of China are significant concerns for companies. Additionally, the domestic Chinese market often requires specific Chinese products and adaptations, necessitating a local Chinese supply chain.

It is difficult to determine the best strategy to mitigate these issues, but nearshoring to countries like Mexico or India may be worth considering. The fashion and textile industry experienced an explosion like that of Shein, which is interesting from a volume point of view, but he feels that low price and low value does not have a long-term perspective, although there is a lot of demand for the products at the moment.

The customer is interested in three main characteristics, including integrated logistics that manage all transportation nodes. A healthcare manufacturer, which has its plants as well as contract manufacturers (PMO), may have up to 10,000 stakeholder locations, including distribution centers. These centers generate information about their needs. An automated system can connect all this information and automate deliveries. This is known as automated logistics. The logistics industry offers high visibility, which is crucial for risk management. Companies face various disruptions, including geopolitical tensions and environmental factors. To mitigate these risks, some companies link their supply chain footprint with artificial intelligence to monitor and develop strategies to prevent or mitigate potential risks. Scenario analysis is one way to simulate new supply chains. For example, it can show the potential outcomes of nearshoring or offshoring production. The ultimate goal is to have automated systems and generative AI make autonomous decisions. This could also improve the automotive sector in the future. The automobile industry is vulnerable to complexity due to changing technology. China has a clear advantage in the EV supply chain. It is interesting to see if innovation will bring changes to the supply chain, as many Chinese suppliers are building their production facilities in Europe, changing the dynamic of dependence.

The discussion of China +1 or China +2 is now a reality. Some countries, such as Vietnam, will benefit particularly if you look at all the indicators. However, it remains to be seen to what extent Vietnam can use this supply chain input to transform and grow its domestic market. Otherwise, it will never achieve the same significance as China but only serve as a production hub, which is interchangeable. Another country that benefits a lot from nearshoring is Mexico. However, setting up an ecosystem for the automotive sector, including moving automotive plants, can be very challenging and expensive. Asian hubs such as Korea and Japan have their brands and firms, while Thailand may be an interesting option. India will also benefit greatly in the healthcare sector and has huge potential. Consumer and electronics products will also largely move to China. The automobile industry's ecosystem is primarily located in China for the Asia-Pacific region. One solution to this problem is to interconnect the Asia-Pacific ecosystem with fewer links to China. It is important to note that there may be multiple solutions to this issue.

Expert Interview 4: **Interview Summary with the Asia Director of large multinational logistics company:**

We discussed various topics, starting with the fact that P&G and Burberry need to consider both the strong local demand and the need to send supplies when managing their supply chains.

We also discussed how China is the largest trading partner for most countries and has achieved high levels of scale and production per capita due to advancements in education and other factors over the last few decades. The Chinese government has invested heavily in local infrastructure and is supportive of foreign direct investment, offering tax breaks and incentives such as free or low-cost rent. As a result, many companies have established a presence in China in recent years. Regarding COVID-19 our Expert explained that some Westerners view it as a single continuum rather than distinct phases. In spring 2020, factories in China continued to

produce, keeping the global supply chains running. However, due to the emergence of the Omicron variant and other policy decisions, confidence in Chinese policymaking has decreased. Although economic factors remain, COVID-19 has led to a loss of confidence in policy consistency. In addition, there are issues between the US and China. From a purely economic point of view, labour costs have also slowly been rising in the south and west of the country. One example he provided was how the garment industry has already moved to Vietnam, Bangladesh and Pakistan in recent years. However, it is the OEMs around the original automobile makers that make China unique, as they have built a comprehensive ecosystem.

Another interesting insight was that although companies like Samsung are moving production to Vietnam, they only handle the final assembly and still rely heavily on subcomponents and raw materials from China. Therefore, the dependency for European or Western companies is still very high. He also mentioned that Executives are not worried about supply chains as they work relatively well. However, they are concerned about potential geopolitical tensions and problems that may arise. Discussing other candidates for China+1, our Expert mentioned India. However, he also stated that moving production there was difficult due to nationalistic economic policies and bureaucratic red tape.

Digital integration has numerous benefits, even in times of geopolitical tensions such as the recent Red Sea Attacks and the closure of the Suez Canal. Visibility has always been crucial, and technology must catch up quickly. Another noteworthy discussion item was that Chinese battery makers are building their plants closer to customers in Germany. Companies can access Chinese technology without the need to maintain local supply chains. BMW is an interesting example as they source from battery makers in Korea, Japan, and China. Although Korean and Japanese battery makers are not as developed as their Chinese counterparts. However, this dependency is quite large across many different sectors and can be found not only in the EV industry.

8.2. Survey: Questions

Below you can see an overview of the different questions which we used in our survey. It needs to be noted that we used an earlier version of the survey for the first questions, in which we had an additional industry (consulting). We also had an additional question to confirm whether participants were willing for us to use this data:

- 1. By participating in this survey, you grant us permission to use your responses anonymously as part of our quantitative analysis for the data set gathered from this survey (Yes/No)

Questions	Options to answer
Please select the option that best represents your primary industry or field	A. Healthcare B. Technology C. Finance and Banking D. Fashion E. Retail F. Manufacturing G. High-Tech/IT/Communication Equipment
Please select the opinion that best describes your professional background	Junior-level (2-3 years of experience) Mid-level (3-5 years of experience) Senior-level (6+ years of experience)
How extensive is your company's supply chain network that includes China?	A. Local (China-based) operations only B. Regional (China + neighboring countries) operations C. Global operations with China as a major hub D. Global operations with minimal reliance on China
On a scale of 1 to 5, how would you rate China's significance in the supply chain of your company? (1- least important, 5- most important)	From 1 to 5
How much do you estimate your company relies on raw materials or components from China within your supply chain, in terms of percentage?	A. Less than 25% B. 25% to 50% C. 51% to 75% D. More than 75% E. I'm not sure

In your experience, how susceptible has your supply chain been to disruptions related to trade disputes in China?	A. Highly susceptible B. Somewhat susceptible C. Minimally susceptible D. Not susceptible at all
In your experience, how susceptible has your supply chain been to disruptions related to COVID-19 pandemic?	A. Highly susceptible B. Somewhat susceptible C. Minimally susceptible D. Not susceptible at all
In your experience, how susceptible has your supply chain been to disruptions related to natural disasters (e.g. earthquakes, floods, typhoons) in China?	A. Highly susceptible B. Somewhat susceptible C. Minimally susceptible D. Not susceptible at all
Rank the factors that contribute to China's significance in global supply chains in order of importance. (1 = Least important, 5 = Most important)	A. Cost-effective manufacturing B. Access to skilled labour C. Access to raw materials D. Market size and growth E. Regulatory Environment
Have you or your organization ever considered rebalancing your supply chain to reduce reliance on China?	A. Yes B. No C. I'm not sure
In your opinion, how do you expect supply chain rebalancing away from China to impact your company's cost structure?	A. Significant cost savings B. Moderate cost savings C. Minimal cost savings D. No cost savings, potential cost increase E. I'm not sure
Would a total decoupling (the process of reducing or severing dependence and interconnections) from China be possible for your company's supply chain?	A. Yes B. No C. I'm not sure
Please rank the supply chain innovation strategies that are most relevant to your	A. Multisourcing (sourcing from multiple suppliers in different locations)

company/industry going forward about China (1 = least important, 5 = most important)	B. Nearshoring (moving production closer to your company's market) C. Recycling (process to improve resource management) D. Data-integrated and automated systems (IoT systems or AI-based)
Do you see nearshoring (moving production closer to your company's home market) as a viable option for reducing reliance on China in your supply chain?	A. Yes B. No C. Maybe
Which of the following supply chain strategies are you more inclined to consider for reducing reliance on China in your supply chain?	A. Multisourcing B. Nearshoring C. Recycling logistics D. None of the above

