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RESILIENCE AND EFFICIENCY DURING AND AFTER BLACK SWAN EVENTS: AN ANALYSIS OF SOURCING STRATEGIES IN THE FASHION INDUSTRY IN THE CONTEXT OF THE COVID-19 PANDEMIC.

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Abstract

The Covid-19 pandemic represented an unprecedented shock that companies had to manage. While companies have dealt with disruptions, there has not been something of this scale since the rise of globalisation. This study analyses the impact the Black Swan event Covid-19 had on the relationship between resilience and efficiency in company sourcing strategies. It examines different sourcing strategies' effectiveness in terms of resilience and efficiency, explores recommended strategies for preparing for such shocks, and assesses whether this advice is followed in the fashion industry post-Covid-19. This will highlight whether companies have learned lessons as to how exposed efficiency based global supply chains are. Or whether they returned to focusing mainly on cutting costs. This was achieved by doing an analysis of the literature on this topic, as well as a case study on Lululemon, a global player in the fashion industry.

Keywords: Strategic Sourcing, Efficiency, Resilience, Covid-19, Fashion

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1. INTRODUCTION

The heightened interest in managing supply chain risks, brought on in part by the Covid-19 pandemic, underscores the need for businesses to reassess their sourcing strategies. Preceding the Covid-19 pandemic, companies predominantly pursued efficiency-driven approaches, utilising concepts such as outsourcing, global sourcing, and streamlined supplier networks to optimise costs and bolster profits. However, this pursuit of efficiency often resulted in longer lead times, thereby increasing vulnerability to supply chain disruptions.

The impact of the Covid-19 pandemic laid bare the consequences of extended supply chains, with companies facing unprecedented challenges in sourcing materials and maintaining operational continuity. Consequently, a renewed emphasis has been placed on striking a balance between operational efficiency and supply chain resilience. The research on this topic has focused on how companies with more resilient supply chains fared better during the Covid-19 pandemic (Ozdemir et al, 2022) and how companies must now be aware and prepare for Black Swan disruption like the Covid-19 pandemic (Um & Han, 2021). However very little literature is forward looking and exploring these ideas in the context of a need to still be able to balance efficiency with resilience or the demand on purchasing managers to increase efficiency in their sourcing. This also relates to how sourcing managers must balance this drive for efficiency with the push to be sustainable with relation to the Sustainable Development Goal (SDG 12) of Sustainable Production and Consumption. This study will also address this issue.

This recalibration due to the Covid-19 pandemic and the research that has followed on what companies performed best during the Covid-19 pandemic prompt the exploration of two fundamental questions:

1. Did fashion companies adapt their sourcing strategies during the Covid-19 pandemic to mitigate lead times and enhance supply chain resilience?
2. Considering the potential trade-off between resilience and efficiency, will fashion companies revert to more efficient sourcing models in the post pandemic landscape?

This paper conducts a review of the literature to provide background to address these questions. First it will define the elements that sourcing managers will need to consider when choosing between a more efficient and resilient supply chain. It will then focus on industry specific concerns of the fashion industry before finally analysing a real-world situation by evaluating the sourcing strategy of Lululemon to evaluate their response to the Covid-19 pandemic and their strategy for a post-Covid -19 pandemic world. This will enhance the evaluation of what level of an impact the Black Swan event had on the fashion industry by looking at a company that was affected by it.

The fashion industry was chosen for this analysis, due to the extreme impact the Covid-19 pandemic had on this industry. A shortage of goods, closure of stores and changes in consumer preferences among other things impacted how and what companies needed to source. Lululemon is a particularly interesting example as a health and fitness fashion brand. The Covid-19 pandemic led to a rise in demand for sports clothing and homeware as people were left with more time on their hands to exercise at home and relax in the house.

By addressing these questions, this paper aims to offer insights into the evolving dynamics of strategic sourcing in the wake of the Covid-19 pandemic and illuminate potential trajectories for future sourcing strategies.

2. BACKGROUND AND THE COVID-19 PANDEMIC

Even before the outbreak of the Covid-19 pandemic, sourcing teams in the fashion industry had to constantly balance the dual pressure of maintaining short lead times, while lowering costs (Shen & Chen, 2020). This often led to making a trade-off between having an efficient supply chain and a resilient one. This balance shifted during the Covid-19 pandemic and is not something static as companies must constantly adapt their sourcing strategies to the changes that happen around them (Ghadge et.al, 2020). Using the existing literature on this topic as a guide, this section will highlight some of the considerations for sourcing practitioners when they are deciding the best strategy for them.

2.1. Efficient Supply Chain

By focusing on efficiency in the supply chain companies will adopt a sourcing strategy that will look to reduce cost, something that will make them more exposed to risk. These sourcing strategies are also synonymous with longer lead times, global sourcing, outsourcing, consolidation of supplier bases and a transactional relationship with suppliers (Gurbuz et.al, 2023) (McMaster et.al, 2020).

Global sourcing is a strategy that highlights how firms prioritise cost reductions to the detriment of risk mitigation. Globalisation has given firms the opportunity to source products from cheaper production centres in developing countries, but given the distances involved lead times have increased greatly and firms find themselves unable to exercise the necessary control needed to better manage risk (Ivanov & Dolgai, 2019). This lack of control becomes even more of a problem when the supply chain experiences external shocks (DeTreville et al., 2014). For example, during the Covid-19 pandemic when countries began to close their borders companies had no control over or access to their materials as their supply chains were so long. This sort of exposure caused by longer supply chains must be considered when choosing the optimal sourcing strategy in a post-Covid-19 pandemic world, as the effect of this Black Swan event has made managers aware that endlessly pursuing lower costs and efficiency does have significant downsides as well. As Figure 1 highlights the longer your goods travel the more stakeholders they must interact with, which in turn increases the odds of issues and delays.

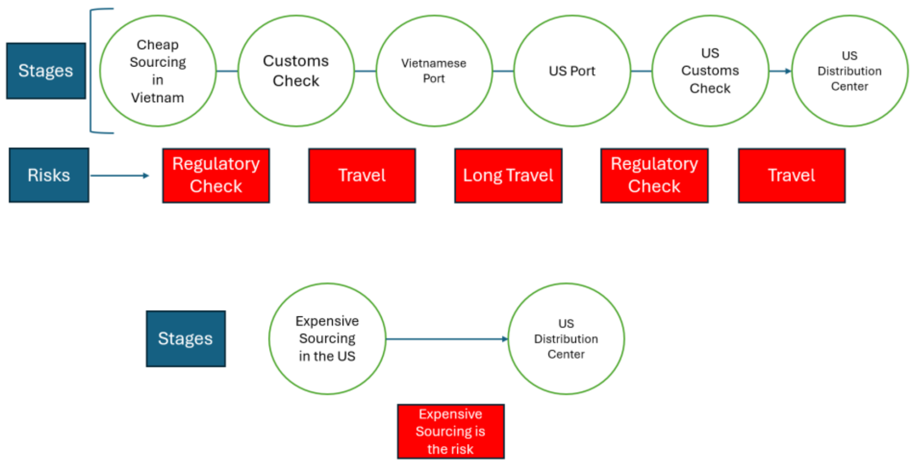

Figure 1. Risks of sourcing from far away countries with cheaper labour and sourcing locally (Gurbuz et.al, 2023)

Another key aspect seen in firms that are looking to increase efficiency in their supply chain is outsourcing. Outsourcing involves a firm delegating certain aspects of its business to external partners so that it can focus on its "core business" (Lin, 2020). This strategy can lead to significant cost savings as the firm is able to designate more resources to its core activities and have a specialised firm handle certain elements where it is not an expert. However, outsourcing also exposes the firm to more risk as it is no longer in control of elements of its supply chain. Should something happen to the suppliers that the firm has outsourced activities to, it loses the ability to function even in its "core business areas" (Lin, 2020). Outsourcing also significantly decreases the visibility that a firm has over its supply chain. As you give more power to partners it becomes more cumbersome to track what they are doing as you are no longer dealing with raw material suppliers directly. This lack of visibility makes it almost impossible to know where the vulnerabilities in the supply chain lie. It also makes it harder for the sourcing team to know if they are sourcing goods ethically (Ivanov, 2021). This is because it is harder to verify where the raw materials that your outsourced supplier is getting are coming from, leaving the company exposed to greater risk. On the other hand, firms take on less financial risk by outsourcing as they are not exposed to liability at every instance of the supply chain. Additionally, companies who are looking to shield themselves from responsibility for unethical practices may be inclined to outsource the execution of these practices to partners who will in turn be liable for them. However, from an ethical standpoint, the less reviewing you do of your suppliers the more responsible you are if things go wrong (Ivanov, 2021).

Consolidating supplier bases is a sourcing strategy that involves the firm decreasing its number of suppliers (Cousins, 1999). This reduction leads to cost savings as dealing with multiple suppliers is more cumbersome than dealing with one. There is a reduction in administration costs, the price of goods is reduced as a firm has a closer relationship with the supplier and there can be tighter coordination between the supplier and the firm, allowing for product specifications and improved coordination. Yet, this reliance on one supplier opens the firm to additional risk. Should something happen to the one supplier that a firm has, the firm may be unable to source the necessary materials they need for long periods of time. A widely reported example of this could be seen in the healthcare industry where many governments relied solely on singular suppliers in China for PPE equipment (Finkenstadt & Handfield, 2021). This led to these countries not having the ability to give their healthcare workers the equipment they needed when China closed their borders. This is just one example of how reducing your supplier base can leave a firm exposed in a crisis. As seen in Figure 2 this kind of exposure must be considered by sourcing managers as they look to drive efficiency when reducing suppliers, as they too could be left without the materials they need when their supplier faces serious disruptions.

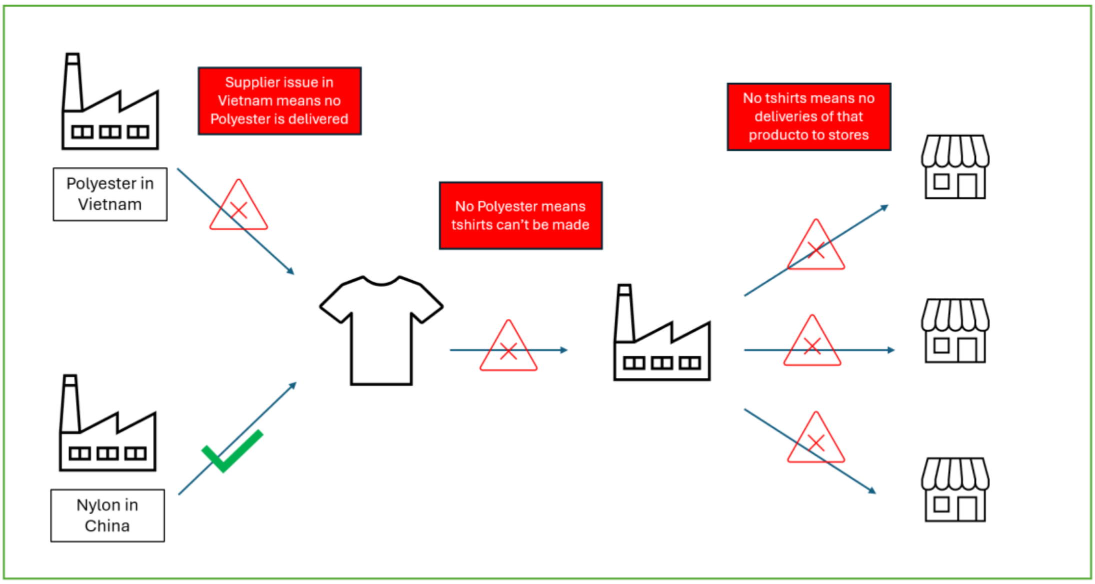

Figure 2. Simple example of a delivery issue caused by disruption to one supplier in the decreased supplier base model: Own elaboration

An efficient supply chain centres around the idea of transaction cost economics (TCE) where the focus is on "the interaction between economic entities" (Ketoviky & Mahoney, 2020). Companies following this theory focus on finding the best price for the products that they source (Ketoviky & Mahoney, 2020). While TCE often focuses on the "make or buy decision" it also discusses the role of how to handle relationships with your buyers if you do decide to buy. As can be expected, the emphasis is not on maintaining a relationship with your supplier but rather on pitting potential suppliers against each other to get the best price. During times when there is no disruption this can be massively advantageous as you are able to constantly negotiate with your suppliers to get a lower price, allowing you to make marginal gains (Reece et.al, 2022). However, this adversarial approach has clear negatives when it comes to Black Swan events. The first of these is the unlikelihood of your supplier going the extra mile to ensure that they can get their goods to you as they know that the relationship is strictly transactional and therefore, they will likely prioritise other companies that have built up goodwill with them. Companies can also end up squeezing the supplier so much that they are forced to close in response to the Black Swan event (Burke et.al, 2007). The second issue with this transactional style is it misses out on other spillover benefits that come from building a good relationship with your supplier, including the collaboration on designing new materials and discovering new methods to source goods in better ways to make marginal gains (Wang et.al, 2013). As such maintaining such a transactional relationship particularly with suppliers for bottleneck or volume goods can leave a company exposed to large external shocks.

In summary, there are different ways in which a firm can use their sourcing to make their supply chain more efficient, but all of these strategies lead to an increase in how exposed the supply chain is to external shocks. This means that firms can not solely pursue efficiency and short-term gain if they are looking to survive long term. In turn, they will also look at strategies that leave their supply chains less exposed. This will be discussed in the next section.

2.2. Resilient Supply Chain

By focusing on resilience in a supply chain companies will adopt a sourcing strategy that will look to reduce risk and increase sustainability at the expense of increased short-term costs. Preparedness, visibility, sustainability and agility are four pillars of supply chain resilience (Ozdemir et al., 2022) (McMaster, 2020). These pillars are linked to the following strategies: local sourcing or reshoring, increased supplier bases, strong relationships with suppliers and technological advancements. This must be continuously monitored as teams will likely look to cut costs in the short-term where possible unless there is continuous monitoring.

