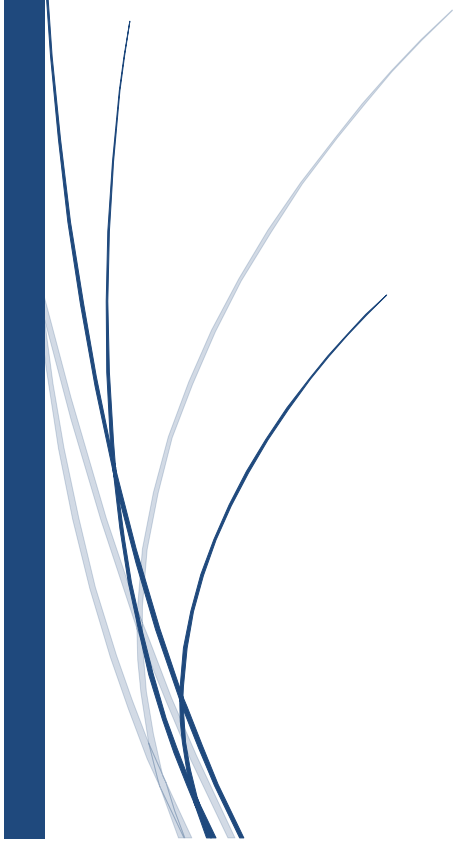
Master Thesis

MNE's and Resilience: A literature review of drivers



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Abstract

In the aftermath of the pandemic and the continuous threat from disruptive events such as the Russian-Ukrainian war, multinational corporations experience an increased level of uncertainty. Covid-19 was a severe example of how intertwined global supply chains are and they have been tested on multiple aspects throughout the event. The goal of prosperity and growth among MNE's has led to a high level of efficiency in the global value chains, which makes them fragile towards shocks, but the current literature on this subject is fractured, which makes it harder to grasp the scope of how to resolve this issue.

This study is based on a literature review conducted through a critical realist approach, which seeks to explain how MNE's can increase their level of resilience, which has been done by initially creating an overview of the scattered literature. This will be used to conceptualize the resilience and examine relevant theories, concepts, and frameworks. The literature will be used to identify drivers that can be applied by corporations to deal with fragility, but also to detect areas within the literature that require further research to provide a higher level of evidential suggestions to solve this IB issue of how MNE's can become more resilient. The drivers will be divided into the different aspects of the value chain to create an overview of the findings, whereas these will be weighted based on their evidential background to create a list of potential implementable strategies that will create resilience.

Conducting the literature resulted in identifying 31 different drivers, whereas 20 of them met this study's requirements of sufficient evidence for implementation, which can be implemented by the firms after they have conducted a risk assessment of the firm to locate the most vulnerable aspects of the value chain.

The study has several implications, and these will create the foundation of future research, which could be based on conducting additional research on the lesser investigated areas, examining the drivers based on specific disruptive events or observing companies implementing the located drivers of resilience in this project.

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1. Introduction

The dynamics of the world is shifting, which creates a world in constant change. In the past few years there have been several exogenous shocks in the world and Covid-19 has been a severe example, testing the dynamics around the globe. The countries of the world are becoming more intertwined due to globalization, which results in these shocks escalating the effects. This event caused shortage and malfunction alongside the value chains, which has resulted in lack of goods globally. This created scarcity, which affected several aspects of the behavior among the population and to the majority of business industries (McKinsey, 2021).

Thoughts of adaptation have arisen to overcome the negative effects, which has led to debate of deglobalization, especially in terms of the global value chains. Growth and prosperity have been a popular term to describe the evolution of multinational corporations, but this creates friction with the concept of reducing uncertainty (McKinsey, 2021).

This study will conduct research on this topic through a systematic literature review by using secondary data. The already published research on this topic is fragmented (Blackhurst et al., 2011), whereas this study will create an overview of what has been published on this complex subject field. The aim is to identify the elements revolving around the term of resilience, which has the purpose of locating drivers for the reduction of uncertainty. These will then be discussed to create a set of possible implementations for companies and highlight potential areas for further research.

1.1 Background of the study

The number of events causing disruptions alongside the value chain grows at an increasing rate, whereas the increase can be derived from political reasons, climate change or pandemics. The external environment of a company is now carrying a higher degree of uncertainty compared to previously, which increases the risk for multinational corporations. The globalization movement has increased the level of interconnectedness, which causes the effects of disruptive events to have enhanced consequences on offshore branches, departments, and manufacturing sites.

The list of examples with negative consequences from these events is long, whether it is shortage of medical supplies during Covid-19(McKinsey, 2021), increased prices on oil due to the Russian-Ukrainian war (White, O. et al, 2022), or general goods imported due to the

US-China trade war (Wolf, M. & Kalish, I., 2021). All the examples intensify the need of how companies can cope and adapt to these changes that can occur overnight or within a short time span.

The forthcoming sections will be used to introduce the elements involved in this research, which is, disruptive events, global supply chain, and the gap created among these.

1.2 Disruptive events

In ancient Greece, Heraclitus of Ephesos stated ‘’all things flow’’ and this doctrine of flux is used to describe change that reveals the unity of the world (Berrey, 2012). This set of beliefs has also given life to the popular phrase ‘’You cannot step in the same river twice’’ (Egan, n.d.), which was later evaluated by Plato and defined as ‘’all things are in constant flux, regardless of how they appear to the senses’’ (Britannica, 2019). These are some of the earliest descriptions of the change phenomena occurring in the world going back almost 500 BCE (Berrey, 2012) and yet still has an impact in modern perceptions of the world (Mortensen, 2020). The concept of change is perplexing due to its consistency as it has incompatible properties and remains unaltered, which has led to the perceptions of change being consistent solely rendered by the continuation of time or to view inconsistency as the essence of change (Mortensen, 2020).

Charles Darwin did explain change in scientific disciplines as geology, zoology, and botany in his theory of evolution, whereas variation, natural selection and inheritance are the key components to describe the mechanisms defining the species on earth (Darwin, 1859). He described the rate of the evolution as varying but was in the 1970’s specified by Gould and Eldridge in the Punctuated Equilibria (Gould & Eldridge, 1977). The change is very concentrated in rapid events, whereas the speciation development is for the remainder of the period close to or even non-existing in terms of morphology or apparent direction.

The sudden change can also be defined as disruption or shock and these events have happened at different scales throughout the past century. The events range between everything from the great stock market crash of 1929, World Wars, Oil crisis to the great recession in 2008(Srinivas, n. d.). These events affect different aspects of different individuals depending on them for example their geographically location or income. The number of events that are related to the economical aspect is increasing and the world is currently still battling the aftermath of the Covid-19 pandemic and currently the Russian-

Ukrainian war is continuously on the uprise. The continuity of the events relates to the nature of them, which means that they will continue to occur. Besides the macro level phenomena as natural disasters, there are also operational and internal risks that can occur, which can be defined as uncertainty within demand, customer behavior, logistics, IT and communication (Yazdani, M. et al., 2022).

1.3 Global supply chains

The global patterns of multinationals have been transformed since the middle of the 1980s due to the economic globalizations, which has led to another remake of the world economy (Dowlah, 2018). Foreign direct investments, global value chains and multinational enterprises are the primary factors behind this prosperity, and it especially revolves around employees, trading, investing and production (Dowlah, 2018). Outsourcing and offshore activities is the main driver behind the transformation and creation of the global value chains, which leads to the boundaries of the companies becoming more permeable (Magnani, 2019). By vertically disintegrating, the company can fragmentate internationally, which can relate to the transactional work alongside the value chain or even the core activities (Magnani, 2019).

To conceptualize this drastic transformation the foreign direct investments has had an increase of more than 32 times from 1980 to 2015 (Dowlah, 2018). The rise of multinational enterprises began after the end of WWII, but the growth has been accelerating alongside the FDIs, whereas the number of parent MNEs in the 1970s were around 7000 but has risen to 320.000 in 2015 (Dowlah, 2018). The size of the MNE's has risen to a level, where they exceed the GDP of several countries, for example the multinational retail business Walmart exceeds Poland (Dowlah, 2018).

The foundation of the prosperity among MNE's can be related back to classical economic theories such as Perfect Competition even though it did not include internationalization or mobility of capital. These were fundamental assumptions when Adam Smith (Smith, 1776) produced his trade theory about perfect competition. A country or firm would gain expertise within an area they hold an economic advantage and then firstly supplying the domestic need and afterwards exporting. Areas with an economic disadvantage should then be imported, which leads to the theories trading across borders instead of producing as in today's world (Dowlah, 2018).

The theoretical foundation of MNE's does also arise from the Uppsala model, which was introduced by Vahlne and Johansson in 1977 (Johanson & Vahlne, 1977). The aim of this theory is to separate the foreign development of a company into stages, which can be defined as the internationalization process is based on the operation form and the market diversification of the company. When the corporation either expands its number of markets or its level of commitment in the foreign countries it gains a higher degree of internationalization.

The above standing theories were all published before the globalization and major increase of MNE's occurred (Dowlah, 2018) and in correlation with Lean Management theory it creates the finalizing components behind the drivers of global value chains. The concept of Lean originates back to Toyota shortly after WWII and the key takeaway from this process is to optimize all practices within the company and hereby removing all unnecessary tasks (Dekier, 2012). In 1990 Womack, Ross and Jones rebranded the Toyota Production System as Lean through the book ''The machine that changed the world'' (Womack, et. al., 2007) and has led to a vast amount of further research within this topic.

The elements of waste within a corporation reaches out to every aspect and not just the parts of the value chain associated with the manufacturing of the products. Companies often create vague and undefined strategies as ''being the best in the class'', which can be defined as waste within the management department (Orr, et. al., 2014). Michael Nir (Nir, 2018) has described the general issue regarding Lean with the analogy of a microwave. The microwave does have a large number of features on its keypad, but the vast majority is only using less than a handful, if not just a single one or two. The microwave does then include the problem, need, decision and waste. This relates to multiple organizations and the way they operate their departments, which also correlates to why the outcome of Lean can be so effective (Nir, 2018).

An effective tool to incorporate the main aspect of Lean and in general optimizing the corporation has been outsourcing. By fragmenting the system of the company internationally, it's possible to reach the end goal that the majority of the theories relate to, which is increased profits. The focus on increasing profits has reached new levels due to globalization, as it has then been possible to aim even higher through foreign expansion.

1.4 The gap

As previously mentioned MNE's strive to prosper through efficiency, which has been occurring at a highly increasing rate since the 80's, but the disruptive shocks are also occurring at a higher rate than before. The value chains of these companies have roots in several countries across the globe, which also makes it more likely that a department of the organization will encounter difficulties. Furthermore, the value chains have also been efficiently optimized in order to achieve the goal of maximizing the shareholder wealth, which has led to supply chains becoming more fragile due to disruption. (Ewing & Clark, 2021). One of the latest exogenous shocks was the Covid-19 pandemic, which for example resulted in the car industry experiencing a shortage of semiconductors, which is being used as an essential part for manufacturing modern cars. The suppliers chose to shift their production setup in order to meet the need for chips in personal electronics and this led to disruption alongside the supply chains of the car companies (Ewing & Clark, 2021). The pandemic did not only cause fragility of the supply chain, it was not only occurring within the car industry, but also for many other sectors such as healthcare. This led to less efficiencies deriving from the global value chains and that resulted in multiple companies wanting to reshore international operations in order to gain security (Ryan, P. et al., 2022).

Efficiency is a main consideration when determining the development of MNE's activities and this has led to especially Asian countries acting as primary locations for manufacturing and therefore the MNE's are dependent on the supply from these countries (Ryan, P. et al., 2022). After the pandemic this has resulted in increased focus on this subject and how it can be solved, which is what has led to the discussion regarding resilience. It has been interpreted as an opposing factor to achieving growth, but nevertheless has resulted in practitioners and scholars focusing on this very subject and its importance moving forward (Ryan, P. et al., 2022). These two parameters can be seen as an aspect that could require equilibrium, but whether or not this balance would result in sacrificing a part of the opposing part is not definitive (Golgeci, I. et al., 2020).

2. Problem formulation

Lean management theory has been an inspiration to the efficiency dominating the strategies of global value chains, which has led to increased profits and a decreased or non-existing

focus on security of supply. Multiple value chains are fragile towards exogenous shocks, which results in the efficiency strategies having the reverse effect when these occur.

Covid-19 has caused several disturbances alongside the value chains, which has led to companies not being able to supply their customers' demand. The overall goal for the majority of the large multinational corporations is to expand and increase their bottom line, but events such as the Covid-19 pandemic prevents this from happening. Should the companies just accept that these events will cause a temporary loss or will it be more appealing for companies to make their strategy more resilient at the cost of profit during passive times?

The information and research on this topic is scattered, which makes it hard for companies to adapt into a more resilient strategy going forward. Scholars within this subject field also frequently prescribe their own perception of the term by editing or adding related words, which enhances the effect of the fragmentation. Furthermore, there are multiple independent and inconsistent descriptions of the concept. For this reason, organizational resilience has been criticized for having a vague and lacking in definitions (Hillmann, J. & Geunther, E., 2021), which is one of fundamental thoughts behind why this literature review is being conducted.

2.1 Research Question

Problem definition: How can MNE's become more resilient?
Research question 1: What is organizational resilience?
Research question 2: What are the drivers of resilience?
Research question 3: Which drivers should companies implement, and which ones require further research?

The overall goal of this study is to answer the problem definition, which requires in-depth knowledge of the term resilience, what drives it, and which has the most current evidential weight in improving the MNE's level of resilience.

2.2 Justification

94 % of all Fortune top 1000 companies have had disturbances with their supply chain during the pandemic, whereas 75 % of them have had negative or severely negative impacts on their

business (McKinsey, 2021). This has led to 55 % of the companies having implemented a downgrade on their growth plans. To put the Fortune list into perspective the top 500 accounts for an estimate of 1/3 of the world's gross product. Both statistics show that they've been growing steadily in the past, but the curve turned negative due to Covid-19 (McKinsey, 2021).

The events have occurred multiple times during the past 100 years, which ranges between everything from the great stock market crash of 1929, Suez crisis, international debt crisis to the great recession in 2008(Srinivas, n. d.). The number of economic events that have caused damage to the world economy is long and we are currently still battling the Covid-19 pandemic and the Russian-Ukrainian war is continuously on the uprise (White, O. et al, 2022). These rapid shifts have happened all across the globe multiple times and are happening continuously, which speaks into the nature of it will continue to happen. This is relevant for our study in terms of prescribing the actual effect of these and furthermore that all the companies that survive will still be vulnerable to another shift.