8.3. Survey tables and findings

Survey Table Screenshots

ID	Start time	Completion time	Email	By participating in thi	Please select the option that best represen	Please select the opti	How extensive is your company's supp
1	10.11.23 18:17:24	10.11.23 18:19:45	anonymous	Yes	Retail	Junior-level (2-3 years of	Global operations with minimal reliance on
2	10.20.23 8:45:02	10.20.23 8:47:56	anonymous	Yes	Consulting	Junior-level (2-3 years of	Global operations with minimal reliance on
3	10.25.23 17:46:05	10.25.23 17:53:20	anonymous	Yes	Manufacturing	Senior-level (6+ years of e	Local (China-based) operations only
4	10.25.23 23:00:12	10.25.23 23:05:42	anonymous	Yes	Technology	Senior-level (6+ years of e	Global operations with minimal reliance on
5	10.26.23 12:25:51	10.26.23 12:43:46	anonymous	Yes	Technology	Senior-level (6+ years of e	Global operations with minimal reliance on
6	10.30.23 18:48:24	10.30.23 18:57:40	anonymous	Yes	Technology	Mid-level (3-5 years of ex	Global operations with minimal reliance on
7	11.12.23 18:29:33	11.12.23 18:36:41	anonymous	Yes	Retail	Junior-level (2-3 years of	Global operations with minimal reliance on
8	11.13.23 19:13:43	11.13.23 19:28:31	anonymous	Yes	Manufacturing	Senior-level (6+ years of e	Global operations with minimal reliance on
9	11.13.23 20:13:08	11.13.23 20:13:34	anonymous	Yes	High-Tech/IT/Communication Equipment	Mid-level (3-5 years of ex	Global operations with minimal reliance on
10	11.13.23 20:13:38	11.13.23 20:14:07	anonymous	Yes	Retail	Junior-level (2-3 years of	Global operations with China as a major hu
11	11.13.23 20:12:10	11.13.23 20:14:40	anonymous	Yes	Fashion	Junior-level (2-3 years of	Global operations with China as a major hu
12	11.13.23 20:30:30	11.13.23 20:38:20	anonymous	Yes	Healthcare	Junior-level (2-3 years of	Global operations with minimal reliance on
13	11.14.23 16:28:47	11.14.23 16:36:44	anonymous	Yes	Manufacturing	Senior-level (6+ years of e	Global operations with minimal reliance on
14	12.7.23 2:30:58	12.7.23 2:39:38	anonymous	Yes	Consulting	Senior-level (6+ years of e	Regional (China + neighboring countries) op
15	12.16.23 15:39:12	12.16.23 15:41:48	anonymous	Yes	Finance and Banking	Junior-level (2-3 years of	Global operations with minimal reliance on
16	12.16.23 15:39:12	12.16.23 15:43:27	anonymous	Yes	Healthcare	Junior-level (2-3 years of	Global operations with minimal reliance on
17	12.16.23 15:44:53	12.16.23 15:48:30	anonymous	Yes	Manufacturing	Senior-level (6+ years of e	Global operations with China as a major hu
18	12.16.23 15:42:18	12.16.23 15:54:18	anonymous	Yes	Retail	Senior-level (6+ years of e	Global operations with China as a major hu
19	12.16.23 15:53:56	12.16.23 15:55:51	anonymous	Yes	Retail	Mid-level (3-5 years of ex	Global operations with China as a major hu
20	12.16.23 15:33:57	12.16.23 15:57:30	anonymous	Yes	Retail	Senior-level (6+ years of e	Regional (China + neighboring countries) op
21	12.16.23 16:01:22	12.16.23 16:06:35	anonymous	Yes	Manufacturing	Mid-level (3-5 years of ex	Global operations with minimal reliance on
22	12.16.23 16:10:33	12.16.23 16:12:39	anonymous	Yes	Finance and Banking	Junior-level (2-3 years of	Regional (China + neighboring countries) op
23	12.16.23 16:14:54	12.16.23 16:17:41	anonymous	Yes	Fashion	Senior-level (6+ years of e	Global operations with minimal reliance on
24	12.16.23 16:16:12	12.16.23 16:20:37	anonymous	Yes	High-Tech/IT/Communication Equipment	Senior-level (6+ years of e	Global operations with China as a major hu
25	12.16.23 16:37:54	12.16.23 16:41:35	anonymous	Yes	Finance and Banking	Junior-level (2-3 years of	Global operations with minimal reliance on
26	12.16.23 17:34:54	12.16.23 17:36:18	anonymous	Yes	High-Tech/IT/Communication Equipment	Senior-level (6+ years of e	Global operations with minimal reliance on
27	12.16.23 17:41:12	12.16.23 17:43:51	anonymous	Yes	Technology	Senior-level (6+ years of e	Global operations with China as a major hu
28	12.16.23 18:20:38	12.16.23 18:32:58	anonymous	Yes	Fashion	Senior-level (6+ years of e	Global operations with China as a major hu
29	12.16.23 18:42:55	12.16.23 18:44:59	anonymous	Yes	Finance and Banking	Junior-level (2-3 years of	Global operations with minimal reliance on
30	12.16.23 20:00:55	12.16.23 20:02:58	anonymous	Yes	Finance and Banking	Junior-level (2-3 years of	Global operations with China as a major hu
31	12.16.23 20:32:16	12.16.23 20:33:58	anonymous	Yes	Healthcare	Junior-level (2-3 years of	Global operations with minimal reliance on
32	12.18.23 1:16:21	12.18.23 1:18:18	anonymous	Yes	Fashion	Mid-level (3-5 years of ex	Regional (China + neighboring countries) op
33	12.18.23 1:18:22	12.18.23 1:22:03	anonymous	Yes	Manufacturing	Senior-level (6+ years of e	Global operations with China as a major hu
34	12.18.23 19:23:36	12.18.23 19:45:56	anonymous	Yes	Manufacturing	Senior-level (6+ years of e	Global operations with minimal reliance on
35	12.18.23 19:45:59	12.18.23 20:07:13	anonymous	Yes	High-Tech/IT/Communication Equipment	Senior-level (6+ years of e	Regional (China + neighboring countries) op

On a scale of 1 to 5, how would you rate China's significance in the supply chain of your company? (1- least important, 5- most important)	How much do you estimate your company relies on raw materials or components from China within your supply chain, in terms of percentage?
5	Less than 25%
1	Less than 25%
2	Less than 25%
3	Less than 25%
2	Less than 25%
4	Less than 25%
2	Less than 25%
2	Less than 25%
3	More than 75%
1	51% to 75%
4	More than 75%
2	Less than 25%
2	Less than 25%
2	25% to 50%
1	I'm not sure
2	Less than 25%
5	More than 75%
4	25% to 50%
4	51% to 75%
5	51% to 75%
2	Less than 25%
3	25% to 50%
3	25% to 50%
4	Less than 25%
4	51% to 75%
3	25% to 50%
4	51% to 75%
3	Less than 25%
3	I'm not sure
4	More than 75%
1	I'm not sure
5	25% to 50%
3	Less than 25%
3	Less than 25%
4	25% to 50%

In your experience, how susceptible has your supply chain been to disruptions related to trade disputes in China?	In your experience, how susceptible has your supply chain been to disruptions related to COVID-19 pandemic?
Somewhat susceptible	Highly susceptible
Not susceptible at all	Not susceptible at all
Minimally susceptible	Minimally susceptible
Somewhat susceptible	Somewhat susceptible
Minimally susceptible	Minimally susceptible
Minimally susceptible	Minimally susceptible
Minimally susceptible	Minimally susceptible
Somewhat susceptible	Somewhat susceptible
Not susceptible at all	Somewhat susceptible
Minimally susceptible	Not susceptible at all
Minimally susceptible	Somewhat susceptible
Somewhat susceptible	Minimally susceptible
Not susceptible at all	Somewhat susceptible
Minimally susceptible	Minimally susceptible
Not susceptible at all	Minimally susceptible
Minimally susceptible	Minimally susceptible
Somewhat susceptible	Highly susceptible
Highly susceptible	Highly susceptible
Somewhat susceptible	Highly susceptible
Highly susceptible	Highly susceptible
Minimally susceptible	Highly susceptible
Somewhat susceptible	Somewhat susceptible
Somewhat susceptible	Highly susceptible
Highly susceptible	Highly susceptible
Minimally susceptible	Highly susceptible
Somewhat susceptible	Somewhat susceptible
Minimally susceptible	Somewhat susceptible
Somewhat susceptible	Highly susceptible
Minimally susceptible	Somewhat susceptible
Highly susceptible	Highly susceptible
Not susceptible at all	Highly susceptible
Somewhat susceptible	Highly susceptible
Somewhat susceptible	Highly susceptible
Somewhat susceptible	Somewhat susceptible
Highly susceptible	Somewhat susceptible