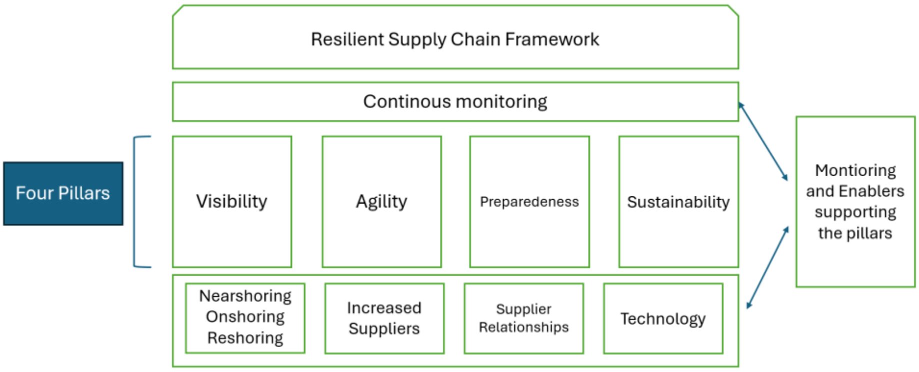

Figure 3. Resilient supply chain model based on (Ozdemir et.al, 2022) and (McMaster, 2020).

Local sourcing refers to sourcing products locally in the market where you will look to sell the product (Niu, Mu & Chen, 2018). Traditionally, local sourcing was a preferred option when it allowed you to avoid tariffs, save on taxes and win the favour of local Governments (Martins et al., 2019). This was set against the high labour and operational costs of locally sourcing in Western countries. However, since the outbreak of the Covid-19 pandemic one other major advantage has become clear and that is shorter lead times. These shorter lead times allow for companies to have more control over their supply chain, which makes it easier for them to adapt to disruptions (Thilmany et al., 2021). After the outbreak of the Covid-19 pandemic, companies with a local sourcing strategy didn't have to worry as much about border closures or lockdown related restrictions. For example, a company importing goods from China to the US faced far more disruptions than a company that sourced its products locally. Suppliers were also far more likely to fill local orders before orders from countries further afield (Wang & Sun, 2021). Given this, companies will now have to consider this new variable a lot more when evaluating local sourcing.

Reshoring is something that is particularly encouraged by western governments as they look to bring jobs back to their country (Barbieri et al., 2018). The argument is that the firm benefits from an improvement in the quality of labour, however, many firms saw that this benefit did not outweigh the additional labour and operational costs. Many authors also show that a lot of reshoring promises by firms are a myth or a false sale to their local market as it rarely actually happens (Barbieri et al, 2020). However, the idea of reshoring has become popular again since the Covid-19 pandemic. Companies who reshore activities shorten their supply chains and by extension have more control, lowering risk (Barbieri et al., 2020). Some authors have even gone as far as to say that the Covid-19 pandemic "undermined the global value chain model" and that it would lead to a reshaping of supply chains by both managerial and political factors

(Barbieri et.al, 2020). As the dust settles on the Covid-19 pandemic it will now be important to see if this is still the case or if companies will return to their global value chain model as has been the status quo for the 21st century. While reshoring and the renewed efforts to encourage it are seen as a safeguard against Black Swan events the additional costs associated with the practice have not disappeared. In order to remain competitive sourcing managers will still have to look after the bottom line and reduce costs wherever possible.

Increasing supplier base focuses on the preparedness and agility pillars of resilience. Firms are more prepared as they have more suppliers to choose from (Spieske, et al., 2022). Having built a relationship with these different firms, the sourcing team does not have to be reactive if there is a disruption that impacts one of their suppliers. Instead, they have a contingency plan in place and turn to suppliers that they have already worked with to increase the number of materials that they purchase from them. See Figure 4 showing how this would work. This is also linked to the agility pillar of resilience. The sourcing team is more agile as they can move between suppliers, increasing supply from one to the other, based on the various factors that will influence their choice of supplier in normal times. The company can also shift based on who responds best to Black Swan events (Spieske, et al., 2022). This of course is not without its drawbacks as there are increased costs and complexities to managing multiple suppliers for certain materials, this again leaves sourcing managers with a decision to make regarding the trade-off between the resilience of their supplier base and the efficiency of it.

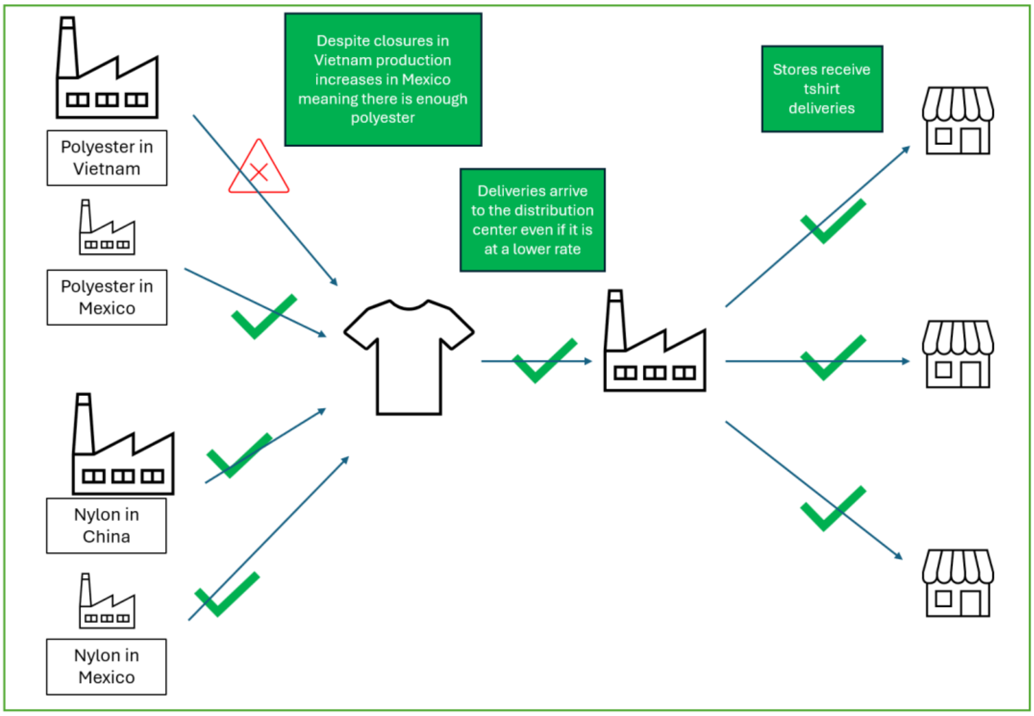

Figure 4. How dual sourcing helps you overcome supplier issues by getting goods from other suppliers of the same material: Own elaboration

Another key element of building a resilient supply chain involves having a good relationship with your suppliers (Van Hoek, 2020). This is highly linked with the preparedness pillar of resilience. This relationship will help both when firms are looking to initially respond to the external shock and when they are looking to return to a level of normality. When you have built up goodwill and a good relationship with your suppliers, they are more likely to help you when there are difficulties (Van Hoek, 2020). This makes building a good relationship a key part of a sourcing teams' job when they are building a resilient supply chain. Of course, price can't be ignored as goods must be sourced at a good enough price to ensure that the company is competitive in the short term. Instead, the attitude of the sourcing team needs to shift so that they are not only thinking in terms of getting the best deal, but also in terms of making sure that there is trust and goodwill between both parties (Van Hoek, 2020). This is further backed up by (Frederico et.al, 2021) who highlighted a strong relationship between companies who focused on relationships with their suppliers and their resilience during the Covid-19 pandemic.

Technology can also be used to help build resilience in supply chains (Cui et.al, 2022). It can aid companies both when monitoring their supply chains and preparing for external Black Swan events that may impact a company's sourcing strategy. This contributes to the alertness pillar of a resilient supply chain. A company can improve the visibility of their supply chain by using technologies like the Internet of Things (IoT) to help track goods that are in the supply chain. Helping both from a perspective of monitoring supply and improving sustainability (Cui ei.al, 2022). Artificial Intelligence (AI) is a technology that tries to mimic human intelligence. It can be used to help automate tasks and predict human patterns. As such it helps companies to be more resilient by predicting the trends of their customers (Cui et.al, 2022). The final key technology that sourcing teams can utilise to build resilience is Data Analytics. This can help the company predict trends based on analysing what has happened in the past (Cui et.al, 2022). While these technologies can be expensive to implement, they can improve supply chain resilience.

As companies are subject to increasingly stringent legislative regulations pertaining to sustainability, alongside growing public consciousness of the sustainability practices of the companies from which they buy, it is necessary for this paper to examine the relationship between resilience and sustainability in the context of the Sustainable Development Goal (SDG 12): Responsible consumption and production. While some papers argue that sustainability is more linked to efficiency than resilience (Negri et. al, 2021). This paper agrees with the perspective of authors like (D'Adamo & Lupi, 2021) who argue that "sustainability and resilience go together" as a supply chain must be sustainable to recover from reputation damages as well as other elements that occur when external shocks impact the supply chain and (Mohammed et al, 2021) who maintains that "resilience and sustainability are interconnected". As such sourcing teams must build sustainability into their strategy as it will not only make them more resilient but also make their company a more viable option for the sustainably conscious consumer. It is also clear that in the immediate aftermath of a Black Swan event companies are more exposed to reputational damages if their supply chain is not sufficiently sustainable. Examples of this include factories that are affected by natural disaster events, if this also is coupled with unsafe working practices for workers in a supply chain the company will suffer. During the Covid-19 pandemic this was observed when suppliers or companies themselves didn't implement safe working plans to limit the transmission of the disease. Showing that building sustainability is not only important before the shock happens, but also as you look to return to normality in the aftermath of a Black Swan event.

2.3. Impact of Covid-19

Covid-19 had a massive impact on not just the fashion industry but the global economy. Government shutdowns and company closures meant that sourcing teams and supply chains were impacted not just from the "supply side but also the demand side" (McMaster et.al, 2020). Covid-19 highlighted the impact of the ripple effect where a disruption triggers a chain reaction up and down the supply chain. Every problem that companies faced at any stage of the supply cycle impacted all the other areas (Marcucci et.al, 2024).

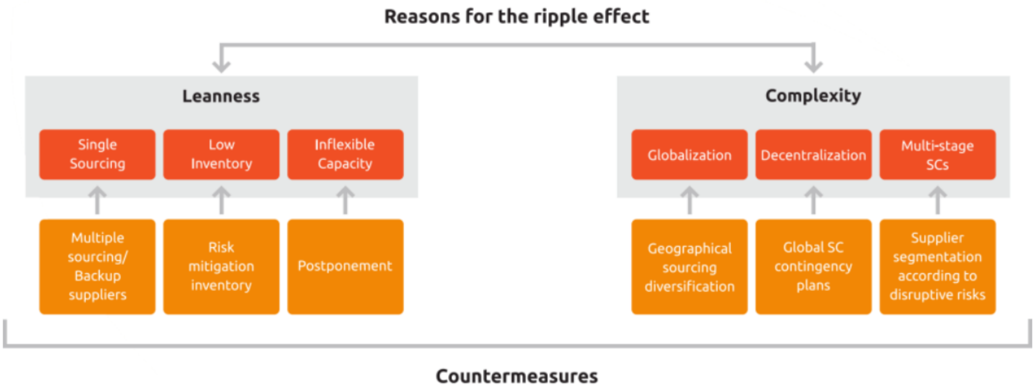

Figure 5. Causes and resolutions of the ripple effect (Wilkinson, 2021).

The supply side implications were mainly caused by factory shutdowns and workers being kept at home due to illness (Raj et.al, 2022). These disruptions began in China in early 2020 which had a massive impact on companies sourcing materials in the fashion industry. However, companies did have alternatives but as the Covid-19 pandemic spread these alternatives became harder to find. The components and nature of SCs in the fashion industry differ between companies and are dependent on factors including their products, target market, competitive priorities, global strategy, lead time, delivery delays, and supplier integration (Kim, 2013). This means that some companies were better able to respond to the impacts of these supply side issues and those companies could react to who was handling the situation the best. While before the Covid-19 pandemic companies looked to prioritise efficiency to cut costs, during the Covid-19 pandemic companies with "resilient supply chains" that were able to consistently source materials were able to outperform their competitors (McMaster et.al, 2020). Most companies had to be reactionary in their response to these global structural supply shocks as they had to alter how their supply chains were set up and where they would source their materials from (Ivanov, 2018). As supply chains in the fashion industry tend to be long and global they were especially exposed to these external shocks.

> "The internationalisation of supply chains has exposed fashion MNC's to country specific risks, which leads local high-risk events to snowball in magnitude" (Ivanov, 2018).

In this case the event was not only just local but global meaning that this snowballed even faster than during a normal disruption. The impact of store closures caused a bullwhip effect which made many brands like Adidas, Nike and Levi to stop production and sales (Barua, 2020) and then started them again making variations in orders. The bullwhip effect highlights how small order variability at the customer level amplifies the orders for upstream players, such as wholesalers and manufacturers, as the decrease or increase in orders moves up along a supply chain. These huge difficulties lead to company losses as companies reported major economic downturns because of supply issues and Lululemon's CEO commented that the reason for their growth not being even higher during the Covid-19 pandemic was due to factory closures in Vietnam and other parts of Southeast Asia (Kohen, 2021).

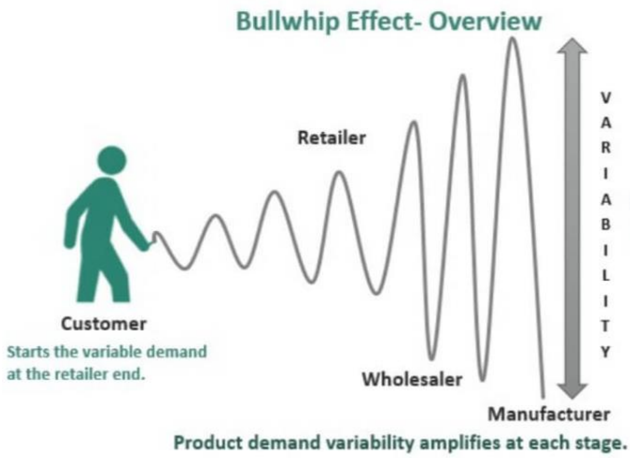

Figure 6. Example of the Bullwhip Effect based on (Metters, 1997)).

