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Economics

Import tariffs’ influence on sourcing strategies – European battery and energy storage companies under the USA-China trade conflict

Management and Organization,
Department of International Management and Entrepreneurship

Master's thesis

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15.5.2026
Turku

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Subject: Management and Organization
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Supervisor: Assistant Professor, Anne Quarshie
Number of pages: 65 pages (+ appendices 6 pages)
Date: 15.5.2026

Abstract

Recent trade disruptions have guided companies to adapt their sourcing strategies. This is because disruptions can have a significant influence on a company's profitability. Growing tensions between countries, trade wars, and the resulting tariffs have forced companies to evaluate their sourcing. This has become increasingly topical during the US-China trade war that saw the US raise the import tariffs on many sectors, especially towards China. Previous literature examines trade disruptions and tariff adjustments, but limited research has been carried out on factors affecting these adjustments or on European companies, rather than companies from the US or China. Therefore, this study aims to fill this research gap by answering the research question of how companies are adjusting their sourcing strategies in the battery and energy storage industry in relation to the US import tariffs.

The methodology chosen for this research was a qualitative case study using an abductive thematic approach. A qualitative approach is well suited to answering "how" questions and to finding new insights of the topic from the perspective of the participants. A case study allows for the study of the current phenomenon in its real-life context. The case in this thesis is the battery and energy storage industry during the US import tariffs, especially on China. The data is collected through semi-structured thematic interviews with sourcing specialists from the companies in the field, as well as industry specialists and a trade specialist. The research was conducted abductively, with previous literature guiding the topic formation and the interview structure, participants' voices guiding the interviews, and the data analysis, and both being compared in the discussions. Iteration was pursued by including further previous theory into the literature chapter based on the findings from the analysed data.

This research contributes to the existing literature by increasing the understanding of the factors affecting sourcing adjustments and how companies are adjusting in relation to tariffs. The findings increase our understanding of uncertainty affecting sourcing strategies, and both short- and long-term adjustments, the view of product and supply risk as limiting factors are deepened. Geopolitics is defined as a limiting factor and so is non-tariff drivers, which often outweigh tariffs when adjusting sourcing strategies. Managerial implications are limited by uncertainty, but some long- and short-term options are still available, such as diversification. Companies should consider also non-tariff drivers when adjusting their sourcing strategies. The limitations of the study include its small sample size and its industry- and company-specific context. Further, more comprehensive research into the topic is encouraged.

Keywords: tariffs, US-China trade war, battery and energy storage industry, sourcing strategy, sourcing adjustments, long-term, short-term, wait-and-see, key factors, Primary triggers, operational factors, external environment, non-tariff drivers, transaction cost theory, resource dependency theory.

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1 Introduction

1.1 Background

Recently, the political tensions between countries have increased, causing multinational corporations to be more concerned about the potential political risks to their supply chains (Charpin & Cousineau 2025). Disruptions, like COVID-19, trade wars, and tariffs, have caused organizations to reconsider their sourcing strategies (Charpin et al. 2021). Due to the large impact on profitability, disruptions to supply chains are considered and managed more tentatively (Hendricks et al. 2009).

This topic has become increasingly important because of the US-China trade war when, in 2018, Donald Trump set tariffs for products from China. These tariffs included 25% on steel and 10% on aluminium, in addition to general tariffs (York 2024). However, some of these tariffs were announced as possibly temporary, and they were postponed at times (Bown & Kolb 2023). Since the tariffs were introduced as possibly temporary, this caused the organizations to be less willing to make large investments towards the new requirements, such as acquisitions (Rogers et al. 2024). These tariffs resulted in China applying retaliatory actions and tariffs against the US, and in 2019, China and the US froze the trade war and achieved a phase one agreement, still leaving the tariffs in place (Benguria et al. 2022). The tariffs have increased in the years 2024 and 2025 during the presidencies of Joe Biden and Donald Trump, not only towards China, but to other countries as well (Eezyimports.com). This has further increased the importance of this subject and the focus of companies globally.

1.2 Previous research

With the US-China trade war, more focus has been placed on adjusting sourcing strategies to tariffs. Johnson and Haug (2021) investigate how US companies have changed their sourcing strategies to mitigate the effects of the USA-China trade war and other trade disruptions, such as geopolitical tensions and overall tariff increases. These include short-term strategies like stockpiling and applying for exceptions, and long-term strategies such as changing and diversifying the supply base. They encourage further research into the interpretation of tariff uncertainty, resulting actions, and what triggers these decisions.

Chae et al. (2019) build a framework of how firms adjust their supply bases to predicted increased tariffs. According to this research, the decision whether to adjust the supply base depends on the severity and uncertainty of the tariffs. Companies are more likely to react to tariffs that have a high impact and certainty. These adjustments are shaped by the tariff's geographical scope, relative purchasing spend, and the level of supply risks. Therefore, the effect of the tariffs on the complexity of the supplier base of a company depends on these factors. This is a great study on the topic of tariffs and their effect on supply base configuration, but at the same time, Chae et al. encourage more granular research into this topic.

Recently, Miller et al. (2025) studied company responses to tariffs and the effects limiting them. They examine this topic from the viewpoint of US companies, both importing and exporting. Their framework sees that the tariffs affect supply and demand, and there are three dimensions of limiting factors: Product and firm traits, and uncertainty. The final choice is based on adjustment, transaction, or opportunity cost, which are limited by the three factors. Therefore, they argue that adjustments are made based on this framework. They encourage further investigation into tariffs and how they affect supply chains, especially during this unprecedented situation.

There has been extensive research into supply chain management and sourcing. There are relevant theories related to strategic sourcing and supply chain decisions that are often used in this literature. Transaction cost theory (TCT) talks about indirect costs stemming from sourcing (Coase 1937), and Resource Dependence Theory (RDT) about dependencies and access to critical resources (Pfeffer & Salancik 2003). These also relate to the topic of sourcing strategy adjustments in this study. Similarly to RDT Shih (2020) talks about how companies should not give. up on China, as it is still the powerhouse of the battery industry. Recently, the topic of supply chain disruptions has also been researched more. Significant research has been pursued towards the optimal size of the supply base. These touch on the pros and cons of diversification and having a simple supply chain, with many talking about finding the optimal balance between efficiency and flexibility. Hendricks et al. (2009) and Kashem et al. (2024) among others talk about the importance of diversification as a way to tackle disruptions whereas Fan et al. (2022) and Tang (2006) argue that a simple supply chain is the best in the face of disruptions. Chae et al. (2019), Millet et al. (2025), and Choi and Krause (2005) talk about finding a balance between these two approaches of strategic sourcing.

1.3 Research problem

This study aims to increase scientific and practical understanding of how companies adjust their sourcing strategies in relation to import tariffs. It focuses on examining how global European companies in the battery and energy storage industry have adjusted their sourcing strategies in relation to the increased US import tariffs, especially on China, and what main factors affect these adjustments. The research gap relates especially to the key factors driving the sourcing strategies. In addition, the focus of this study is on the less researched European companies, instead of the viewpoint of the US or China.

While prior research focuses largely on tariffs' effect on adjustments, such as diversification and complexity of the supply base (Chae et al. 2019; Miller et al. 2025), in this research, we study whether there are other adjustments the companies are making and deepen the knowledge of what factors are affecting these adjustments. Previous literature, such as Chae et al. and Miller et al. encourages more research on this topic. Thus, the research problem is formed as follows:

How are companies adjusting their sourcing strategies in the battery and energy storage industry in relation to the US import tariffs?

What key factors affect these sourcing strategy adjustments?

2 Literature review

2.1 Tariffs

According to Morton (1937) tariffs are taxes between countries on export and import. They are a way of trying to protect the economy of the country and a stream of income for the government. According to Chae et al. (2019) recently, many nations have increased their levels of protectionism by setting or raising tariffs. Handfield (2020) finds that such policies have a significant effect on corporations that source globally, increasing importation cost and total cost of ownership (TCO) and lowering supply chain efficiency. Supply chains often aim to achieve the lowest TCO, but disruptions can change this (Handfield). These tariff changes can motivate companies to alter their supply base and sourcing strategies, to reduce the cost increases (Chae et al. 2019).

According to Fan et al. (2022), tariffs undermine companies' profitability by disrupting operations and increasing transaction costs, especially when they rely on sourcing from overseas. They showed in their research that because of the tariffs on China in 2018, US companies without direct suppliers in China had better profitability and lower inventory levels than the companies with such suppliers. This is in line with the prediction made by Dong and Kouvelis (2020). In addition, the 2018 tariffs on China decreased the competitiveness of US companies (Fan et al. 2022).

According to the changes in US trade in 2019, the tariffs on China caused companies to change their production to other low-cost countries instead of the United States or China (Zumbrun & Davis 2020). Therefore, Fan et al. (2022) argue that tariffs set on a single country are not enough to increase reshoring in this global economy. Tariffs also caused an increase in inventories, which implies that companies had to prepare for possible changes in trade policies (Fan et al.).

2.2 Sourcing strategy adjustments

COVID-19 was a significant catalyst for companies to consider and improve adaptability in their sourcing (Kashem et al. 2024). Johnson and Haug (2021) find that adjustments made in relation to US tariffs are comparable to those made in relation to COVID-19. Especially that of stockpiling and diversification (Shih 2020). Johnson and Haug (2021) find that firms react to the US-China trade war by both short- and long-term strategic changes. In the short term, companies act reactively and could apply for exemptions regarding the tariffs, increase their inventories, and advance production to conduct these before the tariff comes into effect. Proactive long-term strategic decisions relate to moving or diversifying production and suppliers from China to other countries. Agility and resilience are found to be the main aspects of mitigating the negative effects of the disruptions (Johnson & Haug).

2.2.1 Long-term adjustments

Long term sourcing strategy adjustments include vertical integration, new market shifts. international diversification, and supply chain simplification. Vertical integration is one way of lowering risks, in other words, the decision of making within the company (Coase 1937). Vertical integration can enhance the administrative performance of a firm (D'Aveni & Ravenscraft 1994). Fan et al. (2022) agree with this and argue that companies that insource their products suffer less from transactional costs and can be more resilient. Vertical integration is also a way to make coordination easier and to achieve faster adaptation (Forbes & Lederman 2010). According to Hendricks et al. (2009), in the event of a disruption in the supply chain, companies with supply chains that have more slack, are less geographically diversified, and are highly vertically integrated, suffer fewer negative consequences in their stock prices.

According to Gereffi et al. (2021), to mitigate the effects of trade restrictions, companies can change the location of their suppliers, production, or market. Firms can switch the manufacturing or sourcing countries to one that is not affected by the tariff, which can also be done in co-operation with the current suppliers (Darby et al. 2020). Companies can also consider selling their products to countries that do not have tariffs or domestically (Gereffi et al.) Moving production to low-cost countries is often done to keep the TCO low or this can also be done to the country setting the tariffs, to try and avoid them (Johnson & Haug 2021).

Diversification of the supply base increases flexibility and resilience during disruptions, which can reduce risks by offering alternative ways of sourcing when one fails (Hendricks et al. 2009). From the point of minimizing risks, diversification improves performance. Supplier diversification, which can be done locally and horizontally, is a way to reduce dependency on a single source and improve negotiation power. Resilient supply chains need redundancy and flexibility to minimize the effects of disruptions. (Kashem et al. 2024; Charpin & Cousineau 2024.) Diversification of the supply chain offers better financial performance during periods of significant geopolitical risk (Zhu et al. 2025). This is in line with the principles of the RDT (Kashem et al. 2024). Shih (2020) also suggests diversification should be more regional. Diversification is often made to geographically closer suppliers to decrease risks related to distance (Zhu et al. 2025).

However, strategic diversification and multi-sourcing can increase other supply risks (Charpin & Cousineau 2024). During disruptions and geopolitical risk, a diversified supply base can also hinder the company, as a complex supply base is also more vulnerable to supply chain disruptions (Wissuwa et al. 2022; Fan et al. 2022). According to Fan et al. (2022), the disadvantage of international diversification can be explained by being vulnerable to policy risks. They argue that geographically diversified companies suffer more financially from supply disruptions.

Fan et al. (2022) suggest that companies with less diversified supply bases suffer less from disrupting events, such as increased tariffs, than their more diversified counterparts. Similarly, Tang (2006) argues that during uncertainty, a simple supply chain offers better profitability and continuity. Simplifying the supply base can reduce transaction costs, but this might affect the company's competitiveness, as a less complex supply base can increase the responsiveness of the suppliers and be more cost-efficient, but it can also lower supplier innovation and raise the supply risks (Choi & Krause 2005). Too lean and cost-effective sourcing can become a major problem during a disruption (Kashem et al. 2024; Charpin & Cousineau 2024).

2.2.2 The balance in diversification

Chae et al. (2019) suggest that companies must assess the cost-benefits between the capabilities of a complex diversified supply base and the low transaction costs of a simple one. The tariff environment in question impacts this analysis (Chae et al.). Companies need to evaluate different costs and find a balance that works for them (Miller et al. 2025). Thus, Choi and Krause (2005) find that this requires optimization of the complexity of the supply base. The optimal supply base size can depend on many factors, such as the type of the product (Kraljic 1983) and changes in the environment (Chae et al. 2019).

Lampel and Giachetti (2013) find that there is an inverted U-shaped financial performance outcome from international supply base diversification. International diversification will increase the profitability of the company up to a certain point, from which this starts to decline (Lampel & Giachetti). Shi and Ni (2024) argue that resilient supply chains are more economical than purely cost-based ones, due to low-cost differences during normal operations and highly more cost-efficient operations under disruptions. Resilience here means building a flexible supply chain that can recover from disruptions by, for example, diversifying to lessen dependence.

Companies must balance the ratio of efficiency and slack in their operations to be able to adjust to both normal and disrupted environments. They need to recognize the areas in which a lack of slack can be crucial during disruptions. (Hendricks et al. 2009.) Riordan and Williamson (1985) argue that there is no optimal level of diversification fitting for every situation, but instead, this requires entrepreneurial decision-making.

2.2.3 Short-term adjustments

Some companies might not be making large scale changes due to tariffs and choose to do low commitment adjustments or none. Johnson and Haug (2021) mention stockpiling as a way to adjust to disruptions in the short term. This way, companies are not as vulnerable to disruptions in the supply. This can also be a way to avoid the tariffs by increasing stocks of a product before tariffs take effect. Companies could also try and negotiate agreements with better prices. (Johnson & Haug.) Redundancy should be increased in the form of larger storage to defend from disruptions (Shih 2020). However, firms do not necessarily use increasing inventory to mitigate policy risks as this depends on the instability and rate of change in the industry, and the uncertainty of the environment (Darby et al. 2020).

2.2.4 Wait-and-see approach

The wait-and-see approach means that companies choose not to change their supply base or make any major changes. These companies do not see the tariffs as significant enough to justify adjustments. Managers need to evaluate if the transaction costs of adjusting the supply chain are comparable to the tariffs. The aim is to find the best TCO scenario, thus companies would rather wait to see the more certain effects of the tariffs and even the decisions of competitors. This is often implemented in the case of interpreted low severity of tariffs. (Chae et al., 2019.)

2.3 Factors affecting sourcing strategy adjustments to increased tariffs

According to Chae et al. (2019), strategies to tariff increases can be characterized by two features: severity and timing uncertainty. These define whether companies want to react to the tariffs and adjust the supply base complexity. This means that firms choose to act based on how big the cost impact is and how likely it is to happen. Miller et al. (2025) acknowledge both these factors as well but consider tariff rate (severity) as the catalyst, and uncertainty as a moderating factor.

The adjustments made in relation to tariffs are affected by many factors, in addition to cost and uncertainty. Chae et al. (2019) suggest that these factors limiting the sourcing strategies can be categorized into the tariffs' geographic scope, relative purchasing spend, and supply risk. Thus, these factors can restrain how companies can mitigate the sourcing cost or supply chain complexity and how they react to the tariffs (Chae et al.). Miller et al. (2025) divide these a bit differently, into product, company, and uncertainty, which entail factors such as, uncertainty, the supply chain and industry. They see that these factors affect the costs and possibilities of different adjustments. However, their viewpoint is based on only US-based companies, whereas Chae et al. (2019) have a universal approach. There are also other factors affecting adjustments such as geopolitics and the market.