By collecting important findings from the fragmented current knowledge regarding this topic, it will create an easier way for companies and scholars to understand the dynamics of the elements connected with this issue. This will result in an easier process of determining whether a company should introduce resilient elements within their strategy and furthermore, how it will affect the company.

3. Conceptualization of resilience

Resilience has throughout time been defined in several ways and likewise in several different contexts and it is being defined by the Oxford Dictionary as either ‘’the ability of people or things to recover quickly after something unpleasant, such as shock, injury’’ or ‘’the ability of a substance to return to its original shape after it has been bent, stretched or pressed’’(Oxford, n.d.). The term has its origins from scientific research fields within biology and psychology, whereas this section seeks to create a fundamental background of the term by defining the term based on different standpoints, however all definitions include the idea that someone or something overcomes stress or adversity or likewise any resistance towards environmental risks (Masten, 2001; Rutter, 2006).

3.1 Psychological resilience

The context of psychological resilience and with the individual as a focus point, Rutter underlines the interactive component of resilience and debates the combination of experience with risk and relatively positive psychological outcome, in spite of those risk experiences (Rutter, 2006). An individual is not only deemed resilient due to positive outcomes across areas of functioning, but it has also been argued that a consistent positive development should not be expected when individuals are exposed to stress or adversity (Luthar, Cicchetti, & Becker, 2000). To understand the specific effects of resilience and which outcomes it has on an individual level the process should be investigating the specific environmental stressor. Understanding which specific stressor is causing distress and if there is evidence towards if a stressor is actually playing a role, is important when measuring the outcomes.

The interactive component which (Rutter, 2006) used in the description of resilience is likewise crucial to identify for the understanding of how resilience functions. A statistical interaction cannot always be analyzed, for it to be possible a statistical interaction must consist of variation within the environmental exposure and the outcome measured.

Looking into the meaning of an interactive component in relation to the definition of resilience, helps to understand how resilience as a factor is not a simple quality which can be measured precisely. When looking into the events which cause stress or adversity an insight on how these are associated with different compositions of consequences can help to understand that some individuals can be resilient to specific environmental stress situations while others are not. It is likewise in this context important to consider the outcomes with a life course approach when analyzing resilience since individuals may develop resilience towards an event at some point in their lives, while others may not. It is therefore crucial to consider resilience as a dynamic process instead of an individual characteristic (Luthar et al., 2000).

The process of measuring resilience is vital for studies and requires an accurate measurement within the environment. The core concepts of resilience states; not all individuals are affected by risk experience in the same sense, while some are exposed others can remain resilient. The most important part of measuring resilience requires the exposed risk to remain the same. Without these a situation of risk could not be measured due to less risk exposed in terms of difficulty or the duration of risk.

3.2 Biological resilience

Within the scientific area of biology the term is being examined by defining the phenomenon as either ecological resilience or robustness, whereas the ability of such can be defined as ‘’the ability of an ecosystem to maintain its normal patterns of nutrient cycling and biomass production after being subjected to damage caused by an ecological disturbance’’ (Levin, 2015). Furthermore, the two words prescribing the phenomenon can act interchangeably when examining the ability of continuing regular patterns after recovering from any kind of disturbance (Levin, 2015).

Resilience within ecosystems has had a significant role within natural history and was defined in the book ‘On the Origin of Species (1859)’ by Charles Darwin as an ‘’entangled bank’’, which relates to the mutuality between species. Since the publication of this work the concept has held a significant level of importance within conservation and management of the environment, but the significance has also been recognized within the nature and health of human beings and societies. The importance of resilience and hereby the ability for an ecosystem to overcome disturbances and continue to thrive endangers the benefits the human species derive from those. These disturbances can be caused either by natural events as earthquakes, but also from human induced events as pollution, which could lead to an ecosystem being unable to recover and the effect of this would result in loss of clean water or food variants (Levin, 2015).

Sustainability within evolutionary- and ecological developmental biology can be split into two different segments, which is individual species and local ecosystems. The relation and study of both these at the same time is vital in order to understand the level of adaptability within resilience and sustainability (Levin, 2015). This can be exemplified by examining the evolution of Biston Betularia, which was endangered by bird predation, but due to industrial soot it darkened its wings completely. Insects have also been reportedly absorbing pesticides to grow, which initially killed them (Levin, 2015).

3.3 Organizational resilience

The term organizational resilience has also been described as an umbrella, a divergent construct of themes, which can be derived by the statement of Hirsch and Leving: “a broad concept or idea used loosely to encompass and account for a set of diverse phenomena’’ (Hirsch & Levin 1999). In 1988 an early introduction to a resilient alike theory was proposed,

which is the enactment perspective, it introduced and revolves around crisis prevention and management. The perspective characterizes crisis as a phenomenon that occurs rarely, but the consequences of these events are threatening the vital parts and goals of companies. The basis of the concept is focusing on the process, product and the enacted environment within an organization (Hirsch & Levin 1999). Enactment in itself it used to preserve the focus on when individuals act; it creates structures and sets events into motion. This also leads to constraints and opportunities within an organization that was not existing before people acted. Furthermore, this perspective has the assumption that errors and crises are variabilities derived from humans, which means it can be reduced, but the threat of those cannot be completely extinguished. The approach is proactive and seeks to reduce the threat by activities as prevention and preparation, but nevertheless also includes coping with the actual crisis as it will occur occasionally (Hirsch & Levin 1999).

Resilience can also be defined as an element that is occurring instead of anticipatory when a company operates closer to their safety barriers. Furthermore, it is used to overcome problems and limitations that are unexpected, which is done by intervention after the event instead of preparation. When a problem has been identified by a company then there will be sought for new approaches to handle the issue (Hirsch & Levin 1999).

The article “Developing a capacity for organizational resilience’’ has combined the views of previous research regarding the definition and has come forth with two different explanations of the term (Lengnick-Hall, C. A. et al., 2011). The first one is equal to the biologically approach, which is regaining the original characteristics after an experience that made an entity deviate from those. The second one defines organizational resilience as being a positive capability for a firm and it is based on whether or not a company is able to profit on unexpected challenges. The distinction between these is that the second one does not accept resilience as simply returning to the original characteristics, but more in terms of actually gaining for experiencing unexpected challenges (Lengnick-Hall, C. A. et al., 2011). Despite of the article stating these views, the authors has determined the following quote to be their perception of the term: “Organizational resilience is defined here as a firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities to capitalize on disruptive surprises that potentially threaten organization survival”, which correlates with the second view. Furthermore, the authors mentioned that resilience from a psychological starting point, which focuses on the individual

level provides a starting point for understanding it on an organizational level as this is based on interactions between individuals (Lengnick-Hall, C. A. et al., 2011).

Organizational resilience is a construct, which often is associated with including three different elements such as adaption, agility and flexibility that define the rate and degree of resilience within a company.
1) Adaptability can be defined as the skill a company possesses to reconnect with its environment.
2) Agility is the capability of a company to develop and within a short timespan to implement strategic change that generates dynamic competitiveness.
3) Flexibility consists of the degree a company can change based on time and cost of doing so (Lengnick-Hall, C. A. et al., 2011).

Duchek (2019) has an opposing view, as he states that agility and flexibility is highly useful, but more on a daily basis, whereas the crisis requires resilience. He defines the concept of resilience as meta-capabilities, which can be divided into three stages and those are anticipation, coping, and adaptation, which is derived from the theory of Dynamic Capabilities by (Teece, 2007). The aim of resilience according to Duchek is to enable the firm to adequately react to exogenous shocks and capitalize on these occurring events that may cause a threat to the survival of the organization (Duchek, 2019).

Lengnick-Hall and Beck has examined the development and capacity of resilience within a company and developing a resilient organization derives from the internal process and practice based on the capabilities of the firm (Lengnick-Hall, C. A. et al., 2011). The context of these factors is also relating to the organization's orientation and hereby creating a foundation for diversifying and integrating adjustably. The capacity of resilience is emerging from behavior, context and cognitive capabilities on the level of the organization. The knowledge and abilities of the individuals within the company are hereby integrated through the management system of human resource (Lengnick-Hall, C. A. et al., 2011).

The creation of resilience within the cognitive element can be enhanced by the company if it has positive core values that include and relate to the individual with identity and purpose. Furthermore, this conceptual orientation of the firm can also aid the cognitive element if it also includes a vision and careful language usage (Lengnick-Hall, C. A. et al., 2011).
By creating a setting within the firm that has focus on flexibility and allows the employees to

problem solve rather than threat rigidity will create constructive sensemaking and the attitude towards this from the employees is vital when dealing with crises. The feeling of flexibility among the employees during uncertainty will inspire opportunism and thereby allowing and enabling their creativity and skills to problem solve (Lengnick-Hall, C. A. et al., 2011).

Resilience can be divided into three aspects of conceptualization, which are those that view it as an outcome, process or the capabilities. It is afterwards applied to the exact goals of the research, which has created the need for a predominant overview and structure of the term and how to apply it monotonously (Mafabi et. al., 2012).

The collection of the fragmented literature will be used to create exact definitions and approaches to resilience that can be used for scholars in future work to easilier research specific areas within this subject field, whereas potential areas will be elaborated and highlighted at the end of this paper. The problem definition includes what potential information corporations need to consider and hereby even application of these findings, whereas these will be examined in the discussion to debate the different viewpoints in order to create easy understanding and implementable standpoints for how companies could act going forward in terms of becoming more resilient. A sorted list of definitions alongside advice will be relevant for companies who have experienced fragility alongside their global value chain or expect to do so within the foreseeable future. An important element that will be included is to examine whether or not resilience and efficiency are two opposing factors, as that is a predominant standard train of thought towards the subject, which will make it necessary to either confirm or deny in terms of how corporations would view and consider the list of advice.

3.4 Choice of definition

The preliminary sections have provided numerous definitions and approaches to understanding resilience as a term and what affects it. This study will proceed with defining resilience as the ability to endure uncertainty and disruptive events, but also to anticipate and recover from them. Enduring can be conceptualized as the firm’s level of robustness and preparation, which makes it a prerequisite for achieving resilience. Robustness and preparation are prerequisites for achieving resilience, it is relevant to include as the drivers or elements creating robustness a part of resilience but will on its own not define a resilient organization. Recovering can be defined as the firm's ability to regain stability and hereby

continue business as usual before the disruption occurred. This aspect is being leveraged by multiple characteristics, which is adaptation, agility and flexibility.

4. Literature Review

The aim of this literature review is to create an overview of previous literature on this subject through a systematic design in order to derive evidence-based suggestions for how companies can improve their organizational resilience. The prior knowledge on organizational resilience will be collected and used to generate a foundation of understanding regarding how MNCs can increase the resilience of their global value chains.

This review will focus on creating transparency, which will include how the empirical gatherings have been identified and debate the relevancy and validity of these articles. This is done to allow the reader to subjectively assess the applied qualitative and quantitative data in order to make their own conclusions regarding the subject based on the empirical gatherings. The quantitative results and the qualitative gatherings will be divided into segments based on the value chain in the findings section to create an overview of the data and the process of examining it. The literature review will be conducted based on the approach of Hannah Snyder (Snyder et al., 2016) which divides the process into four phases: design, conduct, analysis and structuring, and writing the review, whereas the last phase poses as an internal checklist after the review has been conducted. She has written her guide on how to perform a literature review based on prior knowledge within different areas and includes how they can be applied to business research. These will be explained and elaborated based on how this study has progressed in the sections below. The analysis and synthesis section has also been influenced by Rob Briner and David Denyer's guide to systematic reviews (Briner & Denyer, 2012).

The majority of the empirical gatherings applied in this study is qualitative, which does possess some disagreements among scholars in this field. Research within a qualitative review is being perceived by several as "constraining exercise rather than a guiding one'' (Ramalho, et. al., 2015), which also expresses disagreement when it comes to determining the purpose of a literature review within this area (Gay, et al., 2006), but there does however

exist consensus regarding that there will be preliminary reading, which will be revisited to interpret and discuss additional findings (Hallberg, 2010; Ramalho et al., 2015).

4.1 Systematic literature review

The systematic reviews were primarily developed within the medical field, to combine research discoveries in a systematic, transparent, and reproducible approach and has been mentioned as the benchmark among reviews (Davis et al., 2014). Regardless of the advantages connected to this type of review,the usage of systematic literature reviews within a business context is a new method of conducting knowledge (Snyder et al., 2016).

The systematic review can be identified as the method of research connected to the process of identifying and critically appraising research. Likewise, the collecting and analyzing of data within the research (Liberati et al., 2009). The purpose of utilizing the systematic review is to classify all empirical evidence which fits within the given inclusion criteria to hereby answer a specific research question. Through the usage of explicit and systematic methods while reviewing evidence the focus is on minimizing bias with the purpose of delivering reliable findings to furthermore provide conclusions and thereby creating decisions (Moher et al., 2009).

Efforts has been made to adapt the systematic review into a business-related context, challenges continues to erupt within the assessment of research quality, this has led to the solutions of qualitative approaches with the purpose of assessing quality and strength of findings within studies and further to compare these (Greenhalgh et al., 2004). This solution can be identified as the qualitative systematic review, which has the purpose of comparing findings within qualitative studies (Grant & Booth, 2009). The qualitative systematic review can be classified as a strict review process of collecting articles with a qualitative method of assessment.

Within these types of systematic reviews, both contribute to the understanding of whether a subject is affected constantly across studies and further creates knowledge which can lead to the understanding of what future studies must require. Furthermore, the reviews can discover if characteristics of a sample influences the subject. An example could be if a study

conducted in one cultural context has another answer in other cultural contexts (Davis et al., 2014).

4.1.1 Phase 1: Design

The literature review has the purpose of reviewing and synthesizing the concepts within resilience regarding global value chains and/or multinational corporations. There has hereby been conducted a search strategy for the identification of research regarding the above mentioned. For the found research to be qualified for the first inclusion, a set of criteria has been stated, with the intention of collecting all relevant data regarding resilient concepts within global value chains and/or within multinational corporations. Due to the fragmentation of the theory within resilience, the result after the general search terms is very high, this search has been done to establish a database withholding all relevant data. Within the search terms * (stars) has been used to expand the search further. An example is "resilien*", by using the star at the end of the word, we obtain several different words and those include "resilien". This could be resilient, resilience or resiliency.