These supply-side issues were coupled with difficulties that sourcing teams faced with predicting demand. As one of the key jobs of the sourcing department is to find a balance between the amount of material they are sourcing and the number of products that people are purchasing.

The first key change was an initial overall drop in demand for fashion products (Arania et.al, 2022). As uncertainty around the world was growing and people began to worry about shortages of essential goods like food and PPE consumers began to be careful about where they spent their money as huge layoffs initially impacted the spending power of consumers (Lord, 2020). While eventually governments in most western countries implemented large unemployment payment schemes to workers restoring a certain amount of their purchasing power, this initial drop in demand made it extremely difficult for sourcing teams to know how much materials to bring in, something that would have a big impact on them when demand increased again. It also had a large effect on the modelling that companies used to predict demand as there was a gap of the time when demand fell. The second key change was one of a change in consumer preferences. As the Covid-19 pandemic continued to spread and more and more people were forced to stay at home their purchasing patterns changed. Many people no longer saw the need to purchase clothes for going out of the house but rather comfortable, high quality sustainable clothing to wear in the house (Kohen, 2021). This change in demand again affected some brands in different ways than others. For Lululemon, for example, this meant an explosion in interest during the Covid-19 pandemic meaning that their sourcing teams had difficulty filling demand. For others however this led to a drop in demand, meaning that they struggled to know whether it would align with the impacts they faced on the supply side (Zhou, 2022). Both issues posed huge challenges for the respective companies sourcing teams as they tried to predict demand.

2.4. Common Company Responses

Company sourcing strategies and by extension supply strategies are all unique which means that their responses to Black Swan events like Covid-19 are also likely to be unique. However, despite these differences there were some common trends, as (Zhou & Kim, 2021) highlight. There was first a frantic push to get materials as quickly as possible. This was followed by an effort to make supply chains more resilient as the Covid-19 pandemic progressed. This resilience came in three main forms: increasing flexibility, improving supplier relationships and increasing visibility. “The Covid-19 pandemic has caused supply and demand disruptions indicating a need to build flexibility to mitigate epidemic and demand risks” (McMaster et.al, 2020).

As most companies had not prepared for a Black Swan event at the scale of the Covid-19 pandemic it is expected that their initial responses were going to be reactionary (Klöckner et.al, 2023). For most companies this meant following the guidelines from governments and ensuring that they could do everything they could to complete the orders that they were already waiting for. Companies then looked to scramble to make plans for how they would source their goods for what most expected to be a short-term disruption (Veselovska, 2020). Some companies opted not to fulfil orders citing the disruption as the reason, this would follow a more efficiency-based strategy, whereas those that looked to maintain good relationships ensured that all orders were filled.

As the Covid-19 pandemic progressed and it became clear that this disruption was not going to be a short term one, the thinking not only in the fashion industry but in all industries shifted from reactive thinking to strategic decision making (Forman & Mossialos, 2021). Building flexibility into your supply chain became an essential element for sourcing teams around the world. This flexibility came in multiple forms. The first was an increase in safety stock. Companies became more uncertain as to when their next shipments were going to come, as such they were willing to take on the additional cost of having more safety stock to ensure that they were able to fill orders when they came. This was not only for profit related reasons, but also to ensure that a brand kept up with trends (McMaster, 2020). This flexibility was also linked with how goods were sourced, and the times suppliers had to deliver products as well as payment terms. These changes indicated a clear shift to a more resilient outlook of the supply chain. More and more companies began to realise that to be able to source goods they needed to be flexible with their suppliers to give them the space to operate in such an uncertain environment. Squeezing your suppliers would either lead them to look elsewhere for companies who had more flexibility or put the supplier under financial strain which helped nobody in the relationship (Frederico et.al, , 2021).

Another key factor became the increased focus on improving supplier relationships, as mentioned in the resilient supply chain section when a company builds a better relationship with their suppliers, they are going to be better able to source goods when there are disruptions. Companies also began to work with their suppliers to build new delivery strategies moving from a transactional relationship to a more codependent one. This was because the suppliers now relied on each other for survival during such a difficult period. Also switching costs increased during the Covid-19 pandemic (Polyviou et.al, 2023). This was due to suppliers being barely able to fill the orders they had let alone take on new clients meaning it made more sense for companies to have more loyalty to the companies that could provide them with materials (Kohl et.al, 2022).

Finally, companies looked to improve the visibility that they had over their supply chain. This became increasingly important as companies had to recalibrate their lead times as sourcing became more complex. It is more difficult to have visibility over areas of the supply chain that are in developing countries (Aslam et.al, 2020) and as most materials in the fashion supply chain are sourced from developing countries. This posed a massive challenge for companies. This was particularly difficult for companies operating with highly lean supply chains as "lean strategies adopted by fashion brands significantly reduces transparency in the supply chain" (McMaster, 2020). This also posed considerable issues from a sustainability perspective as companies were not able to ensure that they were sourcing ethically or that Covid-19 guidelines are being followed throughout their value chain. Sourcing teams looked to improve this visibility by increased visibility mapping, maintaining relationships with suppliers as well as investing in new technologies (Mubarik et.al, 2021). The last of which will be discussed in the next section.

2.5. Impact on the use of technology

As seen in section 2.2 technological advancements have always been an important part of supply chains and they have a huge impact on a company's sourcing strategy. Whether these technologies help forecast demand, track deliveries or even predict disruptions, failing to adapt to new technologies will leave companies at a competitive disadvantage. Covid-19 accelerated the importance of technology as disruptions and demand became harder to predict (Ivanov, 2021). While an in-depth study into these technologies is not within the scope of this paper, we will highlight the two main technologies that increased in importance during the Covid-19 pandemic as the level of investment in these technologies will highlight the importance of resilience to a company's sourcing team.

The Internet of Things (IoT) refers to the process of attaching a normal object to the internet. This allows people to track the IoT device and improve the analysis and information that the item provides. "IoT can help address complex issues and improve the visibility, flexibility and transparency of operations" (Song et.al, 2023). Covid-19 added a particular importance for companies to be able to improve visibility, flexibility and transparency as these key issues became incredibly difficult particularly in emerging economies (Scala & Lindsay, 2021). In the fashion industry where a lot of sourcing comes from developing economies IoT can be a particularly useful technology. It is also a technology that can improve sustainability as companies are better able to track if raw materials have been sourced ethically. The issue with IoT is that it remains an expensive technology to implement. Now it is more likely to be utilised in industries where the raw materials are more expensive like pharmaceuticals or technology (Song et.al, 2023). With that being said the price is dropping and being an early adopter of this technology would indicate that a company is serious about building resilience as this would show that improving visibility and flexibility is being prioritised over pure cost cutting and search for efficiency gains.

The other technology that we will analyse that increased in importance during Covid-19 and that can help build resilience within a supply chain is Artificial Intelligence (AI). AI is a branch of computer science with the aim of building computer technology that can think and act like a human being. This technology is particularly useful in supply chain planning, forecasting demand and optimization (Cui et.al, 2022). This improvement comes from AI´s ability to analyse large quantities of data helping predict trends and patterns of human behaviours as well as accurately forecast demand. While during stable periods this can be used to increase efficiency in terms of having accurate forecasts that reduce stocks (Cui et.al, 2022). It can also be used to predict how consumers will act during a Black Swan event. This new tool has also increased in popularity since the launch of Chat GPT which happened during the Covid-19 pandemic. Investments in this tool will help firms navigate through future Black Swan events, whether they are localized or on a global level like Covid-19.

A push to invest in technology is inevitable in our fast-growing economy, but how these tools are used and where the investments are placed tells us a lot about the attitude that practitioners have towards risk. Before Covid-19 the emphasis was on investing in technologies that will help drive greater efficiencies. While these investments are still happening many scholars now think that companies need to figure out how these technologies can also make their supply chains more resilient. Analysing how these technologies are being used in the real world will help us to understand the importance of supply chain resilience to companies as well as their plans to offset any potential future Black Swan events.

2.6. Trend for the future or temporary adaptation

There is no doubt that Covid-19 had a major impact on sourcing strategies of companies around the world. But did it have a big enough impact to mean that companies would permanently change their sourcing strategy to account for Black Swan events and increase resilience? It would be unrealistic to suggest that companies are going to completely rehaul their supply chains because of Covid-19 (McMaster, 2020). However, according to the literature there has been a change in attitude in areas that are more prone to Black Swan events like hurricanes, tsunamis and other natural disruptions (Gurbuz et.al, 2023). Future sections of this paper will look to evaluate companies’ attitudes to this key question and help to answer RQ2.

3. METHODOLOGY

3.1. Research Design

Research methodology is about one's attitude to and understanding of research. Along with the strategy used to answer research questions (Greener, 2008). The methodology that will be used in this master's thesis is the mixed method, which refers to the use of both primary and secondary sources of data (Leech et.al, 2010). This allows you to both view the concepts in the context of the wider industry as well as get the perceptions of individuals related to the topics at hand (Leech et.al, 2010). The main focus of this study will be conducted using secondary data, which will be done through an analysis of the academic literature to provide a theoretical basis for the theories and topics that are related to the strategic sourcing industry as well as an exploration of the fashion industries response to the Covid-19 pandemic. This will be followed by a case study of Lululemon, a major player in the international fashion industry. The advantages of using this case study is that it allows us to see how these events were responded to in real time and by focusing on one company we can analyse their strategy in depth and understand how effective or ineffective it was. It will also highlight if these choices reflected the recommendations from the literature. This research also used a deductive approach as it looked to test how the theories of efficiency and resilience fared during and after the Covid-19 pandemic. Primary data will also be used in the form of two semi structured interviews with members of the Lululemon sourcing team. This will improve the findings of the paper by grounding them into reality, but the limitations of only having two interviews must be acknowledged. This was done due to the scope of this study and the resources available.

This paper will be structured by first defining the concepts that will be discussed using a literature review, then shape these concepts into the context of the fashion industry before finally using the case study of Lululemon to show how an individual company within the fashion industry responded to the Black Swan event that was Covid-19. Finally, a conclusion will be made regarding the effectiveness of both efficiency and resilience, before answering our two research questions.

1) Literature Review.

The purpose of the literature review in this study is to provide a theoretical foundation to the concepts that are going to be discussed regarding the fashion industry and Lululemon. The focus on one industry allows for a deeper and more comprehensive understanding of the industry's specific challenges, trends, and best practices. This targeted approach enhances the relevance and applicability of the research findings, providing more precise insights and recommendations.

The literature that was accessed for this section was sourced from Web of Science, Scopus and Google Scholar.

First a literature review search on Web of Science and Scopus was conducted using the search strong; Covid* and Sourcing* and Risk Management and Resilience, searching only for articles. This produced 32 articles, after removing duplicates and filtering for only articles in English 20 articles remained. Then after a manual search removing all articles that were about the spread of Covid-19 and not supply chain or sourcing strategies, 15 articles remained. Additional articles were then added based on manual searches in Google Scholar as well as from the bibliography of articles read from Web of Science and Scopus. This method of adding articles through the original searches is called snowballing. It allows the author to gain more context from the articles that they are researching and provides a deeper understanding of the topics discussed (Jalali & Wohlin, 2012).

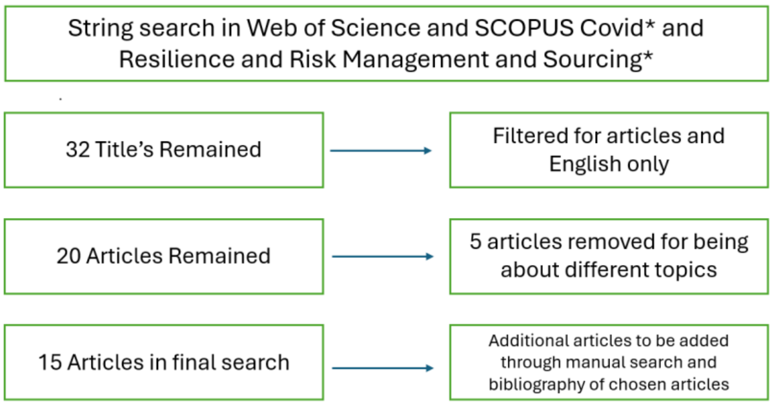

Figure 7. Master Thesis search process: Own elaboration.

These articles gave the theoretical bases to study this topic at a deeper level and guide the reader through the theories that were to be discussed throughout the Master Thesis.

2) Case Study

Case studies are a useful method to undertake a modest scale research-based project (Ghauri, 2004). When conducting this project there was a conscious effort to avoid the common pitfall of simply describing what happened when using a case study. With this pitfall in mind an effort was made to ensure thorough analysis that would add to the project (Ghauri, 2004). This addition came in the form of linking the analysis of the literature with a real-life example. This allowed the project to follow a structure where: first the theory behind different Covid-19 responses were explained, framing that in the context of the fashion industry, before using Lululemon as an example of how one company in the fashion industry responded.

The obvious limitation to this method is that due to the scope of this study the paper was unable to evaluate more than one company. However, getting the insight from sourcing managers who had firsthand experience with dealing with Covid-19 and the fashion industry offered valuable insights that contributed to the overall goals of the project.

Additionally, case studies are highly suited to new areas of research (Ghauri, 2004). As the impact of Covid-19 and the ever-evolving landscape of a post Covid-19 world is very recent. As such when studying this changing area of research, a study into how an individual company adapted and is planning to change as a result of the crises is highly beneficial.

During the case study data collection, different data and materials were gathered to conduct the search. This involved analysing interviews throughout the Covid-19 pandemic as well as economic results and changes to suppliers. To elevate the project from simply being descriptive there was also a manual search conducted on Web of Science and Scopus to articles related to Covid-19 and Lululemon which allowed the paper to analyse how other authors viewed the company's response in relation to efficiency and resilience and their strategic sourcing strategy.