2.3.1 Main triggers

Companies are considering changing their sourcing strategies based on the certainty of the expected tariffs to alleviate the resulting cost increases (Chae et al. 2019). Tariffs affect companies' TCO, thus, they can influence their sourcing strategies, and cause companies to adjust their supply chains (Miller et al. 2025). Bode et al. (2011) agree that companies are more likely to adjust their sourcing strategies if the tariff has a substantial effect. The likelihood of adjusting to disruptions depends on both the severity of tariffs and the cost of alternative possibilities (Miller et al. 2025). Miller et al. see that tariffs can create both negative and positive impacts on demand and supply, thus affecting companies differently based on their circumstances.

Uncertainty means how unpredictable the tariff’s validity is, meaning when it will become valid and for how long, which includes possible increases in the tariffs (Chae et al. 2019). Differing from the view of Chae et al. (2019), Miller et al. (2025) define tariff uncertainty both as uncertainty of the timing of the tariffs, but also at what rate and toward which countries they are set. The ideas are the same, but only the scope of the terms differs.

Uncertainty affects the competitiveness of companies, so they are keen on mitigating it (Walker & Weber 1987). A high tariff uncertainty can make the decisions of developing a new supplier less attractive and cause companies to refrain from doing so (Wu et al. 2024). According to Johnson and Haug (2021), when a country’s policy uncertainty increases, companies tend to mitigate these risks by reducing suppliers in that country and diversifying to other countries. Uncertainty in policies can cause companies to restructure their supply chains even before the policies are approved, since they look for stabile environments (Charoenwong et al. 2023). Miller et al. (2025) see that uncertainty leads to companies making less investments and investments that are hard to reverse, due to high possible opportunity costs.

2.3.2 Operational factors

Operational factors such geographical scope, purchasing spend, supply risk, and firm characteristics relate to the product being sourced and the sourcing company, thus affecting the sourcing strategies. Handley et al. (2024) agree with Chae et al (2019). and argue that the geographic scope of the tariffs means that if the tariffs are directed at one or a few countries, companies can have a higher chance of finding alternative suppliers that are not affected by the tariffs. Whereas, if many countries are affected, then companies have fewer options to change to (Handley et al.). According to Chae et al. (2019), the assumption here is that the TCO in a tariff-influenced country is higher than in countries not under the tariff. Due to tariffs, the country setting the import tariff might become a viable option for companies to source from, to avoid the increased tariffs (Miller et al. 2025).

When the relative purchasing spend of an item affected by the tariff is high, companies will more likely act and try to mitigate this effect. If switching suppliers amounts to less cost than the increased tariffs, then changing suppliers becomes a viable option. With higher spend, it becomes more probable that avoiding the tariffs is more economical than embracing them. If the chance for savings from switching is high, the companies are more likely to react rapidly. (Chae et al. 2019; Miller et al. 2025.) Product characteristics such as complexity and cost of building a new product line can affect decisions due to large adjustment costs or difficulty (Miller et al. 2025). Excessive product variety can also hinder production and should be narrowed down to be more effective (Shih 2020). Another strategy for reacting to restrictions is upgrading the product or process with R&D and thus, capturing more value (Gereffi et al. 2021).

Supply risk controls the diversification of a company, even if they are keen on adapting their sourcing strategies. If the item sourced is under a high level of supply risk, companies are less likely to stop using a supplier than with lower risk ones. (Chae et al. 2019.) Thus, with high-risk items, decisions are often about maintaining access to critical resources, in accordance with the RDT (Riordan & Williamson 1985). This is why differentiated products needing specific inputs are sensitive to uncertainty (Charoenwong et al. 2023). Sectors with a more concentrated number of importers are affected less by the changes caused by tariffs than more diversified ones (Handley et al. 2024). When supply risk is high, supply is concentrated, and it is hard to find substitutes for resources, companies cannot cut ties with existing suppliers, and therefore, changing suppliers is less viable. And vice versa when supply risk is low. Therefore, sourcing strategies and supply bases for items with less supply risk are more adaptable, and in case of tariff increases, can be adjusted swiftly. (Handley et al. 2024; Chae et al. 2019.) Supplier dependence greatly affects companies' sourcing decisions (Bode et al. 2011). In addition, current supply chain and its complexity also affect sourcing decisions (Miller et al. 2025).

Changing production locations can be a strategy to mitigate policy risks (Darby et al. 2020). However, substituting one location for another may create a new dependency (Charpin & Cousineau 2024). New and especially low-cost countries might suffer from the knowledge and skills required for production, causing risks and problems (Wang et al. 2023). This would require the countries to have reliable infrastructure, financial structure, and human capital, which might take time to grow (Gopalakrishnan et al. 2022). In the face of high tariffs, companies prefer moving their production to low-cost countries despite the increased risks for the supply chain (Wang et al. 2023). Miller et al. (2025) find that critical ecosystem characteristics can limit possibilities to change suppliers, which means that if, for example, knowledge in the industry is limited, then changing suppliers is not viable.

Supplier auditing should be possible, improve visibility, and lessen supply risks (Day et al. 2025). Companies should map their supply chains thoroughly to be able to assess their ability to handle disruptions and the possibility of changing to other sources (Shih 2020). Day et al. (2025) see technology transfer in the form of supplier development and joint ventures as a way to mitigate supply risks.

According to Miller et al. (2025), the size of the companies affects their adjustments. Companies' large size, market share, and power make them more sensitive to uncertainty (Charoenwong et al. 2023). However, large size gives companies more room to negotiate, through both larger volumes and power, and due to more resources to change sourcing locations (Miller et al. 2025), which is consistent with the RDT (Pfeffer & Salancik 2003). According to Bode et al. (2011) adjustments depend also on the company’s position and knowledge on supply chain disruptions, since the reaction of firms depends on their past experiences . The sourcing knowledge of the management can help to mitigate tariff-related geopolitical supply chain risks (Wicaksana et al. 2025).

2.3.3 External environment

External environment such as geopolitics and the market highly affect the sourcing strategy adjustment made. Charpin and Cousineau (2025) find that companies typically reduce their suppliers in countries that drastically differ in politics from their own, to reduce risks from geopolitical disruptions, which indicates that companies avoid countries with hostile or unstable politics. Kalvelage and Tups (2024) agree that firms are looking to “friendshore,” in other words, locate production in countries perceived as allies to alleviate risks related to geopolitics and other disruptions, even if it increases their costs. Countries encourage this to reduce the chance of coercion resulting from dependence or possible sabotage by adversaries. This can also provide countries relationships with strategic interests. (Kalvelage & Tups.) Kashem et al. (2024) find that near-shore and local sourcing diminish geopolitical and supply risks. However, instead of friendshoring toward politically aligned countries, companies think about factors like comparative advantages, logistics, and production scale when choosing where to diversify (Freund et al. 2024).

The decisions for new locations are affected by the geographic area or country in which the company makes sales (Johnson & Haug 2021). The location of the company's customers and market is a factor that affects the decision of how to diversify. Companies with US customers are more likely to set production there, and ones with global customers will source in local markets, due to increased uncertainty in the US. Maintaining the same geographic market for both manufacturing and sales activities can lessen the negative repercussions of international diversification. This Co-location reduces the costs resulting from coordinating the supply chain from manufacturing to different markets. (Lampel & Giachetti 2013.) Moving production to the US is still less likely than moving globally (Charoenwong et al. 2023). Domestic suppliers can help navigate and avoid import tariffs in a tariff-imposing country (Wicaksana et al. 2025). However, tariffs are not often enough to secure reshoring or moving production to the US (Gur & Dilek 2023).

The theoretical framework of the study is presented in the Figure 1. The figure depicts the relationship between sourcing strategy adjustments, main triggers, and operational factors and external environment. The "how" question of the research relates to how companies adjust their sourcing strategies in response to tariffs. Main triggers are the tariff-related factors that cause companies to consider adjustments, whereas the operational factors and external environment limit these adjustments. The framework is adapted from Chae et al. (2019), which depicts a similar topic.

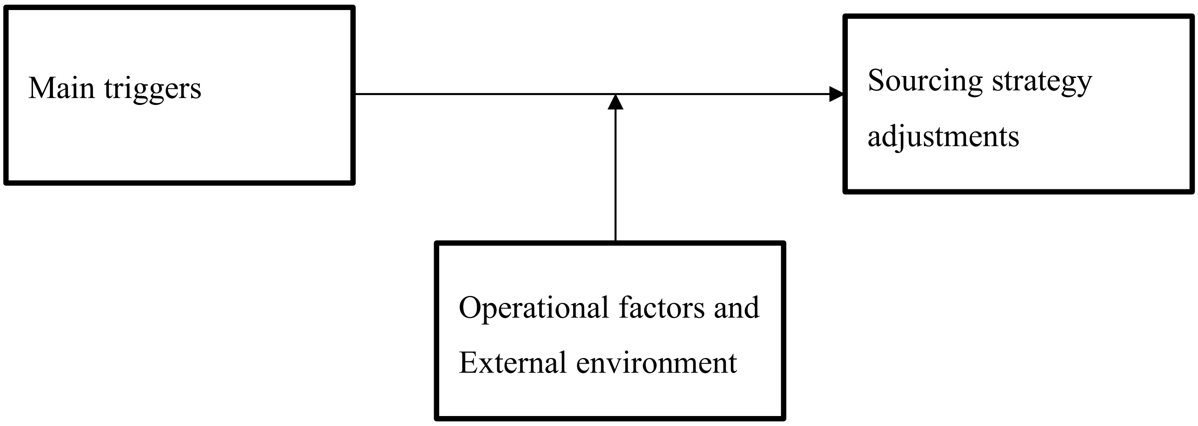

Figure 1. Framework

Adapted from Chae et al. (2019). This picture illustrates the relationship between main triggers, operational factors, external environment, and sourcing strategy adjustments.

The key is to globalize the supply chain smartly, to stay competitive, but also to mitigate risks (Shih 2020). Gopalakrishnan et al. (2022) see that supply chains will become more diverse, localized, and shorter, with more supplier redundancy, in order to reduce dependency and be closer to the markets.

2.4 Theoretical views on sourcing strategies

Transaction Cost Theory (TCT) and Resource Dependence Theory (RDT) see sourcing decisions from different views highlighting cost-dependency trade-offs. TCT sees the sourcing strategy decisions from the perspective of indirect costs stemming from supplier selection, measurement, negotiation, communication, coordination, and creation of safety measures (Rindfleisch & Heide 1997). A more complex supply base increases transactional costs (indirect costs) since managing these requires more input. This complexity makes coordination more difficult and can lower responsiveness. Also, suppliers might source from each other or be connected in another way, voiding the benefits of a complex supply base. (Choi & Krause 2006). Fan et al. (2022) suggest that the advantages of flexibility of diversification might be nullified by the increased transaction costs. Lampel and Giachetti (2013) argue that according to TCT, diversification increases companies' internal expenses as management requires more resources and coordination, which will diminish the received income. Diversification will also introduce constraints on the company.

RDT sees companies as dependent on their external environment (Pfeffer & Salancik 2003). According to Rogers et al. (2024), when there are changes in the availability of resources, companies can try to adjust their actions by changing their relationships to fit the situation. They suggest diversifying suppliers and having more than one source to ensure the supply of critical resources for a company. This way, they do not need to rearrange their supply chain after every change in the environment or tariffs. (Rogers et al.) Diversifying also reduces a company's dependency and allows it to recover from supply disturbances more rapidly and efficiently (Polyviou et al. 2023). During geopolitical tensions, companies tend to increase supplier base complexity both horizontally and spatially to reduce risks of disruptions and dependency, which is consistent with resource dependency theory (Zhu et al. 2025; Charpin & Cousineau 2025). However, these new suppliers can raise other risks and create transaction costs that must be managed (Charpin & Cousineau 2025).

2.5 Battery and Energy Storage industry – US-China trade conflict

The context of this research is the battery and energy storage sourcing strategies during the US import tariffs, especially on China. These US import tariffs started in 2018 (York 2024), and the more changes came in 2024 when Joe Biden's administration increased tariffs for resources coming from China in certain sectors, and promises were made to raise the tariffs even more in 2026 (The White House 2024). Depending on the sector, the tariffs will increase in the year 2024 or 2026 by 25%-100%. This includes the tariff on batteries to increase to 25% in 2024, battery components, parts, and critical minerals in 2026, and steel and aluminium to increase to 25% in 2024. (The White House.)

The 2024 presidential election increases the uncertainty and possible effects of tariffs, as Donald Trump has threatened to increase the tariffs on all imports from China to 60% and all imports at least to 10%, in addition to various other tariff levels toward other countries (Aratani 2024). This 10% tariff on all imports came into effect in April 2025, and while other tariffs were placed on temporary hold, the ones on China were not only continued, but increased to 125%, signifying a drastic change in the US-China trade war (Eezyimports.com). These tariffs and possible further increases have caused companies to consider adjusting their sourcing strategies.

The 2018 US import tariffs on China guided companies to divert their production to other low-cost countries, such as Vietnam, Mexico, India, South Korea, and Taiwan, depending on the advantages of certain products in these countries. This was seen more than reshoring. However, many of these diversified suppliers still rely on Chinese goods for their products. Instead of decoupling from China, the tariffs have increased intermediate countries to trade. (Freund et al. 2024.)

Industrial access is a significant risk related to working with China, as China has most of the raw material processing in multiple industries. Thus, companies must balance between depending on

China, thus risking disruptions, and decreasing these risks by diversification while possibly increasing costs. China also raises concerns about sustainability, especially related to ethics and labour laws, which can cause risks in costs and firm's reputation. (Day et al. 2025.) This is also the case for the battery and energy storage sectors. The US is trying to reduce dependence on foreign production, especially China, and rebuild its industrial base, by protectionism, in this instance, tariffs. (Gur & Dilek 2023.)

Gur and Dilek (2023) see the US rivalry against China as both economic and security-related concerns. Due to trade disruptions with China, other Asian countries may be targets of diversification (Gopalakrishnan et al. 2022). While China's trade with the US has decreased due to tariffs, China has increased trade with other countries and still holds a central stake in global trade (Freund et al. 2024). China's position may be reduced, but it will remain a major player (Gopalakrishnan et al. 2022).

Shih (2020) points out that companies should not abandon China, as it is still a strategically important powerhouse that provides economical, quality products, therefore instead a China+1 strategy could be followed. This follows the ideas of RDT (Pfeffer & Salancik 2003). Some companies, for example in the automotive industry, have considered moving component assembly to China, to gain access to Chinese raw materials, despite the tariffs (Miller et al. 2025).

According to Chuang et al. (2023), there are many different forms of battery and energy storage systems (ESS), such as magnetic, electrochemical, and hydro systems. In this study, we focus on the electrochemical system and especially battery-based ones. Most of the electrochemical ESS are lithium-ion battery-based. Energy storage is a rising industry that is considered a key development industry by many countries. They can offer solutions for supplying power during high-demand times and offer increased stability in the power grid. (Chuang et al.) The global market for energy storage is estimated to grow by 30.43% annually between 2022 and 2030, and it is also estimated that in 2030, over half of the installed energy storage systems will be in the US and China (Bloomberg NEF 2021). Especially the Asia-Pacific region is estimated to grow by reaching 53.5% of the market share by 2025. In the year 2019, the three countries with the most cumulative installed capacity of electric Energy storage systems were South Korea (1987MW), China (1709MW), and the US (1590MW). (Chuang et al. 2023.)