We have used " (quotes) to combine words, to eliminate the search of every individual word in that sentence. An example is: "Global Value Chain". To eliminate the search of Global and Value and Chain.

The search terms include:

(1) A Focus on Resilience and synonyms (Robustness, Anti-fragile, resilien*)

(2) A focus on MNCs, multinational*

(3) A focus on "Global Value Chain", "Global Supply Chain*", "International Supply Chain"

(4) Search only includes articles

(5) Search is limited to the subject area of business, management and accounting

(6) Search is limited to English written articles only

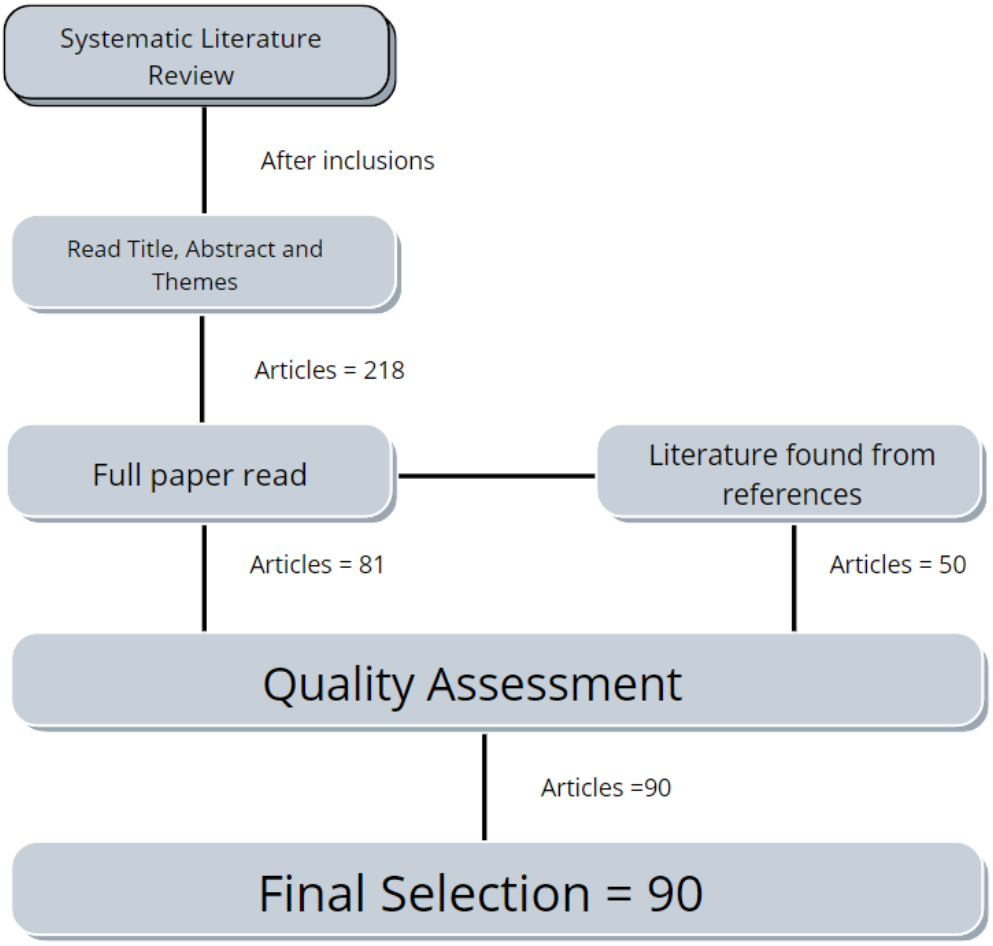
After inclusion of criteria: 218 Results (Searched 25-05-2022)

(Figure 1 - Search results after inclusions of criteria)

The inclusion of the search strategy was conducted to merge (1), (2) and (3) together, creating a search which would identify research of resilience, or its synonyms connected to either MNCs, multinationals* or Global Value Chain, Global Supply Chain, or International Supply Chain.

To increase the knowledge and information derived from the literature review there can be applied additional methods to acquire literature. The subject has been previously described as being fragmented, which means that the search-string will most likely contain several flaws and not gather all the literature on the subject. In addition to searching on the Scopus, this study has reviewed the reference list of the literature in order to expand the collection of knowledge upon resilience and related terms describing the same phenomenon (Snyder et al., 2016).

The aim of this study is to generate a foundation of knowledge regarding the topic, which will be done by selecting a number of relevant articles based on quality assessment, which will reduce the overall quantity of empirical gatherings. This will be done as the goal of this study is not to summarize every published article and study, but more in terms of the applied articles in this review will be selected as a means to define the overall approaches and conceptualizations of resilience.



(Figure 2 - Illustration of literature structure and assessments

Within the literature review there has been excluded articles, which is based on the subjects deviating from the chosen subject field. The reason behind this has been that a significant number of articles has met the inclusion criteria since it contained robustness checks but was not related to the inclusion criteria. Furthermore, there has also often been referred to the concept of performing a robustness check on data gathered. The article has also been revolving around defining the effects of Covid-19, non-multinational enterprises and resilience literature related to non-business scientific areas such as psychology and biology.

The found literature within the search scope will be categorized within a contingency table, which illustrates the following:

Title	Author	RQ/Aim/ Purpose	Concept -ualization	Method	Data/ Contex	Findings	Further research	Themes

			/ Theory		t		suggestion s	

The categorization within the contingency table assists in the identification of the chosen literature and ensures attention towards research questions, literature research questions, aims or purposes, the methods and data used to conclude findings. These categorizations have the function of creating overview of the literature and furthermore creating structures of literature findings and themes.
After the final selection of literature was acquired 90 articles were found within the database and within the references of relevant literature. The complete tables of both literature and reference sources can be found in the Appendix one.

4.1.2 Phase 2: Conduct

To define the quality of the search process within a literature review it is important to understand the term, quality. Palmatier et al. (2018) suggest that for a literature review to reach a status of quality it must have both depth and rigor, which is essential for the review to demonstrate applicable strategy in the selection of articles, data, insights for the purpose of contributing to knowledge beyond a recitation of formerly conducted research. Furthermore, a quality literature review must be replicable, the method used must be defined so an external reader has the possibility to replicate the works and discover similar findings. Finally, the literature review must be useful in the sense of being valuable for future scholars and practitioners to use.

The search terms and criteria have been adjusted several times in order to gain an optimized main review and final sample. This has been done by using other forms of the applied terms and furthermore enlisted them in different orders to see the change in the number of search results. The selection of articles has been done by performing a search protocol, which has been executed by both authors of this study in order to increase the level of quality and reliability of the review. The review has been conducted in stages, whereas the first process has been performed by reading the abstracts in order to ensure the significance of the articles, which afterwards led to narrowing down the total amount of searches and then reading the complete articles and determining the ones to be included within the final sample. Due to the fragmentation, references from within articles of the initial final sample has been added to

review, due to the broadened knowledge regarding the subject, which is the aim of conducting the literature review. Furthermore, the complete read-through of the narrowed down articles has been done not only to gain the complete amount of information within the document, but also to ensure that the standards of the inclusion criteria are met.

4.1.3 Phase 3: Analysis and synthesis

The problem definition is as mentioned previously divided into three research questions, whereas the first one is relating to the definition of the term resilience and the second in identifying the drivers, which leads to the third part regarding implementable suggestions. For the review to properly fulfill the purpose it will firstly contain a variety of different aspects on the term resilience, which will be showcased in the conceptualization section. To conduct and successfully answer that part of the question there is needed several definitions of the term resilience and the context of appliance. The context is relevant since the term has roots in biology and psychology as well, which only will be important in terms of understanding the exact definition and will be excluded when conducting the review that answers the other parts of the question relating to corporation advice and implementation.

To fulfill the purpose of delivering relevant suggestions to companies or a relevant foundation for scholars for further research the empirical gatherings will need to contain information regarding implementation of resilience and the outcome of it, which also relates to the exclusion criteria. The analysis of the review will be conducted by dividing the sections based on the categorization of the themes within the literature, which is closely related to Porter's value chain and this will be the headlines applied in the findings section to create an overview of the drivers.

The drivers located in this study will be weighed based on the evidence and mentioned in their respective section within the findings. There are numerous metrics to measure the weight of evidence, but since one of the research questions of this study is to decide which drivers that can be implemented and which ones that requires further research, then the driver must include various research methods as literature review, case, cross-sectional, experimental, or longitudinal studies. There are several implications for this approach, as the suggested drivers may be discarding relevant drivers purely based on a theoretical background. Furthermore, the theoretical background and observations are not constant and differentiate from research to research, which means that a single case study does not have

the same level of evidence as a study based on 100 companies. This approach and perception of weighing the evidence also create the basis for a discussion and can be perceived and applied differently by readers. Furthermore, this study has its focus on MNE's in general, which eliminates the possibility of ranking the implementable strategies as corporations will have different use of the mentioned guidelines and some will pose relevance for only a selected number of firms.

The empirical gatherings will be examined by a narrative synthesis, which also is the most common way of handling qualitative reviews (Hammersley, 2001). The criticism of this approach is based on authors being able to subjectively prioritize some findings above others, which could result in reduced reliability as two reviewers using the same method could end up with the different results (Rumrill & Fitzgerald, 2001).

We agreed upon a relevant and monotonous way of determining the relevance of the articles, which is being done by enlisting all the empirical gatherings within a document based on the title, author, research question, primary keyword, keywords, context, concept/theories, findings and further research. The categories are based upon the implications that can be involved when there are multiple reviewers, which is furthermore enhanced when the empirical gatherings are mainly based on qualitative and theoretical perspectives rather than undiscussable quantitative data (Snyder et al., 2016)

4.2 Theory

This section will be used to go in-depth with some theories mentioned multiple times throughout the literature that require additional information to become applicable in this research. Increasing the fundamental knowledge of the theories is also used to understand the effect and areas the theories can be used to examine a business-related problem.

The definition choice of resilience was based on multiple understandings of the term, but throughout the literature review there have been several ways to handle, generate or measure resilience. For scholars and organizations to apply resilience it requires an understanding of how the term is structured in phases and not just the exact definition. Dynamic Capabilities, Resilience Cycle, Supply Chain Risk Management and The Four Dimensions of Resilience have three to five stages, whereas an combined understanding of the elements and their recognition in the literature review will weigh towards what will be applied in the rest of the discussion. The relevance of interpreting the difference between them is not based on adding

additional layers to the most applied theory, but more in terms of highlighting potential areas that need further investigation, since they have not been included in the findings.

4.2.1 Dynamic Capabilities Theory

The dynamic capability's view has the ability to analyze how organizations manage resources and how the deployment of capabilities functions towards responding to supply chain disruptions or risks. Within the dynamic capability view organizations strive in the development of capabilities of sensing, seizing and reconfiguration with the purpose of maintaining competitive advantage (Teece, 2007). This competitive advantage will be created throughout the creation, deployment, and protection of the intangible assets of the firm. David Teece released his theory of Dynamic Capabilities in the 90's but did in 2007 publish a new version with more in depth details of specific parameters (Teece, 2007). In the 90's the standpoint of major companies like IBM and Phillips was to accumulate technology assets that held a significant degree of value, which then also included a high focus on intellectual property. This strategy has its origin from the resource-based view, but that theory was improved due to it did not grant a company a sustaining competitive advantage. The dynamic capability theory has been suggested as a superior management theory over other theories such as the resource-based view, due to how the dynamic capabilities concerns solutions for dynamic environments (Teece, 2007), which is a constant under times of disruptions (Raj, A. et al., 2022). The trends of the companies with the most success did also include aspects such as timely adaptation, which can be defined as being able to respond quickly with innovation and hereby utilizing the innovative capabilities of the firm. This way of thinking creates a strategy focusing on dynamic capabilities within the firm, which focus misaligns with the primary strategies beforehand.

The definition of this theory can be divided into two parts, whereas dynamic will allow a company to act accordingly to the environment and hereby create and execute response timely. This is relevant due to the speed of innovation is growing continuously, which leads to markets being less predictable and likewise with the competition. Secondly, capabilities can be defined as ''the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competencies toward changing environment'' (Teece, 2007).

The Dynamic Capabilities framework is built upon a resource-based perspective, which can be defined as an aspect that focuses on utilizing assets within the firm. Other frameworks or models are primarily based on competitive forces or game theory, which relates to a focus on entry, position and interaction between competitors (Teece, 2007).

To utilize dynamic capabilities, it is necessary to create a clear distinction between inside the organization and the market organization. The internal part of a corporation displaces the market, which is due to the possibility of applying different types of activity. This might be transaction cost related, but in general to avoid high powered market incentives as this may cause destruction alongside the internal activities such as learning (Teece, 2007). The focus is instead of incentives with low power, which can be defined as rewards that are yielded at a group level and not personal. This will lead to unique organizational skills, which will be hard to replicate, and it refers to the company reviewing the employees and capabilities as an organizational structure that supports productivity through management processes instead of only determining and understanding the capabilities as a balance sheet (Teece, 2007).

Teece suggests three criteria for enabling the dynamic capabilities of the firm, which is sensing, seizing and reconfiguring (Teece, 2007). Sensing can be defined as the ability of the organization to identify change within their environments, which can be related to new opportunities, but also potential risks. This includes corporations continuously scanning and exploring local and global markets for emerging technology or knowledge. Once a change has been observed, seizing the opportunity is the next step for the firm, which can be done by either introducing a new product or service, but also adapting one or multiple processes to the new landscape. Reconfiguration can be defined as the process of maintaining the corporation on the path of evolving, which enables the firm to handle their resources and thereby creating stability. This will allow the firm to continuously sense and seize opportunities (Teece, 2007).

he relationship between dynamic and resilient capabilities has been interpreted by Chowdhury and Sensing can be seen as a readiness capability within supply chain resilience, studies shows that the capability of readiness is used as a sensing capability due to how readiness is seen as the capability solutions such as: skilled workers, fast coordination, and excess production capacities (Chowdhury & Quaddus, 2016).
Seizing can be identified as the capability of response. Elements with response capabilities in supply chain resilience can be seen in how resources are seized. The response capability has

been argued as a major dynamic capability for supply chains, enabling the ability to capture opportunities and dealing with threats and sustaining competitive advantage (Chowdhury & Quaddus, 2016). Reconfiguring can be seen as the capability of recovery, the recovery capability is deemed a critical function with the purpose of assisting systems in the creation of sustainability under disruption (Chowdhury, M. M. H. & Quaddus, M., 2017).