In your experience, how susceptible has your supply chain been to disruptions related to natural disasters (e.g. earthquakes, floods, typhoons) in China?	Cost-effective manufacturing	Access to skilled labor	Access to raw materials	Market size and growth
Minimally susceptible	4	5	1	5
Not susceptible at all	4	3	3	4
Minimally susceptible	5	4	4	4
Somewhat susceptible	4	3	5	5
Not susceptible at all	1	4	2	5
Not susceptible at all	1	3	1	2
Minimally susceptible	1	3	2	4
Minimally susceptible	1	3	1	1
Not susceptible at all	3	2	2	2
Not susceptible at all	1	1	1	1
Somewhat susceptible	1	1	3	1
Minimally susceptible	3	3	2	4
Not susceptible at all	2	3	1	3
Minimally susceptible	2	2	2	3
Not susceptible at all	5	3	4	4
Minimally susceptible	5	4	3	5
Somewhat susceptible	5	2	3	4
Minimally susceptible	5	3	4	5
Somewhat susceptible	5	4	5	4
Minimally susceptible	4	3	4	5
Not susceptible at all	4	2	4	5
Minimally susceptible	4	3	4	5
Not susceptible at all	5	2	4	5
Minimally susceptible	4	4	1	5
Minimally susceptible	4	2	2	1
Somewhat susceptible	3	2	1	4
Minimally susceptible	5	3	5	3
Not susceptible at all	5	2	3	4
Minimally susceptible	2	3	2	2
Minimally susceptible	3	3	2	3
Minimally susceptible	2	3	1	3
Minimally susceptible	4	3	4	5
Minimally susceptible	5	3	5	4
Not susceptible at all	4	3	5	3
Not susceptible at all	4	3	4	4

Have you or your organization ever considered rebalancing your supply chain to reduce reliance on China?	In your opinion, how do you expect supply chain rebalancing away from China to impact your company's cost structure?	Would a total decoupling (the process of reducing or severing dependence and interconnections) from China be possible for your company's supply chain?
I'm not sure	No cost savings, potential cost increase	I'm not sure
No	I'm not sure	I'm not sure
Yes	No cost savings, potential cost increase	Yes
Yes	No cost savings, potential cost increase	No
No	Moderate cost savings	Yes
Yes	Minimal cost savings	I'm not sure
I'm not sure	No cost savings, potential cost increase	Yes
Yes	No cost savings, potential cost increase	I'm not sure
No	No cost savings, potential cost increase	No
Yes	Significant cost savings	No
No	Moderate cost savings	I'm not sure
No	No cost savings, potential cost increase	No
Yes	Minimal cost savings	I'm not sure
Yes	No cost savings, potential cost increase	Yes
I'm not sure	I'm not sure	I'm not sure
No	Minimal cost savings	Yes
Yes	No cost savings, potential cost increase	No
Yes	No cost savings, potential cost increase	No
Yes	No cost savings, potential cost increase	I'm not sure
Yes	Minimal cost savings	No
No	I'm not sure	Yes
I'm not sure	No cost savings, potential cost increase	No
Yes	No cost savings, potential cost increase	Yes
Yes	No cost savings, potential cost increase	No
I'm not sure	No cost savings, potential cost increase	I'm not sure
Yes	Moderate cost savings	Yes
Yes	Minimal cost savings	Yes
Yes	Moderate cost savings	Yes
No	Minimal cost savings	I'm not sure
No	No cost savings, potential cost increase	No
I'm not sure	No cost savings, potential cost increase	I'm not sure
Yes	Minimal cost savings	No
Yes	No cost savings, potential cost increase	I'm not sure
No	Minimal cost savings	No
Yes	No cost savings, potential cost increase	No

Multisourcing (sourcing from multiple suppliers in different locations)	Nearshoring (moving production closer to your company's market)	Recycling logistics (process to improve resource management)	Data-integrated and automated systems (IOT systems or AI-based)
4	2	3	4
2	3	1	3
3	4	2	3
4	3	2	4
4	1	1	4
4	2	1	4
3	4	2	2
3	2	4	3
1	3	1	3
4	3	2	3
1	1	1	2
3	2	1	2
3	2	2	2
3	4	2	4
0	0	0	0
4	1	1	2
5	4	4	3
3	3	4	5
4	5	3	1
5	4	4	5
3	2	5	3
4	3	3	4
5	2	3	4
5	4	3	4
5	3	3	4
3	4	2	5
5	3	5	5
5	2	3	3
3	2	3	4
3	2	3	3
3	2	3	1
4	3	5	3
5	3	3	3
4	3	4	5
4	1	4	4

Do you see nearshoring (moving production closer to your company's home market) as a viable option for reducing reliance on China in your supply chain?	Which of the following supply chain strategies are you more inclined to consider for reducing reliance on China in your supply chain?
Maybe	Recycling logistics
Yes	Nearshoring
Yes	Nearshoring
No	Multisourcing
Yes	Multisourcing
Maybe	Multisourcing
Yes	Nearshoring
Yes	Recycling logistics
Yes	Multisourcing
Yes	Multisourcing
No	None of the above
Maybe	Multisourcing
Maybe	Multisourcing
Maybe	Nearshoring
Maybe	None of the above
No	Multisourcing
Yes	Multisourcing
Yes	Automated systems (IOT)
Yes	Nearshoring
Maybe	Multisourcing
Maybe	Recycling logistics
No	Multisourcing
No	Multisourcing
Yes	Multisourcing
No	Multisourcing
No	Multisourcing
Yes	Nearshoring
No	Multisourcing
Maybe	Recycling logistics
No	Recycling logistics
No	None of the above
Maybe	Multisourcing
No	Multisourcing
No	Multisourcing
No	None of the above

Survey Table: Responses wrapped up after we asked some of our initial respondents and contacts to share the questionnaire within their network.

Table with additional comments

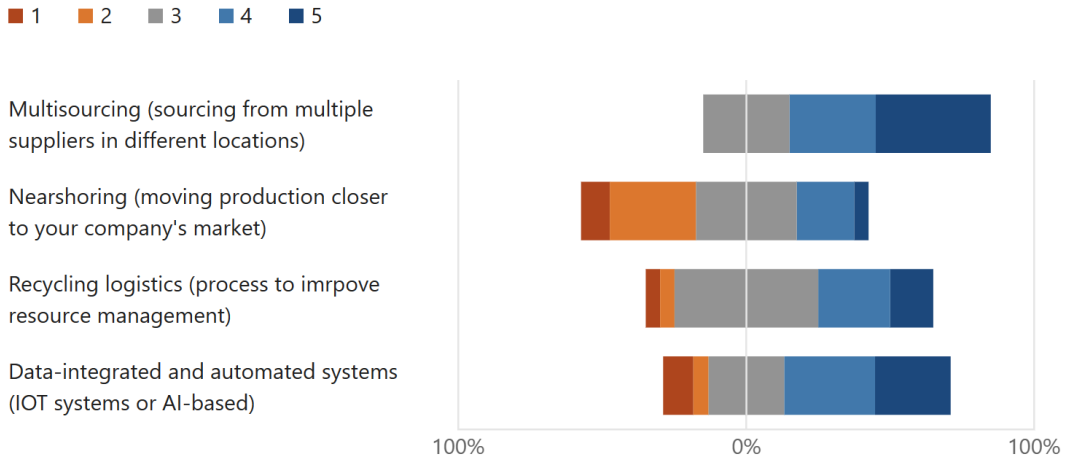
Respondent ID	Industry	Comment
3	Manufacturing	My company is primarily exporter to China (23%of our total sales) , more than importer. Therefore, we see a great risk exposure to China from a supplier point of view. We are increasing our sales in Europe, America's, and India to compensate a gradual decrease of our sales to China.
6	Technology	We are mainly currently hoping for local (European) suppliers of hardware to be able to offer more of a competitive offering compared to their Chinese competition. Especially in terms of price. As supply chain issues during Covid-19 caused significant extra costs, we are very interested in more localized sourcing.

8	Manufacturing	Our company is still dependent on certain raw materials from China, which we are increasingly trying to source from other countries due to the supply disruptions we experienced during Covid-19.
13	Manufacturing	We noticed material costs increase during and following the pandemic.
14	Consulting	Unfortunately to much politics involved in business now. The West is regulating themselves out of the world market. Not looking at reality.
15	Finance and Banking	Not really applicable for us as a financial company, as our operations in China do not involve much of a supply chain
18	Retail	As a logistics provider, most of our customers are very interested in implementing new digital systems with AI that allow them to automate their supply chain.
20	Retail	Operations primarily in Asia-Pacific, have started shifting some of our production to other countries such as Vietnam and Indonesia
21	Manufacturing	We have a manufacturing footprint in Indonesia, China not very important for our company at the moment.
23	Fashion	Primarily produce in SEA, China some relevance for sales
24	High-Tech/IT/Communication Equipment	Main focus is to rebalance imports and exports with China
28	Fashion	We already shifted a lot of production following Covid-19. China has become less interesting because of higher production costs

Tables showing distribution of answers within the survey.