Barman et al. (2023) find that battery consumption is in a major state of growth, rising from 11 GWh in 2015 to 460 GWh in 2023, and could surpass 800 GWh by 2025. This is mostly due to the EV industry, and most of these will use lithium-ion batteries, which Jones (2024) agrees on. According to Barman et al. lithium battery supply is heavily concentrated, which exposes it to geopolitical and supply risks. China is the leader in battery supply chains, while the USA and Europe lack battery production. However, countries globally are focusing on developing battery supply chains. To manage these risks, the raw materials and their refining need to be diversified. There are options for lithium, for example, Na-ion batteries. R&D toward these technologies can allow new competitive actors to rise. but these are not yet at the same level as lithium-based ones. (Barman et al.)

3 Methodology and Data

3.1 Methods

This topic was chosen due to the unusual tariff situation and interest in how companies adjust their sourcing strategies to it (Eezyimport.com 2025). The battery and energy storage industry was chosen as the context due to being influenced by the tariffs (Barman et al. 2023), and due to the interest of both the assigning company and the author. The study focused on European companies, in other words, outsider companies that are not from either the US or China. Previous literature about tariffs and sourcing strategies was reviewed, giving further understanding of sourcing strategies and theories. These tariffs and the factors affecting adjustments had not been researched in this detail from a European, third-country perspective, and the context of the battery and energy storage industry was also new. The goal was to understand how import tariffs affect companies' sourcing strategy adjustments and what factors guide this. Therefore, this was deemed a fitting definition for this research.

The methodology chosen for this research was a qualitative case study using an abductive thematic approach (Dubois & Gadde 2002; Eriksson & Kovalainen 2016, 132). Theory served as a foundation for developing initial themes for interview questions, particularly informed by Chae et al. (2019), with the primary focus of the analysis being the collected data (Dubois & Gadde). At the beginning of the study, limited research had been done to understand the factors limiting adjustment to import tariffs (Chae et al); thus, this study aimed to improve the knowledge of this gap, and an abductive approach was justified (Vinitha 2019). After analysing the interview data, iteration was pursued by further researching the theory based on the analysis, as the analysis guided the search for theory on other subjects related to the situation (Dubois & Gadde). At this point, new similar studies on the subject had also been published, which were then included in the theory.

According to Pratt (2009), qualitative research can be used to understand topics related to how-questions and to achieve a deep understanding of the topic. It is also a way to find new insights into the topic and let the interviewee tell their perspective. For these reasons, the method was considered to fit this research, as the goal is to find and understand new sides of sourcing strategies in relation to tariffs. As the interviewees know best what factors are relevant to this topic, it is best to let their ideas come through in the data collection, which is easiest in interviews (Eriksson & Kovalainen 2016).

The research method for this thesis is a qualitative case study, which aims to understand own thoughts, behaviour, and experiences of the interviewees (Eriksson & Kovalainen 2016, 132). A case study researches one or several cases comprehensively, allowing the phenomenon to be studied in its real-world context, while the subject can be a person, organization, event, or some other clearly defined concept (Farquhar 2012). Case-study serves the purpose of this research to provide practical and empirical information (Eriksson & Kovalainen, 132). A case study fits the study of current phenomena, for which it is hard to gather information otherwise (Donmoyer 2009), and therefore it is perfect for the study of the ongoing tariff situation. Therefore, the subjects of this study were companies and specialists in a field affected by the import tariffs, which were still not in effect or partly in effect. In case studies, previous theory is used to plan the gathering of data and its analysis (Eriksson & Kovalainen, 132), which was also the case here. According to Dubois and Gadde (2002), a case study can also improve or build theory. In such cases, theory, empirical research, and analysis all progress at the same time. Case studies often evolve in a circle, like qualitative studies usually (Dubois & Gadde). For this, the abductive method of this study fits well as it uses both empiric and theoretic information (Vinitha 2019). This Case is related to one industry, and the aim is to find information that can be transferred to other industries as well.

According to Yin (2018, 4) case studies can be divided into explanatory, exploratory, and descriptive. This study has both exploratory and explanatory features. Exploratory methods map new information, which fits well for subjects that have little or none of previous information or research. However, it is not purely explorative, since previous theory has shaped the interview questions. The study also has explanatory properties, as it tries to explain the question “how”. and strives to explain the mechanisms of the case. (Yin, 4.) Thus, the aim was to find possible new information about the case and have an open-minded approach, as well as explain its mechanics and background. Eriksson and Kovalainen (2016, 133) divide case studies into intensive or extensive. This study is intensive, as it focuses in depth on one phenomenon from the view of a few companies, where the view of the participants is at the centre. This kind of case study can still be used to develop existing or new theories (Eriksson & Kovalainen, 133).

This study was conducted as an assignment for a company working in the battery and energy storage industry. However, this company is kept anonymous in this study, as well as all the other companies, due to the focus on business strategies. The author was employed by the assigning company for part of the research. Also, the author’s previous work experience with the subject created certain presuppositions about the topic. To mitigate this, the presuppositions were written down and circled back to, to make sure the topic was thought from other perspectives as well. The literature about the topic was also thoroughly researched, and this information was used as a base for the interview themes and questions. This measure also aimed to minimize any potential bias arising from the author's employment at one of the case companies during the thesis interviews. The same interview structure was also used for all the interviewees to provide coherent data.

In this thesis, in addition to the assigning company, the topic and structure of the research have been influenced by the thesis supervisor, and both have brought up different viewpoints from the practical and theoretical sides. The author has made the final decisions, and the research aim has guided the entire thesis process. To increase trustworthiness, the thesis processes of choosing the research topic, methods, analysis, and data collection have been described in detail.

3.2 Data collection

The analysis method was decided before the interviews and thus guided the creation of the interview themes and structure. The analysis was continuous throughout collecting, interpreting, and reporting the data, which is one factor that separates qualitative research from quantitative (Hirsjärvi & Hurme 2008, 136). Previous literature and its suggestions were used as a base for preparing the interview questions, particularly the initial factors mentioned by Chae et al. (2019). Thus, the interview themes were adjustments, product, firm, supply chain, industry, and risk. Due to the time constraints of the research, pilot interviews were not possible.

The data was gathered through semi-structured thematic interviews, in which the question list was used to structure the interview (Appendix 1 interview questions) (Eriksson & Kovalainen 2016, 133). The question list was prepared with a thematic structure from the theory, with main questions and possible sub-questions to aid in the conversation. The questions were open-ended and as neutral as possible to allow the interviewee to guide the conversation. These were planned thoroughly to touch on many themes, but also to allow the interviewee to give new information about the topic, not considered by the interviewer or by the limited previous literature. In addition, this method allows for digging deeper into interesting subjects or answers brought up by the interviewee. At the same time, answers and questions can be clarified if needed. (Hirsjärvi et al. 2015, 208–209.) This was also to avoid leading the interviewees. Some interview questions were slightly changed after the first interview to be easier to understand, while keeping their original intent.

For this research, sourcing specialists in battery and energy storage companies were chosen to be interviewed. This was to receive the best information on the firms' sourcing decisions related to the tariffs and the most up to date information (Eriksson & Kovalainen 2016, 133). Once an interview was agreed an official interview invitation was sent to the participants (Appendix 2. interview invitation). European companies in the battery and energy storage industry were contacted through email if their portfolio included battery-based products. These companies were searched with terms "battery companies", "energy storage companies", "...in Europe", "…in Finland" on Google, LinkedIn, and Ensun, and from an article from Syed (2025). However, finding interviewees was difficult, and from the 32 companies contacted, initially interviews were only agreed with three companies and five employees in total. The rest did not answer or were not interested in participating in the interview.

For this reason, the data acquisition strategy was refined, and triangulation of sources was implemented by approaching expert consultants in the field and general trade experts to improve the credibility of the study (Guion et al. 2011). Thus, two specialists in the battery industry and one specialist in trade were interviewed. This was chosen to give a more trustworthy and comprehensive view of the subject despite the small sample size, and to highlight the main points more clearly. Due to challenges in finding participants, the period for interviews was rather long, about nine months between December 2024 and August 2025. The first two interviews were conducted in December 2024, and the rest between May 2025 and August 2025. This might have caused different perceptions of the situation between participants due to changes in the tariff situation. However, no chances were made to the interview questions between the second interview and the rest. Only minor clarifying changes were made after the first interview to make the questions clearer and easier to understand.

The companies interviewed differed in size and function, and interviewees by job positions, which are listed in Table 1. The first one was a large battery-based energy storage company in Finland that did business in the US. From this company, two sourcing specialists were interviewed. The third interview was with a manager of a large renewable energy and battery maker, which did not do business in the US. The fourth and fifth interviews were from a small Finnish battery company that, in its current form, had some business in the US. The fourth one was a sourcing specialist, and the fifth one was a tariff specialist. All these companies were doing business internationally. Sixth and seventh participants were from a consulting company in the industry. The sixth one was a project consultant, and the seventh one was a sourcing consultant. All these previous companies were from the private sector. The eighth interview was with a trade and climate policy specialist in a business union. All interviewed companies and participants worked in Finland, which helped the gathering of material. This sample size was deemed sufficient for this study due to its triangulation of different types of entities and companies in the field. The information about the companies and participants is kept minimal to ensure the anonymity of the interviewees. Some background questions were still asked to understand the viewpoint and participants familiarity of the subject.

The interviews lasted between 27-46 minutes, and they were conducted in Teams in either English or Finnish. These were recorded and transcribed with Teams' own recording and transcription tools. The transcriptions were then cleaned up, meaning that repetition, filler words, and pauses were removed, and they were compared to the original video to ensure they were correct. These were then translated into English when needed and used for analysis. The translations were thoroughly compared to the original transcripts to ensure that the meaning of the answers did not change in translation.

Table 1. Interviews

Date	Length (min)	Field	Company size	Title	Code
25.11.2024	36	Energy storage	Large	Sourcing specialist	1
26.11.2024	46	Energy storage	Large	Sourcing specialist	2
3.7.2025	41	Battery company	Large	Manager	3
20.8.2025	36	Battery company	Small	Sourcing specialist	4
22.8.2025	27	Battery company	Small	Tariff specialist	5
26.6.2025	34	Industry consultancy	-	Project consultant	6
13.8.2025	29	Industry consultancy	-	Sourcing consultant	7
7.8.2025	37	Business union	-	Trade specialist	8

Confidentiality was practiced in this research, and the confidential data was handled only by the author. The interviewees were reminded of their rights and the characteristics of the voluntary research in the interview invitation sent through email, and at the start of the interview. Consent for participating in the study and for recording and transcribing the interview was ensured at the start of the interviews. Only personal information essential for the research was asked from the participants. The materials gathered in the interviews have only been handled by the author and only for this research. The interview invitation and questions are included in appendices 1 and 2. As suggested by Hirsjärvi et al. (2015, 210) the interviews were conducted individually to ensure anonymity and for the interviewee's voices to come through. Keeping the interviewees anonymous increased trust and allowed them to talk about the subject more openly and realistically.

3.3 Analysis

The research was conducted by using an abductive method, meaning that both existing theory and data were used together to further the research (Dubois & Gadde 2002). This allowed for interesting information from the interviews to guide analysis. At the same time, it allowed for comparing the findings with previous literature and theory (Vinitha 2019). The interview used previous literature, especially Chae et al. (2019), as a base to form the structure and the themes for the interview. However, the analysis was conducted more inductively based on the material to let the interviewees guide the findings and limit the influence of existing literature. Material-based analysis is especially relevant when basic information about a phenomenon is needed (Eskola & Suoranta 2014, 19). This was also to minimize the author's influence on the results with personal bias. Ethical principles of the research were acknowledged during analysis and reporting (Hirsjärvi et al. 2015, 210). The quotes used in the analysis were checked to ensure the anonymity of the participants.

The analysis was done thematically by coding information into themes. This approach was chosen as the goal of the research was to find the interesting and relevant factors that affect this subject. For identifying patterns, themes, and interesting topics, thematic analysis is a good and flexible method (Lochmiller 2021). Due to the small sample size, focus was given to interesting findings, and notable individual findings were also examined to help us understand the situation better. In thematic analysis, the materials are organized into themes (Thompson 2022).

Once the material was collected, cleaned, and translated, it was first read thoroughly following the first step of thematic analysis by Braun and Clarke (2006, 86-93). Step two, the quotes were coded with initial codes/terms to best fit the meaning of the quote. After this step 3, the initial themes were formed based on the codes. Quotes were placed under the themes, and the themes were modified, added, and deleted to best describe the topics and to achieve a coherent division, as per the step 4. After this, the themes were further sorted into aggregate themes to create categories and sub-categories, as per step 5. These were then reviewed again to make sure that the themes are sensible. The high-level themes were edit in the final modifications of the study to be as clear as possible and to group the themes efficiently. Then during the final step the material was analysed and reported.

During the coding, it was also noted that some quotes related to adjustments and others to reasons or limiting factors for the adjustments. This was considered and implemented in the coding. During the data collection and analysis, the key factors affecting adjustments were seen as the key findings, and focus was directed more towards them.

The initial interview themes, based on Chae et al. (2019), were adjustments, product, firm, supply chain, industry, and risk. When analysing the data, the information was divided into other, more fitting themes and categories by the author. The themes are presented in table 2. New themes were chosen and could be categorized under two main categories: 1. Sourcing strategy adjustments: Long-term adjustments, Short-term adjustments and Wait-and-see approach 2. Key factors: Main triggers, Operational factors, External environment, and Non-tariff drivers. There are also subcategories for these themes. These were chosen to best showcase the important factors in the data and to align with the research questions. The analysis was then conducted based on these themes. The analysis was based on the data but included interpretation from the author. Thus, the influence of the author can be seen in the formation of categories.

Table 2. Themes

Main categories	Themes	Sub-themes
Sourcing strategy adjustments	Long-term adjustments	
	Short-term adjustments	
	Wait-and-see approach	
Key factors affecting sourcing strategies	Main triggers	Cost Uncertainty
	Operational factors	Product Company Supply chain
	External environment	Industry Geopolitics Market and demand
	Non-tariff drivers	

After recognizing these themes and their properties in the analysis chapter, a final analysis was conducted on how they relate to each other in the discussion part. After the analysis, iteration was pursued by returning to the theory to find previous literature related to the findings from the material (Dubois & Gadde 2002). Theory and findings were then compared in the discussion chapter. Thematic analysis needs interaction between the data and theory, to not be too shallow (Eskola & Suoranta 2014, 125–126), which is why the abductive method was seen as fitting.

3.4 Reliability of the study

The trustworthiness of a qualitative study can be assessed through different ways, one of them is using the four categories: dependability, confirmability, credibility, and transferability (Ahmed

2024). Dependability refers to factors such as transparency and the consistency of the study, which means that the process of the research is explained in detail and honestly, including the decisions made and the role of the author in relation to the participants (Ahmed 2024). All the methods and choices should be transparent so that the research can be replicated (Ali & Yusof 2011). Hirsjärvi et al. (2015), find that the detailed description of the study process increases its trustworthiness, which has been one of the aims of this study. transparency of choices and methods is included to allow for reproducibility of the study. Also, the author’s employment under one of the companies and how this affected the decisions made is mentioned. The reliability of the study has been evaluated in every step of the study. The use of AI is described in detail in the appendix 3, explanation of the use of AI.

Confirmability means that it is possible to confirm the results with the methods and materials used, so that they are not just the products of the authors' interpretation and thoughts (Ahmed 2024). This grounds the findings in the data, and thus, research bias can be reviewed (Eriksson & Kovalainen 2016, 307). In this study, the interview recordings and transcripts were used to ensure that the collected data were correct. To increase credibility, all the coded data were included in the analysis chapter, so that the reader can check them and the conclusions made from them.

The credibility of a qualitative study is related to its validity by consistency of research methods, analysis of the data, and research questions improves this. The research should also be based on a theoretical framework that supports the analysis of the material and connects it to the existing literature. (Eriksson & Kovalainen 2016 305.) Consistency of methods has been one of the primary goals of this research, and a detailed description of these abductive and thematic methods has been provided to allow for evaluation. Previous theory has been used to guide the research in the right direction and to compare with the findings from the analysis. According to Guion et al. (2011), and Ahmed (2024), triangulation, meaning the use different sources, methods, or theories, increases the credibility of the research. In this research, material collection methods were chosen to suit the case and research. Thus, triangulation is done by using different sources of battery company employees, industry consultants, and a union trade specialist. Different theories of TCT and RDT are also used in the theoretical framework. Therefore, the study is based on different sources and theories, increasing its credibility.