4.2.2 Resilience Cycle:

The Resilience Cycle is a process created by five stages and those are to prepare, prevent, protect, respond, and recover (Scharte et al., 2014). The aim of the theory is to prescribe a way of interpreting the act of implementing resilience within a company, which is not something definitive that should just be done once, but as a continuous process to be repeated. The first step is prepared, and this refers to the actions made before a disruptive event, which includes anticipating and identifying them through systems and protocols. The second stage is prevention and revolves around the process of taking actions that reduce or even remove any potential risks that could arise from an unforeseen event. Protecting means that operation systems must be ensured to be completely functional, which covers both the physical and online and this results in a reduction of the overall risk from the event. The response parameter refers to providing a fast and effective disaster relief system. The last factor of the cycle is recovery, which can be defined as the ability to bounce back and apply the knowledge obtained throughout the event to prepare for future shocks. The recovery rate and success of it can be determined by how the sales are currently compared to before the event (Scharte et al., 2014)

4.2.3 Supply Chain Risk Management

To successfully mitigate the risk within a corporation the following section will create an overview of the underlying factors affecting the parameter and the drivers that can be applied to enhance them within their boundaries of interconnectedness. To successfully cope with potential risk and increase the resilience of the firm there have been multiple findings, which includes different points of view towards how to reduce the threat of disruptions, but nevertheless they all include some of the same elements and the definition of the applied terms does as well point in the same direction.

The goal of applying supply chain risk management is to protect the corporation from exogenous shocks, which can be done through a four-phase system (Colicchia, C. et al.,

2019). The first phase emphasizes the importance of observance, which leads to identifying potential sources of risk, whereas the second is the risk assessment and it is split into two parts, whereas the first is based on the occurrence rate of potential events and expected loss the company will experience if it occurs. Calculating both these correlations is vital to making an in-depth assessment. The second aspect is to identify areas of damage if these different events occur, whereas the focus should be on those causing the most damage to the infrastructure and organization in general depending on what disruptive phenomenon that occurs.

In continuation to risk assessment, Strange proposes the acceptance strategy, which refers to the corporation relying on the existing environment of the company being able to absorb the uncertainty that can arise from an event, which means the company will simply absorb the outcome and continue business as usual without taking any precautions and this will be useful if either the occurrence rate or consequences is deemed very low (Strange, R., 2020).

The third stage is designing and selecting potential strategies that can be implemented to reduce the risk of the determined risk, whereas the fourth phase is regarding diagnosis methods to measure and be aware of risk indicators and handle them proactively (Colicchia, C. et al., 2019; Sáenz, M. J. et al. 2018). The actual achievement of resilience within a firm often heavily relies within the balance of risk within the supply chain and how prepared it is to uncertainty. The concept of balanced resilience (Gualandris, J. & Kalchschmidt, M., 2015) is visible through the determination of risks within the corporation compared to the actual investments performed by the company to mitigate potential disruptions.

The four stages are primarily an internal setup, which needs to be supported by adjusting to the optimal levels of centralization when it comes to executing the decisions involved, but there is however, also a requires for coordination with the members alongside the global value chain as these will pose a vital source to managing the risk and increasing the level of resilience. The coordination includes pro- and reactive measurements to achieve the desired level of resilience, where the proactive part can be defined as the company's level of agility and reactively as the degree of robustness within the firm (Colicchia, C. et al., 2019).

Cohen and Kouvelis (Cohen, M. A. & Kouvelis, P., 2021) has a slightly more simplified approach to risk management, which contains three different levels. The first step is risk avoidance and the aim of this is to shift the strategic response from make-to-stock to make-

to-order and thereby lowering the lead time of production. The second stage is risk reduction, which is in correlation with the SCRM stage 4 (Colicchia, C. et al., 2019) regarding diagnosis, but it also emphasizes delaying product differentiation to be responsive to the order that has been placed, which increases the lead time significantly and is referred to as a postponement strategy (Cohen, M. A. & Kouvelis, P., 2021). The last step of risk management in this aspect is risk hedging, which will be elaborated in the sourcing section, however, it does briefly emphasize upon hedging capacity and inventory, but it also includes the approach of including operational flexibility, which includes choosing additional supply routes at increased cost (Cohen, M. A. & Kouvelis, P., 2021).

Generating resilience through risk management has also been conceptualized in four dimensions, whereas the first is resistance and can be defined as a firm's level of stamina to endure uncertainty, which by other scholars also is being defined as operations robustness (Golgeci, I. et al., 2020). Secondly, recovery is the speed of restoring and regaining stability and thirdly, reorientation refers to the ability of adapting a new alignment of strategic changes going forward. The last dimension is renewal and includes integrating innovation and flexible capabilities to leverage and grow from adversities, instead of merely just surviving and recovering to the original state of the firm (Golgeci, I. et al., 2020).

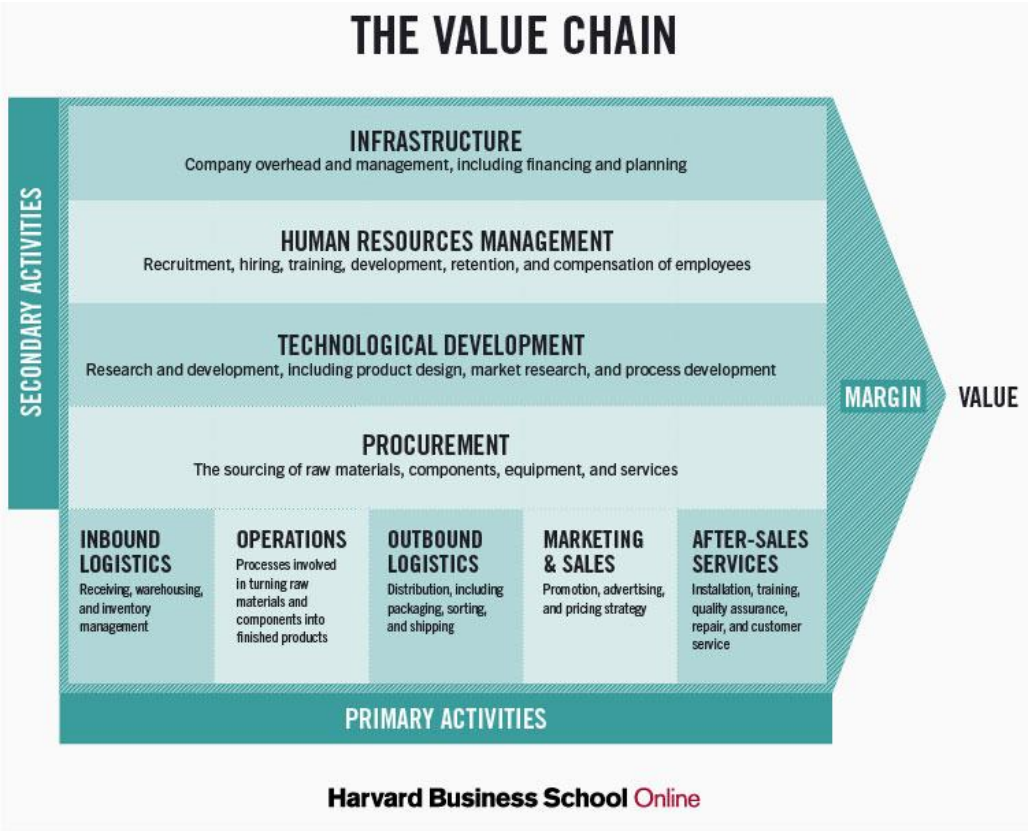
4.2.4 Stages of resilience

The point of reference for resilience within the literature review is Dynamic Capabilities as multiple authors perceive resilience as a capability and refer directly to Teece or The Resource-Based View. The other theories have primarily similarities with Dynamic Capabilities, but they do spread some of these stages into multiple, since the term capability is broad and hereby referring to multiple factors and actions within a firm, which is based on Dynamic Capabilities is not solely focusing on threats, but also opportunities.

A potential area to investigate and include is the difference between Dynamic Capabilities and SCRM, as the last mentioned has focus on occurrence rate, chance and cost of the risk, which could be defined as an knowledge or managerial resource of the firm, but it has not been applied throughout the examined literature and including a cost benefit analysis of potential disruptions will enhance the effect of prioritizing the most damaging disruptive events and becoming resilience towards them first.

4.2.5 Global Value Chain Theory

The value chain is described as the chain of activities within the creation of a product or service. From the gathering of materials to the delivery onto markets and every activity between them. The value chain can be divided into the five primary activities of: inbound operations, operations, outbound logistics, market and sales, and service. Furthermore four secondary activities supporting the value chain are: Firm infrastructure, human resource management, technology development and procurement.
The purpose of the value chain is to identify activities and evaluate the efficiency connected to these activities (Porter, 1985).



(Figure 4 - The Value Chain, Harvard Business School Online, *Business Insights*, 2020)

The primary activities of the value chain regarding the inbound logistics are related to the processes of receiving, storing and distributing of internal inputs, and furthermore connected to the operations, which revolves around the activities of transforming the inputs into outputs. An example could be the raw materials inputs being produced into goods. In addition to the acquiring and production of goods, the outbound logistics concerns the delivery of products or services towards the end-user, such as storage and distribution systems. Furthermore, these

products have to be marketed and sold, which is enabled by the processes of acquiring customers, communication and value propositions (Porter, 1985).

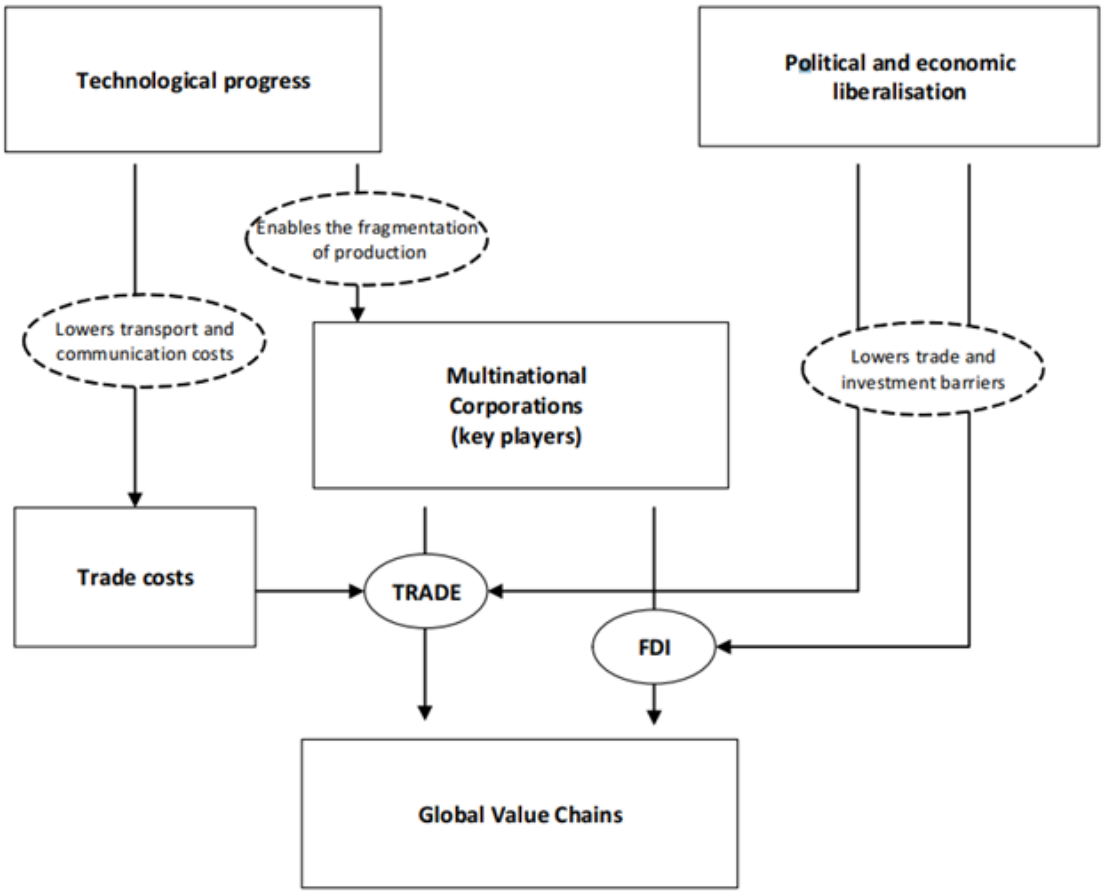
Within the supportive activities, the element of procurement or purchasing is the activity of vendor finding and negotiation of prices. In addition, the human resource management revolves around the ability of how competently the company recruits, hires, trains and motivates workers. The important factor of human resources is the valuation of human capital, the people involved in the organizations are valuable and can create advantages in great human resource operations. Another important element is technological development, which relates to the management and processing of information, furthermore the technological developments assist the protection of knowledge within the company. A great technological development ensures companies' sources of value creation. The last supportive activity is infrastructure, which revolves around the functions of daily operational management such as: accounting, administrative and general management, such activities are critical in creating business advantages (Porter, 1985).

Due to technological evolution, lean management and outsourcing, the value chains have developed into complex and intertwined global value chains. The concept of outsourcing is to move any part of the value chain to another country in order to optimize the process. This can either be in terms of upscaling the capacity or simply just to increase profits, which results in outsourcing primarily to the continent of Asia. This is relevant for our study to gain an elaborated insight of why the current value chains are so fragile and hereby not susceptible to rapid shifts. The rise of global value chains can be explained by the concept of market imperfection theories, whereas the foundation of the Transaction Cost Theories was developed by Buckley & Casson in 1976(7) and Hennart in 1982 (9). These theories define that companies internationalize in order to internalize the transaction costs of the firm. The MNE’s would then choose a market where they can perform their activities as cheaply as possible and the growth happens when they internalize this market, which they will continue to do until internalizing is no longer beneficial. The aim of the transaction theories is then to emphasize on factors at a corporate and industrial level instead of focusing solely on countries.