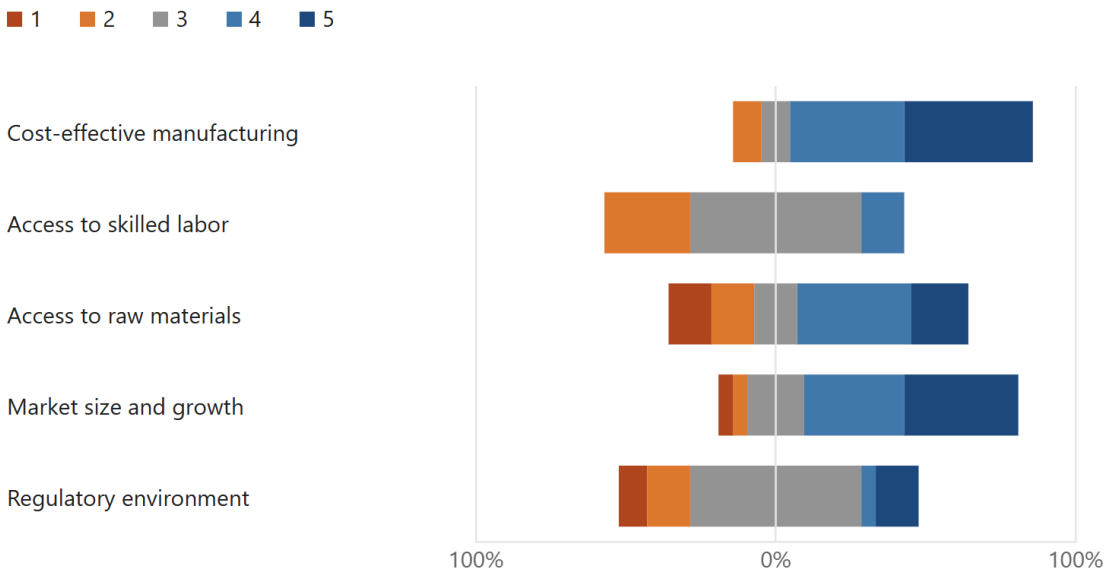
14. Please rank the supply chain innovation strategies that are most relevant to your own company/industry going forward in relation to China (1 = least important, 5 = most important)

Weitere Details



10. Rank the factors that contribute to China's significance in global supply chains in order of importance. (1 = Least important, 5 = Most important)

Weitere Details



Tables showing distribution of industries:

Industry	No. of Respondents
Consulting	2
Fashion	4
Finance and Banking	5
Healthcare	3
High-Tech/IT/Communication Equipment	4
Manufacturing	7
Retail	6
Technology	4
Total	35

Figure showing distribution of seniorities:

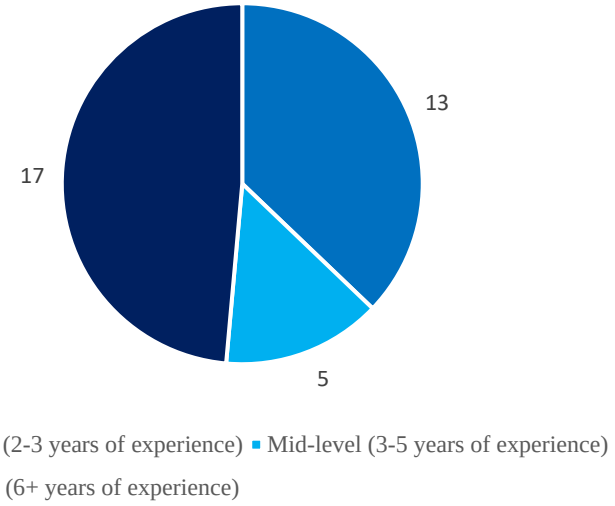


Figure showing distribution of types of supply networks:

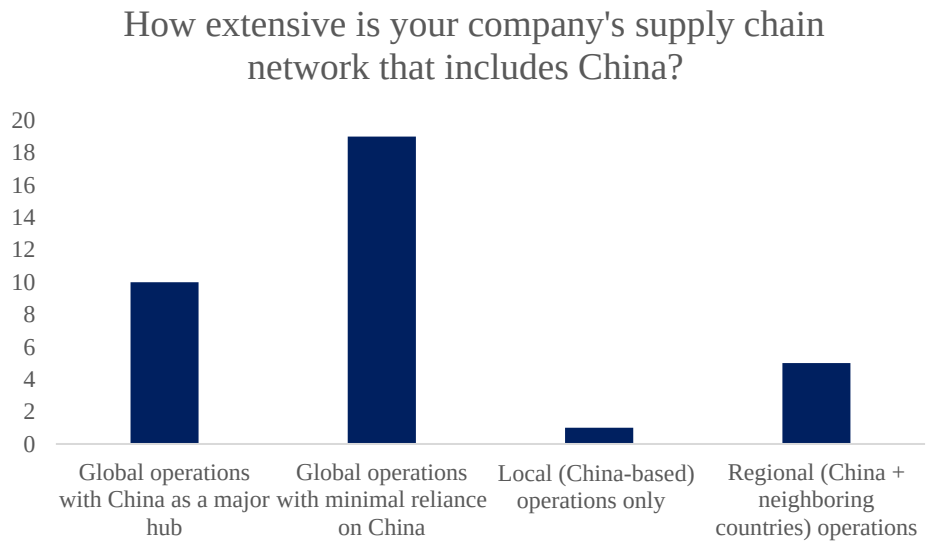


Figure showing distribution of how many raw materials come from China:

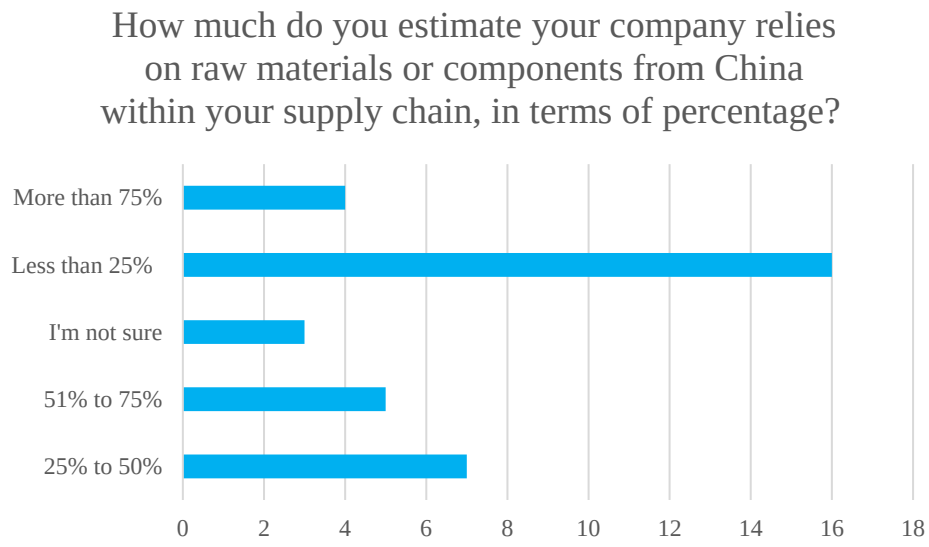
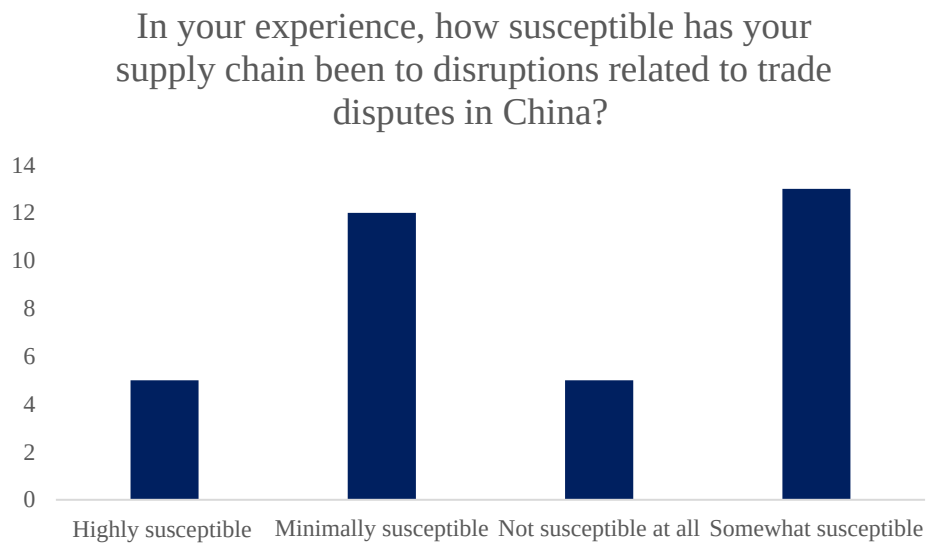