Instead of quantitative research’s generalizability, in qualitative research, transferability is pursued, which means how well the results can be applied to other contexts (Ahmed 2024). To improve this, the processes, scope, context, and sampling of the study have been described in detail to allow future researchers to evaluate if these findings can be transferred to their situation (Ali & Yusof 2011; Ahmed 2024). In this study, the aim was to create information that could be transferred to sourcing strategies in other industries under import tariffs. It is good to note that this tariff environment and related uncertainty are unprecedented, which might limit the transferability to other import tariffs. Also, the industry's high dependency on one country limits the transferability.

The research has been influenced by the availability of research subjects, which affected data collection and, consequently, the scope of the study. However, the sample of the study was a comprehensive representation of the industry, with both small and large international battery and energy storage companies. The interviewed sourcing specialists provided relevant information on the subject. On top of this, the data collection included triangulation of sources with industry consultants and a trade specialist being part of the study. Thus, this sample fits well to achieve a comprehensive understanding of the sourcing adjustments and key factors in the industry, in this tariff situation. This versatile sample of people specializing in this topic and working in this environment improves the generalizability, or transferability, of the study (Eskola & Suoranta 2014; Ahmed 2024).

3.5 Research ethics

Ethics in a study refer to social practices in line with good scientific practices, which increase the credibility of the study. Good scientific practices require honesty, accuracy, and paying attention to possible mistakes. Thus, ethicality requires an explanation of the choices made. (Eriksson & Kovalainen 2016, 63-65.) Issues of research ethics begin with the choice of the research topic. It is good to think about both the theoretical and practical contributions of the study, and thus, how it can be justified. (Hirsjärvi & Hurme 2008, 20.) Good scientific practice was followed in this study. This means that the study used scientific methods and focused on honest and accurate description in its entirety. The sources of the study and previous literature on the subject have been listed and marked clearly and accordingly. Both the decisions made and possible limitations are described transparently. The use of AI has been described in detail in appendix 3. The assigning company for the thesis and its influence on it has been mentioned, even if the company is kept anonymous. These actions are in line with the good scientific practices described by Keiski et al. (2023).

According to Keiski et al. (2023), one of the pillars of good scientific practice is also respect and proper handling and analysis of the research material. Great attention was paid to ensuring this respect for the interviewees. The participants in the research were informed transparently about the research and its goals. The author’s leading of the interview participants was minimized, and the voice of the interviewees led the conversations. This was important to get the actual information about the subject, but also because of the sensitive topic of sourcing strategies. The voluntariness of the research was important due to the new and sensitive information of the study, and this was emphasized in the invitation and at the start of the interview. At the same time, the participants were reminded that they can withdraw from the study at any point and that they can check their answers before the publication of the thesis, if asked. The permission to record and transcribe the interviews was verified from the participants at the start of the interview. The interviewees were also informed of their other rights, including that the collected data would be stored and used only for the sake of this thesis and by the author, and destroyed after its publication. The participants cannot be recognized from the thesis. The analysis was done neutrally and honestly, to avoid any distortions.

4 Analysis

The interviews provided results for the research questions. We further improved the understanding of how companies have adjusted their sourcing strategies in relation to the import tariffs, what the main reasons are for their actions, and what factors they consider when making them. The results are presented here in two dimensions, which are “sourcing strategy adjustments” and “key factors affecting sourcing strategies”. These include the aggregate themes and their sub-themes. The interview data indicates that the companies’ adjustments are significantly limited by the key factors, Therefore, the analysis places greater emphasis on the key factors affecting adjustments. The interview quotes are present to support the results. The quotes from the participants were used in their original, clean form to increase the transparency of the research and to minimize the author’s views in interpreting them.

4.1 Sourcing Strategy Adjustments

The first theme and topic of the research was about what adjustments the companies have made or are considering to their sourcing strategies in relation to the US tariffs on China, presented in table 3. The main themes of adjustment are long-term changes, short-term changes, and the wait-and-see approach. In the long-term companies are looking for adjustments such as diversification, new target markets or joint ventures, and in the short-term stockpiling or increasing agility. Some have chosen to not make any major adjustments for now and are adopting the wait-and-see strategy. Overall companies are looking for possible adjustments but remain cautious about committing to them. Also, the key factors affecting sourcing decisions heavily limit possible adjustments.

Table 3. Sourcing strategy adjustments

Main categories	Themes
Sourcing strategy adjustments	Long-term adjustments
	Short-term adjustments
	Wait-and-see approach

4.1.1 Long-term adjustments

When asked how the companies have adjusted their sourcing strategies to the US tariffs on China, some of the interviewees answered that the main strategy they have is looking to geographically diversify their supply base and source also from outside of China to avoid tariffs. These options include other low-cost countries, possibly in Asia-Pacific, finding battery suppliers directly in the

US, and closer to the markets and end customers. Experts share the opinion that companies are trying to find competitive options to diversify suppliers. For European companies, this includes finding BESS suppliers in Europe. Some companies even provide BESS products without any Chinese parts as “China-free”.

We are reviewing the possibilities of finding supply from outside China, in other low-cost countries, and scanning the opportunities for battery supply in the United States. Our strategy now is to have a non-Chinese battery supply from the beginning of 2026, when the new tariffs are put in place. (1)

Everyone surveys the market and tries to include as many European suppliers as possible, and there are European BESS system providers. (7)

However, not all strategies involve moving away from the Chinese suppliers. Some mentioned that diversification can also be achieved with a current Chinese supplier moving their production to another non-tariff-affected country. Thus, existing good relationships can be continued through joint ventures and long-term agreements without the need for extensive due diligence towards a new supplier. Or part of the product could be done in China and part in the US to avoid the entire amount of the tariff. One company mentioned trying to make long-term contracts that are not affected by rapid changes. Some companies have also considered adding a Chinese supplier into their supply chain.

Moving the supply chain to a non-China country does not mean a completely new supplier, but using the same supplier with collaboration, joint venture, and long-term agreement with the supplier. (2)

We are now considering an offer from a Chinese supplier. (3)

This tariff disturbance has also encouraged companies to look for expanding exports to new geographic markets and countries other than the US. This could mean decreasing the US market share or increasing the share of the other markets. Especially Europe is seen as a viable option, but also Asia and Australia. This has also worked the other way, as Finnish companies are trying to get suppliers that are depended on the US to become interested in the Finnish market. While not a big strategic change, it is still a way to take advantage of the situation. On the other hand, the US market is still a focus for many, and some are even thinking about entering it due to the tariff situation.

We have also been discussing the possibility that if our business were a bit smaller in the United States and we would compensate for that with demand from Europe, Asia, or Australia (1)

Tariffs have led to a greater focus on the US market. (3)

4.1.2 Short-term

The interviewees mentioned less significant short-term options being considered or taken advantage of in this situation. Small changes are being made to benefit from the situation or achieve better margins. Stockpiling, in this instance importing a large number of batteries before the tariff deadline, is one way to react in the short-term. According to the experts' reports show that many companies have gone this route, but not all have, including the interviewees in this case. One company presented a way of increasing agility by bundling smaller projects together to better accommodate the larger quantity of big companies and their excess supplies. US companies and customers could also apply for tax relief for the products in the form of IRA.

> *We have discussed the possibility of, for example, importing batteries to the United States just before the tariff is increased, but we have not decided that we would be doing this kind of storing of batteries in the United States or any other short-term option. (1)*

> *The core structure is not being overhauled, but efforts are made to secure better margins during this period. The main approach is to capitalize, if possible, in the short term. (3)*

4.1.3 Wait-and-see

Many of the companies are evaluating options but have not yet made any big adjustments. One company stated that they or the companies they know of are not making any significant changes due to the tariffs. Experts in the battery field also reported that there have not yet been any major changes in the field solely because of the tariffs, and the tariffs have not had a great impact on sourcing decisions, especially related to sourcing from China.

> *There have not been significant adjustments. Procurement strategy has not been changed due to tariffs, but short-term actions are being taken. If you look at the big picture, not everyone is really making large-scale adjustments. (3)*

> *No, I have not noticed any changes in sourcing or production from China attributable to tariffs. I have not noticed a change directly because of tariffs (6)*

4.2 Key factors affecting sourcing strategies

When looking deeper into the key factors that affect the sourcing strategy adjustments, new insights were found. This allowed us to better understand the reasons behind the company's sourcing decisions. The following high-level themes were formed: Main triggers, operational factors, and external environment. Main triggers determine whether companies see the need to adjust their sourcing strategies to the tariffs, and operational factors and external environments limit the possibilities of these adjustments. Except for the "non-tariff drivers", these themes and sub-themes are similar to the ones suggested by Chae et al. (2019) and Miller et al. (2025), but there are some exceptions such as geopolitics and non-tariff drivers. These themes are presented in table 4.

Table 4. Key factors

Main category	Themes	Sub-themes
Key factors affecting sourcing strategies	Main triggers	Cost Uncertainty
	Operational factors	Product Company Supply chain
	External environment	Industry Geopolitics Market and demand
	Non-tariff drivers	

4.2.1 Main triggers

The main driver for decisions was the product cost and TCO. Since the tariffs have a high-cost impact on the companies, it encourages them to act on this and try to mitigate the effects. After all, green energy must be economical to receive investments. The high costs, the time it takes to make adjustments, and the effects of big changes also mean that these decisions are not made lightly. Therefore, it takes time to develop a strategy for this situation. The cost also dictates which adjustments are chosen. An expert agrees that the increased prices from the tariffs drive companies to assess other markets. However, even though China has been hit with tariffs, its cost-efficiency is enough to keep it as the best option in terms of cost. This improvement in cost-efficiency can almost nullify the tariff costs, and thus, encourage companies to continue with Chinese suppliers.

In the end, price often determines the choice. (4)

Chinese suppliers' cost advantage partly offsets tariff effects. (7)

Another main trigger that guides how companies react to the situation is uncertainty. Some tariffs are already in place, and some have been published to start in 2026. This has caused companies to consider tariffs in their sourcing. However, the uncertainty related to the tariffs is still greatly affecting strategic thinking as the tariffs are chancing constantly and rapidly. This is very unusual compared to previous long trade agreements therefore it is hard to forecast the market and determine the optimal way to act. Thus, companies need to consider many options, scenarios, and backup plans related to different political situations. This makes decision making difficult and requires significant *resources.*

> *Uncertainty is central; companies must make big financial decisions rapidly, often with limited or incomplete information, which is a challenge for strategic planners. (8)*

Uncertainty affects possible long-term solutions such as diversification. The tariffs could rise even higher than what has been published now. The US might also increase the tariffs on other countries as well, or on Chinese-owned companies in other countries. This is a risk when choosing future geographical locations, which is a slow process, thus making decision making difficult. Something that both companies and experts agree on. Also agreeing to long-term contracts to limit the effect of tariffs also depends on the supplier, which might not agree to such terms in this uncertain situation.

> *We have already seen a risk that the tariffs might go even higher. The USA may increase the tariffs for those countries where our batteries would be coming from. So, the USA may consider that even if the manufacturing is outside China, if the ownership of such a company is Chinese, totally or partly, they would still put tariffs on this kind of product. (1)*

Then again, there are also opposing possibilities and views. The tariffs might also decrease suddenly, and some believe them to be a temporary disturbance, and that the situation will revert in some time. Because the tariff situation is so unpredictable, some companies have decided not to let the tariffs affect their decision-making or have chosen not to make any large-scale changes due to the tariffs. It is also important to remember that this kind of tariff policy from the US could only be related to the current administration. Therefore, when adjusting strategies and making big investments, it is important to consider what the situation might become in the future.

> *Future tariff increases are not considered in procurement strategies. Tariffs could be gone next week or next month, making things unpredictable. Recovery is anticipated, but some opportunities exist. Procurement sees tariffs as a temporary market disturbance. (3)*

> *In some countries, the situation has already normalized after tariffs were imposed. (3)*

The uncertainty is also limiting the short-term solutions to the tariffs, as the tariffs might come into reality before 2026, or even in just a few days. This could nullify the benefits of, for example, stockpiling batteries just before the tariffs increase. Many companies are closely following the situation and trying to seize possible advantages without greatly changing their operations.

> *We have discussed the possibility of, for example, importing batteries to the United States just before the tariff is increased, but the situation is quite unpredictable. It is possible that a sudden tariff increase can be made in just a couple of days. (1)*

Overall, due to the uncertainty in the tariff landscape, it is still unclear which decisions will be the right ones. The future tariff decisions will determine this.

> *We are still in a period of uncertainty for some time, and the coming months will tell us if we have taken the right actions for the next four years or if we should have done something different. (1)*

4.2.2 Operational factors

One category for operational factors is the product. This includes dimensions such as the product type, R&D, and how complicated it is. The products in the battery and energy storage industry are impacted greatly by the tariffs. Parts like certain metals and batteries are the costliest critical components of the products, and they are already under high import tariffs. Many other parts of BESS products are also under the tariffs. Due to the battery as a product, short-term solutions like stockpiling are not often viable options, since technology and its price are constantly changing, and the product would degrade and lose warranty terms.

> *The battery modules are the biggest cost component; if tariffs raise their price, it strongly impacts the total system price. (7)*

> *Increasing stock, for certain commodities and components, including batteries, is not possible due to cash flow risk, degradation of the battery, and loss of warranty terms for all these components. (1)*

The batteries are made most of the time from lithium-ion, which limits the possibilities for raw materials. Research and development of the product can increase the cost-effectiveness of the product and provide new, cheaper options. It is also good to note that changing parts from the original, if they are not exactly one-to-one, need adapting and therefore, change the product. Batteries are delicate and complicated products, and defects can cause serious hazards. Through R&D, batteries that use other raw materials could be made, but it is not very feasible due to the expensive and long processes. Even then, it would not be certain that one could be made, due to the complexity of the technology.

> *We only use LFP battery, so lithium-ion phosphate battery with prismatic form factor, so we are not considering anything else, and that limits the supply alternatives a little bit, (1)*

> *R&D helps; for instance, using different battery chemistries or components less reliant on one country enables further adaptability (6)*

One theme of influencing factors is the company. Especially their location and size. Due to the US tariffs, US-based companies like Tesla, which already have domestic battery production, are at an advantage, and will probably win market share. However, these companies are not enough to serve the demand of the US market.

> *Of course, certain integrators like Tesla have a big advantage in being already fully established in the US. (2)*

The size of the company also matters, according to most interviewees. Small companies do not have similar possibilities or leverages to affect their suppliers due to their low volumes. There is also a risk of larger companies being prioritized by suppliers. Therefore, it might not be an option to source from the EU, where the supply is limited. This also makes many things, such as logistics, more difficult. Smaller companies are especially interested in the EU options, but this is due to having production closer and saving on logistics costs. Small companies also have different strategies to attract suppliers than large ones. They are trying to fill the gaps in the orders of the larger companies with their steady flow of orders.

> *As a small player, procurement volumes also limit choices, especially for battery cells. Sometimes, it is not even possible to source from the EU. (5)*

> *We try to attract suppliers by pointing to our steady, predictable order flow, even if volumes are not large. That regularity can help fill gaps in suppliers' production schedules. (4)*

An interviewee in a large company also sees the size as an advantage in business, but also in adjusting to tariffs. Their centralized procurement increases the positive sides of larger volumes. Also, large companies have an advantage in adjusting to tariffs due to their larger portfolio allowing for easier changes. With a lot of capital, they have more options to react to the situation compared to small ones, for example, by entering the US market, which requires big investments. They usually have a better possibility of acquiring financial support to make large changes, and resources to verify suppliers. Large companies are more interested in their image and due diligence, in addition to having the resources to maintain it.