3) Interviews

The last method used to conclude the research was the gathering primary data in the form of semi structured interviews. This meant the author had some set questions but was also able to follow the flow of the conversation and ask for clarification to dig into the responses of the industry experts. In these interviews a merchandise sourcing manager and a sourcing manager from Lululemon were interviewed. This was done to get 2 different perspectives as after the first semi structured interview with the merchandise sourcing manager there were still some gaps and questions that were left unanswered. The main advantage of these interviews is that they allowed for greater insight into the thought process behind the decisions that were made by Lululemon. Instead of just seeing what decisions were made, the author was able to notice how risk was perceived and how it has shifted since the Covid-19 pandemic. This provides context for when we look at how the trade-off between resilience and efficiency will change in the future.

Being able to see what practitioners are doing in the field through interviews enables us to validate and identify some gaps that can be found in the literature. Of course, there are some limitations that come from interviews that must be acknowledged (Alsaawi, 2014). The first is the biases of the people from the company that are being interviewed who are likely to reflect more positively on their company. The second is that personal feelings are subjective and while in this instance a company's perspective towards risk is also subjective it is important to acknowledge this bias as well (Adams, 2015). Finally, this paper must acknowledge the limitation of only interviewing 2 members of a company's sourcing team. This was due to the resources available to the author. Ideally more people within the company would be interviewed to allow for additional perspectives giving a more thorough understanding of the company's decisions.

3.2. Data Collection

In this section the data that was collected will be discussed, including both the case study that was conducted on Lululemon and the interviews that were held with members of the Lululemon sourcing department.

1) Case Study

Providing context is a key part of research in the field of International Business (Ghauri, 2004). It allows the reader to understand the study in the terms of an industry or an individual company. As such when analysing a Black Swan event at the magnitude of Covid-19 it was thought that the best course of action to contextualise the study for readers would be to shape it using Lululemon as an example. The reason Lululemon was selected is that they provide an interesting paradox during Covid-19, because even though countries closed their borders and the company faced massive uncertainties, their sales increased. This magnified the issues that their sourcing department faced not just on the supply side, but on the demand side as well. Lululemon is also a premium fashion brand which would have perhaps made the prospect of nearshoring/reshoring more appealing to them, making them a good case study for initial investigation of these concepts in a post Covid-19 world. The data that was gathered in relation to this case study was financial information on the company, as well as an analysis of their suppliers and how they changed throughout the Covid-19 pandemic. Secondary interviews with senior Lululemon employees were also evaluated, providing context into the thought process behind some of the decisions that were made at the higher levels of the company.

2) Interviews

Interviews allow the researcher to gain valuable insight on a topic (Adams, 2015). The selection of interviewees was done based on their experience and relevance to the job role of sourcing materials for Lululemon. Selecting the right interviewees is essential for well conducted semi structured open-ended interviews (Adams, 2015). This structure also allows the candidate to showcase their knowledge of the topic without being hindered by closed questions.

Two members of the Lululemon sourcing team were selected. The first, a merchandise sourcing manager with 10 years of experience in the industry and the second a sourcing manager also with over 10 years of expertise within the industry. Between the two interviewees, they were able to efficiently answer any questions that this paper had on the topic. The interviews were conducted using online communication platforms. In this case, Zoom was the medium through which dialogue was facilitated. They were recorded on android's sound recording app and then they were converted to a transcript.

The data collected both in the form of the case study and the interviews that were undertaken helped to enrich the findings of the literature reviews, by grounding the theory in the context of a real-world example with the testimony of people working in the industry. It also allowed for a deeper exploration of the concepts evaluated.

4. EFFICIENCY AND RESILIIENCE IN THE FASHION INDUSTRY

This section will now build on the considerations of the literature regarding resilience and efficiency during the Covid-19 pandemic. Using the foundations established in section 2 we will analyse the importance of efficiency and low-cost manufacturing for the fashion industry and how it has shaped sourcing within the industry for at least the last two decades. We will then look at the risks that sourcing departments in the fashion industry were exposed during the Black Swan event that was the Covid-19 pandemic. This will emphasise the importance of resilience and give us background as to how this trade-off is a big dilemma for companies. After getting the grounding of how this is conducted throughout the fashion industry, we will finally focus on Lululemon in section five to link the industry results we find here to a case study of a company.

4.1. Considerations for the trade-off in Strategic Sourcing

For decades, apparel companies have profited from moving their manufacturing to low-cost countries (Arrigo, 2020). Given the massive cost savings that are available to companies it was not just low-quality brands that were sourcing from developing nations but also high-end brands as these large cost savings were too hard to ignore. As such, strategic sourcing became an integral part of the fashion industries business model. As globalisation and a growing reliance on network relationships continued there was renewed interest in global sourcing for higher competitiveness and productivity (Javaligi et al., 2009). The longer this offshoring to developing countries continued the more expertise was also moved to these nations meaning that countries now don't have to only consider the cost savings of offshoring but also perhaps the better expertise and capacity that these countries have to manufacture clothing.

As global sourcing became the norm in the industry it brought with it key risks from a sourcing perspective. These risks can be characterised into three different groups: financial, operational and reputational. Before the outbreak of the Covid-19 pandemic, it seemed that despite the danger these risks posed for companies the benefits strongly outweighed the costs (Arrigo, 2020). However, as the literature suggested the companies that were most exposed to these risks suffered the most during the Black Swan event that was the Covid-19 pandemic (Raj et al., 2022). As such these risks must now be analysed considering the additional exposure to large-scale unpredictable supply chain disruptions.

4.2. Strategic Sourcing Risks in the Fashion Industry

This paper identified three unique types of risk that sourcing teams must be aware of when they are sourcing materials in an international environment. These risks are the operational risks that come from disruptions or delays, financial risks that come from orders not coming on time or obsolete stocks and reputational risks that come from mistreatments of workers and the environment. These three risks can cause the company serious damage that will impact a company's earnings before interest, taxes, depreciation, and amortisation (EBITDA), not just in the short term, but in the long term as well meaning that they must be carefully considered when making any decision when it comes to sourcing. Figure 8 highlights the different disruptions that happen based on each category of risk.

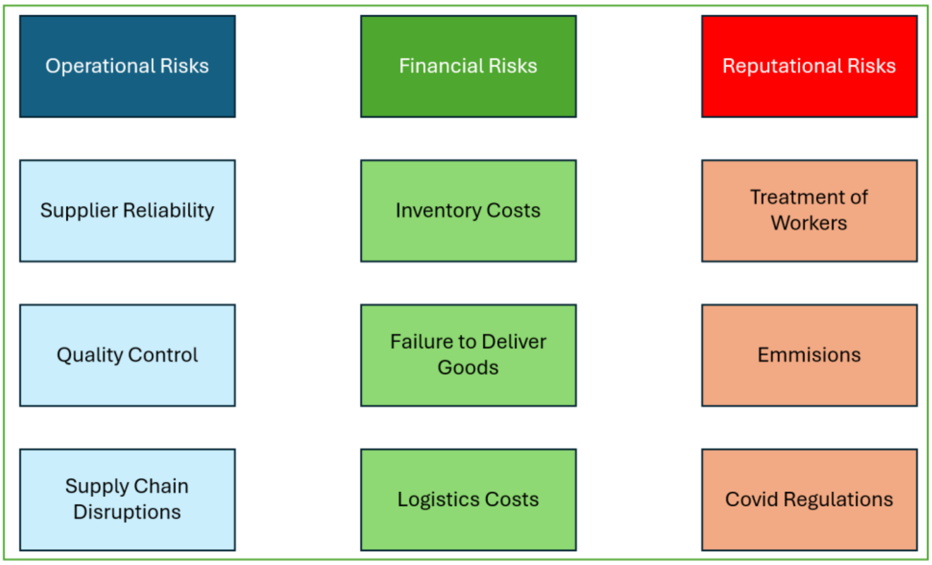

Figure 8. Each area of risk found in the paper and the elements related to each: Own elaboration.

4.2.1. Operational Risk

From an operational perspective there are many risks that are associated with the fashion industry's globalized sourcing model. The longer and more complex that a supply chain is the more likely it is to be vulnerable to severe disruptions (Ivanov & Dolgai, 2019). In this case sourcing goods from far away countries like Bangladesh and China leads to greater operational risk. Disruptions can also have a huge effect on a company's bottom line as it can cost them to "miss a trend" meaning they are unable to effectively respond to customer demand. This also has an impact on the brand's image as if a company constantly misses trends people will perceive their brand as being out of fashion. In the fashion industry there has been a lot of pressure to lower the operational cost of supply chains; this has exposed companies to huge operational risks meaning companies have foregone flexibility in order to achieve a lean supply chain. When the Covid-19 pandemic hit, the rigid effects of the lean supply chain model in the fashion industry were exposed (McMaster, 2020). Going forward it is clear that from an operational perspective sourcing practitioners will need to change their attitude towards risk. Losing the ability to operate efficiently leads to massive losses and while it doesn't happen very often hence the name Black Swan, the losses that are incurred are large. If a company wants to be able to operate in the long term, they must not only consider operational efficiencies but also operational resilience.

Certain products also have a higher level of importance when it comes to sourcing goods. This is because some goods are easier to source than others and some goods are more integral to a product than others. The more integral and difficult to source a product is, the more important it is to have resilience when sourcing this product as it is essential to run your operation. This can be seen in Figure 9 that highlights the type of relationship a sourcing team should have with their supplier depending on the product that they are sourcing. Products can also be difficult to source due to external events making a resource scarce, for example a shortage of cotton caused by massive crop failures in India, making it harder to find cotton. This will make companies scramble to be able to source cotton and they will usually pay a higher price or have worse contract terms. However, if the company already has a good relationship with suppliers, they are more likely to get a better deal during these disruptions. As such resilience also must be considered for all products when considering the operational risks that can come from Black Swan events.

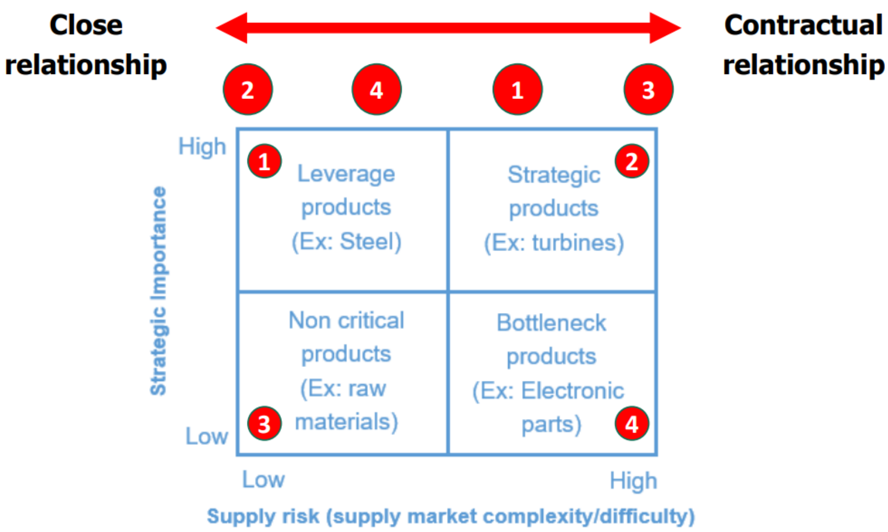

Figure 9. The Kraljic Matrix and the relationship each type of product has with its suppliers (Putri et.al, 2020).

This highlights how if a product is critical to your production, you must be aware of how exposed you are to the risk of not being able to produce if you can't find that material and you must therefore make an increased effort to mitigate that risk.

4.2.2. Financial Risk

This section will discuss some of the financial risks that companies are exposed to in their supply chain during normal times as well as during a major disruption like the Covid-19 pandemic. This will allow us to have an additional perspective on the trade-off that companies must make between efficiency and resilience. Sourcing teams must ensure that they are competitive in the short term, while still able to respond to external shocks that may arise and be resilient in times of disruption.

Inventory costs account for a huge amount of the financial risk that sourcing teams are responsible for. The team must ensure they can keep stock as low as possible while remaining operational. Reducing storage space can help a company keep costs down. The team must also try to reduce obsoletes i.e. inventory that isn't sold as low as possible because they will also add a financial burden on the company (Lascu et.al, 2020). As such there is a financial pressure to minimise stock and safety stock as much as possible. The leaner this number is the more cost savings that are made which in turn increases profit margins. Safety stock refers to the level of stock that a company does not expect to use but is kept in reserve in the case of an emergency (Miranda & Garrido, 2009). When calculating the amount of safety stock a company should have, there must be some element of risk taken as it is impossible to have a service level of 100%, as achieving this level of service would imply a company has infinite stock (Miranda & Garrido, 2009). It would also be foolish to have no safety stock in case of emergencies. Therefore, there is a trade-off that must be made somewhere in the middle. See Figure 10 and 11 for a display on the marginal gains of reduced safety stock in the short term. The savings are not only a positive for the EBITDA of a company through a reduction in Cost of goods sold, but they also increase the cash flow that is available to the company. Allowing them to invest in other areas instead of having money tied up in stock. This shows the short-term advantages of safety stock reduction and resilience in general. The savings can be seen in dollar terms in a created example in table 1.