Figure showing distribution of how susceptible one is to trade disputes in China:



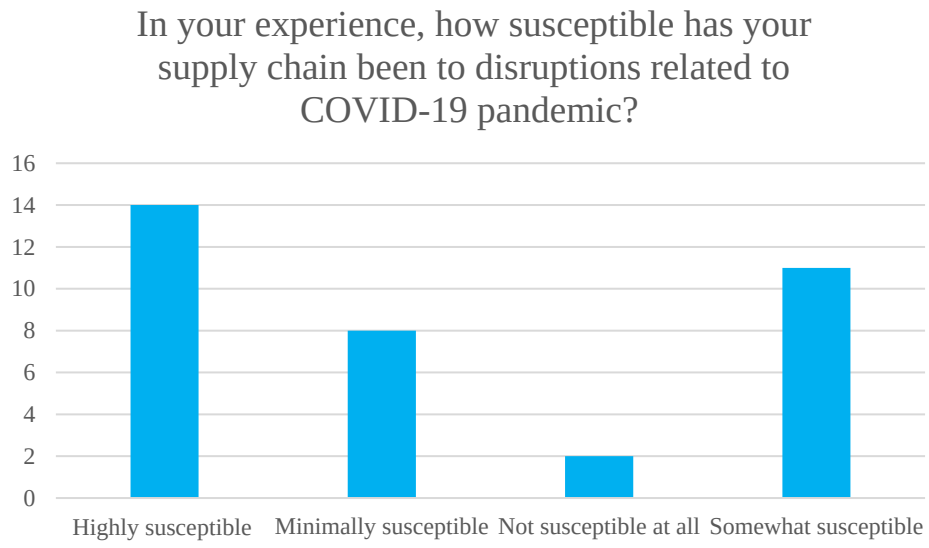


Figure showing distribution of whether nearshoring is a viable option:

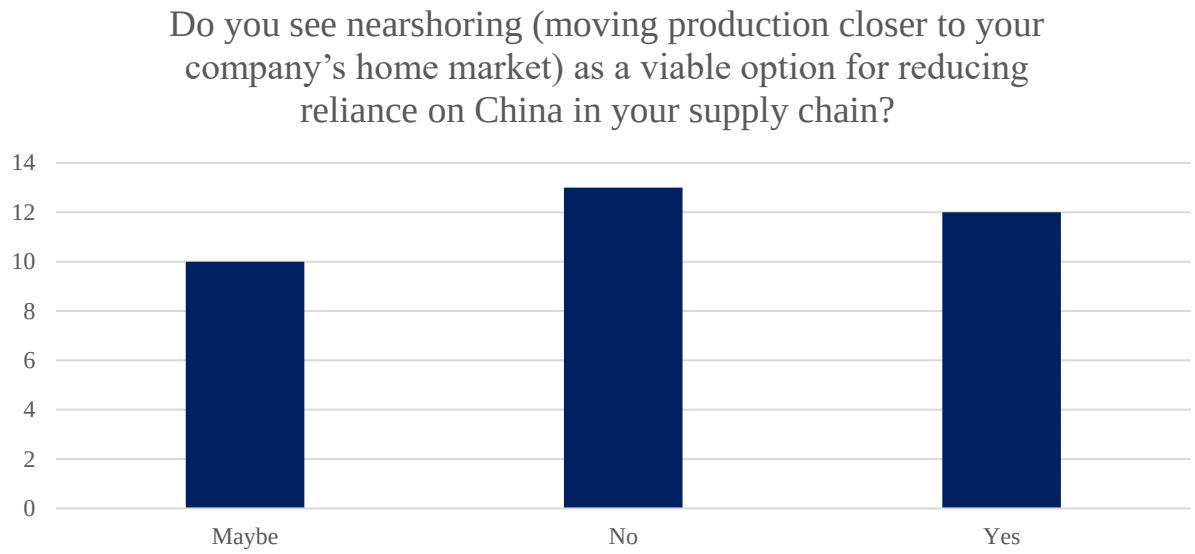


Figure showing which strategy is the most promising.

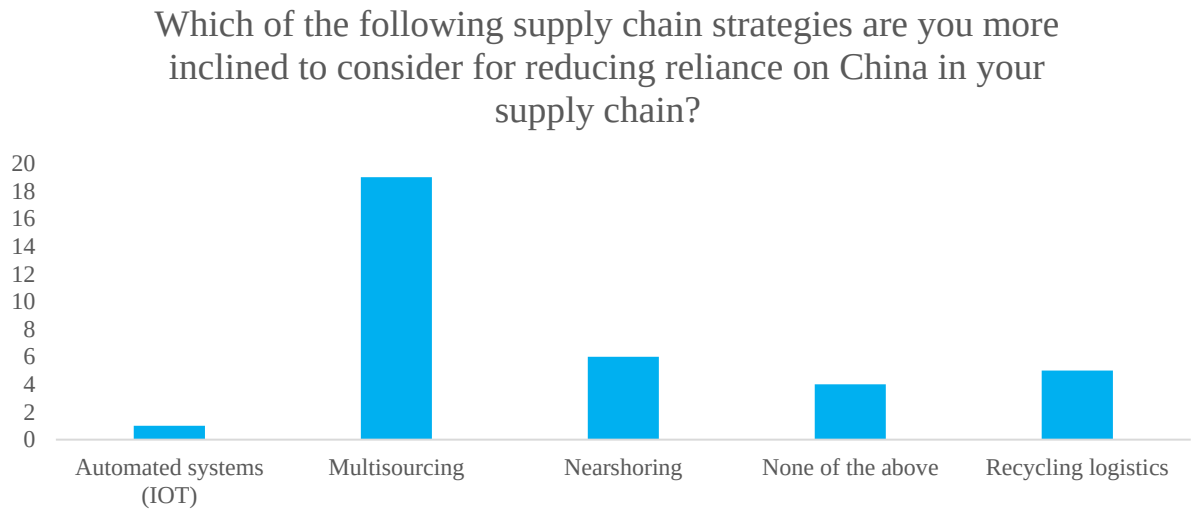


Figure showing whether a decoupling is possible.

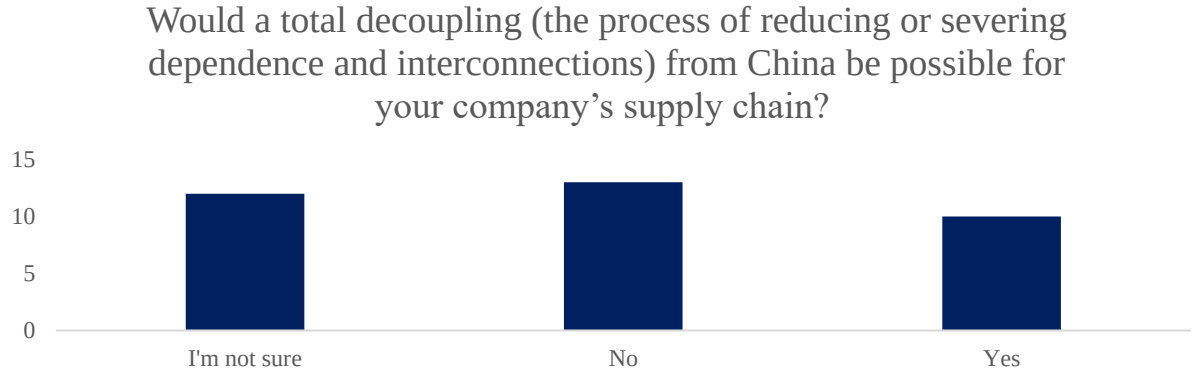
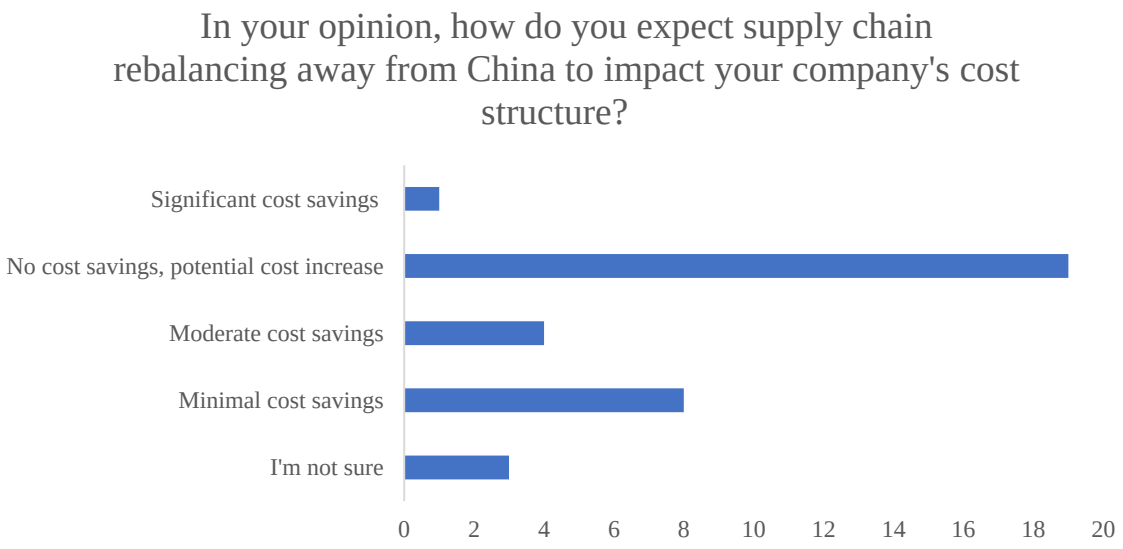