As discussed in the article by Hillberry (2011), it has been found difficult separating the drivers of international trade increase from the elements of which specifically impacts

fragmentation of production. The same rules apply for the growth of foreign direct investment (FDI) flows, which has shown to be influential for the development of GVCs within Multinational enterprises (MNE). However, it can be argued that declining transport, information and communication cost, increases within technology, lower political and economic barriers for trade and capital flows have been the main drivers of GVCs in newer times.

A schematic illustration by Amador & Cabral (2014) contributes to the understanding of how the main channels impact numerous factors behind the development of the Global Value Chain. Even though joint impacts exist, such as technological progress has an effect on trade cost, while trade cost likewise helps shape technological progress. The figure below highlights the primary effects, while other notable subjects such as within the classic structure of effects could help to understand the overall expansion of Global Value Chains, under such circumstances of how demand grows within sectors where an organization is pervasive. Such effects have been left out of the figure.



(Figure 5: Elements of Global value chains by Amador & Cabral, 2014)

Hillberry (2011) likewise underlines the ability of how air transport and integration in a world economy of new countries such as in Europe or Asia can have crucial importance as a source of growth within the international production fragmentation. Another important point for the understanding of GVC drivers is highlighted by the WRO (2008), two factors is considered crucial for the process: decline of international trade costs (this includes the reduction in tariff rates, lowered cost of transportation and communication costs and likewise the reduction of time essential to exchange goods) and secondly the lowering managerial costs of acting offshore (this includes the search, monitoring and coordinating cost of foreign activities), typically reflecting developments in telecommunications technology. The main drivers of Global Value Chains is furthermore mentioned in the framework by Baldwin (2013) contributing to the understanding of GVCs in a historical perspective, he further discusses factors which most likely affect a future evolution within the value chains, more specifically within the trade-off in between specialization gains and coordination costs.

4.2.6 Coping Theory

Companies are driven by a human factor, which within the literature of resilience supply chains, has been argued to be an important factor for developing resilience. A factor within this area is Coping theory, which was beforehand used in a psychological matter and has in recent times been adapted into an alternative solution towards supply chain management (SCM) functions (Halldorsson et al., 2015).

Coping theory is used to revise the knowledge of organization's supply chain disruption management (SCDM) (Altay, N. & Pal, R., (2022), with the purpose of developing an alternative frame of reference. Furthermore, the Coping theory is based on the cognitive processes of individuals, thereby directly linked to the members of the company and likewise how companies internally could cope with disruptions, which also includes enabling employees to work from their own home in case the event prevents them for being present at the current facility (Doytch, N. et al.,2021) .

(Nezih, A. & Raktim, P., 2022) draws parallels between coping and resilience in the psychological field, and further argues that evidence with psychological literature within coping, namely strategies focused on solving problems leads to resilience.

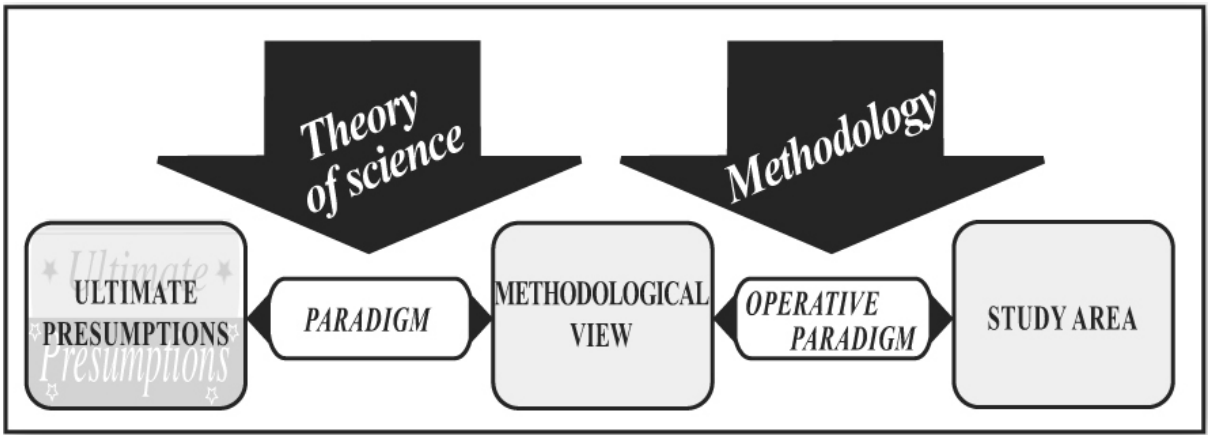
A strategy with a focus on solving problems under coping theory can be deployed with the usage of the resources and capabilities within the organization that has the possibility of assisting in responding adaptive to disruptions (Altay, N. & Pal, R., (2022). The solution presented under this strategy suggests problem-focused strategies within coping have the purpose of changing environmental conditions, which a disruption would cause, or try to mitigate the damage of a disruption which it has caused the organization (Nezih, A. & Raktim, P., 2022).

5. Methodology

Throughout time the number of different philosophies of science and subcategories of these has expanded significantly, whereas science in the beginning was based on the paradigm of positivism, which includes scientific areas as biology, astrology, and physics. This theory of science only accepts knowledge as what can be proven or is based on mathematics and logic. It neglects the idea of metaphysics being able to contribute to science and knowledge, which led to the creation of post-positivism and shortly described, the main difference is that it does include metaphysics (Arbnor & Bjerke, 2009).

The methodology of this paper has been written based on the book: ‘’Methodology for creating business knowledge’’ by Arbnor and Bjerke released in 2009 (Arbnor & Bjerke, 2009). The book revolves around the figure showcased down below, which aims to explain the collaboration between the elements and hereby how to become a creator of knowledge within business. The book is divided into three different views, which have their basis in the paradigms of positivism, critical realism and pragmatism (Arbnor & Bjerke, 2009).

The methodology of the thesis is shown in both the analysis and within the strategic solutions found clarified in the discussion. The following sections will explain what considerations have been made in relation to the method of the thesis. The foundation for understanding methodology within this thesis is built around the figure below.



(Figure 6 - Theory of Science and Methodology (Arbnor & Bjerke, 2009, p. 38)

The model consists of the following elements: Ultimate presumptions, paradigm, methodological view, operative paradigm, and study area. Theory of science and methodology, which are indicated as arrows are the two categories that help to illustrate the methodological choices made in the thesis are not random but chosen based on relevance to the thesis and the problem definition.

The paradigm will likewise have an impact on how the problem definition is answered in an analytical and debating context. The paradigm used in this thesis is Critical Realism, which is found appropriate in relation to the methodology, where there is a focus on the system theory approach.

5.1 Ultimate Presumptions

The first element of the above-mentioned figure is ultimate presumptions, these presumptions have a crucial impact on how the thesis is developed. The ultimate presumptions help to form the basis for how the individual members of the thesis should act when the problem definition is analyzed and discussed. Arbnor and Bjerke describe it as, that all individuals' perception of reality is unique and different (Arbnor & Bjerke, 2009). This has great significance for the thesis as several group members compared to a single group member will contribute with their own unique view of reality and thereby contribute with different opinions and ideas (Arbnor & Bjerke, 2009).

Based on the argument mentioned above, the ultimate presumptions help to form a frame of reference for the thesis and can have a significant impact on which topics and strategic

choices are made. The authors aim to find a common frame of references within the ultimate assumptions for the importance of the thesis development.

The ultimate presumption of system view is reality is built upon fact-based structures, which can be defined as systems. These structures are acknowledged as being based on objective reality, which exist with the awareness of subjective opinions, and this does combine to create reality. The conception of science within this view relies on examinations of structures that consist of viewing elements as different wholes and patterns, instead of parts of the system as an isolated individual, which leads to the idea that reality is not summative. The scientific ideal of this process is to locate these patterns and perceive them as objective structures and hereby create an improved picture compared to what has been done beforehand. The ethical dimension of this view includes being aware of the dependence between the systems being examined.

5.2 Paradigm

The word and concept of a paradigm has been tried and defined many times, therefore has the authors of the thesis chosen to use the methodology defined by Arbnor and Bjerke as their primary understanding of methodology. In the book "Methodology for Creating Business Knowledge" (Arbnor & Bjerke, 2009) Arbnor and Bjerke define a paradigm as being a set of general assumptions. A paradigm is further described as following: "A Paradigm is any set of general and ultimate ideas about the constitution of reality, the structure of science, scientific ideals and the like" (Arbnor & Bjerke, 2009). A paradigm will be defined on the basis of the above quote, as being a unique asset of patterns within a science that contributes to the perception of reality, the perception of science, ethics and scientific ideals. When a specific paradigm is chosen in the thesis, the purpose of the paradigm is to illustrate how the project group intends to generate knowledge about the chosen international business problem, based on the group members' individual assumptions and frames of reference.

Between the workings of Burrell & Morgan (1985) within the paradigms of functionalism, interpretivism, radical humanism and radical structuralism and the workings of (Guba, 1990): post-positivism, critical science, and constructivism, Arbnor and Bjerke argue the works of being "incomplete". Burrell & Morgan asserts their described paradigm as under influence by Marx, which contradicts the beliefs of Arbnor and Bjerke when addressing paradigms within a business context and likewise within its methodological views. Furthermore (Guba ,1990)

classified paradigms for qualitative research only which contradicts the beliefs of how Arbnor and Bjerke views the usage of quantitative research in business (Arbnor and Bjerke, 2009), which is why this thesis has been conducted based on critical realism instead of post-positivism.

The argument for choosing Critical Realism as a paradigm is due to an individual who appears to be a critical realist recognizes that all generated knowledge is socially constructed and historically conditioned and can never contribute a perfect representation of reality. The system within this study can be a corporation, which exists based on the knowledge that can be obtained regarding it, but also accepting that we do not possess all knowledge, which also in a business context means acknowledging that co-workers, management and other entities within the system is in contact, which increases the level of complexity and makes it hard to obtain the perfect amount of knowledge, which is why one of the system view and critical realisms ultimate presumption is accepting the subjective element. Furthermore, the collected and generated knowledge is determined to be changing, which means past data will be less likely to represent perfect information in current time.

The chosen paradigm is a specific direction within the theory of science, which was developed in the 1970s by the philosopher Roy Bhaskar (Bhaskar, 1975). What characterizes the paradigm is that Critical Realism is considered to be a discourse within science. The paradigm has fundamental limits, and on the basis of this, it is considered to be an open paradigm towards the perception of reality.

Furthermore, the paradigm also describes that the framework of society does not always seem definitive as a society is always changing. In this way the paradigm contributes to a realistic approach to the environment, such as the international business problem, which will be addressed in this thesis. This illustrates that critical realism, unlike other similar paradigms, does not believe that reality can be reflected directly in the empirical data. Empiricism and theory thus only help to uncover a part of reality, rather than covering the whole of reality (Darmer, P., 2010). The argument of why Critical Realism is chosen for this thesis is the critical approach to reality as well as the empirical collections.

5.3 Methodological View

The methodological view used to research this thesis is the system view, which foundation can be defined as an objective explaining approach, which includes the subjectively aspect

and its effect causing the conclusion to differentiate from the perfect truth. The view perceives all entities as systems, whereas these entities have relations to each other and can be part of an even larger system, which for example could be related to the employees of a firm and the firm itself. The creator of knowledge within the methodological then aims to examine regular relations through interactions or patterns. These relations can cause a significant impact to the findings of the research according to Arbnor & Bjerke (Arbnor and Bjerke, 2009).

This view has been chosen to examine the synergy between the individual aspects of the paper and likewise the relation between these within the subject field that is being examined to achieve a higher level of knowledge regarding the subject. This methodological approach often begins by exploring existing literature in order to generate a foundation of knowledge and to inspire interesting research issues, which as well can lead to inspiration in the use of the operative paradigm in terms of design. This has been applied in this study to generate an understanding of the term, which also has led to a section of conceptualization of the term due to inconsistent theoretical definitions and meanings. The conceptualization within this view is commonly examining intangible aspects of a business such as the relations made by organizational learning and interactions. The creator of knowledge within the systems view is convinced that any subject field only can be explained in the specific context (Arbnor and Bjerke, 2009). This is done by approaching the concept of resilience as the link that connects different systems. Resilience exists as an effect that alters the relation between at least two systems, which in context to our study could be between the MNC and one of their suppliers. The relation between these two is made up by all interactions and not just resilience, which makes studying these relations complex. Due to the level of complexity, the guidelines extracted from the finding and discussion section to answer the problem definition will be due to the nature of the systems and their relations be general guidelines and therefore not specific and directly implementable by every system.

5.4 Operative Paradigm / Methodology

The methodology is within the ontology, epistemology and method view, a tool being applied to define the frames and restraints that exist within the theory and empirical gatherings in the study. The definition of methodology is the techniques and methods being used to reach the desired knowledge within the project. In a study it is essential to illustrate what type of empirical gatherings has been used as it can have a significant impact on the reliability and

validity of the study. The two major parts of the operative paradigm are the methodic and the methodical procedure. The last mentioned is about how the process in this research is using qualitative and quantitative data, which is being examined in a way to make the most objective conclusion based on the problem definition, while still recognizing the elements of subjectivity existing (Arbnor and Bjerke, 2009). The qualitative and quantitative empirical gathered research will be secondary data obtained through Scopus. The outcome of this is to heighten the level of objectivity in the thesis, which is due to the amount of subjectivity being decreased, especially among peer-reviewed sources. Critical realism is within the system view, which means that even despite the data being objective it is not possible to be entirely objective due to the involvement of humans, which also will deem the findings in the conclusion not clearly objective, but awareness regarding that in terms of the results is the essence of it.