> *Unlike many similar companies, procurement is centralized, offering a better market picture, larger volumes, and the ability to make bigger moves. Large size and procurement volumes are advantageous: better terms, prices, and the ability to profit from market disruptions with a broad portfolio. (3)*

> *Bigger companies have more resources to vet suppliers; small companies look at price and, if the EU allows import, just buy based on that. (7)*

In addition to size and location, some companies have such management and approaches that can make adjusting easier.

> *At the corporate level, companies vary in capabilities and strategic approaches; some find current conditions easier to manage than others. (8)*

The supply chain is another major factor affecting the adjustments. This includes factors such as supply and resources. The supply chain of the company defines how the tariff will affect the business. If the company has only Chinese battery suppliers, this would mean that all their products will be affected by the tariffs, thus increasing costs. Whereas companies with non-Chinese suppliers could avoid the tariff. This is one reason why finding non-Chinese suppliers is important. A diverse and localized supply chain and not being dependent on one supplier also increases the resilience of the company, lessens the risks for the supply chain, in addition to making it easier to avoid tariffs.

> *100 percent of our battery supply is coming from China. So, all exports to the United States are subject to the tariffs. (1)*

> *We are working closely with our supplier to make sure that the supply chain is going to be guaranteed to not be dependent or be less dependent on China. (2)*

Some suggested extending their supply chain with an existing Chinese supplier in a country that is less affected by the tariffs. This verified supplier would lessen the quality risks of adding a new supplier and help avoid tariffs. Similarly, part of the product could be done in China and part in the US to partly avoid the tariffs. However, this is not an easy or fast solution, but feasible, since some Chinese companies already have branches in Europe.

> *Having current suppliers move to another less tariff-affected country is very important in terms of optimization of the supply chain and leveraging the best cost but also having suppliers that are fully validated from a product design and quality point of view. (2)*

> *For the supply chain, we have an alternative to either importing batteries to the United States and then doing the product there, or then we do the full product somewhere and bring the full product to the United States. (1)*

Finding existing production is usually easier than building one. But since the demand for new suppliers is high now due to the tariffs, there is a lot of competition for them. Therefore, finding effective suppliers with good prices is not easy. This can be especially difficult with Chinese suppliers, not because of their capabilities, but because they might not allow for thorough supplier auditing. Due diligence regarding a new supplier is still a critical task which needs to be done.

> *Building new relationships with suppliers is generally easier than constructing plants, but everyone is trying at once, so finding a supplier with good quality and becoming a preferred source requires skills and strong negotiations. (8)*

However, increasing diversification means that the advantages of centralization weaken, such as lower costs, economies of scale, and a higher focus on relationships. Some companies focus more on centralization and see this as a better strategy. Overall, adjusting a company's sourcing between diversification and centralization is an optimization task where companies need to decide the best number of suppliers and strategy for them and for the situation. According to one interviewee, the optimal situation would be to have three suppliers to optimize the advantages of risk diversification and competition between suppliers but still have sufficient volumes for each.

> *The optimal situation is having three suppliers who understand the business, suit the needs, and compete on everything, rather than many suppliers who may not fully meet the criteria. With fewer, larger suppliers, attention and commitment are greater, and processes are faster. (3)*

One expert, however, sees that the tariffs have not affected supply chains greatly.

> *I have not seen tariffs have much impact on the supplier network structure. (7)*

The pool of possible suppliers is also a major factor. The capacity and availability of quality suppliers can affect sourcing options. After all, quality and availability were mentioned as key factors for sourcing decisions by both companies and experts. China has the know-how and a surplus of supply. Chinese suppliers are so superior in terms of efficiency, quality and costs that others cannot really compete with them. This means that if you want to compete with the costs, you need to choose a Chinese battery cell supplier. Non-Chinese suppliers can also increase supply risk, such as quality. One expert sums up that tariffs are not affecting the sourcing strategies, because almost everyone's batteries come from China, and there are not enough viable alternative options to change this. The tariffs have not had much of an effect because the Chinese product prices are still the best.

> *Only Chinese suppliers are considered for battery cells because they have a near-monopoly status and are significantly cheaper than European versions. The supplier pool is heavily China-dependent; Chinese suppliers are getting stronger, but this also increases market efficiency and competition. (3)*

> *In my work, tariffs have had very little impact. Mostly because there really are not alternatives, especially for battery cells and modules, which are essentially always Chinese. Sometimes there’s reluctance to use them, but there are not technically or economically sensible alternatives. Many clients accept that if you want a BESS system, you must use them. (7)*

In comparison to China, the industry in the US is still very underdeveloped, and it is hard to find good suppliers that fit the needs of companies. Thus, many companies do not have a supplier base in the US. In Europe there are some, but they are very limited and the prices do not compare to those of Chinese suppliers. Other low-cost countries are options, but there are not simply enough of them, and they do not often have the Chinese quality. In general, changing away from China means to change to a more risky and expensive option.

> *The battery industry in the United States is in very early phases now, and at least for 2025, even 2026, the supply is very limited. The limitation is that we do not have a supplier base in the United States. And I believe that it is not only the number, but it is really the maturity of the battery industry, being able to supply those batteries that we want in the United States. (1)*

> *Koreans and Japanese are good, but in Europe, this technology is quite limited and in high demand. (6)*

The tariffs might change the situation and offer US domestic producers a chance to catch up to Chinese providers in terms of prices. That is the goal of the US. Similarly, European suppliers are not as efficient as their Chinese counterparts, and there are not that many options, but there are still some. The tariffs might change the situation in Europe, however, this is still not the case. At the moment, if the tariffs were to greatly rise, there would not be enough alternatives to change to from China. As the battery field is developing fast, this is bound to cause the supply to evolve as well. This is not necessarily only due to the tariffs, but it still affects a lot of the decisions made by companies on where to source from.

> *U. S. is trying to increase the supply chain content for the production of batteries on U.S. territory and is trying to limit the dependency on Chinese raw materials. (2)*

> *The battery sector is one of the fastest-growing parts of the global energy industry; therefore, it will create new suppliers and consolidation. (3)*

However, the complicated battery product requires new suppliers to test and prove their quality, which takes time. This means that all changes in the supply mean testing and verifying that this option works. Smaller and newer companies and technology can create a risk in quality. Thus, changing suppliers is no small feat. Of course, continuous testing is still needed and an important part of supply chain management, and testing new suppliers is also normal and key in mitigating risks.

> *New manufacturers entering the market must test and verify their production for a long time to ensure quality and reliability. (6)*

> *Every part of the chain must be validated, and switching even one component supplier changes the whole picture and means more testing. Especially later in the value chain, replacing a supplier or introducing a new one is a long process and requires plenty of testing and assurance. (8)*

Another major factor in the industry and in the supply is the availability of resources and raw materials. Most of the lithium-Ion battery cells are made in China, and they cannot be fully replaced now. Even the US is still dependent on Chinese raw materials for batteries, which make up for most of the battery costs. Even if everything else is made in another country, the battery cells are almost always from China. China's dominance in the battery field is so strong that even European projects usually have Chinese partners or support.

> *About 95% of the world's lithium comes from China, which is where batteries are almost always manufactured. Even companies like Tesla, though American, have supply chains extending to China. (3)*

> *There are European BESS system providers, but they mostly use Chinese battery modules. Battery cells and modules almost always come from China. Other parts of a BESS, like inverters, electrical gear, cooling, containers, or transformers, are readily available from European suppliers. (7)*

The biggest bottleneck in the supply chain is not the suppliers, but the critical resources according to both companies and experts. Therefore, it is important to be able to move or generate both the production and the resources away from China and the influence of the tariffs. One expert states that the only viable strategy to avoid the tariffs is to reduce dependence on Chinese materials. Whether this is possible is another matter.

> *China controls most critical minerals in battery supply, about 90% of production and processing, which pushes efforts to find alternative supply chains. (8)*

> *The only real strategy is trying to reduce dependence on Chinese materials. (6)*

Third key theme in the interviews was the external environment outside the companies and their supply chains. These factors include industry, geopolitics, and market and demand. One topic that the interviewees were asked about was the battery and energy storage industry and how it affects adjustments to tariffs. For the moment, the industry is not seen as heavily impacting the subject, but due to the increased pressure on sustainable energy, the industry might be able to affect and lessen the tariffs in the future. Some do believe that the industry includes such big players that a solution is bound to happen.

> *Something is probably already moving to have a kind of consortium of energy storage that could leverage the US government to mitigate any further increase in the imported tariff to avoid this energy storage unit costing too much. And of course, providing more gigawatt hours of green energy. (2)*

A key point about the industry is that China has been the driver of the battery market; therefore, the tariffs might slow down the growth of this entire field and increase the prices, especially in the US. One expert noted that since the industry is changing and growing, it could make it better able to adjust to changes. The tariffs are influencing the industry, but one interviewee mentioned that it is equal in the way that it touches almost everyone.

> *China's technological and scale advantage has driven the market's growth; China has led development with state support, building large-scale battery technology value chains, which has facilitated adoption worldwide. Whether the US tariffs and weakening US-China relations will shrink overall market growth is still unclear, but there is a risk of slowed development. (8)*

> *Tariff, of course, is making everything more difficult, but most of the providers of energy storage unit equipment and integrators are in the same boat (2)*

One reason companies or countries do not want to rely too much on one source, in this instance, China, is geopolitics. Naturally, the tariffs are themselves geopolitics. But another large topic is being very reliant on Chinese hardware, especially in the critical energy industry. One expert even said that the only main effect of the tariffs was to raise awareness of geopolitical risks. This reliance can become a problem if, for example EU or the US were to place sanctions on China. These tariffs or sanctions could greatly affect companies.

> *If US–China relations deteriorate further, you could get secondary impacts in the EU. For example, the US might impose punitive tariffs on EU companies using Chinese products, or there could be technology export restrictions. (6)*

> *There are geopolitical risks, such as the possibility of a Taiwan crisis leading the EU to sanction Chinese products, which would severely impact European industry. (6)*

Security is also a related concern in the US and the EU, stemming from the risks of having a significant amount of Chinese software in the grid. This could cause a security risk, one which could be difficult to adjust to. One action related to this was when the US blacklisted a major Chinese battery maker due to alleged ties to defense. Whether this is true or not, this raises the concern of the same happening in larger scale towards China.

> *There is also concern about issues like cybersecurity. Companies avoid Chinese control systems, even if the cells come from China, because of fears of backdoors or risks to the European grid. (6)*

> *One related issue: the US Department of Defense labeled CATL (a large Chinese battery maker) as having defense-related ties and blacklisted it. This was not a tariff ruling, but it did cause uncertainty, since CATL cells are used by many system manufacturers. It raised questions about what could and should be bought. (7)*

High Chinese dependence and security concerns in the industry have led to companies trying to differentiate by offering non-Chinese batteries and using this as their advantage. There is also demand for such products. Experts also say that the tariffs might be a possibility for smaller battery provider countries, like Finland, to compete against Chinese companies in the US market.

> *For example, a Finnish battery maker has long argued that Chinese independence is a key advantage, which might improve competitiveness in US markets relative to Chinese tariff-affected rivals, to improve their position towards the US. (8)*

For the possible locations of suppliers, the political situation of the countries matters. Low-cost countries were mentioned, but also the countries with free trade agreements with the United States, to provide security from the tariffs. Companies should also consider what happens in relations and tariffs between their country and China. Countries have different ways of acting. Where the US is using tariffs to try and increase local production, the EU is supporting its companies, therefore not restricting Chinese batteries there. At least at the moment.

> *With the new countries, we need to understand the political or economic relations with the United States. Understand that there are some countries where the USA has a free trade agreement, and it seems that those countries might be more favorable as the country of origin for batteries. (1)*

> *The EU aims to increase self-sufficiency in battery products but has not imposed tariffs on batteries themselves. Instead, it is supporting domestic production and battery value chains, rather than using tariffs. (6)*

The situation in the energy industry has sparked conversation of whether Chinese suppliers should be used or only Chinese hardware to be used. This requires talks about increasing possible substitutes, which is not easy. For now, countries and companies must think about whether some China dependence is necessary.

> *Due to tariffs, Chinese suppliers have become more active in Finland, raising some concerns, for example, whether China should be used only for raw materials, and whether software should be retained in European hands. (3)*

> *At the same time, developing comparable expertise and capacity in Europe is difficult. So European efforts must balance whether to accept some China dependence or not, and this certainly has implications. (8)*

One of the key factors affecting adjustment to tariffs is the market demand. And currently, the demand for lithium-ion batteries is high. The US is a big market in the energy storage industry, one that is constantly growing and for which the domestic companies cannot fully provide for; therefore, big companies cannot afford to lose market share there. When asked if they have considered other markets due to the tariffs they had, but the company already working in the US sees it as too big a market to lose its share of it. One company is considering entering the US market now, since this could provide an advantage after the situation normalizes.

> *The United States is one of the biggest energy storage markets for everyone in the industry. Of course, it is a difficult decision to give up such a market. So, at least for*

> *now, we continue acting and building the supply even for US customers who want domestic content. (1)*

> *Market demand has increased a lot in the past few years, with battery and BESS prices dropping significantly. Any tariff effects are lost in that overall decline; nobody's told me they have delayed or refused a project because tariffs raised prices too much. (7)*

Many US customers are looking for domestic content. To supply this demand, firms must look for ways of sourcing in the US. The customers are influencing the actions of the companies, and they are especially keen on cost-effective options.

> *If we could not support the customers in the US with a product that is not subject to tariffs, we might lose our market share there. And that would have a very negative impact on our business size. (1)*

Increased costs due to tariffs have guided a small company to look for other markets to sell its products to, but for now, they are selling to familiar markets. However, these other markets are not affected by the tariffs, which makes the situation there easier to predict and the location more desirable.

> *Tariffs are something we have had to consider. Where in the world does it make sense to sell? For now, we have stayed with the EU and US markets, familiar, safe areas. (4)*

Meanwhile, due to the disruptions in the US market Chinese suppliers of batteries and battery cells have increased their activity and flow towards new markets like Europe. Especially companies that do not export to the US have been targeted by the Chinese suppliers. Previously many companies considered markets like Finland to be too small for doing business in, but the situation has changed. This increased push from Chinese suppliers could lower the prices and investments in local supply chains in the EU market.

> *In Finland, tariffs have affected supply more than demand; sometimes, there may be more battery capacity available than can be utilized. Chinese operators are now very active. Previously, they thought the Nordic market was too small, but now they have made us an offer that is quite hard to refuse. This is probably because their major markets in the US are now more challenging. (3)*

4.3 Non-tariff drivers

While tariffs do have certain effects, decisions are not often made purely based on them. Assessing new suppliers, markets or products is an almost constant process that companies need to do to stay competitive, even without tariffs. Supply chain and sourcing-related decisions are affected by many factors that need to be balanced. These include supply risks, such as availability, quality, and costs. Often, these reasons outweigh the tariffs.

> *A lot of it is related to US tariffs, but of course, all the time in strategic sourcing, we need to scan the supplier base. Adding a new supplier always carries a certain risk. several factors need to be considered when we add more suppliers to the supplier portfolio, such as understanding the capacity, quality, total cost, and schedule for these alternative suppliers. (1)*

Reducing dependence on China has been a topic for other reasons before the tariffs, especially in Europe. This is not just because of China, but relying on one country dominating an industry is seen as a risk. Whereas, in the US, the IRA was a way for companies to receive benefits for products that had only a certain amount none of Chinese components, already before the tariffs.

> *Reducing dependence on China and diversifying have been under consideration for other reasons than tariffs. Companies see it as risky to rely on one country, but that is broader risk management, not due to tariffs specifically. (6)*

The idea of having more than one supplier and a diversified supply chain is to ensure constant supply regardless of any disturbances. For example, localized suppliers provide security in this way and faster delivery schedules. Tariffs themselves have not necessarily driven companies to big changes, but they are a part of a trend of disruptions that require companies to become agile, resilient and ready to adjust to changes.