Figure showing which impact on the cost structure



8.4. Company dataset

Categories Analysis	
Industry	**Variables collected**
Automobile	Name, Type, HQ Country, Market Cap, No. of Employees, Revenue, EBIT, EBIT Margin, Do they produce in china (binary), Are they operated in a joint venture (binary), Revenue from China/Asia-Pacific (% of total revenue), ***Vehicle Sales to China/Asia Pacific (in % of total vehicles),*** Does the Annual Report mention supply chain risks related to China (binary)
Luxury	Same basic variables, ***Total No. of operated stores worldwide, Total No. of Operated Stores in Asia, Total No. of Operated Stores in China***
FCMG	Same basic variables

*Variable in blue was industry specific

Exchange Rates Used

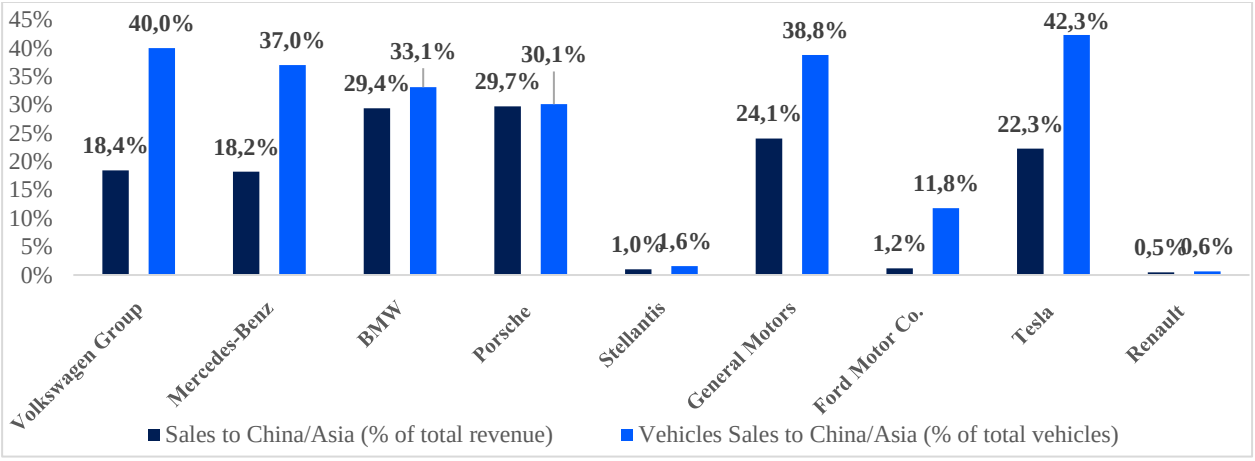
Currency	Value of currency	Value in orginal currency (in billions)	Value in EUR (in billions)
USD	0,95	50,59	48,0605
HKD	0,12	50,59	6,0708
GBP	1,16	50,59	58,6844
CHF	1,05	50,59	53,1195

The exchange rates above were used to streamline.

Dataset Automotive Industry

Name	Type	HQ Country	Market Cap in USD (Billions)	Market Cap in EUR (Billions)	No. of Employees	Revenue in EUR (2022) in Billion	EBIT (EUR)
Volkswagen Group	Automobile manufacturer	Germany	56,03	52,56	675 805	279,00	22,12
Mercedes-Benz	Automobile manufacturer	Germany	63,64	60,136	168 797	150,00	20,49
BMW	Automobile manufacturer	Germany	60,99	58,246	149 475	142,60	14,00
Porsche	Automobile manufacturer	Germany	78,7	74,08	39 162	30,32	6,77
Stellantis	Automobile manufacturer	Netherlands	58,23	55,11	272 367	179,60	20,43
General Motors	Automobile manufacturer	USA	39,77	37,64	167 000	149,04	11,97
Ford Motor Co.	Automobile manufacturer	\	46,23	43,75	173 000	150,27	4,53
Tesla	Automobile manufacturer	USA	675,91	639,7	127 855	77,51	13,23
Renault	Automobile manufacturer	France	9,779	9,41	105 812	46,39	2,52
Continental AG	Autosupplier	Germany	12,54	11,94	199 000	39,40	0,76
Schaeffler	Autosupplier	Germany	3,53	3,4	84 000	15,88	0,98
Magna International Inc.	Autosupplier	Canada	13,65	12,9	168 000	35,99	0,95
Michelin	Autosupplier	France	20,9	19,8	132 000	28,59	3,00
Valeo	Autosupplier	France	4,35	4,11	109 900	20,04	0,71
Lear	Autosupplier	USA	7,51	7,1	168 700	19,87	0,58
Forvia	Autosupplier	France	3,96	3,74	150 000	25,50	0,52
Goodyear	Autosupplier	USA	3,37	3,19	74 000	19,78	0,81
Visteon	Autosupplier	USA	3,36	3,18	10 000	3,57	0,18
BorgWarner	Autosupplier	USA	8,97	8,49	52 000	15,03	1,31

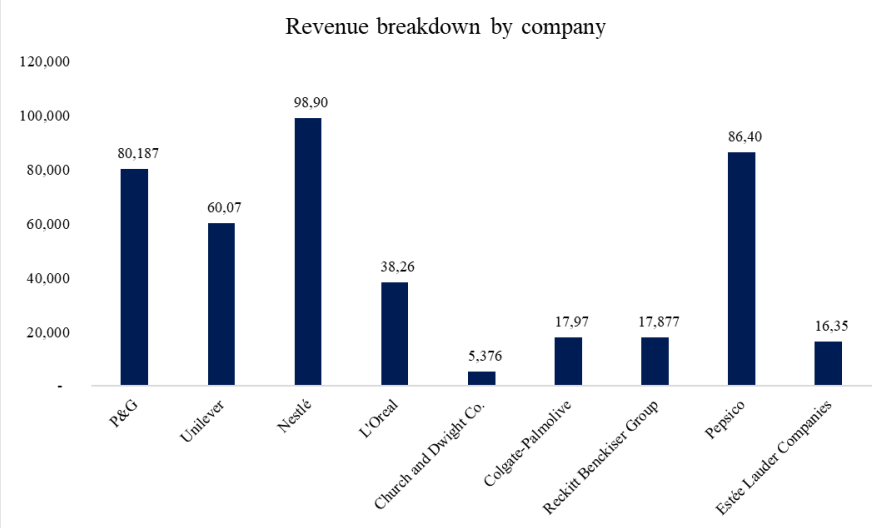
EBIT Margin (2022)	Does the company produce in China?	Are they operated in a joint venture ?	Cars sold in China (in Ths. Units) (2022)	Sales to China/Asia-Pacific (in revenue)	Sales to China/Asia Pacific (in % of total vehicles)
7,93%	Yes	Yes	3 122	18,4%	39,99%
13,64%	Yes	Yes	754	18,2%	37,00%
9,82%	Yes	Yes	794	29%	33,10%
22,33%	No	No	93	30%	30,10%
11,37%	No	No	94	1,01%	1,57%
8,03%	Yes	Yes	2 303	24,06%	38,77%
3,01%	Yes	Yes	495	1,18%	12%
17,07%	Yes	No	556	22,27%	42%
5,44%	Yes	Yes	13,3	0,47%	0,65%
2,02%	Yes	Yes	-	12%	-
6,15%	Yes	No	-	23%	-
2,65%	Yes	Yes	-	10,3%	-
10,51%	Yes	Yes	-	6%	-
3,55%	Yes	Mixed	-	16%	-
2,91%	Yes	Yes	-	15%	-
2,04%	Yes	Yes	-	21%	-
4,09%	Yes	No	-	2,9%	-
5,03%	Yes	Yes	-	22%	-
8,67%	Yes	Mixed	-	21%	-