The methodic of this paper is in correlation with the procedure, as the findings section will be incorporating the articles located in the literature review, which then will be developed in relation to the problem definition in order to provide resilient guidelines. When applying this methodology to a research it does has some consequences, which is being highlighted in order for the reader to transparently being able to judge or readvise the conclusions. A system can be rather extensive, especially if the number of humans involved is sufficiently high, which it is in multinational corporations. To create a clear picture of the entire systems of these entities it would require a large number of interviews of each system the guidelines are being produced for. This is a very extensive process, which leads to these guidelines could be used for further research and hereby examined through the lens of a single or a selected number of entities. However, the picture of the system can be enhanced by reviewing as much literature as possible, which is being done in this study through the systematic literature review and hereby creating the foundation for future research. The consequence from this methodological approach also includes that the system view and critical realism in general perceives knowledge as historically determined, which means that in this case the system does not occur overnight and has appeared. Due to this perception of reality, it is necessary to determine and evaluate critical events that have happened throughout the history of the system. In correlation to this study, it is referring to the development of research within the subject field of resilience, which has been majorly increased after the pandemic, but also has importance in the exact definition of the term as it derived from other scientific research fields.

5.4.1 Ontology and epistemology

Bhaskar has created three foundational beliefs of critical realism: ontological realism, epistemological relativism, and judgmental rationality. Critical realism has a distinction between a transitive and intransitive dimension, which allows the paradigm to successfully sustain a structural separation between ontology and epistemology. Critical realism has a realist approach to ontology, which acknowledges a structured, changing and mind independent reality. The ontological question is often formulated as “What is reality?” (Darmer, et al., 2010), and occurs in this thesis in the context of the chosen paradigm, critical realism. When the project is analyzed and discussed with the paradigm, the ontology appears primarily objective. It does so precisely as the paradigm assumes that neither theory nor empiricism can uncover the world completely, but instead it is up to the individual group member. The group members conducted work is likewise done within a common frame of reference, as even though an individual will have a unique point of view, the ontology will be discussed in order to achieve a joint decision towards the end goal of the analyzes and discussions. The thesis aims to analyze and discuss as objectively as possible, but the group is aware that subjective context may occur when relevant knowledge is acquired.

Nevertheless, the approach towards epistemology as a critical realist is not entirely realistic. The paradigm recognizes knowledge is a product of a social construct without being independent of individuals which has produced it (Bhaskar, 1975). The epistemological relativism advocated by Bhaskar has a weakened, non-standard approach (Groff, 2004). And is simplified as the acknowledgement of how science cannot conclude a complete truth revolving the working of the world (Collier, A. et al., 1994). Critical realism in contrast to constructivism, is based on our knowledge can be seen as relative to factors of human subjectivity which can affect the construct of knowledge (Groff, 2004).

5.5 Study Area

Throughout this study a research field has been identified and described. This revolves around the rapid shifts the world is encountering and how the corporations can manage to adapt and hereby navigate through these periods, which derives the papers focus on resilience. Outsourcing and global value chains is a core part of major companies' strategy,

which makes them vulnerable to reacting and surviving in the time of crisis, which enables the choice of implementing resilience as a measure of handling the uncertainty.

The problem definition will be examined by firstly accounting for different perceptions and definitions of the term resilience and afterwards how the context of this term is in organizations. This will be used to create guidelines that companies can consider implementing in their strategy or provide the basis for future research to go more in depth with specific companies or further analyze the advice with the aim of enhancing the outcome for companies adopting them.

5.6 Validity and reliability

The validity and reliability are directly defined in this project by the systems approach. The systems approach uses secondary information, primary information from observations and interviews. Furthermore, the system questions the possibilities of discovering two such comparable circumstances and additionally begins to discuss these matters in a casual relation (Arbnor & Bjerke, 2009).

The systems approach regarding the problem of validity is conducted in a different manner than other approaches, due to the low degree of generality and absoluteness within the systems theory. The definitions within a project using the systems approach does not have to be consistent with present theory or have an operational function, due to the project's importance and relevance is connected to the creator of knowledge and furthermore other possible participants engaged in the creation of knowledge. In short, people involved have the opportunity to decide if measurements are correctly conducted and if the outcome is acceptable and accurate. Furthermore, experts may be asked in connection with judgment of measurement procedures and the outcome (Arbnor & Bjerke, 2009).

Within the systems approach procedures have been made for the purpose of reflecting upon findings and outcome. It is important to uncover the truth from as many possible angles. This can be to interview as many possible people on a subject or to discover evidence from as many articles within the search terms of a literature review. The validity control can be found within these procedures and how the effect of these can be seen within the measurements. On the other hand, the reliability within the systems approach is rarely used, the purpose within the systems view is what measurements can be used for and often not the ways measurements were conducted (Arbnor & Bjerke, 2009).

Although reliability is often seen as rare, for this project it has a major role for the construction of the Systematic literature review. The method of review requires transparency. The reliability of this project likewise illustrates whether the review can be reproduced. It is crucial there are foundations for the possibility of recreation, this can be found in the empirical gathering and sources. This form of reliability is closely connected to the validity, due to the credibility of sources is a necessity in order to recreate the research and the findings. In the literature review both objective and subjective sources have been used, this is visualized in the gathering of evidence within the review with both qualitative and quantitative sources.

There are likewise several phases within the literature review which ensures the credibility, validity, and reliability of the findings. The acquiring of articles within the literature review will be undergoing inclusions and exclusions with the purpose of establishing a database of possible evidence connected directly with the subject of the project.

6. Findings

The aim of the findings section is to create an overview of the findings from the literature review, which will be used to gain a better understanding of what areas that are primarily being affected, but also to weigh the individual drivers based on their evidence, which will be done by accepting the driver as implementable if it has both practical experience and theoretical background. This section will be as previously mentioned in the literature review be divided accordingly to keywords and topics mentioned in the articles, which will be segmented within the sections of the original value chain theory of Porter (Porter, 1985). The elements included in this section are intertwined even though they are split into different sections as companies can be seen as systems including sub-systems, which makes it impossible to entirely view one factor without accepting the existence and interference of the other components within the system of a corporation.

The section will at the beginning illustrate the findings within firms' infrastructure, which will be divided into several sections due to the amount of literature within this area. The literature also examines other supportive activities of the value chain as human resource and technology, but significantly less focus on the primary activities as logistics and operations. In addition to the original factors of the value chain there is also an external section regarding governmental support. An important aspect of examining the findings is the relevance based on the critical appraisal of the literature review, which refers to whether the driver is directly enhancing the level of resilience or merely just a prerequisite as improving the level of robustness and will be mentioned in the respective section of each driver. Each section will contain a brief overview at the top of each section and highlight the drivers, application, effect, context and source used to create the evidence for that driver; an elaboration of the data and context can be found in the appendix 2.Within the literature the scholars often describe the effect as being resilience, but due to our conceptualization it will be defined within the findings section as the part of resilience that contributes to the term, which is useful for firms when implementing strategies based on their risk profile and scholars in their future research to examine the factors leading to resilience more in-depth.

6.1 Firm Infrastructure

The firm's infrastructure will be separated into multiple sections as this covers the majority of the findings, which is finance, management, capabilities, and location planning. An additional separation has been made to create an overview of the suggested theories, approaches, or solutions within these activities.

6.1.1 Finance

Drivers	Application	Effect	Context	Sources
Collaboration	Aligning the interests of all involved parties of the firm	Preparedness, robustness, agility, flexibility, adaptability	1x Cross-sectional 2x Literature reviews on:	Mouzas & Bauer, 2022; Um, J & Han, N, 2021; Aigbogun, o. et al., 2022
Redundant Resources	Additional liquidity and stock	Robustness, Flexibility	2x Case study 3x Literature reviews	Xu, Z. et al., 2020; Yossi Sheffi, 2005; Bogataj, D. et al., 2016; Mouzas, S. & Bauer, F, 2022; Jiang, B. et al., 2021

(Table 1 - Financial Drivers, Effects and Sources - Elaborate context found in Appendix 3)

Multinational corporations have the possibility to overcome the tension between remaining efficient and becoming resilient. The long term of handling this conflict will result in surviving the exogenous shocks and demands made by the ever-changing market (Mouzas, S. & Bauer, F.,2022). Recovery from a disruptive event and resilience can be achieved within almost all aspects of the corporation and this also covers legal and financial support, which is deemed essential for recovering (Tukamuhabwa, B. et al., (2017).

The term financial resilience can shortly be defined as the ability of the company to endure adversities, which can be achieved by creating a solvent firm, which is not exposed to uncertainty and also the degree of the firm's ability to regain control financially within the global value chain in case of experiencing unexpected events (Mouzas, S. & Bauer, F.,2022). In the results of a case study of 20 manufacturing firms in Uganda, (Tukamuhabwa, B et al., 2017) shows financial disputes during a time of crisis leads to companies being unable to pay their suppliers, which leads to potential further delays or shortage and hereby it creates a circular effect enhancing the initial impact of the event, this observation was conducted from 45 individual interviews within actors of the manufacturing industry.

6.1.1.1 Aligning interests

Stefanos Mouzas and Florain Bauer (Mouzas, S. & Bauer, F.,2022) analyzes this aspect of resilience, combining it with operational efficiency, which relates to profitable aspects as production time and cost-efficiency, but also alongside market effectiveness, which can be defined as the firm's ability to satisfy the needs of the customers based on the market conditions. These three interrelated factors are being used to theoretically determine the foundation of the firm's performance and do so by analyzing the effects of changing these parameters in terms of profitability, growth, and solvency (Mouzas, S. & Bauer, F.,2022). The intertwinement of these factors is clearly visible while analyzing the negative effects they can apply to each other. When focusing short term on achieving operational efficiency it will often limit the long run growth of the company and this growth will furthermore be reduced as flexible and redundant resources are required for achieving a higher level of financial robustness.

The financial aspect of a multinational corporation is often being leveraged into different directions by varying interests of shareholders, development- and financial managers. The sole focus on creating profit by efficiency can neglect investing in innovation and both of

these could lead to prolonging the return of capital, which will lead the company vulnerable to uncertainty (Mouzas, S. & Bauer, F.,2022). Collaboration is a main element in preparing an organization for a potential crisis (Um, J. & Han, N.,2021), which can be enhanced by forming a collateral understanding of the firm and acknowledging it is a coalition between individuals with shared interests. It creates the foundation of creating organizational goals that can include multiple performance factors (Mouzas, S. & Bauer, F.,2022). Aligning the interest creates an enhanced orientation of the supply chain, which can be furthermore enhanced by illustrating trust and cooperation with the stakeholders, but also the top management supporting the decisions being executed alongside the value chain. Another result of this aspect is the reduction of uncertainty within the system and it also emphasizes the importance of trust and free sharing of communication through the links of the value chain, which ultimately enhances the overall level of resilience within the cooperation (Aigbogun, O. et al., 2022).

Avoiding bankruptcy and enabling the ability to survive is the core essence of financial resilience within a firm, which will be treated based on the probabilities of different events arising from uncertainty and including the element of not being able to foresee every outcome and when they will occur, whereas the last mentioned is frequently being overlooked and underestimated. These risks will be compared with the NPV of the estimated cash flow in the future and hereby create the foundation of the level of financial resilience within a firm. The goal of creating this strategy except for survival is also to enable the firm to create a quicker response during shocks alongside rapid recovery and allowing the company to create a more creative solution based on the conditions of the event (Mouzas, S. & Bauer, F.,2022).

6.1.1.2 Redundant resources

Sheffi and Rice (Yossi Sheffi, J. B. R. J., 2005) provide two layers to the fundamental understanding of resilience, which is flexibility and redundant resources (Xu, Z. et al., 2020). If the possible shock alongside the probability has been properly assessed alongside the plausible consequences, the redundant resource, which in terms of financial robustness could be additional liquidity, which will create the foundation of flexible actions such as continuing the critical functions within the company (Bogataj, D. et al., 2016)(Jiang, B. et al., 2021)(Yazdani, M. et al., 2022) or acquiring them outside choosing a local and hereby more expensive supplier (Mouzas, S. & Bauer, F, 2022). Increasing the level of solvency can also

be derived from other redundant resources such as employees, stocks, brand, and capital equity (Yossi Sheffi, J. B. R. J., 2005).

The act of purchasing from a local supplier instead of a regular one overseas will cause the global value chain to re-localize, which creates policy implications in case the overall goals for the organization have not been determined (Mouzas, S. & Bauer, F, 2022). The redeployment of resources in order to enhance the level of flexibility within the firm and decrease the vulnerability to uncertainty will result in lowering the market effectiveness and hereby navigate the corporation towards a strategy aiming for resilient growth. For a company to achieve a united goal setting, the operational performance aspect also needs to shift towards efficient solvency, which can be done by perceiving profitability as a factor that does not need to be increased constantly, but more in the direction of enhancing the value of the firm long-term (Mouzas, S. & Bauer, F, 2022). The balance between solvency and growth will create the opportunity for these firms to restructure their current global value chain into new formative and collaborative structures, which includes increasing the involvement of local clusters within the value chain (Mouzas, S. & Bauer, F, 2022).

6.1.2 Capabilities

Drivers	Application	Effect	Context	Sources
Knowledge	Utilize the capabilities of the firm	Preparedness, adaptability, agility	**2x Cross-Sectional** **1x Experimental**	Orlando, B. et al., 2022; Mafabi, S. et al., 2012; Golgeci, I. & Y. Ponomarov, S., 2013
Asset Management	Deploy resources on stable markets	Flexibility, agility	2x Cross sectional analysis 4xLiterature review on 1x Longitudinal case study	Fainshmidt, S. et al., 2017; Helfat, C. E. & Winter, S. G., 2011; Grøgaard, B. et al., 2019 Strange, R., 2020; Giannakis, M. & Papadopoulos, T., 2016

(Table 2 - Capability Drivers, Effects and Sources - Elaborate context found in Appendix 4)

6.1.2.1 Knowledge capabilities

A rapid bounce back from a crisis into regular patterns enables a company to fulfill their market commitments and thereby continue to deliver their products and service within regular delivery time. The ecosystem of the company determines this degree of competitiveness and time is of the essence as the success of logistics is primarily determined by this factor (Orlando, B. et al., 2022). The pace determines the agility of the firm, and the responsiveness of the firm is being increased by a reduced lead time, which shifts the competitive focus from first mover to fast mover (Orlando, B. et al., 2022).

Another management related approach to increase resilience is achieving a high level of time-based performance. It requires the firm to develop and acquire knowledge capabilities, which is based on creating, sharing, and acquiring knowledge within the organization.
The knowledge approach has references to resource-based view and dynamic capabilities in how companies generate and apply the knowledge within the structure, processes, and competencies of the organization (Mafabi, S. et al., 2012). Performance and innovation are derived from the knowledge within human and relational capitals, which means the innovation of a firm is based on the corporation's ability to utilize the knowledge of the internal and external environment and this can be defined as the overall capacity of knowledge within the firm (Orlando, B. et al., 2022). The firm performance is related to how the organization can adapt to change in demand, which will be achieved by the influence of knowledge between the company and the customers and suppliers within their environment.