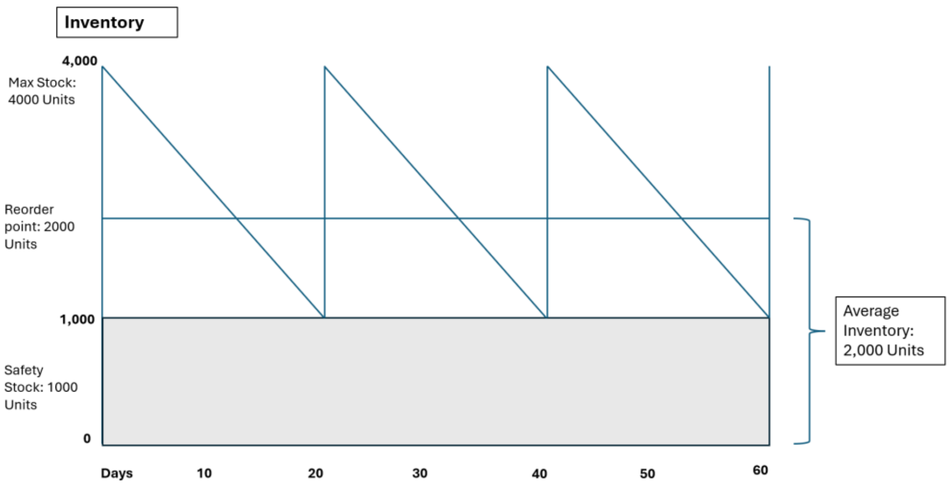

Figure 10. Example of a company's stock and safety stock patterns with a 1,000-unit safety stock: Own elaboration

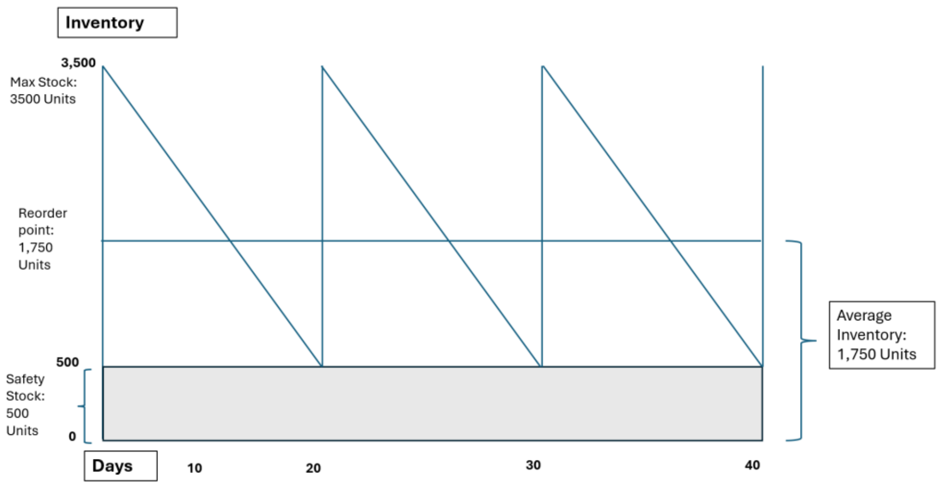

Figure 11. Example of a company's stock and safety stock patterns with a 500-unit safety stock: Own elaboration.

Figure 10 and 11 highlight that reducing your safety stock by 50% also reduces the maximum number of units you have to store as well as the average units that you are handling. This brings with it many different cost reductions. The first of which can be seen in Table 1 below highlighting the reduction in the storage costs of your units by 12.5% as your average stock is 12.5% lower.

Resilience Driven Saftey Stock			Efficiency Driven Safety Stock	
Storage cost per unit	$ 7,00		Storage cost per unit	$ 7,00
Average stock in the warehouse	2000		Average stock in the warehouse	1750
Average storage cost	$ 14.000,00		Average storage cost	$ 12.250,00

Table 1. Savings from a 50% reduction in safety stock: Own elaboration.

There will also be savings in the form of lower rent and rates as the business can hold the goods in a smaller storage facility. For example in Figure 11 one would only need a warehouse that holds 3,500 units whereas in Figure 10 one would need one that can hold 4,000 units. Spread over a year these increases can lead to higher margins for the company reducing their safety stock allowing them to undercut the company that tries to be more resilient.

However, the value gains in this equation flips when it comes to a disruption caused by a Black Swan event. For example, during Covid-19, when factories closed in Vietnam and companies could not get t-shirts. Instead of being worried about inflated inventory costs, they were worried about the lost revenue that they missed out on due to having a lack of inventory. At this time many companies suffered from shelves being emptied and missed out on the opportunity of supplying products to customers. This leads to large concrete losses that outweigh the marginal gains that can be made by trying to reduce cost. As such during a Black Swan event like Covid-19 companies are willing to hold on to larger amounts of inventory as well as pay more for transportation and delivery. In this instance again companies will rely on the fact that they have multiple suppliers and a good relationship with them. See Table 2 to highlight how a company holding more safety stock can gain more than a competitor that is unable to deliver goods during a Black Swan event.

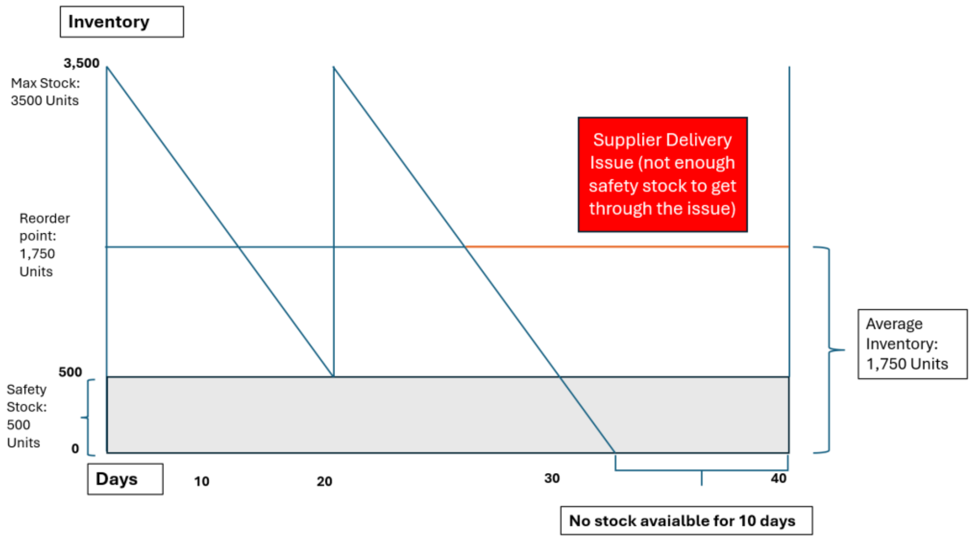

Figure 12. Insufficient safety stock to get through a supplier delay: Own elaboration.

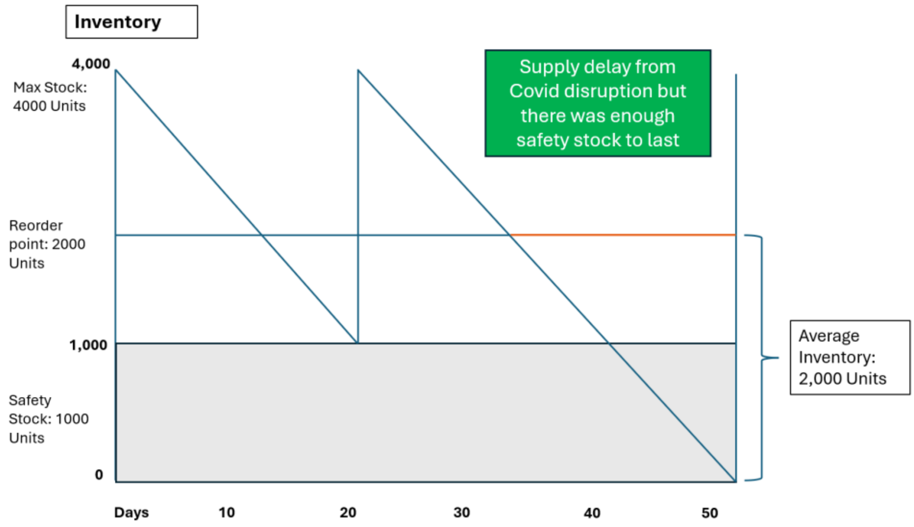

Figure 13. Higher level of safety stock allows companies to get through supplier delays: Own elaboration.

Resilience Driven Saftey Stock	
Profit margin per unit	$ 40,00
Units sold during delay	2000
Increased profit during the delay	$ 80.000,00

Efficiency Driven Safety Stock	
Profit margin per unit	$ 40,00
Units sold during delay	1750
Increased profit during the delay	$ 70.000,00

Table 2. Difference in profit based on safety stock levels during supplier delays: Own elaboration.

As illustrated above a company must carefully consider where their focus should be when it comes to efficiency and resilience. If a company does not focus on efficiency in the short-term, they risk missing out on the better margins of their competitors, which could squeeze them out of the market. However, a failure to focus on resilience in the long term could see a company lose out massively to a competitor when there are disruptions during Black Swan events. As such, practitioners must be aware of these risk trade-offs. This awareness has increased due to losses that some companies faced during the Covid-19 pandemic.

4.2.3. Reputation Risk

For decades companies in the fashion industry have been profiting off the cheap manufacturing of countries in the developing world. This exploitation comes at the risk of reputational damage if the sourcing team is not careful about where they are sourcing their materials from (Arrigo, 2020). The collapse of the Rana Plaza factory in Bangladesh that killed over a thousand workers placed an increased level of scrutiny on companies and forced them to act by removing manufacturers in their supply chains that are treating workers unfairly or having them work in unsafe conditions (Vanpeperstraete, 2021). There are three distinct ways that the sourcing team can decrease the risk of reputation risk. These are; improving transparency, increasing visibility and reshoring/nearshoring (Arrigo, 2020). In this section we will analyse how these actions can mitigate reputation risk as well as how the Covid-19 pandemic put an increased focus on these issues.

Improving transparency can help avoid reputational damage as companies are revealing where they are sourcing their goods from, this increases consumer trust and ensures that products are coming from safe environments. One of the strategies that sourcing teams will use is to publish an approved list of suppliers from whom they are sourcing these goods. This strategy has the advantage of narrowing the number of suppliers that a company must audit as well as allowing consumers to rest easy knowing that the company has vetted their suppliers. The downside to this strategy is it is difficult to track second and third tier suppliers who supply these approved companies. As such companies can use this published list to greenwash, with the suppliers of their suppliers being the ones using the unsafe factories or working conditions or unsustainable materials. Consumer awareness of this issue has also increased as more people are aware that these lists published by companies are often misleading, meaning they are now more of a requirement than an advantage. The importance of transparency increased during Covid-19 as companies in the fashion industry had to ensure that their workers and workers in their value chain were following the restrictions implemented by governments. This increased anger comes from the fact that people themselves were locked indoors and were therefore less forgiving of companies not following Covid-19 rules (Majumdar et.al, 2021). This increase in transparency is likely to remain an area of importance for sourcing teams as once a sustainability initiative is implemented there is likely to be a backlash against the company if it is removed for no good reason.

If companies only deal with finished goods vendors i.e., the last suppliers. It is more difficult to have vision through your entire supply chain as seen in Figure 14

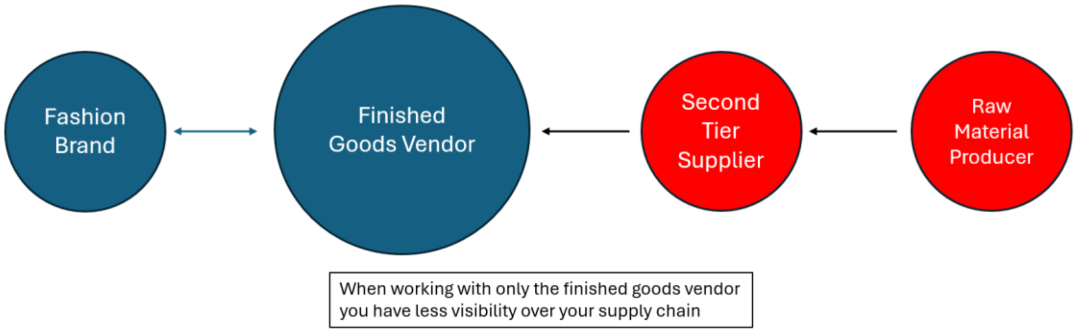

Figure 14. Visibility over your supply chain with red circles representing a lack of visibility of your suppliers: Own elaboration.

Increasing visibility is another strategy that can help decrease the reputational risk that companies face (McMaster, 2020). By ensuring that companies have a clear view of their entire supply chain, the sourcing team can be confident that they won't be exposed to any scandals that might come from suboptimal practices in their supply chain. This can be achieved by closely monitoring second or third tier suppliers or even better also sourcing from raw material manufacturers ensuring that you have a full view over the supply chain.

4.3. Balancing the risks and efficiency gains in the fashion industry

Given the gains that can be made by having longer supply chains in terms of decreasing costs and increasing margins and the inherent risks that these longer supply chains bring companies must be able to balance between the two to ensure that they can survive the high levels of competition in the short term and be able to return to normal operations after shocks that happen in the long term. In the next section we will use a case study of Lululemon to highlight how they handled this trade-off when navigating the risks discussed in this section that came during the Covid-19 pandemic and the years that followed. This will allow us to ground our research in a real-life scenario and enhance our findings for our conclusions to come.

5. LULULEMON

5.1. Company background

Lululemon is a premium fashion brand founded in Canada in 1998. The company brands itself as a technical luxury apparel company with a commitment to sustainable high-quality clothing (Qian & Zou, 2021). In the beginning the company just focused on women's clothing particularly leggings but has since expanded its line to cover all manner of sports and comfortable clothing for men and women. The company began to grow as the desire for high quality athletic apparel grew and it is now a global brand operating around the world. The company saw a huge increase in growth leading up to the Covid-19 pandemic with a 2.5x increase in their brand value between 2013 and 2020 (Statista 2024a). See Figure 15 for a look at Lululemon's revenue growth from 2008 to 2023.

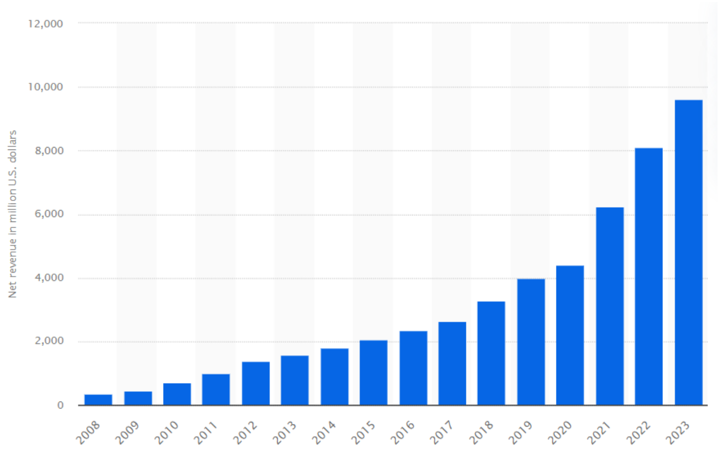

Figure 15. Revenue growth of Lululemon 2008-2023 in millions of USD (Statista, 2024a)

Leading up to the Covid-19 pandemic the company had established itself as a major player in the apparel market and they began to further expand their line to not only remain as a niche sports fashion brand but to move into the mainstream. These levels of growth offer a challenge for a sourcing team as it makes it difficult to predict demand. However, with more accurate forecasting techniques this can be managed outside of Black Swan events.