> *Major changes started after the COVID-19 pandemic disrupted supply chains, prompting industries to diversify procurement and increase resilience. This trend accelerated with trade war risks. Significant work has been done over the past five years to diversify sourcing more than before. Political changes, including tariffs, have reinforced this trend. (8)*

> *All businesses try to build alternative and parallel supply chains, so they are not reliant on a single source. Thoughtful companies plan for logistical disruptions and have options, say, several Chinese suppliers, but also Korean or Japanese ones, to give themselves geographical diversification and some protection against tariffs. (6)*

Of course, one factor that greatly affects decisions is sustainability. Especially Chinese products raise concerns related to ethics and safety. Therefore, non-Chinese products could promote sustainability. However, they must compare it to the costs, which is still the main driver that usually makes the decisions. The company needs to assess if it is acceptable to weaken sustainability in favor of lower prices.

> *Sustainability is considered in adaptations: When rapidly switching suppliers due to tariffs, the supply chain's functioning, reliability, ability to supply to Finland, and battery safety are all assessed, with an emphasis on ethical sourcing: sustainability versus low cost. The overall assessment is whether downsides are acceptable. (3)*

> *Tariffs are not the main issue. There is concern among some consumers over the quality, safety, and ethics of Chinese products. Companies promoting sustainability might highlight non-Chinese sourcing in marketing, but that is not because of tariffs. (6)*

Overall, it is important to notice that tariffs are not affecting in a vacuum, and they are just one topic when thinking about company's sourcing. Decisions need to be made by taking into consideration all the factors and try to find the optimal approach for the company.

5 Discussion

The main findings in the analysis relate to the factors affecting how companies adjust their sourcing strategies. Thus, the discussions are organized based on these factors and the adjustments are discussed in relation to them. These findings are then compared to the existing literature and what new knowledge this research provides.

The updated theoretical framework is presented in figure 2. In addition to the main triggers, operational factors, and external environment, it highlights non-tariff drivers as factors affecting sourcing strategy adjustments. The framework is adapted from Chae et al. (2019), which depicts a similar topic.

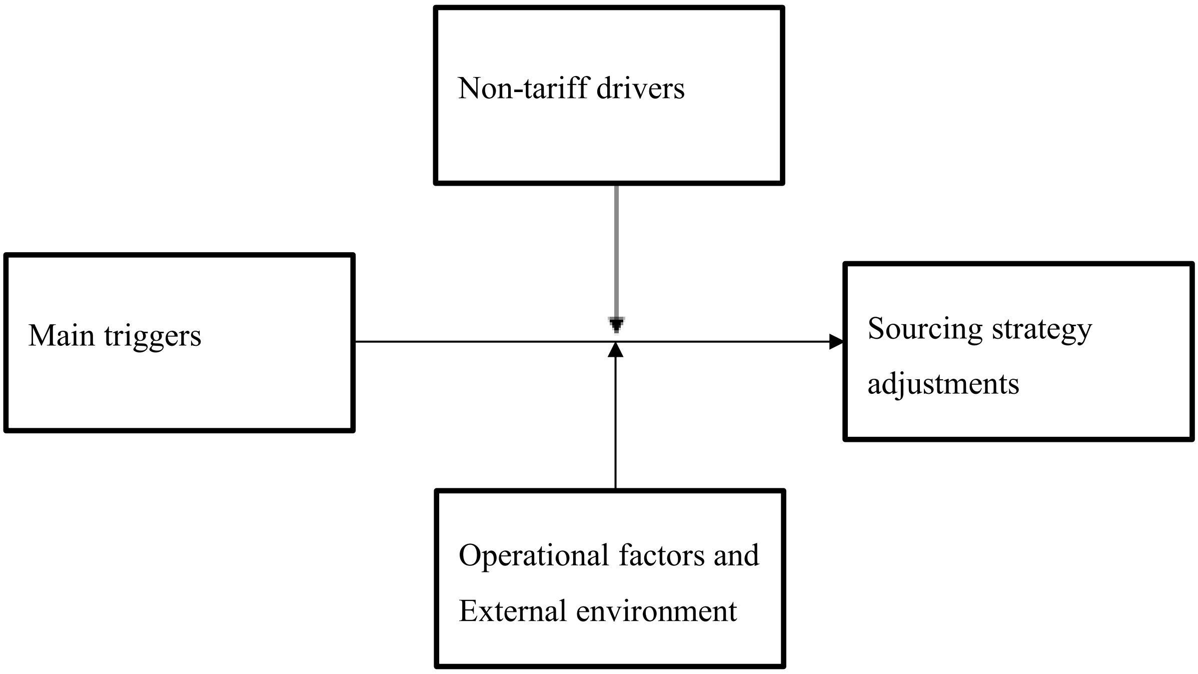

Figure 2. Updated framework

Adapted from Chae et al. (2019). The figure extends the original framework from Figure 1 by including non-tariff drivers as factors affecting the sourcing strategy adjustments.

5.1 Primary triggers

The most important factor that companies consider when adjusting their sourcing is cost. This is in line with previous literature by, for example, Chae et al. (2019) and Miller et al. (2025), and the views of TCT. Every interviewee mentioned cost as a key factor affecting their adjustments. Costs can be seen influencing all the other factors on a higher level. Other factors affect how companies can react, but most of the time, cost is what makes the final decision of how and whether they will or not adjust. Of course, there are still many other factors that affect the situation. The tariffs have a high impact on the TCO, encouraging companies to assess the situation. This is in line with Chae et al.'s results that expected tariffs, and their severity or purchasing spend, can cause companies to diversify their supply base.

Uncertainty is another trigger-factor affecting the adjustments made. This is showcased in previous literature by Chae et al. (2019), how the relationship between expected tariff severity (costs) and the timing uncertainty of the change affects the supply base complexity. However, this study deepens our understanding of the subject. This situation can be seen in the battery industry. The tariff situation is unprecedentedly uncertain, which is line with Miller et al. (2025), as the US could increase, decrease, or erase them with a couple of days' notice, or they could stay like this for a long time. This study found out that the situation is so uncertain that some companies have stopped reacting to it, even though the cost effect is great. Thus, meaning that high enough uncertainty can cause companies to adapt the wait-and-see strategy even if the costs are very high, therefore deepening our understanding of the topic.

The situation causes companies to not be certain about both the timing and the severity of the tariffs, which makes choosing how to react to the situation very difficult, following the ideas of Chae et al. (2019). This uncertainty can affect companies' competitiveness; therefore, they want to mitigate it, which is consistent with the findings of Walker and Weber (1987). This uncertainty can drive companies towards other, more stable markets, which is in line with Johnson and Haug's (2021) argument. However, there is also the possibility of the US increasing tariffs on countries other than China. This uncertainty limits the advantages and increases the risks of geographical diversification.

However, there are some differences in how companies perceive the situation and how this affects their actions. The ones that see the tariffs as a severe cost are looking to diversify their supply base. Some see the tariffs as a temporary disruption, meaning that the severity is low, and choose not to make any large changes at the moment, but are monitoring the situation. The wait-and-see approach. These are both in line with Chae et al.'s (2019) research. Due to the uncertain situation, suppliers are also not willing to commit to long-term agreements. This study found that this extremely uncertain tariff situation can also affect these low-level short-term adjustments, as even stockpiling can be rendered moot by fast changes in the tariffs, deepening Johnson and Haug's (2021) views on short-term adjustments to tariffs.

5.2 Operational factors

Battery as a product especially affects the short-term adjustments to tariffs. This is because the batteries degrade with time and lose warranty, making the stockpiling of them risky. Batteries also develop rapidly, meaning that the stockpiled ones might not be up to standard after a short while. The costs of the batteries would also mean tying up significant amounts of capital, which also increases risks. This provides further understanding to the research of Chae et al (2019) and Miller et al. (2025) of the product as a limiting factor. Some companies have still chosen to stockpile their products, which is in line with Fan et al.'s (2022) result that some companies raise inventory levels when faced with possible tariffs. The product naturally affects tariff adjustments, because the product defines whether the tariffs apply to it. In the case of expensive batteries and energy storage, the tariffs are significant and greatly affect the TCO. Product-specific factors were seen as vastly affecting the battery and energy storage industry. Where Chae et al. (2019) discuss product spend and supply risk, in this research, more specific product factors, like complexity and degradability, are determined.

The battery products are mostly made from lithium-ion or lithium phosphate. The complexity of the product limits the possibility of changing this material to other resources through R&D, which is in line with Miller et al. (2025). This change could result in problems with the product or hazards. Such a major change would also require heavy R&D investment, which would incur great costs, and even then, it is not certain that this kind of change could be implemented, following the ideas of Barman et al. (2023). Even smaller changes can cause costly modifications. However, through R&D, advancements, and cost-effectiveness, can be achieved in the current product.

Another category affecting adjustments relates to the company. The biggest differences can be seen between large and small companies. Large firms have more resources, finance, and the possibility to acquire finance, and might already have a larger portfolio to help with disruptions. Large companies are often more interested and capable of considering factors like sustainability and PR. They also have more power over the suppliers due to their volumes. This is in accordance with Miller et al. (2025), and RDT (Pfeffer & Salancik 2003). Whereas small companies have few possibilities to affect their suppliers or even choose them. This makes other actions like logistics difficult. This causes small companies to use different strategies than larger ones and be less likely to adjust their sourcing to tariffs. However, compared to Miller et al. (2025), we did deepen the understanding of how small companies can react to this by bundling their offers together or by targeting the production gaps between suppliers' orders of the large companies. In addition, similarsized companies can also differ in their corporate structure, knowledge, or culture, and thus be more adjustable.

One advantage of companies can be the location, in this situation, especially being a US-based company. Having already established production in the US can mean that tariffs do not affect you, which can be a great advantage. This is in line with Fan et al. (2022) that due to US tariffs toward China in 2018, US companies without direct suppliers in China were more profitable, and with Chae et al. (2019) that the country setting the tariffs can become affordable in comparison. This can also motivate non-US companies to set up production in the US. After all, the US is a significant market for practically all large companies in the industry. Furthermore, this study found that setting a base there now could become more advantageous if the tariffs were to be removed. However, in this industry's case, most US production is still reliant on the Chinese suppliers, and is not adequate quality wise, thus limiting heavily this option.

Especially in the battery and energy storage industry, supply chain factors greatly affect how companies adjust to tariffs. This is mainly because of the raw materials for the lithium-ion battery cells are heavily concentrated in China. China also has a large supply of affordable, high-quality batteries. For example, the US and Europe have significantly fewer suppliers, which are more expensive and of worse quality. This surplus of the supply of Chinese batteries has allowed companies to consider short-term options such as stockpiling, further improving Johnson and Haug's (2021) ideas on the short-term adjustments. The battery is a complex product with specific inputs, which limits the supply chains. Thus, we deepen our understanding of the supply risk factor mentioned by Chae et al. (2019) by dividing it into more precise supply chain factors, such as the supply chain, supply, and resources.

Companies from other countries are still dependent on Chinese batteries and battery cell resources, which are almost always made in China or with Chinese support. Thus, if companies want to use quality products that are also economical, they must choose China. This deepens our understanding of the industry and follows the RDT view from Riordan and Williams' (1985) on maintaining access to high-risk critical resources. China's almost monopoly like position of the raw materials has greatly prevented companies from changing away from Chinese battery cells. For this change to happen, not only the production, but also the critical battery cell resources need to come from a non-China country, and the quality needs to be improved by R&D. This further continues the idea of Chae et al. (2019) of supply risk deterring companies from changing suppliers for high-risk suppliers and the critical ecosystem characteristics of Miller et al. (2025).

Tariffs have influenced this situation by increasing Chinese component prices in the US, but in many cases, Chinese batteries are still the most affordable. This has caused many companies not to change their sourcing due to the tariffs, because Chinese products are still the best option. Thus, the situation encourages companies to continue with Chinese suppliers to minimize the TCO, which follows the views of TCT (Coase 1937). This means that in the industry, the condition for severity of the tariffs by Chae et al. (2019) does not apply, since these other countries are still not cheaper than China. Therefore, the severity is not high enough for companies to change suppliers. The supply in the industry is constantly evolving, and tariffs might change the situation by raising the Chinese product prices and quality to the level of other countries, but this does not seem to be the case yet. Thus, we can see that the tariffs are not effective in getting operators to change suppliers from Chinese ones.

Even though China is dominant, there are still possibilities to diversify the supply chain and include suppliers from other countries. However, adding a new supplier, especially outside of China, exposes the company to risks regarding quality and capacity, and requires a thorough, time-consuming assessment, which Wang et al. (2023) agree on. In addition, diversifying diminishes the advantages of economies of scale. Therefore, diversification is seen as a balancing act for which each company must find its own strategy. This is in accordance with the ideas of Lampel and Giachetti (2013) and Hendricks et al. (2009) about balancing supply chains' diversification and slack, with its efficiency.

Diversifying the supply chain can also be achieved by having the current suppliers move their production to non-tariff-affected or less affected countries. Changing production to low-cost countries due to US tariffs on China was also seen in 2019, according to Zumbrun and Davis (2020). This would lessen the supply risks as the supplier would already have been verified, and reduce the transaction costs of adding another supplier, which Day et al. (2025) agree on. Some Chinese companies already have branches in, for example, Europe. However, creating new production is generally harder than finding an existing one. The uncertainty still limits this option, as it is unclear if the US will set tariffs on these kinds of companies or other countries in addition to China, or if the tariffs will change in some other way in the future. Uncertainty greatly affects diversification decisions, which need great resources and time, and therefore, are not made lightly. This builds upon the idea of Wu et al.'s (2024) argument about tariffs possibly deterring companies from developing new suppliers.

5.3 External environment

Factors in the environment outside the company and supply chain also affect adjustments. The industry is not seen as driving companies toward adjusting to the tariffs, but instead as a probable force to normalize the situation and tariffs sooner or later. Still, since the industry is constantly developing, it is believed that companies will find solutions to the situation, even if the tariffs might slow this growth for a while. This deepens our understanding, and research of Chae et al. (2019) and Miller et al. (2025) of the external environment as a limiting factor. The environment includes factors such as geopolitics and market demand that affect actions.

Geopolitics is one factor that Chae et al. (2019) and Miller et al. (2025) do not mention separately, but which has a high effect on sourcing strategies. Geopolitics affects sourcing decisions, especially tariff-like policies between countries. Companies and countries do not want to be reliant on one source, like China, and the tariff situation has highlighted these risks. Since the industry is heavily dependent on China and Chinese resources, if, for example, the US or EU were to place sanctions on China, this could severely impact companies. The same would happen if China chose to restrict exports, set more retaliatory tariffs or limit the sharing of knowledge, supply, and workforces, which we have already seen some signs of.

China is also seen as a security risk. Having a lot of Chinese software in the country's grid can expose it to risks, for which countries can react to. This was showcased when the US blacklisted a major Chinese battery manufacturer due to alleged ties to defense. These security concerns have encouraged companies to offer non-Chinese batteries and energy storage products and to use this as their selling point. This deepens the view of Kalvelage and Tups' (2024) on Friendshoring to countries that are considered safe and whose politics are in line with the tariff-setting country's. However, the industry is still extremely dependent on China, and while a company can cut loose from the country, for the entire industry, it is impossible. This cutting loose will also result in higher costs. Therefore, companies and even countries need to consider whether some level of China-dependence is necessary, thus following the view of RDT (Pfeffer & Salancik 2003). One viable option is to use Chinese suppliers only for the raw materials and not for the software.

Tariffs are also a possibility for new supplier countries to compete with China. When thinking of possible new suppliers, their country's political situation affects the choice, thus following Charpin and Cousineau's (2025) view of companies avoiding countries with politics that greatly differ from theirs. Low-cost countries are potential, but also countries with free trade agreements with the US, to avoid tariffs. Also, countries' policies towards domestic and foreign production are affecting, such as tariffs or other restrictions.