Innovation is related to resilience within the global supply chain (Golgeci, I. & Y. Ponomarov, S., 2013), which leads to these sharing mechanisms that will enhance the knowledge of the firm and hereby also enable the performance. This improved performance based on innovation will reduce the lead time and thereby improve the worldwide coordination, which is derived from the increased level of efficiency (Orlando, B. et al., 2022). in terms of innovating the processes regarding time within the organization.

6.1.2.2 Dynamic managerial capabilities

Another way of utilizing an aspect of dynamic capabilities is through dynamic managerial capabilities derived from that exact concept and the term organizational capability (Fainshmidt, S. et al., 2017), whereas the last mentioned is defined as the ability to execute an activity reliably or at least in a satisfied way (Helfat, C. E. & Winter, S. G., 2011). The aim of the dynamic managerial capabilities is to employ existing and generate resources and capabilities and skill possessed by the managers within the firm is hereby to continuously extract additional value from the total amount of resources within an organization (Fainshmidt, S. et al., 2017) (Grøgaard, B. et al., 2019). This approach can depend on the context and be a part of a MNE's resilience strategy, but also involves the ability to commit to the strategic changes, so they actually get executed, which requires the complete support from the headquarters (Grøgaard, B. et al., 2019).

One of the strategies that can be performed based on this approach is asset management, which relates to in an economic crisis the firm concentrating their resources on markets that

are financially stable instead of unstable (Fainshmidt, S. et al., 2017). The effect of this will increase the firm's ability to utilize their resources and this systematic alignment of assets may also be necessary especially if the value of the assets is steadily declining. A proposed strategy within asset management is emphasizing upon avoidance as it seeks to lead the management away from investing and performing activities that can impose a significant amount of risk, which could be choosing a supplier from a country that is unstable politically or a supplier that neglects pollution as an issue (Strange, R., 2020; Giannakis, M. & Papadopoulos, T., 2016).

6.1.3 Strategic management

Managers within a corporation will need to quantify risk in a new manner after the pandemic to develop risk reduction strategies. Substantial changes in global value chains are often a process, which includes a long-time horizon and may involve the need for experimenting with different business models to create the optimal one (Phillips, W. et al., 2022). This section will be used to describe all the theories, models, concepts, and ideas revolving around resilience and management, which due to the intertwinement of the departments within the corporation also will relate to other sections.

Drivers	**Application**	**Effect**	**Context**	**Sources**
Co-opetition	External gathering of knowledge	Preparedness	1x Case study	Tukamuhabwa, B. et al., 2017
Just-in-case	Increasing storage capacity	Preparedness, robustness	1x Cross sectional analysis 2x Literature reviews:	Fonseca, L. M. & Azevedo, A. L., 2020; Kwak, D.-W. et al., 2018; Jiang, B. et al., 2021

Postponement Strategy	Reduce resource commitment	Robustness	1x Literature review	Strange, R., 2020
Partner Selection	Decentralizing decision-making	Efficiency	1x Survey	Golgeci, I. et al., 2020
Crisis team	Responsible manager to handle the crisis	Preparedness, Agility	1x Case study 1x Survey 1x Literature review	Kaeo-Tad, N. et al., 2021; Golgeci, I. et al., 2020; Sharma, M. et al., 2021
Dynamic environment	Allow work from home / split work-force	Flexibility, Adaptability	1x Case study	Kaeo-Tad, N. et al., 2021;
Dynamic Pricing	Efficient pricing based on demand	Agility	1x Case study 1x Literature review	Sharma, M. et al., 2021; Das, D. et al., 2021
Avoidance Strategy	Focus on stable markets	Stability generated by Agility and Flexibility	1x Literature review 1x Cross-Sectional:	Strange, R., 2020; Giannakis, M. & Papadopoulos, T., 2016
Risk sharing strategy	Contracts of - Insurance - Collaboration	Robustness	1x Literature review	Strange, R., 2020;

				Xu, Z. et al., 2020
Locating facilities	Geographical zones with low disruption chances. If not possible, seek insurance	Adaptability	1x Literature review	Bader, B. et al., 2020;
Protection	-Metal Detectors -Bomb-proof buildings -Protection Company	Robustness	1x Literature review	Bader, B. et al., 2020

(Table 3 - Strategic managerial drivers, Effects and Sources - Elaborate context found in Appendix 5)

6.1.3.1 Co-opetition

During a crisis the management will face tough decisions in order to navigate through the uncertainty, which can be done by examining the environment outside the formal supply chain (Tukamuhabwa, B. et al., 2017). The co-opetition strategy is relying on networks, social relations and even competitors to create a mutual foundation for knowledge exchanging, which can be used to overcome the adversities faced. Information exchange and cooperation can create supply chain resilience if they deal with the same supplier or distributors to mitigate the threat of dishonesty (Tukamuhabwa, B. et al., 2017). This will also allow the sharing of current applied crisis management and strategies to avoid one of the companies making the same mistakes, but this strategy also imposes a threat of confidentiality, and this will most likely also be the reason why companies would not seek this choice of action (Tukamuhabwa, B. et al., 2017).

6.1.3.2 Just-in-case

The overall focus behind a lot of company's main strategy has been to increase the efficiency of the company and minimize the costs. Optimized organizations as mentioned in the introduction section regarding the global value chains have led to the overall structure's fragility, which makes them less susceptible to uncertainty and change within the value chain. An aspect of the operational effectiveness is the concept of just-in-time, which relates to the inventory being kept at a minimum to ensure efficiency (Fonseca, L. M. & Azevedo, A. L., 2020). To enhance the level of robustness within the company it can shift its methodology from this aspect to just-in-case, which relates to instead of reducing inefficiencies and waste to leveraging another aspect of redundant resources by stocking up the inventory to a satisfactory level where it can handle the demand that can be experienced during uncertainty (Fonseca, L. M. & Azevedo, A. L., 2020; Jiang, B. et al., 2021; Kwak, D.-W. et al., 2018). These safety stocks will create the desired level of robustness required to endure some events and the plausible experience of for example delivery delays. This approach can be seen as a compromise between the previously existing aspect with efficiency and the concept of resilience. To perform this strategy as an organization it will include creating contingency plans and acknowledging the increased procurement expenses alongside prolonged delivery time. This could potentially cause the company to focus on cheaper suppliers and ensure transparency alongside the value chain to forecast and create the most optimal contingency plan (Fonseca, L. M. & Azevedo, A. L., 2020). However, this approach does have its downsides as briefly mentioned regarding the increased cost of purchasing goods, but the resilience provided by the just-in-case strategy needs it funding to arise from somewhere, which either can be done by reducing the overall profitability or simply to increase the prices, but the last mentioned could however result in decreased customers satisfaction. A balance between these two could also be a possibility, since if you weigh the three potential outcomes, which is not supplying the products due to shortage compared to supplying them, but with decreased customer satisfaction or just generally reducing the profits of the company neither of them is appealing, which is why a balance between these can become useful (Fonseca, L. M. & Azevedo, A. L., 2020).

The concept of just-in also extends to a worst-case scenario, which is taking more extreme precautions towards potential disruptions (Jiang, B. et al., 2021). The goal of this approach is

to provide a very high level of robustness for the organization and therefore also the probability of survival through an exogenous shock. The factors being leveraged are the same as just-in-case, but enhanced, which would refer to for example a larger amount of liquidity at disposal at all times, which also will reduce the efficiency of the company even further. The probability for a disruptive event and the consequences must be determined severely for this strategy to be a general tool for the management to use (Jiang, B. et al., 2021).

Another strategic take on a just-in-case strategy is the postponement strategy which has been mentioned by (Strange, R., 2020) has a different take on how to apply the essential key element of the approach, to reduce the resource commitment. His idea is instead of reducing differentiation then just produce the parts needed for the product, but then wait with either assembling or packaging until the consumer has purchased the goods.

6.1.3.3 Partner Selection

The tension is steadily increasing between the elements of efficiency and resilience within the multinational corporations in Covid-19 aftermath, which can be reduced by assessing the company's partner selection strategy (Golgeci, I. et al., 2020). The aim of increasing the criteria of partner selection within the firm is to reduce the amount of knowledge exchange occurring, but also the complexity and dissipation involved in this phenomenon. To decentralize the process of decision-making and perceiving the strategy as a collaborative activity will also reduce the monitoring cost associated with none partner or bad partners within the value chain (Golgeci, I. et al., 2020). Multinational corporations have a benefit when approaching potential partners to their global chain due to their capacity and resources and allow the opportunity of creating a mutual identity based on aligning interests. The result of decentralizing the decision would improve identifying local aspects of effectiveness improvements and increased preparedness to being responsive as an exogenous shock will occur (Golgeci, I. et al., 2020) The enhancement of the social mechanisms involved in creation of a selective partnership will not only enhance the level of efficiency within the firm, but also the resilience during an unforeseen crisis (Golgeci, I. et al., 2020).

6.1.3.4 Resilience Cycle

The Resilience Cycle theory has been applied in a multiple case study design, which has derived multiple drivers based on the examination of monitoring three companies throughout Covid-19 (Kaeo-Tad, N. et al., 2021). The findings of the case study points towards

preparation in terms of leadership, which is the most important finding, and it refers to the creation of risk management plans. The second step of the cycle is prevention, and this phase is enhanced through appointing a responsible manager to handle the situation quickly (Kaeo-Tad, N. et al., 2021). The protection phase locates changes during Covid-19 as dividing the workforce to reduce the chance of infection, but also to allow the back-office to work from home.

6.1.3.5 Dynamic Pricing

The last strategic performance enhancer regarding management is the dynamic pricing strategy and the goal is to create an effective pricing strategy based on conditions. Limited supply can cause the increasing cost of production, which means the company needs to determine whether they will maintain their prices and reduce their own margins or adjust the price accordingly to the increased cost. The possibility of ramping up the prices even further is also a possibility if competitors are unable to supply the market or the surge of demand is increasing heavily (Sharma, M. et al., 2021), but awareness of unethical pricing practices is also a necessity. A significant increase of the price can decrease the trust of the consumers or create irreparable damage to the image of the brand, whereas the end result will be a reduction of the customer base (Das, D. et al., 2021).

6.1.3.6 Risk management strategies

Roger Strange (Strange, R., 2020) research risk management alongside resilience as a capability to generate global supply chain resilience and proposes multiple strategic options. Resilience as a capability is based on the theory of dynamic capabilities (Teece, 2007) as a theoretical standpoint to address the alteration of environments and is acknowledged as the way a firm harnesses its supply chain to cope with these circumstances.

A potential strategy is sharing the potential risks through contracts with either the bank, suppliers or consumers is also a plausible approach, which can be done by creating an insurance or simply outsourcing or collaborating with partners to mitigate the risk of the company (Strange, R., 2020; Xu, Z. et al., 2020).

The last potential strategy is based on control, which emphasizes that the company will leverage their environment and value chain to reduce the risk (Um, J. & Han, N., 2021). This can be done by reducing the overall chain by cutting out middlemen or even vertically

integrating parts of the supply chain. This approach is based on turning the costs into fixed instead of variable by reducing the occurrence rate of a disruptive event by investing in control to achieve resilience within the firm (Lutz, S. et al., 2003).

If the risk identified is related to terrorism, a study highlights the importance of physical protecting the company. This can be done by implementing metal detectors or even bomb-proof buildings on the facilities at risk (Bader, B. et al., 2020).

6.1.4 Location Planning

Drivers	**Applications**	**Effects**	**Context**	**Sources**
Reshoring	Regionalizing manufacturing sites	Preparedness, Reconfiguring	1x Case Study: 3x Literature review:	Strange, R., 2020; Pla-Barber, J. et al., 2021; Ryan, P. et al., 2022; Strange & Magnani 2018
Local sourcing	Choosing domestic suppliers	Preparedness, Agility	1x Survey: 1x Case study: 5x Literature review	Sáenz, M. J. et al., 2018; Paul & Chowdhury, 2020; Okorie et al., 2020; Xu, Z. et al., 2020; Raj, A. et al., 2022; Belhadi, A. et al., 2021

Multi-Sourcing	Increasing the number of suppliers	Preparedness, Robustness	1x Case study: 7x Literature review	Sodhi, M. S. et al., 2021 Tang & Tomlin, 2008 Xu, Z. et al., 2020 Chowdhury, M. M. H. & Quaddus, M., 2017 Um, J. & Han, N., 2021 Raj, A. et al., 2022 Shih, 2020

(Table 4 - location planning drivers, effects, and sources - Elaborate context found in Appendix 6)

This section will examine the findings on behalf of sourcing and shoring related opportunities in order to generate resilience (Chowdhury, M. M. H. et al., 2019). Manufacturing has swapped location to reduce cost, whereas development and design has remained in high cost and knowledge economies of the MNE's (Bailey & Propris, 2014). Outsourcing is the decision regarding the boundary of an organization, often referred to as the make or buy decision (Chowdhury, M. M. H. et al., 2019). Offshoring revolves around the decision-making regarding location of activities, referred to as the movement of organizations' own economic activities from a domestic location to a new foreign location (Robertson, C. J. et al., 2010). The idea of regionalizing or reshoring manufacturing has been stated long before the covid-19-pandemic came. The statement of shortening of supply chains has been made by economists, geographers and scholars (Panwar, R. et al., 2022).

The reconfiguration of MNEs GVCs will not be easy, furthermore in the hindsight of the covid-19-pandemic, elements of re- or nearshoring has not been a reassuring solution short-term. It has, however, been suggested that certain elements of reshoring and nearshoring will play a role within the future patterns of the creation of resilience in organization (Zhan, J. X., 2021). A solution towards developing resilience with GVCs is with the usage of diversification and redundancy (Chowdhury, M. M. H. et al., 2019). It is argued that the idea of diversifying internationally could be more effective than reshoring, by engaging in more suppliers and locations of suppliers within the value chain (Zhan, J. X., 2021).