5.2. Pre-Covid-19 sourcing and supply chain

Lululemon's sourcing before the outbreak of Covid-19 was highly concentrated in Vietnam with around 30% of their goods being sourced within the country (Kohen, 2021). Goods were nearly exclusively shipped to the US and Europe as that was the cheapest way to get goods from East Asia to the consumer bases of the West. This was also coupled with a more concentrated supplier network with key suppliers operating using massive factories with up to 6,500 employees (Lululemon, 2019). While this supply chain was more resilient than some of its fast fashion counterparts, as they were using multiple suppliers for key products, there was still an emphasis on efficiency and trying to get as low a cost as possible. This meant that they had longer supply chains as the cheapest labour they could access was in Southeast Asia. Sustainability was still a key aspect of the company's supply chain with all suppliers having to adhere to their workers code of conduct to ensure that workers throughout their value chain were being treated fairly. This made the process of finding suppliers a little more difficult than some of their competitors as they had to have their suppliers vetted by internal and external auditors. The company was also focused on finding the most energy efficient shipping routes to limit the impact of their shipping on the environment (Lululemon, 2019). Finally, there was also an emphasis on making their clothing as circular as possible with research and development money being invested to ensure that their products could be recycled. This highlights how the strategic sourcing is linked to the overall strategy of the brand as Lululemon brands itself as being a sustainable brand that their consumers can be proud of.

5.3. Covid-19 popularity growth and difficulties

Like most other companies, the onset of the Covid-19 pandemic took Lululemon by surprise. The company had to adapt to many different challenges, including store closures, supply disruptions and changes to consumption patterns. The onset of the Covid-19 pandemic resulted in a change to standard consumption patterns as consumers began prioritizing health and wellness, working remotely, and as such they made a switch from material-based consumption practices to an experiential-value-based consumption mindset (McMaster, 2020). This was of course a highly advantageous opportunity for Lululemon who had already positioned themselves in this space. This meant they had possibly more pressure to react to this Black Swan event as it also presented them with an opportunity to capitalise on the changing consumer patterns to gain market share. However, the growth that came from this change was juxtaposed with the economic downturns that were faced by both individuals and economies as a whole. This led to Lululemon having difficulties predicting demand and led to supply issues throughout the Covid-19 pandemic (Kohen, 2021). As a company they now had to see if the growth that would come from changing patterns in their market would outweigh the losses of economic disruption. Despite the economic difficulties throughout the Covid-19 pandemic the sports apparel industry grew by $8 billion dollars in the US alone see Figure 16.

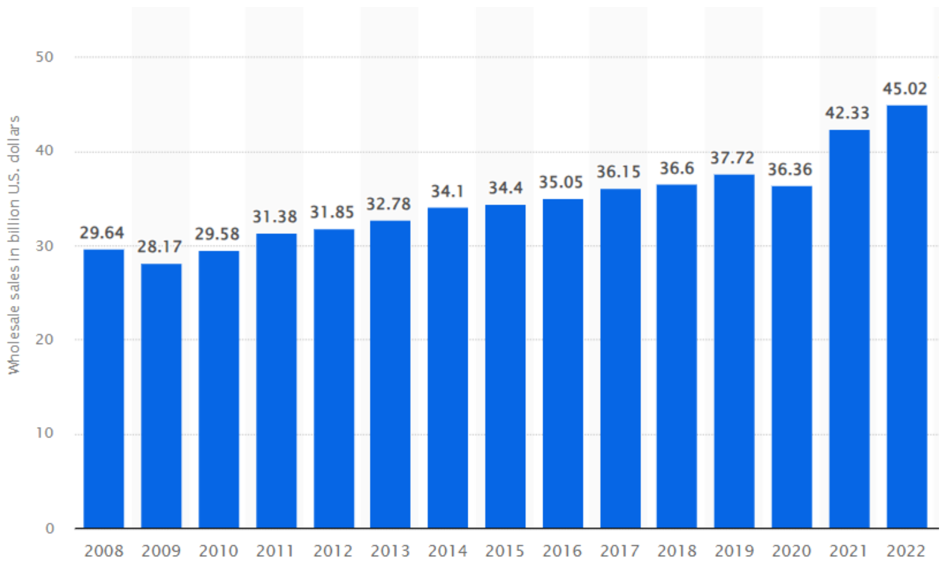

Figure 16. Growth in wholesale sales in the US sports apparel industry between 2008 and 2022 (Statista, 2024b)

Lululemon utilised clever marketing strategies like offering at home workout classes for its customers which allowed them to build a closer relationship with their customers and increase loyalty throughout the Covid-19 pandemic. This brand loyalty is also advantageous to a sourcing team as it means consumers are more likely to put up with delays and disruptions. As such, while Lululemon did face a lot of issues predicting the demand side of their sourcing strategy during the Covid-19 pandemic they were in a better position than a lot of companies in the fashion industry.

These changes in demand were also exasperated by issues that the company faced on the supply side. With suppliers being delayed or unable to make deliveries due to lockdowns, Lululemon were forced to use a reactionary strategy to try to get their goods delivered to customers. This happened both in terms of the raw materials themselves and delivering goods to their customers. Factory shutdowns in Vietnam had a particular effect on their distribution as a third of Lululemon's materials are sourced from Vietnam with Chief Executive Calvin McDonald stating that "despite the growth we have seen it could have been even higher if not for the supply chain issues we faced in Vietnam" (Maheshwari, 2021).

5.4. Response to the External Shock

Like most companies in the industry, Lululemon was taken by surprise by the outbreak of the Black Swan event that was the Covid-19 pandemic. While the company didn't have as much emphasis on efficiency as other companies, they still sourced about 30% of their materials in Vietnam. As such they suffered huge disruptions when the country began to force factories to shut and close their borders. To get a sense of how Lululemon reacted to this Black Swan event this section will be broken into two different parts. First, we will analyse their initial response to the outbreak and how it compared to other companies and the literature before analysing what steps they took throughout the Covid-19 pandemic to ensure that their supply chain was resilient enough to deal with the external pressure.

Initial Reaction

Lululemon immediately took the decision that maintaining a relationship with their suppliers and other stakeholders was going to be key throughout the Covid-19 pandemic. As such McDonald

> "Took the decision not to lay off any staff, pay all our rent and honored all the PO's that we had at the point in time" (Yahoo, 2021). This was a "conscious effort" by the company to support their vendors as they know that building a good relationship and supporting vendor partners is "essential for good results during uncertain times" (Yahoo, 2021).

This reaction aligns with the recommendations of (McMaster et al, 2020) who highlights the importance of maintaining and building good relationships during Black Swan events. It is also linked with the preparedness pillar of the resilience framework as by treating your suppliers well at the beginning of a disruption you have put in the groundwork to get further help as the situation unfolds.

One big problem that the company faced was delays at the Los Angeles port, which meant they had to think of other ways to get the goods to market. This led the team to put more of an emphasis on the use of air freight. Shipping goods by plane is of course a faster but more expensive way of sourcing materials (Korstrum, 2024). However, given the fact that the company was not filling all their orders they saw it as a small price to pay to be able to get goods to customers as quickly as possible as they continued to ride the wave of working from home leisurewear increasing in popularity. This example shows that strategies during the Covid-19 pandemic differed from company to company. Sourcing cannot be seen as a business activity in isolation. It must align with the company's strategy and the other business functions. Chasing low-cost options would have hindered Lululemon in this instance as they would have lost a golden opportunity to take market share off their competitors and in that case lowering cost became less of a priority. This strategy also links to the Sustainable Development Goal (SDG) 12 as of course flying goods into a country, instead of shipping them is not responsible consumption. Lululemon also faced some reputation damage due to these transport strategies.

These two basic ways that Lululemon looked to get through the initial stages of the Covid-19 pandemic led to increased costs, however they also allowed for the company to at least continue to operate to a certain extent.

<u>Continuing through the Covid-19 pandemic</u>

As the Covid-19 pandemic continued and companies began to realise that this level of disruption was going to remain for a sustained amount of time, governments around the world began to label the process of living through lockdowns and border closures as “the new normal” and like everyone else Lululemon implemented certain strategies to make sure that they could deal with the surge in demand that their company was facing. As McDonald put it

> “It is a good problem to have higher demand for our products, but we need to be able to make sure we can fill that demand as much as possible (Yahoo, 2021).

Continued emphasis was placed on working with their partners throughout the value chain but particularly from those that they sourced goods from.

> “[our relationships} puts our business in a good position in terms of the relationship with our partners and we are supporting them through these difficult transitions and this investment in good will is putting us in a better position than some competitors” (Yahoo, 2021).

Dual sourcing was another key area of focus for Lululemon throughout the Covid-19 pandemic, as such a large percentage of their product was being sourced from Vietnam there was a need to rely on other suppliers within the industry to help make sure that they could fill the demand during the initial stages. This dual sourcing came in two ways. The first was having the same vendor operating in two different locations.

> “Sometimes it is the same vendor who has two different locations; one closer to the US and one further away. So if there are issues with one location they will switch to the other location” (See Annex 1).

Or the company would use two separate vendors for the same product allowing them to spread risk even more.

> “Or it could be two separate vendors and then you develop the raw material with one vendor and then you will use that as the standard for the other vendor” (See Annex 1).

Both methods have their pros and cons. Sourcing from the same vendor better facilitates consistency in your materials and it is easier to collaborate with them and build the relationship. However, if that vendor gets into financial difficulty, it is more important to help them out as you are in danger of losing a key supplier. Using a different vendor allows you to spread the risk of vendor failures however it is more difficult to build the relationship and you must ensure that the second vendor has the capacity to manufacture the materials that you have developed with the first.

Lululemon was also willing to hold on to more safety stock during the Covid-19 pandemic. As the Lululemon sourcing manager mentioned during the interview.

> "During Covid you would have been fine if your stock was a little bit higher as you would be worried about when you would be getting your next order" (See Annex 1).

This strategy may have added to the company's storage costs but it allowed them to get through some of the primary difficulties presented by Covid-19, as one issue was that purchases would come in large waves. When stores opened there would be a surge in demand and then there would be no more stock and so Lululemon was willing to hold on to more stock in preparation for these waves.

These two strategies were adopted throughout the Covid-19 pandemic as a way for Lululemon to become more resilient and push to outcompete their competitors in terms of getting goods into the US.

5.5. Current Resilience Vs. Efficiency Balance

As Lululemon emerges from the Covid-19 pandemic they are looking to find the right balance between resilience and efficiency. For Lululemon's sourcing department this is:

"Perhaps the biggest challenge we [they] face right now". During their interview, the Lululemon merchandise sourcing manager described their supply chain as having particularly leaned into the flexibility aspect of resilience. "Flexibility has become a key element of our strategy" (See Annex 1).

This is because flexibility can help companies achieve a lot of the other aspects that make supply chains more resilient. If companies give suppliers more flexibility, they are more likely to be happy and it also allows the company to be able to react better to the changes that are happening in front of them. With that being said, time to market is still an essential Key Performance Indicator (KPI) for Lululemon which suggests that there will be tension between the flexibility and desire to get to market as quickly as possible. This is due to the fact that a certain amount of product is always going to be based around trend and when that is the case you need to go from design to being on the shelves as quickly as possible.

Lululemon has also looked to continue to operate with a multiple supplier model for all of their goods. As their attitude towards risk has shifted, they now see it as essential to be able to source goods from nearer to home in the case of an emergency. This can be seen in the increase in Lululemon suppliers in Central America since 2019 (Lululemon, 2019) (Lululemon, 2024). This means that they will be more prepared for this sort of disruption in the future and could eliminate the need to use air freight in the event of another external shock. This shows a clear shift in the attitude towards risk as an awareness of the danger of longer supply chains is necessary in the long term.

Lululemon has stopped short of implementing any plans to onshore or use vertical integration. This is due both because of the increased costs that are associated with these techniques as well as the lack of expertise to undertake them.

> "I would say to have it within the US or Canada though no because there is not a big enough expertise within textiles to really have that and the cost outweigh the benefit. So, we are looking more in Central and South America to see where the skill set is and where can we leverage that shorter lead time." (See Annex 1).

This shows that while their attitude has shifted to having more of a focus on resilience there is still a need to remain efficient to be competitive in the short term.

5.6. Future Expectations

In this section we are going to highlight the four main strategies that were identified by the literature that companies should implement to ensure that their supply chain through their sourcing strategy is sufficiently efficient, by analysing these four key areas in the context of Lululemon we will be able to begin to answer RQ2 and see if they will look to revert to a more efficiency based supply chain closer to what they had before the Covid-19 pandemic or stay with the more resilient one that they built during the Covid-19 pandemic. These four elements are reshoring/nearshoring, increasing supplier base, focusing on relationships with suppliers and sustainability.

5.6.1. Reshoring/nearshoring

While Lululemon has implemented some elements of nearshoring including sourcing some products from suppliers in Mexico and El Salvador the focus has remained on sourcing from Southeast Asia.

It seems like the company will stay with the current efficiency balance that they have with smaller suppliers based in Central America and their strong supplier base in Vietnam still handling the bulk of the materials that they purchase. By having a good relationship with their suppliers there and can still take advantage of the low labour costs. However, Lululemon is still concerned with the fact that they are sourcing from a country so far away.

> "Of course, you have to be concerned about this particularly in the fashion industry where a portion of your business is going to be on trend" (See Annex 1).

Missing a trend can have a massive impact on the brand's reputation and by extension their bottom line. As such the company has instead focused on the "short term wins" they can get by exploring more effective shipping routes and ensuring that they can get their products quickly (See Annex 1).

However, this strategy is one that was followed by a lot of companies before the Covid-19 pandemic. Getting short term wins is something that can be easier to find in normal times where you can look for different shipping routes and perhaps try to play delivery companies off each other allowing you to reduce costs. This focus on short term wins perhaps does show a slide back to the pre pandemic search for efficiency. As such a Black Swan event that impacts their suppliers in Southeast Asia will leave Lululemon exposed and as such we can say that they are to some extent reverting back to a similar plan as before the Covid-19 pandemic.