Market demand is affecting decisions, and currently, the demand for batteries is high. Miller et al. (2025) do consider demand as a factor, whereas Chae et al. (2019) do not. The US is a particularly large market, which makes it even harder for companies to let go of. There are also other markets, which can be more appealing due to them not being affected by the tariffs; the companies are assessing these, but the US market is too big to lose share of. Some are even considering entering it now due to the high demand and the fact that the need for sustainable energy is growing in the US. A small company has chosen to stay with the familiar EU and US markets, despite the tariffs. This follows the argument of Johnson and Haug (2021) that companies look towards countries where they are currently making sales and where their customers are. Some US companies are looking for domestic or non-Chinese products, which encourages companies to find ways to supply for this need, and to source in the US. However, customers are still looking for cost efficiency, for which non-Chinese batteries cannot compare, thus, companies need to pay a premium for non-Chinese products.

The disruption in the US market has guided Chinese battery suppliers to seek other markets as well. They are willing to consider pushing their batteries to areas that they previously considered too small, like Finland. This has led some companies to include new or more Chinese suppliers in their supply chain, either short-term by taking in part of the surplus battery flow or for the long term. This has especially affected companies that do not export to the disrupted US market. Thus, deepening the idea of moving to undisturbed markets by Charpin and Cousineau (2025) and short-term adjustments by Johnson and Haug (2021). This could lead to lower prices and fewer investments in local supply chains outside of China.

5.4 Non-tariff drivers

While tariffs can be a significant factor, they are still only one thing affecting a company’s sourcing decisions. When thinking about sourcing strategies, companies must account for all the variables and make decisions based on them. Some of these might outweigh tariffs and therefore drive the decisions. These are factors such as quality, availability, and reliability. This highlights a gap in the tariff research by Chae et al. (2019) and Miller et al. (2025), which do not specifically mention this. Diversification has advantages like increasing resilience, reducing supply risks in addition to just avoiding tariffs. This follows the idea of Shi and Ni (2024), who argue that resilience is about having a balanced supply chain that considers both normal and disturbed times, including different kinds of disruptions. This study found that often in the case of the battery industry, these reasons to adjust sourcing strategies are seen as more significant than tariffs.

These import tariffs from the US might not drive companies to change their sourcing, but they are a part of the trend of disruptions from politics or the COVID-19 pandemic, which requires companies to become more agile and able to adjust. This is in line with Johnson and Haug’s (2021) views that changes from tariffs are similar to the ones made for other disruptions. While tariffs have increased the conversation about limiting China's dependence, this has been a talking point already before tariffs. For example, IRA was a way for companies to receive benefits from the US for products with a limited number of Chinese components, before tariffs.

Sustainability is also one major factor affecting decisions that is not directly tied to tariffs, and thus not often mentioned with the topic. Chinese companies raise concerns about sustainable, ethical, and safe production, and therefore, companies with non-Chinese products might brand themselves as more sustainable. However, this needs to be compared to the economic sustainability of low costs, which are often prioritized (Bode et al. 2011). The question is whether the sustainable downsides are acceptable.

6 Conclusion

This study aimed to deepen the understanding of how companies adjust their sourcing strategies in relation to increased import tariffs (Dubois & Gadde 2002; Eriksson & Kovalainen 2016). Thus, the objective is to understand the sourcing strategy adjustments made in the battery and energy storage industry in relation to the US import tariffs, especially on China, and what factors affect this. Theoretically, it aimed to improve the clarity of these key factors and possible new adjustments. The research found that the adjustments are significantly limited by the key factors, thus, the study places greater emphasis on the key factors affecting adjustments. It deepened the understanding of the subject and tariff research in relation to, for example Chae et al. (2019), Miller et al. (2025), and Johnson and Haug (2021).

The methodology chosen for this research was a qualitative case study using an abductive thematic approach. A thorough literature review supported the definition of the research and structured the semi-structured thematic interview. Due to limited previous knowledge of the topic, an inductive and thematic analysis method was chosen to let the material lead the findings and for flexibility in the process. After the analysis of the material, further iteration was pursued by adding previous literature to the surfaced topics in the data. The research findings were then compared to the existing literature, thus following an abductive approach.

6.1 Theoretical implications

This research contributes to the existing literature by increasing the understanding of the factors affecting sourcing adjustments and how companies are adjusting in relation to tariffs. This study deepens the knowledge on these factors provided by Chae et al. (2019) and Miller et al. (2025) from the viewpoint of the battery and energy storage industry. The thesis provides empirical evidence on how European companies adjust sourcing during uncertain US-China tariffs, whereas previous literature, for example, Miller et al. (2025) focuses more on companies from the US or China.

The findings increase our understanding of uncertainty affecting sourcing strategies, suggesting that high enough tariff uncertainty, even with high costs, might cause companies to stop considering tariffs in their sourcing strategies. This builds on Chae et al.'s (2019) concept of costs and uncertainty driving adjustments. In addition, the high uncertainty of possible tariffs targeted towards other countries can limit diversification. High uncertainty can also limit short-term adjustments such as stockpiling, which extends the research of Johnson and Haug (2021) into these adjustments. Similarly, the view of product as a limiting factor was deepened, through dimensions such as degradability and warranty limiting adjustments. This builds upon the view of Miller et al. (2025) of product dimensions such as complexity, economies of scale, and high adjustment costs as limiting factors. This study also deepens Chae et al.'s (2019) findings about supply risk from the supplier point of view by noting that a monopoly-like possession of raw materials, in this case China's reserve of lithium, can prevent companies from changing their sourcing strategies. Thus, tariffs do not have a great influence on such industries. Even very high tariffs might not affect sourcing strategies, if the price of current suppliers stays the best or competitive.

This study extends the tariff literature by determining geopolitics as a factor affecting tariff adjustments, which was not included by Chae et al. (2019) or Miller et al. (2025). This includes retaliatory tariffs or limiting knowledge or supply, as well as security concerns, which can also drive companies to diversify or chance suppliers. Thus, this study deepens the understanding of political views of the countries affecting production decisions by Charpin and Cousineau (2025) especially related to tariffs. Market demand affects sourcing strategies and can drive companies toward customers like in the US or away from countries like China. In addition, this research highlights the gap in the literature, from Chae et al. (2019) and Miller et al. (2025), that tariffs do not happen in a vacuum, and other drivers also affect sourcing strategies. Factors such as resiliency, quality, availability, and sustainability affect adjustments like diversification of the supply chain often more than tariffs.

6.2 Managerial implications

This study's key findings relate to the factors affecting or limiting tariff related decision-making, offering industry operators valuable practical insights on sourcing strategies in global sourcing. Companies should consider these factors while making sourcing adjustments.

Due to the unprecedented tariff uncertainty, decisions are difficult, and companies can choose to make short-term adjustments when deemed feasible, such as stockpiling (Johnson & Haug 2021), applying for the IRA, bundling projects or especially for small companies targeting suppliers' production gaps. Companies can also consider heading to new undisturbed markets or even to US to achieve an advantage if the tariffs were lifted. However, due to the uncertainty, the right course of action is hard to determine, and wait-and-see option could be considered (Chae et al. 2019). Diversification can be considered to avoid tariffs, but tariffs are not the only thing that should be considered when thinking about sourcing strategies (Shi & Ni 2024). Supply chains should be resilient, balanced, and ready for different disruptions in addition to normal operations.

Diversification should be considered to some extent to lessen sourcing risks, also related to tariffs, but the right level of diversification depends on the situation.

When adjusting sourcing strategies companies often consider cost and quality (Chae et al. 2019), but there are other factors which should be thought of as well. The supply of the products and raw materials can be limited, and in for example the battery industry to get the most competitive products, at least regarding battery cells, the company must choose Chinese suppliers. However, there are other options, such as European or other Asian countries, that should be considered as an addition to lessen supply, security and geopolitical risks (Hendricks et al. 2009). Companies can also move their production away from China without changing the supplier. And while changing the complex products significantly through R&D is not feasible (Batman et al. 2023), developing the product could provide efficiency gains and cost reductions.

6.3 Limitations and future research

This study is limited by its small sample size and its context being related to only one industry and a few companies, which might limit its generalizability. While for this exploratory case study, this sample size and its triangulation were seen as sufficient, further and broader studies are recommended to include more companies and even industries, to achieve a more complete understanding of the subject. The US tariffs and their uncertainty are unprecedented and thus differ greatly from traditional tariffs (Miller et al. 2025). In addition, the battery and energy storage industry is heavily reliant on Chinese suppliers (Day et al. 2025). This context makes the information difficult to transfer to all other situations. The time gap between interviews could also limit the credibility of the findings. Future research could aim to understand how the adjustments and the tariff situation evolve. Further studies on strategic adjustments to tariffs are needed, and this could include larger samples with numerous cases to increase transferability, which is also encouraged by Chae et al. (2019) and Miller et al. (2025). Further research could also be directed towards the relationship of tariff-related factors and non-tariff drivers to better understand the relationship between these and how it affects sourcing strategy adjustments.

Initially, the aim of this research was to interview European companies that have Chinese suppliers and do business in the US under the import tariffs, but this was changed to European companies in the industry due to difficulty in finding interviewees, and to achieve a more comprehensive picture of the situation. This more narrow and specific view and sample could be a potential future research topic.

References

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of Medicine, Surgery, and Public Health*, *2*, 100051.

Ali, A. M., & Yusof, H. (2011). Quality in qualitative studies: The case of validity, reliability and generalizability. *Issues in social and environmental accounting*, *5*(1/2), 25-64.

Aratani, L. (15.10.2024) Trump vows to impose tariffs as experts warn of price hikes and angry allies. The Guardian. https://www.theguardian.com/us-news/2024/oct/15/trump-tariffs-price-hikes-warnings

Argyres, N. (1996). Evidence on the role of firm capabilities in vertical integration decisions. *Strategic Management Journal*, *17*(2), 129–150. https://doi.org/10.1002/(sici)1097-0266(199602)17:2<129::aid-smj798>3.3.co;2-8

Barman, P., Dutta, L., & Azzopardi, B. (2023). Electric vehicle battery supply chain and critical materials: a brief survey of state of the art. Energies, 16(8), 3369.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Benguria, F., Choi, J., Swenson, D. L., & Xu, M. (Jimmy). (2022). Anxiety or pain? The impact of tariffs and uncertainty on Chinese firms in the trade war. *Journal of International Economics*, *137*, 103608-. https://doi.org/10.1016/j.jinteco.2022.103608

BloombergNEF, 2021 global energy storage outlook. https://energystorageforum. com/news/energy-storage/global-energy-storage-market-forecasted-double-six-t imes-12-years, 2021.

Bode, C., Wagner, S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding responses to supply chain disruptions: insights from information processing and resource dependence perspectives. Academy of Management Journal, 54(4), 833–856. https://doi.org/10.5465/amj.2011.64870145

Bown, C. P., & Kolb, M. (31.12.2023). Trump's trade war timeline: An up-to-date guide. Peterson institute for international economics. https://www.piie.com/blogs/trade-and-investment-policy-watch/2018/trumps-trade-war-timeline-date-guide

Chae, S., Mena, C., Polyviou, M., Rogers, Z. S., & Wiedmer, R. (2019). The effects of tariff increases on supply base complexity: A conceptual framework. *Journal of Purchasing and Supply Management*, *25*(4), 100556-. https://doi.org/10.1016/j.pursup.2019.100556

Charoenwong, B., Han, M., & Wu, J. (2023). Trade and foreign economic policy uncertainty in supply chain networks: who comes home?. Manufacturing & Service Operations Management, 25(1), 126-147.

Charpin, R., & Cousineau, M. (2025). Friendshoring: how geopolitical tensions affect foreign sourcing, supply base complexity, and sub-tier supplier sharing. International Journal of Operations & Production Management, 45(5), 1006-1031.

Charpin, R., Powell, E. E., & Roth, A. V. (2021). The influence of perceived host country political risk on foreign subunits' supplier development strategies. *Journal of Operations Management*, *67*(3), 329–359. https://doi.org/10.1002/joom.1127

Choi, T. Y., & Krause, D. R. (2006). The supply base and its complexity: Implications for transaction costs, risks, responsiveness, and innovation. Journal of Operations Management, 24(5), 637–652. https://doi.org/10.1016/j.jom.2005.07.002

Choi, T. Y., Dooley, K. J., & Rungtusanatham, M. (2001). Supply networks and complex adaptive systems: control versus emergence. Journal of operations management, 19(3), 351-366.

Chuang, Y.-S., Cheng, C.-C., & Cheng, H.-P. (2022). The current development of the energy storage industry in Taiwan: A snapshot. *Journal of Energy Storage*, *53*, 105117-. https://doi.org/10.1016/j.est.2022.105117

Coase, R. H. (1937). The Nature of the Firm. *Economica*, *4*(16), 386–405. https://doi.org/10.2307/2626876

Coulson, A. (1997). "Transaction cost economics" and its implications for local governance. *Local Government Studies*, *23*(1), 107–113. https://doi.org/10.1080/03003939708433857

D'Aveni, R. A., & Ravenscraft, D. J. (1994). Economies of Integration versus Bureaucracy Costs: Does Vertical Integration Improve Performance? *Academy of Management Journal*, *37*(5), 1167–1206. https://doi.org/10.5465/256670

Darby, J. L., Ketchen, D. J., Williams, B. D., & Tokar, T. (2020). The Implications of Firm-Specific Policy Risk, Policy Uncertainty, and Industry Factors for Inventory: A Resource Dependence Perspective. *The Journal of Supply Chain Management*, *56*(4), 3–24. https://doi.org/10.1111/jscm.12229

Day, S. J., Godsell, J., & Shou, Y. (2025). Impact Pathways: Caught in the deglobalisation crosswind? De-risking by "China+ 1" or "In-China-For-China". *International Journal of Operations & Production Management*, *45*(5), 995-1005.

Dong, L., & Kouvelis, P. (2020). Impact of tariffs on global supply chain network configuration: Models, predictions, and future research. *Manufacturing & Service Operations Management*, *22*(1), 25-35.

Donmoyer, R. (2000). Generalizability and the single-case study. Case study method: Key issues, key texts, 45-68.

Dubois, A., & Gadde, L. E. (2002). Systematic combining: an abductive approach to case research. Journal of business research, 55(7), 553-560.

Eezyimport.com, *2025 US Tariff Changes: Importer Guide to Navigating the New Landscape.* Read on 28.09.2025 https://www.eezyimport.com/understanding-the-2025-us-tariff-landscape-what-importers-need-to-know/?utm_source=google&utm_medium=cpc&utm_campaign=21105015484&utm_adgroup=&utm_term=&utm_content=&gad_source=1&gad_campaignid=21094953576&gbraid=0AAAAACqktoKva-Ms5BEbRSBIVkejm1IT7&gclid=Cj0KCQiAiebIBhDmARIsAE8PGNKzQe59W_JM3938BeMslJAx2n8vEPcNnSOQBPk9xbN6EAMmwEGWLuAaAgF-EALw_wcB

Ensun.io, https://ensun.io/search?threshold=VERY_LOW&q=battery&page=1

Eriksson, P. & Kovalainen, A. (2016). Qualitative methods in business research. 2.p. SAGE Publications Ltd, Los Angeles.

Eskola, J., & Suoranta, J. (2014). Johdatus laadulliseen tutkimukseen. Vastapaino.

Fan, D., Zhou, Y., Yeung, A. C. L., Lo, C. K. Y., & Tang, C. (2022). Impact of the U.S.–China trade war on the operating performance of U.S. firms: The role of outsourcing and supply base complexity. Journal of Operations Management, 68(8), 928–962. https://doi.org/10.1002/joom.1225

Farquhar, J. D. (2012). Case study research for business. SAGE, Los Angeles, USA.

Fine, C. H. (2010). Clockspeed: Winning industry control in the age of temporary advantage. ReadHowYouWant. com.

Forbes, S. J., & Lederman, M. (2010). Does vertical integration affect firm performance? Evidence from the airline industry. The RAND Journal of Economics, 41(4), 765-790.