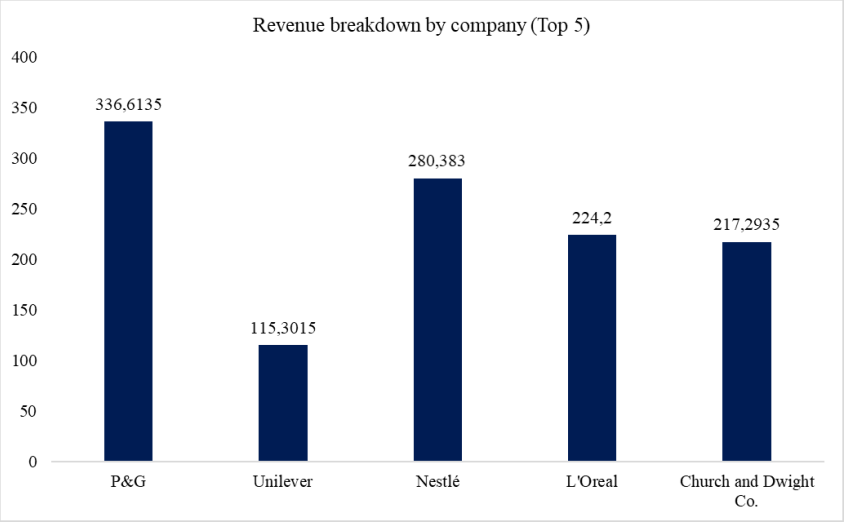


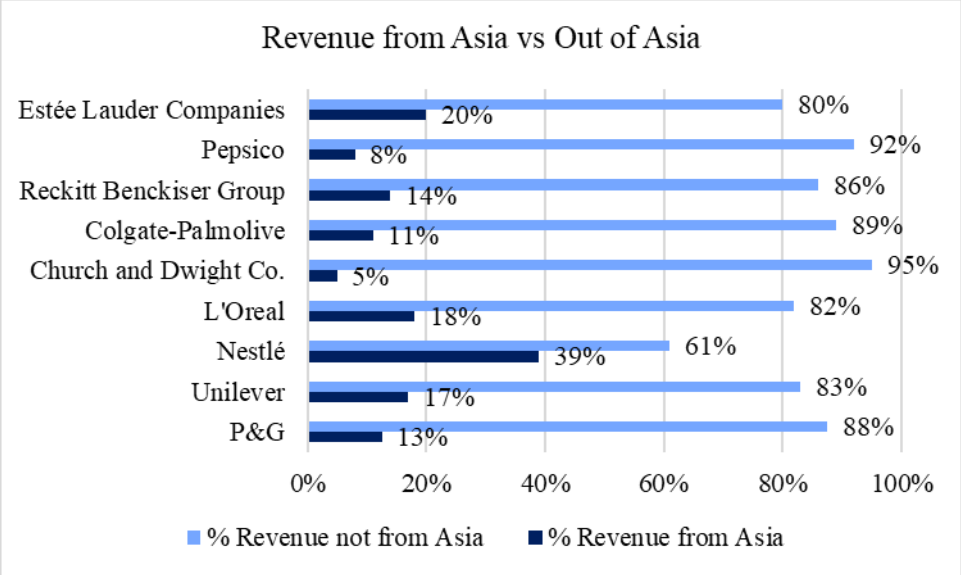
Dataset Fast Moving Consuming Goods

Name	HQ Country	Currency	Market Cap. USD (Billions)	Market Cap. EUR (Billions)	Revenue in 2022 in EUR (Billions)
P&G	United States	USD	354,33	336,6135	80,187
Unilever	United Kingdom	GBP	121,37	115,3015	60,07
Nestlé	Switzerland	CHF	295,14	280,383	98,90
L'Oreal	France	EUR	236	224,2	38,26
Church and Dwight Co.	United States	USD	21,83	20,7385	5,376
Colgate-Palmolive	United States	USD	61,87	58,7765	17,97
Reckitt Benckiser Group	United Kingdom	GBP	48,76	46,322	17,877
Pepsico	United States	USD	228,73	217,2935	86,40
Estée Lauder Companies	United States	USD	40,31	38,2945	16,35

Net Income in EUR (Billions)	% Revenue from Asia	Revenue from Asia in 2022 in EUR (Billions)	Annual Report Mention Supply Chain Risks reg. China	% Revenue not from Asia
14,461	13%	10,02	Yes	88%
8,052	17%	10,21	No	83%
9,3	39%	38,57	No	61%
6,012	18%	6,89	Yes	82%
0,4139	5%	0,27	Yes	95%
1,785	11%	1,98	No	89%
4,019	14%	2,50	Yes	86%
8,91	8%	6,91	Yes	92%
2,39	20%	3,27	Yes	80%