5.6.2. Increased supplier base

Lululemon has expanded its supplier base since the outbreak of the Covid-19 pandemic. While it must be acknowledged that this can be partly attributed to the growth of the company since 2019, they also made a conscious effort to increase their supplier base to offset some of the disruptions during the Covid-19 pandemic. This plan is one resilience recommendation that looks likely to continue beyond the end of the Covid-19 pandemic so that the company can continue to offset some of the risks set by Black Swan events.

> "Of course, it [The Covid-19 pandemic] has changed the company's attitude towards risk". (See Annex 1).

Before the Covid-19 pandemic the company had a lot more trust in the ability of their suppliers to deliver goods. A change in an attitude towards risk has come from the fact that there has been a revelation through the Black Swan event that suppliers may not always be able to fill orders and as such they must rely on having at least two suppliers for every material, see Figure 4 that highlights the benefits of an increased supplier base.

The Lululemon merchandise sourcing manager even went as far as to suggest that they would ideally like to have three suppliers for each of their materials, but this is not always possible due to cost and other challenges (See Annex 1). This could be something that they will look at in the future, but the general expectation is that they will stay remain with two. This reluctance to increase the different supplier locations even more perhaps shows the company has reached somewhat of a limit to the level of resilience that they think they need going into the future. They may now look to refocus on efficiency. One possibility is they will evaluate products based on the Kraljic matrix (Putri et.al, 2020) and increase their suppliers even more for volume drivers and bottleneck products but this remains to be seen.

5.6.3. Supplier relationships

As was indicated in section 5.4, Lululemon immediately saw the importance of building strong relationships with their suppliers throughout the Covid-19 pandemic. They decided to fulfil all their PO's when stores shut down and they also made sure to support their suppliers throughout the Covid-19 pandemic with McDonald emphasizing how building "goodwill" with suppliers would benefit the company in the long run. The company has maintained that this will remain as a key area of focus for them as they move out from the Covid-19 pandemic.

> "I think one of the biggest things that came out of Covid is the relationships you have with your vendors changing. I would say in terms of more leniency in lead times or delays and more flexibility is also expected in return. So yes, just less risk as you are putting more on the relationship side of things" (See Annex 1).

This shows a shift in attitude that has come as a result of the Black Swan event. The perception of risk within the company has changed. Suppliers are less seen as a way to cut down on costs and get a good deal and more seen as a partner that you hope you can build loyalty with. This is done so that when times are tough they are more likely to support you and make an effort to prioritise getting goods to you. This also allows the company to gain some of the benefits that they would get from vertical integration without the increase in risk. This strong rhetoric from both the members of the Lululemon sourcing team and the companies CEO surrounding supplier relationships suggests that the company will look to continue to support their suppliers going into the future as they look to build a long-lasting sourcing strategy.

This shift to a more resilient relationship with your suppliers reflects what the literature recommends as we move into the post pandemic world where these Black Swan events are likely to become more common and "returning to a normal state after a disruption will become more difficult" (McMaster et.al, 2020). McMaster indicates that this can be one of the easiest ways to improve resilience as it doesn't have to massively increase the cost of operating.

5.6.4. Sustainability

Linking back to the SDG 12 of responsible consumption and production, sustainability is a highly important objective for the sourcing team at Lululemon. They have it as one of their highest priorities and it was something that constantly came as an answer when asked regarding resilience and their plans.

> “Sustainability is the big one. That and time to market would be the main priorities for us at the minute” (See Annex 1).

Coming out of Covid-19 the company plans to build on the reputation it has of looking after workers both in its stores and right the way down the supply chain all the way to the country where goods are sourced. The company plans to do continuous and vigorous audits to ensure that their suppliers are following the company’s sustainability guidelines. According to the Lululemon sourcing team the most important thing to keep in mind when making sustainability guidelines is that once they are made, they must be followed or else there will not be a resilient sourcing strategy from an environmental perspective.

Another key innovation that the team managed to produce by working with their supplier is a recyclable nylon. This will help contribute to the company’s plan to make their supply chain more circular. This was seen with the company’s creation of their mixed fabric nylon, something that is very difficult to produce (Annex1). Developing this material with suppliers has shown that the good relationships that are built and maintained as part of the sourcing strategy have spillover benefits where you are able to more efficiently create new materials or products in general.

Lululemon also has another strategy to ensure that their suppliers are acting responsibly and that is working with not only finished goods suppliers but also producers of raw materials. This offers the company two distinct advantages. The first is that they can make proprietary materials with their suppliers and the second is that they can increase their visibility throughout the supply chain as they are in communication with all elements of the supply chain. Unlike Figure 14 seen in section four where the second-tier suppliers and raw material suppliers were marked in red to highlight a lack of visibility in the Lululemon model they have access to these suppliers.

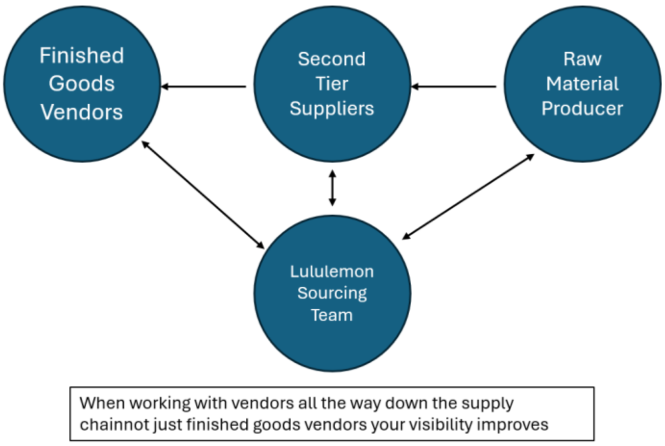

Figure 17. Lululemon sourcing paradigm: Own elaboration based on (Annex 1).

Of course, not all of Lululemon’s Covid-19 response strategies had sustainability in mind. The decision to import goods using air freight which is far less environmentally friendly drew a lot of criticism, with some reports accusing the company of green washing leading to some reputational damage (Korstrum, 2024). This also shows an example of how when a reactionary response like switching to air freight is required a company runs the risk of incurring reputational damage, especially if the brand relies on their image as a sustainable company.

With Lululemon currently not exploring the avenue of onshoring should another Black Swan event occur the company would probably have to increase its reliance on air freight again showing that the company hasn't completely followed the doctrine of resilience over efficiency. With that being said, there has been an increase in suppliers that share a land border with the US. This means that they are better prepared to have different, more sustainable transportation options if there is another Black Swan event.

Overall, sustainability is an important aspect of Lululemon's sourcing strategy, and the company has clearly seen this as a key part of their resilience strategy coming out of Covid-19. However, they still must struggle with the need to balance this with the efficiency that is necessary to remain competitive.

As we look to the future, it seems like the sourcing team in Lululemon and teams in the fashion industry will be facing an internal battle to balance their company's short-term efficiency needs and its long-term resilience objectives.

6. THE BATTLE BETWEEN EFFICIENCY AND RESILIENCE

As shown in the literature the trade-off between efficiency and resilience can be considered in terms of short term and long-term priorities. If a sourcing strategy was created to make a supply chain completely efficient it would be more competitive in the short term but be highly exposed to risk making it less competitive in the long term. However, if a supply chain is completely resilient it would be protected from risk, but less competitive in the short term. As such we can conclude you are not going to find companies with 100% fully efficient or 100% fully resilient supply chains and it is instead somewhere on a scale between the two. Companies that were most prepared for Black Swan events performed better during the Covid-19 pandemic, but all companies changed their strategy in some way to cope with the disruption. This highlights that a balance is needed between resilience and efficiency (Klöckner et.al, 2023)

6.1. Reasons why companies will focus on efficiency

This paper has identified two main reasons as to why companies will focus on efficiency over resilience. The first is that you are likely to be more competitive in the short term. The second is a reaction to competitors who may undercut them and force them to cut prices which can be done through efficiency-based gains.

In the modern globalised economy, there is huge pressure on companies to cut costs as much as possible (McMaster et. al, 2020). Shareholders expect a return on investment and one of the best ways to do that is to decrease costs through finding efficiencies within different areas of the company. This can be achieved with methods such as reducing safety stock, strategic sourcing in developing countries to save on labour costs, or reducing your supplier base (McMaster et.al, 2020). Companies will do this not only for the short-term improvement to EBITDA or as a result of pressure from shareholders, but also to be able to improve their cash flow situation to make more investment opportunities and increase growth.

If a new competitor enters the market that is hyper focused on efficiency it may cause a company to search for efficiency gains that they can make to catch up with the new entrant. This can come in the form of better products or lower prices. New entrants cause companies to reduce their prices so that they don't lose too much market share. The biggest challenge for companies is achieving this without their margins being influenced. This can be difficult for companies particularly in the fashion industry where the barriers to entry are not particularly high and copycat products are common (Eguchi, 2021).

As we can see these pressures to focus on efficiency make clear a company is never going to fully focus on resilience when they are making sourcing decisions. As such companies need to find a way to build resilience but remain competitive.

6.2. Actions to become resilient but remain competitive

As seen in the case of Lululemon and the analysis of the fashion industry there are certain actions that can improve a company's resilience while remaining competitive. These actions include;

1. Increased flexibility and shifting attitudes regarding risk.

When Covid-19 started many sourcing departments were caught unprepared for the event and their sourcing teams didn't have contingency plans in place to deal with the disruptions. As seen in the analysis of the fashion industry and the Lululemon case study, companies have now started to change their approach towards. More emphasis is now being placed on flexibility so that they are able to adapt to issues in their supply chain as they arise.

> "I think flexibility is the thing that is really taken into account. How can we have less time to get things to market, as the shorter time frame means less risk because you're not committing to things a year in advance without knowing market conditions." (See Annex 1).

As this quote shows, this flexibility does not necessarily mean increasing safety stock as that can increase costs, but instead trying to get goods to be ready as quickly as possible and not making decisions too far in advance to ensure that you are not leaving yourself exposed to a potential Black Swan event. Safety stock is instead only increased during the Black Swan event itself. This attitude shift and awareness with flexibility mixed in will make the sourcing team more dynamic when dealing with external shocks.

Flexibility also means that companies need to have contingency plans in place for when things go wrong. As seen with other natural disasters that have happened, a Black Swan event does not have to be something as global as the Covid-19 pandemic. When the environmental situation worsens, regional disruptions, particularly in the developing world are likely to become more regular This will cause more headaches for sourcing departments as they navigate supply related disruptions.

2. Increased transparency and improved relationships with suppliers.

Improving relationships with your suppliers is something that doesn't necessarily massively increase your costs but can give the sourcing team a huge advantage over competitors. By treating your suppliers well in normal times and not looking at the relationship as being something simply transactional companies can expect goodwill when times are more difficult (Ketoviky & Mahoney, 2020). This relationship can be built in various ways. The sourcing teams can work with suppliers to develop new products. This unites both parties, making them more likely to develop a relationship with each other and work cooperatively through more difficult situations. Allowing suppliers more flexibility when they face difficulties is another method of improving this relationship. This can include; allowing for better delivery conditions and offering a better price for products. This sort of help will be highly appreciated by suppliers, which often results in loyalty from the supplier. By not switching to a different supplier any time there are issues the supplier will likely further support the company.

When you have these positive relationships with your supplier you are gaining some of the advantages that come from vertical integration without taking on the risk. As was mentioned in the interviews with the Lululemon sourcing team there are always discussions about vertical integration. However, companies are unwilling to take on fabric risk right along the supply chain. By working closely with suppliers, they don’t have to, but they will still be able to influence them to increase or decrease the amount of fabric that they produce depending on the situation. This ability to have influence on your supplier during a difficult period can make the supply chain more resilient.

3. Increased supplier base.

Finally, increasing supplier bases to ensure that you have multiple suppliers in different locations for your materials can help to mitigate against issues that suppliers face. As seen in Figure 4, this allows the company to be able to continue to produce products during difficult situations. This can be done by having one supplier in multiple locations or through having different suppliers in different locations. The more suppliers that you have the more resilient your supply chain will be (McMaster et.al, 2020).

> “So now especially anything that is a volume driver, as in if you have significant sales in it you will always want to spread the risk. So, we will have multiple vendors in multiple locations, always trying to have less risk essentially” (See Annex 1).

It is recommended that the smaller supplier is closer to the market in which you are selling. While onshoring to the US is unrealistic due to the increased costs and lack of expertise, Lululemon for example uses secondary suppliers to improve their resilience. Their products travel less distance and because they have more transport options with countries that share a land border, they keep their costs as low as possible.

As seen here there are actions that companies can take to improve their resilience and remain competitive. The world of sourcing is of course not static and companies must constantly follow these recommendations in the context of their environment. However, to ensure they are competitive in the long-term global companies must always be aware of the importance of resilience, as failure to enact any of these plans will inevitably lead to supply related difficulties.

7. CONCLUSION

Black Swan events like Covid-19 have a massive impact on a company's sourcing strategy. Those companies that have more resilient strategies are more likely to thrive in Black Swan environments and therefore companies need to consider that when they are evaluating their sourcing plans. This paper set out to answer two fundamental questions regarding this change and they were;

RQ1: Did fashion companies adapt their sourcing strategies during the Covid-19 pandemic to mitigate lead times and enhance supply chain resilience?

RQ2: Considering the potential trade-off between resilience and efficiency, will fashion companies revert to more efficient sourcing models in the post-pandemic landscape?

In this conclusion we will answer these questions based on the research conducted as well as highlighting some recommendations for future research.

<u>RQ1</u>

Companies did adapt their sourcing strategies in response to the Covid-19 pandemic to mitigate lead times and to enhance supply chain resilience in various ways. Directly after the outbreak of the Covid-19 pandemic companies began to scramble to find a way to source materials and as companies realised that the Covid-19 pandemic was not going to be a short-term event, they realised that their thinking was going to have to change. These initial responses included allowing for increased safety stock to ensure that companies would be better able to cope with the disruptions that they faced due to the longer lead times in their supply chain. There was also a push to find suppliers that were closer to the home market so that they could shorten lead times and still be able to get their hands on materials if their main suppliers in Southeast Asia were facing difficulties.