Freund, C., Mattoo, A., Mulabdic, A., & Ruta, M. (2024). Is US trade policy reshaping global supply chains?. Journal of International Economics, 152, 104011.

Gereffi, G., Lim, H.-C., & Lee, J. (2021). Trade policies, firm strategies, and adaptive reconfigurations of global value chains. *Journal of International Business Policy*, *4*(4), 506–522. https://doi.org/10.1057/s42214-021-00102-z

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational research methods*, *16*(1), 15-31.

Gopalakrishnan, B. N., Chakravarthy, S. L., Tewary, T., & Jain, V. (2022). Isolating China: deglobalisation and its impact on global value chains. Foreign Trade Review, 57(4), 390-407.

Guion, L. A., Diehl, D. C., & McDonald, D. (2011). Triangulation: establishing the validity of qualitative studies: FCS6014/FY394, Rev. 8/2011. *Edis*, *2011*(8), 3-3.

Gur, N., & Dilek, S. (2023). US–China economic rivalry and the reshoring of global supply chains. The Chinese Journal of International Politics, 16(1), 61-83.

Handfield, R. B., Graham, G., & Burns, L. (2020). Corona virus, tariffs, trade wars and supply chain evolutionary design. *International Journal of Operations & Production Management*, *40*(10), 1649–1660. https://doi.org/10.1108/IJOPM-03-2020-0171

Handley, K., Kamal, F., & Monarch, R. (2024). Supply chain adjustments to tariff shocks: Evidence from firm trade linkages in the 2018-2019 U.S. trade war. *Economics Letters*, *244*, 112009-. https://doi.org/10.1016/j.econlet.2024.112009

Handley, K., Kamal, F., & Monarch, R. (2024). Supply chain adjustments to tariff shocks: Evidence from firm trade linkages in the 2018-2019 US trade war. *Economics Letters*, *244*, 112009.

Hendricks, K. B., Singhal, V. R., & Zhang, R. (2009). The effect of operational slack, diversification, and vertical relatedness on the stock market reaction to supply chain disruptions. Journal of Operations Management, 27(3), 233–246. https://doi.org/10.1016/j.jom.2008.09.001

Hennart, J. F. (1994). The 'comparative institutional' theory of the firm: some implications for corporate strategy. *Journal of Management Studies*, *31*(2), 193-208.

Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource Dependence Theory: A Review. *Journal of Management.*, *35*(6), 1404–1427. https://doi.org/10.1177/0149206309343469

Hirsjärvi, S. & Hurme, H. 2008. Tutkimushaastattelu. Teemahaastattelun teoria ja käytäntö. Helsinki: Yliopistopaino.

Hirsjärvi, S., Remes, P., & Sajavaara, P. (2015) Tutki ja kirjoita. 20.p. Kustannusosakeyhtiö Tammi, Helsinki.

Holcomb, T. R., & Hitt, M. A. (2007). Toward a model of strategic outsourcing. *Journal of Operations Management*, *25*(2), 464–481. https://doi.org/10.1016/j.jom.2006.05.003

Jacobides, M. G., & Winter, S. G. (2005). The co-evolution of capabilities and transaction costs: explaining the institutional structure of production. *Strategic Management Journal*, *26*(5), 395–413. https://doi.org/10.1002/smj.460

Johnson, J. E., & Haug, P. (2021). Modifications to global supply chain management strategies resulting from recent trade disruptions: an exploratory study. *Journal of Global Operations and Strategic Sourcing*, *14*(4), 701-722.

Jones Jr, E. C. (2024). Lithium supply chain optimization: A global analysis of critical minerals for batteries. Energies, 17(11), 2685.

Kalvelage, L., & Tups, G. (2024). Friendshoring in global production networks: state-orchestrated coupling amid geopolitical uncertainty. ZFW–Advances in Economic Geography, 68(3-4), 151-166.

Kashem, M. A., Shamsuddoha, M., & Nasir, T. (2024). Digital-era resilience: Navigating logistics and supply chain operations after COVID-19. Businesses, 4(1), 1-17.

Keiski, R., Hämäläinen, K., Karhunen, M., Löfström, E., Näreaho, S., Varantola, K., ... & Aittasalo, M. (2023). Hyvä tieteellinen käytäntö ja sen loukkausepäilyjen käsitteleminen Suomessa. Tutkimuseettisen neuvottelukunnan HTK-ohje 2023.

KRALJIC, P. (1983). PURCHASING MUST BECOME SUPPLY MANAGEMENT. In *Harvard business review* (Vol. 61, pp. 109–117). BOSTON: Harvard Business School Publishing Corporation.

Kraljic, P. (1983). Purchasing must become supply management. Harvard Business Review, 109-117.

Lampel, J., & Giachetti, C. (2013). International diversification of manufacturing operations: Performance implications and moderating forces. Journal of Operations Management, 31(4), 213–227. https://doi.org/10.1016/j.jom.2013.04.001

Lochmiller, C. R. (2021). Conducting thematic analysis with qualitative data. *The Qualitative Report*, *26*(6), 2029-2044.

Miller, J. W., Jin, Y. H., & Ortega, D. L. (2025). Shock and Awe: A Theoretical Framework and Data Sources for Studying the Impact of 2025 Tariffs on Global Supply Chains. Journal of Supply Chain Management.

Morton, W. A. (1937). Tariff Theory. *Journal of Farm Economics*, *19*(4), 845-860.

Pfeffer, J., & Salancik, G. R. (2003). The external control of organizations: a resource dependence perspective. Stanford, Calif: Stanford Business Books.

Polyviou, M., Wiedmer, R., Chae, S., Rogers, Z. S., & Mena, C. (2023). To concentrate or to diversify the supply base? Implications from the U.S. apparel supply chain during the COVID-19 pandemic. *Journal of Business Logistics*, *44*(3), 502–527. https://doi.org/10.1111/jbl.12335

Pratt, M. G. (2009). From the editors: For the lack of a boilerplate: Tips on writing up (and reviewing) qualitative research. Academy of Management Journal, 52(5), 856-862.

Rindfleisch, A., & Heide, J. B. (1997). Transaction Cost Analysis: Past, Present, and Future Applications. *Journal of Marketing*, *61*(4), 30–54. https://doi.org/10.1177/002224299706100403

Riordan, M. H., & Williamson, O. E. (1985). Asset specificity and economic organization. *International Journal of Industrial Organization*, *3*(4), 365–378. https://doi.org/10.1016/0167-7187(85)90030-X

Rogers, Z. S., Golara, S., Abdulsalam, Y., & Rogers, D. S. (2024). Protect me not: The effect of tariffs on US supply networks. Journal of Purchasing and Supply Management, 30(1), 100897.

Shi, H., & Ni, Y. (2024). Resilient supply chain network design under uncertain environment. *International journal of general systems*, *53*(3), 273-301.

Shih, W. C. (2020). Global supply chains in a post-pandemic world. Harvard Business Review, 98(5), 82-89.

Shook, C. L., Adams, G. L., Ketchen, D. J., & Craighead, C. W. (2009). Towards a "theoretical toolbox" for strategic sourcing. *Supply Chain Management*, *14*(1), 3–10. https://doi.org/10.1108/13598540910927250

Syed, M, (2025). 10 Energy Storage Companies to Know in 2025, Climate Insider, 21.1.2025, https://climateinsider.com/2025/01/21/10-energy-storage-companies-to-know-in-2025/

Tang, C. S. (2006). Perspectives in supply chain risk management. International journal of production economics, 103(2), 451-488.

The White House. (14.05.2024). FACT SHEET: President Biden Takes Action to Protect American Workers and Businesses from China's Unfair Trade Practices. https://www.whitehouse.gov/briefing-room/statements-releases/2024/05/14/fact-sheet-president-biden-takes-action-to-protect-american-workers-and-businesses-from-chinas-unfair-trade-practices/

Thompson, J. (2022). A guide to abductive thematic analysis. The qualitative report, 27(5), 1410-1421.

Vinitha Ravindran. (2019). Data analysis in qualitative research. 20(1), 40–40. https://doi.org/10.4103/ijcn.ijcn_1_19

Walker, G., & Weber, D. (1987). Supplier competition, uncertainty, and make-or-buy decisions. *Academy of Management journal*, *30*(3), 589-596.

Wang, Z., Cheng, F., Chen, J., & Yao, D.-Q. (2023). Offshoring or reshoring: the impact of tax regulations on operations strategies. *Annals of Operations Research*, *326*(1), 317–339. https://doi.org/10.1007/s10479-023-05346-x

Wicaksana, A., Ho, W., Samson, D., & Lam, H. K. (2025). Tariff barriers and operational efficiency: the mitigative role of top management team supply chain management experience and potential domestic supply base. Transportation Research Part E: Logistics and Transportation Review, 200, 104204.

Wissuwa, F., Durach, C. F., & Choi, T. Y. (2022). Selecting resilient suppliers: Supplier complexity and buyer disruption. *International Journal of Production Economics*, *253*, 108601-. https://doi.org/10.1016/j.ijpe.2022.108601

Wu, L., Wu, X., & Yi, S. (2024). Tariff Hedging with a New Supplier? An Analysis of Sourcing Strategies Under Competition. *Production and Operations Management*, *33*(4), 903-921.

Yin, R. K. (2018). Case study research and applications: design and methods. Sixth edition.

York, E. (26.6.2024). Tariff Tracker: Tracking the Economic Impact of the Trump-Biden Tariffs. Tax foundation. https://taxfoundation.org/research/all/federal/trump-tariffs-biden-tariffs/

Zhu, M., Miao, S., Lam, H. K., Liang, C., & Yeung, A. C. (2025). Navigating through geopolitical risk: the role of supply chain concentration. International Journal of Operations & Production Management, 45(5), 1032-1065.

Zumbrun, J., & Davis, B. (2020). China trade war didn't boost U.S. manufacturing might. The Wall Street Journal. https://www.wsj.com/articles/china-trade-war-didnt-boost-u-s-manufacturingmight-11603618203

Appendices

Appendix 1 Interview questions

Background

- Could you briefly explain your current role and what your company does?
- How do the US tariffs on China relate to your current role?

Adjustments/changes due to tariffs

- How have the US-China tariffs affected your company's operations?
  - Does your company source from or manufacture in China and import to the US or are you otherwise affected by the US-China tariffs?
- Have you changed your sourcing strategies due to increased tariffs? Have you made the changes specifically in response to the US-China tariffs?
  - Have you made any other adjustments than diversifying suppliers? For example such as increasing inventory or vertical integration
- How do you consider potential future tariff increases into your current sourcing strategy?

Product

- What type of products do you provide and how have your products' characteristics affected your tariff-related adjustments?
  - Has the product created some problems or advantages for adjustments? For example, pricing, complexity
- Has market demand for the product affected how you adjust sourcing strategies?
  - Has demand caused you to make certain decisions?
- Have the tariffs guided you to consider other geographic markets?

Firm

- Do the characteristics of your company affect your adjustments?

- For example, spend, size, influence

Supply chain

- How do your suppliers affect your adjustments to tariffs?
- Have you considered possible new suppliers due to these tariffs?
- What is the market/availability for possible new suppliers like?
  - What challenges or advantages are there related to the market of new suppliers?
  - For example, how do you see the amount of options? Geographical concentration
  - Or how does the supplier pool affect…

Industry and environment

- How does the energy storage industry affect your adjustments to the tariffs?
- How do you see the energy storage industry being impacted by the tariffs?

Risks

- What risks and challenges have you considered when adjusting your sourcing strategies to tariffs?
  - For example, transaction costs, quality issues, knowledge gaps
  - Do you see the possible advantages outweighing the risks?
- What risks do you see in diversifying your supply chain?
- How have you tried to mitigate these risks?

Closing

- What would you define as the key factors driving your sourcing adjustment decisions?
- Is there anything else you would like to add or highlight on this topic?

Appendix 2 Interview invitation

Hi!

My name is Juho Perttula, and I study at the Turku School of Economics. Thank you for agreeing to be interviewed for my Pro Gradu thesis on the influence of tariffs on sourcing strategies in the battery industry, especially now during the trade war between the US and China. I seek to interview sourcing specialists from companies in the battery and energy storage industry affected by these US import tariffs, especially on China.

Participation in the interview is completely voluntary, and of course, anonymity and confidentiality will be respected. You can decide at any time to withdraw your participation in the research and still check your answers after the interview, if requested, before the publication of the study. This information will be used only for the sake of this thesis and will be deleted after its publication. Only the author will handle the interview data.

The interview will be conducted via Teams, preferably in English, but Finnish is also possible. The maximum duration of the interview is one hour. The interview will be recorded and transcribed.

By participating in the study, I hope to gain new insights into sourcing strategies, and you will help me progress in my studies. Please do not hesitate to contact me if you have any questions.

Thank you for participating in the interview!

Appendix 3 Explanation of the use of AI

I have used Artificial Intelligence (AI) in this thesis as a supporting tool in its different stages and for different purposes. The tools I have used have been listed below, with the purpose of their use, and how they have been verified. I vow that I have used AI with due diligence, informed about its use according to applicable instructions, and take full responsibility for this thesis in its entirety.

1. Used tool: Grammarly free

   I. Stage of use: Editing of text

   II. Intended use: Grammarly was used to check for spelling mistakes and language throughout the entire writing process to improve the clarity of the text.

   III. Verification: I checked all the suggestions AI made. The entire text was read by the author in the end and spelling, and language was deemed proper and correct. I am fully responsible for my text.

2. Used tool: Open AI ChatGPT (GPT 4 version)

   I. Stage of use: Ideation of the topic

   II. Intended use: I used AI to help narrow down the idea of my thesis and fine tune my research angle and questions. AI was used as a way of finding new ideas and helping me get started, not to use as is. In the end, the topic and research questions changed naturally from the originals as the thesis progressed and became clearer.

      i. Example prompt: "I am writing a thesis and I am thinking of these main and sub-research questions. Can you give me ways to improve this structure?"

   III. Verification: AI offered me ideas, not facts. I analyzed the suggestions it gave me and made my own choices. The answers or texts from AI were not used as is. I am fully responsible for my own text.

3. Used tool: Perplexity AI Pro (GPT-5.4 and Claude Sonnet-4.6 versions)

   I. Stage of use: modifying and checking the thesis

   II. Intended use: I used Perplexity to check that my thesis was consistent from start to finish.

      i. Example: “Here is the latest version of my thesis. Please check that the thesis layout, fonts, headings, and terms used in it are consistent from start to finish. All the body text should be formatted with the body text style, and headings should be formatted appropriately. If you find inconsistent parts write them in a list with page numbers and the part of the text.”

   III. Verification: I went through all the suggestions AI gave me and checked them myself. I also carefully went through my entire thesis by reading it and checking its formats to make sure they were right. I am fully responsible for my own thesis.

4. Used tool: Perplexity AI Pro (GPT-5.4 and Claude Sonnet-4.6 versions)

   I. Stage of use: Finding and reading sources

   II. Intended use: I used Perplexity to summarize articles to check if I should read them myself.

      i. Example: “Can you summarize the key points of this article?”

   III. Verification: I used AI only to see if the article was relevant for me. If I deemed it to be relevant, I went and read it myself. Thus, I verified the content of the text myself before using it as a reference in the thesis.

5. Used tool: Scopus

   I. Stage of use: Finding sources and ideas for the research.

   II. Intended use: I used Scopus to find sources linked to my research topic. I also used it to find sources connected to certain key words, or that had cited other relevant sources I had found.

   III. Verification: I read and researched the sources it provided me and personally made sure that they fit my topic and what exactly was written in the sources.

6. Used tool: Keenious

   I. Stage of use: Finding sources and ideas for the research.

II. Intended use: I used Scopus to find sources linked to my research topic. I also used it to find sources connected to certain key words, topics, sentences that related to my topic or that I had found from another source.

III. Verification: I read and researched the sources it provided me and personally made sure that they fit my topic and what exactly was written in the sources.