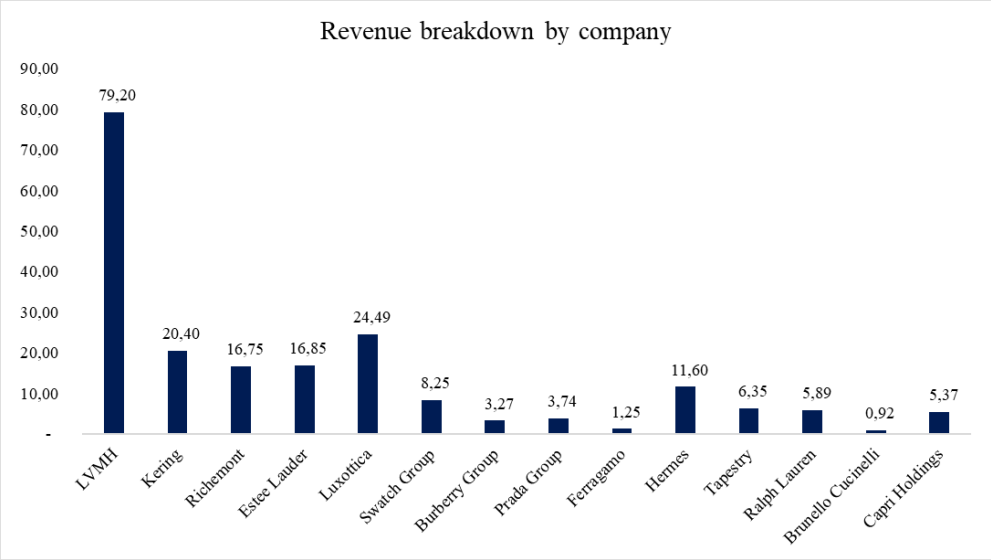


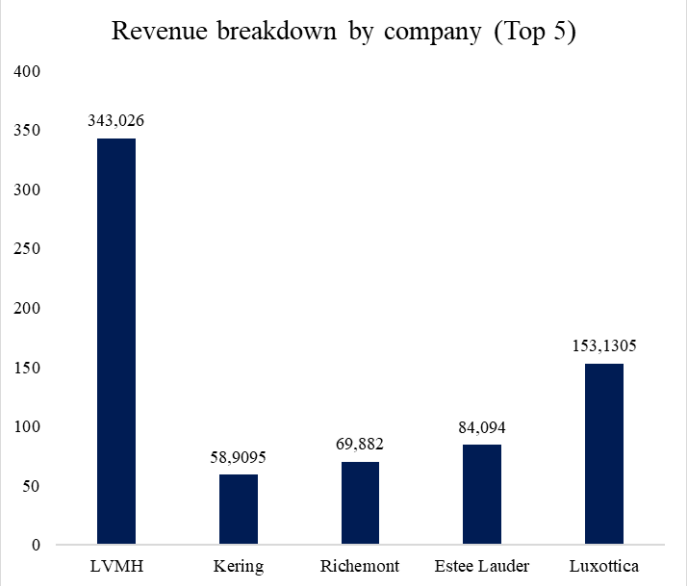


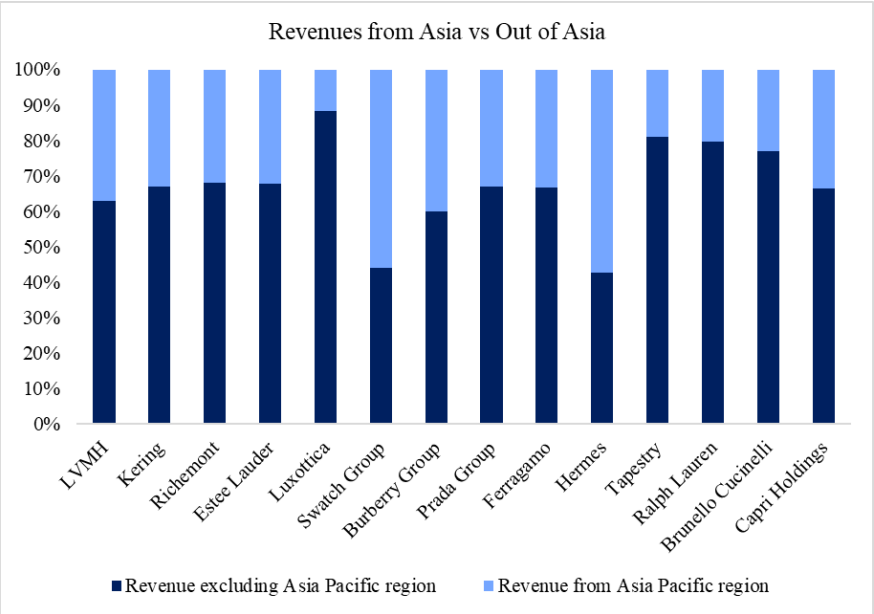
Data Luxury Industry

Name	HQ Country	Currency	Market Cap. USD (Billions)	Market Cap. EUR (Billions)	Revenue in 2022 in EUR (Billions)	Net Income in EUR (Billions)	Total # of Operated Stores Worldwide
LVMH	France	EUR	361,08	343,026	79,20	14,839	5664
Kering	France	USD	62,01	58,9095	20,40	3,7	1659
Richemont	Switzerland	CHF	73,56	69,882	16,75	0,3	458
Estee Lauder	United States	USD	88,52	84,094	16,85	2,2705	1600
Luxottica	Italy	USD	80,32	76,304	24,49	2,147	18000
Swatch Group	Switzerland	CHF	14,16	13,452	8,25	0,8037	3371
Burberry Group	United Kingdom	GBP	9,33	8,8635	3,27	0,51395	413
Prada Group	Italy	USD	14,47	13,7465	3,74	0,46916	612
Ferragamo	Italy	EUR	2,9	2,755	1,25	0,065	447
Hermes	France	EUR	161,19	153,1305	11,60	3,37	315
Tapestry	United States	USD	9,17	8,7115	6,35	0,8132	1400
Ralph Lauren	United States	USD	6,97	6,6215	5,89	0,57	344
Brunello Cucinelli	Italy	USD	5	4,75	0,92	0,0872	119
Capri Holdings	United States	USD	7,38	7,011	5,37	0,7904	1272

# of Operated Stores in Asia	# of Operated Stores in China	% Revenue from Asia	Revenue from Asia in 2022 in EUR (Billions)	Annual Report Mention Supply Chain Risks reg.
1829	62	37%	29,30	Yes
662	57	33%	6,73	Yes
-	-	32%	5,36	No
-	-	32%	5,44	Yes
1188	290	12%	2,84	No
-	-	56%	4,62	No
130	61	40%	1,31	Yes
211	100	33%	1,23	No
170	63	33%	0,42	No
85	31	57%	6,66	Yes
360	60	19%	1,21	No
118	31	20%	1,19	Yes
-	-	23%	0,21	No
430	288	34%	1,80	No







8.5. Risk, success factors & mitigation strategies analysis

By assigning individual weights to our qualitative and quantitative findings, we calculated or estimated the impact of different mitigation strategies, risks, and success factors on our investigated company. This allowed us to rank these factors accordingly.

Although we have clear data entries in some cases, the relevance of expert interviews and literature research (our own ranking) should be considered limited due to their qualitative nature.

In the survey, we sometimes used proxies to gauge the height of individual risks, such as taking a percentage from binary or Likert scale questions. When using our own dataset of public companies, we used revenue or sales percentages as a proxy to gauge economic risk or dependability, as well as whether the specific risk was mentioned in the company's annual statements. We assigned values or calculated them based on this information and data.

Mitigation

Mitigation Strategies	Volkswagen	Burberry	P&G	Survey Average
Multisourcing	3,3171429	3,817142857	3,317142857	3,542857143
Nearshoring & Offshoring	2,3450612	3,245061224	1,845061224	2,628571429
Recycling	2,2303673	1,830367347	3,230367347	2,657142857
Data-Integration	4,0465306	3,146530612	4,546530612	3,257142857

Mitigation Research	Weights
Expert Interview	40%
Literature research	50%
Survey Overview	10%

Expert Interviews		Volkswagen	Burberry	P&G
	Multisourcing	4	4	4
	Nearshoring & Offshoring	2	3	2
	Recycling	3	2	3
	Data-Integration	5	4	5

Literature Research		Volkswagen	Burberry	P&G
	Multisourcing	3	4	3
	Nearshoring & Offshoring	3	4	2
	Recycling	2	2	4
	Data-Integration	4	3	5

Survey Overview		Volkswagen	Burberry	P&G
	Multisourcing	2,171428571	2,171429	2,171429
	Nearshoring & Offshoring	0,450612245	0,450612	0,450612
	Recycling	0,303673469	0,303673	0,303673
	Data-Integration	0,465306122	0,465306	0,465306

Risks

Risks	Volkswage	Burberry	P&G	Survey Average		
Geopolitical Risks (Trade War)	3,6	3,3	2,7	2,571428571	Calculated using Survey Proxies times 5	
Economic Risks (High Dependency on Chinese Sales Market & L	4,5	3,8	2,7	2,714285714		
Supply Chain Risks (Covid-19, High Reliance on Chinese Supplie	3,6	2,2	2,7	2,285714286		
Sustainability & Brand Risk	3	2,9	1,8	1,714285714		

Research	Weights
Expert Interview	30%
Dataset	40%
Literature Research	20%

Expert Interviews		Volkswagen	Burberry	P&G
	Geopolitical Risks	4	3	3
	Economic Risks	5	4	3
	Supply Chain Risks	4	2	3
	Sustainability & Brands Risk	4	3	2

Literature Research		Volkswagen	Burberry	P&G
	Geopolitical Risks	4	4	3
	Economic Risks	5	3	3
	Supply Chain Risks	4	2	3
	Sustainability & Brands Risk	3	4	2

Dataset		Volkswagen	Burberry	P&G
	Geopolitical Risks	4	4	3
	Economic Risks	5	5	3
	Supply Chain Risks	4	3	3
	Sustainability & Brands Risk	3	3	2

Notes:
Economic Risks are calculated from the amount of respondents saying that costs will increase
We used the dataset in terms of sales percentage to gauge economic risk per company as well as if the risk was mentioned specifically in the annual staatements

China's success factors						
Signifcant Success Factors	Volkswagen	Burberry	P&G	Survey Average		
Cost-effective manufacturing	3,382857143	2,537142857	2,537142857	3,46		
Access to skilled labor	2,737142857	2,737142857	1,891428571	2,86		
Access to raw materials	4,228571429	1,891428571	1,891428571	2,86		
Market size and growth	4,228571429	4,028571429	3,582857143	3,63		
Regulatory Environment	4,028571429	1,891428571	1,891428571	3,59		

Research	Weights
Expert Interview	30%
Survey	50%
Literature Research	20%

Expert Interviews		Volkswagen	Burberry	P&G
	Cost-effective manufacturing	4	3	3
	Access to skilled labor	3	3	2
	Access to raw materials	5	2	2
	Market size and growth	5	5	4
	Regulatory Environment	5	2	2

Literature Research		Volkswagen	Burberry	P&G
	Cost-effective manufacturing	4	3	3
	Access to skilled labor	4	4	3
	Access to raw materials	5	3	3
	Market size and growth	5	4	5
	Regulatory Environment	4	3	3

Survey		Volkswagen	Burberry	P&G
	Cost-effective manufacturing	2,765714286	2,074285714	2,074285714
	Access to skilled labor	2,074285714	2,074285714	1,382857143
	Access to raw materials	3,457142857	1,382857143	1,382857143
	Market size and growth	3,457142857	3,457142857	2,765714286
	Regulatory Environment	3,457142857	1,382857143	1,382857143