As the Covid-19 pandemic progressed other strategies were also pursued. Some companies looked to onshore certain elements of their manufacturing to their home market. They also tightened their relationship with the suppliers working with them to get through the difficult business environment presented by the Covid-19 pandemic and they improved their visibility and flexibility, allowing them to better monitor the situation as it unfolded. This action also improves sustainability as the company can better track if suppliers are following their supplier guidelines. Finally, companies also increased their investment in technologies like IoT and Artificial Intelligence to improve predictions of supply and demand. Despite the increased costs companies who were able to implement these plans thrived better during the Covid-19 pandemic than those that couldn't. As such risk mitigation can be seen as an indicator to the longevity of a company. However, these increased costs make it more difficult for companies to thrive in normal times and in the short term which brings us to the second research question of this paper.

<u>RQ2</u>

Considering the trade-off between resilience and efficiency, companies will to some extent revert to more efficient sourcing models in a post-pandemic landscape. This will be done as concentrating solely on resilience means that companies can be challenged by new entrants, and they aren't as competitive in the short term.

The level of this return will depend on each individual company. However, in general, companies are again likely to reduce safety stock as much as possible to increase cash flow and reduce the chances of having obsoletes. They are also unlikely to reshore their manufacturing to their home country due to the increased costs that are associated with that activity. Finally, companies will also put more of a focus on price when it comes to finding their suppliers as new entrants threaten them with price reductions and other competitive advantages.

Despite this, it can be said that the Covid-19 pandemic has fundamentally changed strategic sourcing in the fashion industry. Companies have begun to tighten their relationships with their suppliers and there is an increased focus on improving visibility and transparency, as well as increasing supplier bases to offset risk. This change will also lead to increased investments in technologies that support these changes as well as an increase in goodwill between companies and their suppliers. Finally, this will have a positive impact on SDG 12 as more companies will be tracking how their suppliers are treating workers in the developing world and will hopefully decrease the odds of disasters like the Raza Plaza disaster.

As such, while companies will to some extent revert to similar strategies as there was before Covid-19, things won't fully revert to the way they were, highlighting how this Black Swan event has changed the industry.

Recommendations for future research

Based on these conclusions to the research questions there are some opportunities for future research. Firstly, an interesting study for the future would be to see how many companies revert to resilience-based strategies as we get further and further from the Covid-19 pandemic. Secondly an interesting study would be to see how this relationship differs for companies in the fast fashion industry where there is a hyper focus on cost compared to luxury brands who care more about reputation than their fast-fashion counterparts. Finally, considering the limitations of this study, an analysis of more companies within the fashion industry as well as more interviews with industry experts would provide the reader with increased insight into the impact of Black Swan events and how they affect the industry's sourcing strategies.

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Annex 1: Interviews

As highlighted in the methodology section interviews were conducted with 2 sourcing managers from Lululemon. The informal introductions were made at the beginning and goodbyes at the end have been excluded due to their lack of relevance. The transcripts can be seen below.

Interview 1

Interviewer: In your role at Lululemon how are you balancing the trade-off between efficiency and resilience?

Merchandise Sourcing Manager: I guess that is probably the biggest challenge we have at the minute. In a certain sense we are focusing on resilience with sustainability being the big one [element] that we are focusing on. Within that, having recyclable product. I don't know if you have seen this year, we came out with recyclable nylon which is actually a huge achievement as it is a lot more difficult to recycle mixed blend fabric than it is to recycle 100% pure cotton or pure polyester. So, this is amazing and we're definitely standing for that. Within that it covers both durability and sustainability in the sense that it is fully circular. That will be the main priority within the supply chain. When it comes to efficiency the trade-off that we have are lead times on average are longer in this company, but it is balanced just in terms of how the company is set up. This is attempted to be done through building processes and relationships with our key vendors.

Interviewer: Do you think this outlook has changed since or because of Covid-19? Do you think it has had any kind of impact on how important it will be for companies to be more resilient or more efficient?

Merchandise Sourcing Manager: Ye. For me I think flexibility has become a key element of our strategy and something that people are now looking for. Maybe you don't know how the next season is going to trade, so maybe you are holding out on orders or worrying about fabric liability or maybe pushing out when you receive the inventory. I think one of the biggest things that came out of Covid is the relationships you have with your vendors changing. I would say in terms of more leniency in terms of lead times or delays and then more flexibility is also expected in return. So just less risk as you are putting more on the relationship side of things.

Interviewer: In terms of what we see from recommendations in the literature since Covid-19 and lockdowns there has been a move for people to spread their supplier base. Is that something you are doing? Could you explain to me how that is working?

Merchandise Sourcing Manager: So now especially anything that is a volume driver, as in if you have significant sales in it you will always want to spread the risk. So, we will have multiple vendors in multiple locations, always trying to have less risk essentially. Sometimes it is the same vendor who has two different locations: one closer to the US and one further away. So, if there are issues with one location they will switch to the other location. Or it could be two separate vendors and then you develop the raw material with one vendor and then you will use that as the standard for the other vendor so that it is identical from both vendors. If you can three vendors is nice, but at least two vendors doing the same thing so if there is anywhere where something goes wrong you have spread the risk.

Interviewer: So, you are globally sourcing the materials that you get. Has there been any push to try and get the materials closer to the US or reshoring efforts?

Merchandise Sourcing Manager: Yes and no. I would say for certain things where we want a more trend driven product there is a push. I would say to have it within the US or Canada though no because there is not a big enough expertise within textiles to really have that and the cost outweigh the benefit. So, we are looking more in Central and South America to see where the skill set is and where can we leverage that shorter lead time. So rather than looking within the US or Canada it would be somewhere else closer. The only thing that would be maybe looked at here would potentially be some printing which is just like more reactive again. So, if you want a faster lead time you might have blank t-shirts and just print on them in the US and Canada but if we can avoid it, we do because you just don't have the cost savings and the expertise within the markets

Interviewer: So, it is not just cost that is making that decision it is also expertise?

Merchandise Sourcing Manager: Yes. So it is not just the materials it is also the manufacturing. They have better manufacturing facilities. If you were to go here [US or Canada] there's not really a big enough trade to have the expertise for example. If you want certain techniques or anything there are other countries that are better fit to cater to our needs.

Interviewer: And given this, do you still have concerns about the longer lead times?

Merchandise: Of course, you have to be concerned about this particularly in the fashion industry where a portion of your business is going to be on trend. However at the end of the day it is just too complex and expensive to bring large scale levels of manufacturing to the US or Canada.

Interviewer: And how has your relationship with suppliers changed since the outbreak of Covid-19?

Merchandise Sourcing Manager: Yes, I think the relationships. I think we work even more with our suppliers. I think you can see that with some of the fabrics we have made, particularly the new recyclable nylon, this shows the benefits of this relationship. Perhaps before where you might have seen the relationship with your supplier as being mostly transactional, now you might have to consider that getting the best price is not the most important thing but instead building a relationship that can withstand tough times. So, in that sense the relationship has changed a bit.

Interviewer: As you look into the future, what are your key priorities when it comes to your sourcing strategy?

Merchandise Sourcing manager: It's all about being able to source high quality sustainable products, that is the main aim and then you have to try look at ways to get that for as low of a price as you can, but really you have to make sure that the quality of the products are not being impacted by the search to find lower prices.

Interviewer: Are you using any modelling to forecast possible future risks?

It wouldn't be something that is within what my team does but I would imagine that inside the company there is certain levels of modelling to see where the company is exposed and to play out certain scenarios. This was something that was done in my old company, but it isn't something that I would see in my day to day. With that being said we will look at past data and consumer behaviours and that will allow us to see if we think there is a trend or something coming that will make a certain amount of our products more or less in demand, but yes, it is not something that I am dealing with all the time.

Interview 2

Interviewer: In your role at Lululemon how are you balancing the trade-off between efficiency and resilience?

Sourcing manager: For us it is really all about trying to find the right balance between the two. I think you have to try to be as resilient as you can, while still having an eye on the cost. For us we are at an advantage where we are not only looking to cut cost as much as possible. So this helps you be able to build more resilience. I think the most important thing is having a good level of flexibility so that you are able to manage risk when disruptions happen.

Interviewer: In terms of Risk Management, when it comes to your sourcing strategy in light of lessons learned from Covid-19, how has your relationship with the concept of risk changed?

Sourcing Manager: Of course, it [The Covid-19 pandemic] has changed the company's attitude towards risk. I think flexibility is the thing that is really taken into account. How can we have less time to get things to market, as the shorter time frame means less risk because you're not committing to things a year in advance without knowing market conditions. The biggest thing for us not taking on liability a year or two out without knowing the circumstances. We are also looking at having less stock to sales. During Covid you would have been fine if your stock was a little bit higher as you would be worried about when you would be getting your next order.

Interviewer: What role do technological advancements play in building resilience in a supply chain operation?

Sourcing Manager: I think this is going to be a big one going forward. At the minute it is just looking at accurate predictions of demand and supply, but I think going forward it will play a bigger role in reducing the gaps we have. At the minute we are using it to accurately predict demand and reduce lead times.

Interviewer: As you look into the future, what are your key priorities when it comes to your sourcing strategy?

Sourcing Manager: Sustainability is the big one. That and time to market would be the main priorities for us at the minute. We do have sustainability goals and sustainability teams with KPI's that we have to get including having sustainable products and how does it fit within the overall goals of the company I think it is again making that circular model. How can it be circular or is it circular? Just making sure that it has been ethical and everything like that as well which is a big think a lot of work being done in that area because I think that is part of being a durable supply chain you are standing behind it and you are ok with those standards. And then the second thing is speed to market as its always going to be the thing as you are always going to want to reduce your time to market so you are going to look at that like where are you sourcing your materials seeing if there is any short term wins that you can get from where you are sourcing and how you can actually get it to market, normally that's just looking at the lead times and seeing if there are any improvements from your raw materials to your finished goods vendor, where that could be improved but it is also like lead times with your shipping which shipment method is the best so ye if there is a faster boat or a faster process for it to get through the port we are really trying to look at those areas.

Interviewer: And by speed to market do you mean by the time the design is made to the time it is on the shelf?

Sourcing manager: Yes exactly you are trying to shorten that timeframe essentially because a portion of your business is always going to be trend and if you have a year long lead time potentially you are going to miss a trend so you always want to know that you can react ideally within a few months of seeing business results or if you have like a great reaction on something and then you want to bring it back because you are still seeing results how quickly can you bring it back which I think is a bigger challenge for us because there is a lot of teams involved.

Interviewer: With ethical sourcing as being a key priority how is it that you are going about ensuring that you have visibility over your suppliers?

Sourcing Manager: So they're all vetted by the company, at my previous company we would have only worked with what you would call finished good vendors the ones that are making the product, however Lululemon will have a lot more of a say as a lot of our fabrics are proprietary fabrics that we actually own so we are actually working directly with the raw material vendor so we are in contact with them directly so we have more visibility because we know who they are. That's the issue when you are only working with finished vendors is that you can't really know where they are sourcing their raw materials from. That's where you are more likely to run into issues as those vendors you don't really know who they are using. That's where more issues come in with subcontracting.

Interviewer: How do you look to mitigate the risks of potential supplier delivery issues?

Well first we would have multiple vendors to ensure that if something goes wrong with one we have another supplier that is able to fill at least the majority of the shortfall we have and then we will try to work with our suppliers to demand and capacity planning. I am trying to think of the time lines now but around a year and a half out we will predict how much we will give them per season and pre book capacity essentially in the hopes that you will reserve that space and then they will kind of start production planning and then when you give them that it matches so it is like a 2 year process essentially where you are working with them to say we will probably need X% of product can you reserve some capacity and they will go from there to say yes we will reserve it and then it is just working with them on what can be prioritized and how can it be prioritized is it like pushing up orders or giving them visibility so they can start production sooner.

Interviewer: Are you using any modelling to forecast possible future risks?

Sourcing Manager: We are using modelling to predict demand, for us it is in the infancy phase where it is still teams of people monitoring it rather than systems as we are just trying to set those processes up.

Interviewer: So obviously a large portion of the sourcing process is outsourced at the moment. Is there any element of the supply chain that you are looking to bring into Lululemon or is it going to stay with the model of outsourcing to other companies?

Sourcing Manager: To my knowledge no, there always is discussions of how that could be done like blue sky's how would it work if we were to do it, would it be something that you could have less risk but actually Covid has highlighted it as being something where you have more risk because you are owning the liability from the moment the fabric is created so you are just owning more reliability further down the chain so it is just at what point does that become worth having that risk and I haven't heard of anything happening to move towards that model or even test that model. There is clearly advantages to being a fully vertical company in that you have more control of how much is being produced but that extra risk that you take on is difficult and we feel if you have a good relationship with your vendor you can pretty much have them advantages.

Interviewer: So, looking ahead, What do you believe are the key considerations for sourcing professionals aiming to strike a balance between efficiency and resilience in their sourcing strategies post Covid-19?

Sourcing Manager: So ye I think sustainability is the big one that is being focused on across the market with that just becomes the durability of the product and balancing having durable product with sustainable product and then time to market how you can improve that while not taking a hit to your margins as Covid showed us there are large advantages with lowering your lead times but at the same time you have to ensure that that doesn't have a big impact on your margin and make you less competitive. I think within that there is more of a push to use technology on the design side to use more modelling to reduce time at that end so we are saving time in the design of the product phase which gives us a bit more room when bringing goods from our suppliers, this is more of an option than say to onshore that's not to say that onshoring isn't an option to explore but you are always going to have to look at where the skills are and what would actually be the cost and speed benefit or onshoring more manufacturing.

Interviewer: Obviously there are some companies that don't really care about resilience or sustainability and are more looking to reduce cost and improve margins. Is this something that concerns you?

Sourcing Manager: I think that they can be a concern, but we are going to keep doing what we are doing, that's not to say that cost doesn't come into it, but we are prioritizing durability and sustainability even if it does come at the expense of short-term losses or variance in your margin. If it is drastic, you won't let it happen but if it is partial then you would be willing.