It has been found that organizations utilizing both domestic and global value chain actors have been more resilient than those with only global actors. This could imply that relying on only global actors within the GVC, creates larger vulnerabilities for the organization. A balanced development between domestic and global actors is proposed to create sustaining competitive elements (Ali, L. et al., 2022). Another general claim to improve resilience alongside the supply chain would be to examine sourcing and innovation. These factors could be the solution towards securing GVCs for future disruptions. The proposed idea of how alternative materials and substitute suppliers for locally located suppliers, could become valid for some organizations and might provide a greater availability of materials in times of need. The organizations would identify its alternative materials and substitutive suppliers within their mid to lower tiers of suppliers. (Xu, Z. et al., 2020).

6.1.4.1 Reshoring

The idea of regional supply chains has risen and is likely to rise even more in the future, due to the pressure of resilience and self-reliance, but the regionalization also occurs in the US as a step of becoming less dependent on their Asian manufacturers (Enderwick, P. & Buckley, P., 2020). There is a push for more sustainable and responsive supply chains. Reshoring has the ability to shorten the links in between GVCs and thereby making parts of the supply chain less vulnerable towards disruptions located in the logistics from suppliers or production (Strange, R., 2020; Pla-Barber, J. et al., 2021). It has been suggested, as an effect of reshoring, organizations can become closer towards their customers' needs and hereby become more responsive towards them. It further enables the organization to focus upon their core competencies and in short-term focus on financial and management of resources (Strange, R., 2020). The result of reshoring will enhance the resilience of MNEs and thereby

balance the supply chain, especially in times of crisis. The act of subtracting the global operations and relocating them nearby headquarters and further intensifying inventories (Ryan, P. et al., 2022).

The vulnerability of reshoring is reducing the firm's international key activities, which decreases the level of internationalization. The effect of this is losing some bargaining power between buyer and supplier (Strange & Magnani 2018), but also a reduction in the overall efficiency within the corporation (Ryan, P. et al., 2022). Furthermore, reshoring can result in increased exposure towards disruptions, since the number of suppliers could have been significantly reduced, which would make the domestic country the primary geographical location of risk (Strange, R., 2020). Within future disruptions the idea of reshoring is inefficient. It has been argued that within disruptive times a management of GVC in-house but not fully committing towards reshoring, will ensure organizations to become efficient while not losing stability (Ryan, P. et al., 2022).

6.1.4.2 Local sourcing

An early step towards increasing resilience is determining how high the supply chain is being prioritized and hereby if the strategy is to be as cost-efficient as possible based on the circumstances (Sáenz, M. J. et al., 2018). It has been suggested that within the mitigation challenges of supply capabilities connected to disruptions, that the inconsistency of supply (PIS) could cause the most damage towards supply related elements of upstream vendors and price volatility (Paul & Chowdhury, 2020). Secondly, the scarcity of material (SSM) was considered a highly ranked challenge due to factors of increased price per unit, restrictions and fear of supply (Okorie et al., 2020). Furthermore, it has been seen under Covid-19, that due to time zone differences and slower response time, larger globally supply chains have withdrawn in some parts to smaller ecosystems under distress (Xu, Z. et al., 2020).

A short-term solution consists of the management of material scarcity, taken in the context of the covid-19-pandemic. Organizations have to identify the elements and raw materials which are most crucial for the manufacturing and further identify the materials which show the most risk of losing (Paul & Chowdhury, 2020). The usage of alternative materials would likewise become a possibility within collaborations of R&D departments, with the purpose of ensuring supply in times of crisis (Raj, A. et al., 2022). The decisions of ‘make-vs-buy’ for critical

components within the manufacturing should be considered to mitigate risks of supply and create less dependency upon suppliers.

Within the long-term strategy for organizations a focus towards the planning of recovery must be instated. The planning should include a risk mitigation strategy and revolve the possibilities of alternative suppliers closer to the manufacturing region, this will create a sustaining supply of raw materials or components (Belhadi, A. et al., 2021).

6.1.4.3 Multi-sourcing:

The challenge of constant supply towards the manufacturing site should be of serious concern for the organization and would during disruptions require a costume made sourcing strategy. The ability to know the amount of materials demanded created the ability of economies of scale and lower cost of purchase, which gives organizations the desired attributes of GVCs. Moreover, the organizations lose flexibility and responsiveness attributes due to the size of their value chains and the complexities of the networks. (Shih, 2020) explains MNEs might choose local suppliers to fulfill the responsiveness attributes. Which has been argued as a demonstration of how the sourcing and procurement function of the value chain is undergoing change, organizations are choosing responsiveness over cost-effective attributes to gain sustained resilience (Raj, A. et al., 2022).

Within the idea of applying an alternative sourcing solution towards migrating risk revolved in suppliers, dual sourcing has been argued to be a solution to create preparedness without leveraging a MNEs efficiency completely. By utilizing multiple suppliers of raw materials, a study has shown, an organization using dual-sourcing would perform greater than an organization without (Um, J. & Han, N., 2021), due to the increased level of flexibility and hereby resilience as well (Chowdhury, M. M. H. & Quaddus, M., 2017) . Dual sourcing can be intertwined within the hedging strategy, the strategy revolves around acquiring suppliers, customers and facilities spread out globally to ensure the effects of a single event would not damage all entities of the organization. Using dual sourcing as a hedge can help MNEs with several elements of: risks of quality, quantity of product, and price and opportunism (Manuj & Mentzer, 2008). The effects of dual sourcing will enhance GVC resilience, in environments where subcontracts and the sourcing of material is bought from multiple suppliers (Tang & Musa, 2011).

Other research likewise suggests MNEs to use multi-sourcing or supplier diversification which is defined in a similar way to dual-sourcing. The reduction of supplier risk will be eliminated by the diversification of supply sourcing (Xu, Z. et al., 2020). It is furthermore suggested to use three geographically diversified suppliers, with the purpose of reducing supplier risks and furthermore some geopolitical risks connected to some products (Tang & Tomlin, 2008). The actual implementation of the concept could be if a company has its current manufacturing site with the aim of maximizing efficiency and then a secondary plant, which aims to create flexibility and meet the requirements of surge in demands. Furthermore, the flexible site could also function as a back-up plan in case disruption occurs at the primary unit until it can resume regular operations (Sodhi, M. S. et al., 2021).

6.2 Human Resources

Drivers	**Application**	**Effect**	**Context**	**Sources**
Global Talent Management	Developing the subsidiaries	Adaptability and Preparedness	1x Cross sectional analysis of: 4x Literature review:	Lee, j. et al., 2022; Heinen & O'neill, 2004; Abbas, A. et al., 2022 Ryan, P. et al., 2022 (Kwak, D.-W. et al., (2018)
Hiring	Acquiring staff with expertise	Preparedness, flexibility, agility, adaptability,	1x Cross sectional analysis 2x Literature review	Abbas, A. et al., 2022 Queiroz, M. M. et al., 2020 Raj, A. et al.,

				2022 (Kwak, D.-W. et al., (2018)
Common purpose	-Problem solving -Innovation	Preparedness, adaptability	2x Literature review 1xCase Study	Freeman et al., 2001 Coutu, 2002 Chapman, R. L. et al., 2003
Constructive Sensemaking	-Language use (Words, image, stories)	Preparedness	1x Literature review:	Lengnick-Hall, C.A. et al., 2011
Behavioral training	-Resourceful employees -Useful habits	Preparedness	2x Literature review:	Lengnick-Hall and Beck, 2005 Sheremata, W. A., 2000
Information Security	Protecting knowledge: -Hire IT security -Regular measures of IT	Preparedness, Robustness	*1x Cross sectional analysis* 2x Literature review:	Panwar, R. et al., 2022; P.N., S., 2021; Eloff, M. . & von Solms, S., 2000; Luo, Y., 2021

(Table 5 - human resource-based drivers, effects and sources - Elaborate context found in Appendix 7)

The complexity of systems is derived from the influence of those who drive it, humans, which makes it a central aspect of achieving resilience within an organization (Halldorsson et al., 2015). This part of the value chain will be examined by including multiple studies and

these are focusing on aligning the orientation of the organization (Mouzas, S. & Bauer, F.,2022), which is deemed important to enhance the cognitive element (Freeman et al., 2001) and also enabling the internal part of the firm to handle disruptions, but HR also includes information security for reducing threats (Werlinger et al., 2009) and behavioral elements to foster the creation of resilience (Lengnick-Hall and Beck, 2005).

Aspects of human resources in firms have been correlated with the Navy Seals, which at first seems like a vast distinction, but nevertheless the aim of both is to prepare uncertain environments, and this is partly what it means to create resilience within an organization (Lengnick-Hall, C. A. et al., 2011). MNEs are elites within the business world and likewise the military need to educate their workforce and mobilize them as a team with the necessary tools and skills to manage disruptions. Former experience can be used to manage specific situations, but others require a creative response and the distinction between these is required for enabling resilience (Lengnick-Hall, C. A. et al., 2011).

6.2.1 Global Talent Management:

Within the gathered literature researchers suggest that global talent management (GTM) is important as an element of developing resilience within subsidiaries (Lee, j. et al., 2022). With the usage of GTM competitive advantages are created (Heinen & O'neill, 2004).

The ability to hire skilled employees does not only create great opportunities within a company's headquarter (HQ), but with the allocation of talents within a company's foreign subsidiaries, and knowledge of what resources are needed to cope with challenges connected to a given crisis (Heinen & O'neill, 2004). Instead of hiring new employees, the alternative could also be to yield a course to bring the former employees up to date. Absorbing fresh and useful innovative knowledge is the key to optimize the current operations, which can be done through learning organizations (Kwak, D.-W. et al., (2018). GTM and organizational resilience within MNE subsidiaries is connected to how managers are able to overcome external challenges from global crises. However, different levels of GTM are found in MNEs, with different types of human capital used. Namely, the headquarters (HQ) with a corporate level of human capital, Regional Headquarters (RHQ) with an international or regional level, and the local subsidiaries of the MNEs, with a local and subsidiary level (Lee, j. et al., 2022).

The human capital invested in the level of HQ plays a crucial role within GTM and ensures that talent acquired within the company is under correct management across the company.

Furthermore, the corporate human resource (CHR) within GTM should provide efficient senior management development, identify important positions in the company to be filled out by hired talent, and develop teams of global managers. The global talent management within HQ level would hereby enhance resilience in foreign subsidiaries (Lee, J. et al., 2022).

A solution towards strategically enabling resilience within subsidiaries can be found within the RHQ, by integrating the RHQ within the decision making of GTM. The purpose of collaboration between the HQ and the RHQ is to utilize the knowledge acquired from the RHQs (Lee, J. et al., 2022). Their regional location can deliver intel regarding how an interplay between talent management and resilience could occur. The RHQ is positioned within the local networks and works closer to leaders and managers within these parameters than the HQ. This gives the RHQ access to knowledge of know-how and direct solutions to solve specific daily challenges under crisis., which could help HQ develop or analyze new potential solutions towards subsidiary resilience (Lee, J. et al., 2022).

Developing subsidiaries can aid in increasing both the level of efficiency, but also the resilience. The headquarters can monitor distant links of the supply chains frequently with the intention of assessing the capabilities of the subsidiary and hereby assists in developing it. The process is often long-term, and the subsidiaries will not advance at an equal pace but will be influenced by external parameters as the skill of the laborers within that country, which can be enhanced by teachings from the MNE (Ryan, P. et al., 2022). Headquarters can also self-inflict a reduction in the balance between efficiency and resilience if they do not assess capable links of the value chain as capable of developing into supplying additional activities, which can increase the general level of value supplied by that subsidiary (Ryan, P. et al., 2022). This involvement can be executed by investing the specific resources that the department is requiring for evolving, which can be investing in either improved machinery for production or focus on innovative processes (Ryan, P. et al., 2022).

6.2.2 Hiring

The enablement of resilience by hiring skilled personnel has been proposed in several contexts and it has proven evidential to consider the implications of the hiring or development of human talent. Not only are MNE's in search of a skilled and cheap workforces, which is seen as an obstacle, but the corporations can embrace the idea of increasing the recruitment of skilled labor outside the host country, since they are primarily

searching for domestic human capital (Abbas, A. et al., 2022). It has further been proposed that the supply network needs optimization if high levels of resilience is the goal of the organization, which requires holistic management through the network, which would require including all links of the chain from the production sites to the customers (Queiroz, M. M. et al., 2020). Integrating resilience across this wide span within the supply chain can be achieved by implementing agents, which will be assigned geographically with the goal of reducing asymmetry when information is shared. This will also enhance the flow of material goods and social relationships and also there will be an agent to execute the necessary decisions when potential disruptions are threatening the supply chain (Queiroz, M. M. et al. (2020). In addition to the hiring of agents, MNEs can develop 'sourcing teams' with the purpose of reducing risks regarding single vendor sourcing (Raj, A. et al., 2022). Another proposed hiring method to reduce risk is the hiring of a protection company, which can facilitate the necessary requirements of digital or physical protection and hereby create safety, which will alleviate the employees working in this environment (Bader, B. et al., 2020).

To set a proper foundation within the firm to build an environment that can achieve increased resilience within the area of logistics, managers should acknowledge that long time employees with simple knowledge and experience from the past is not optimal based on innovation alongside the supply chain that is derived from change of practices within the global logistics (Kwak, D.-W. et al., (2018). Instead, the focus should be on hiring employees with relevant knowledge and expertise that can be deployed directly within the practice, but the alternative could also be to yield a course to bring the former employees up to date. Absorbing fresh and useful innovative knowledge is the key to optimize the current operations, which can be done through learning organizations (Kwak, D.-W. et al., (2018).

6.2.3 Cognitive & Behavioral Orientations

While solutions revolving coping with disruptions, driven from the psychological field, a solution taking parallels within the military theory, argues Navy SEAL training factors could directly affect the development of capacities for resilience within organizations. The solution is based on the strategic approach to how organizations can create resilience, with the use of strategic human resource management. Namely the cognitive and behavioral factors which drive organizations to resilient supply chains (Lengnick-Hall,C. A. et al., 2011).

The organizational orientation can be fostered from positive and constructive concepts with the purpose of creating a great sense of purpose, values, vision, and language use. All factors within the cognitive elements (Freeman et al., 2001). A combination of strong values within the organization, purpose and identity creates the foundation for how organizations could develop conditions for problem solving (Coutu, 2002). An increased level of efficiency within this area can be achieved by cultivating innovation as an important part of the workplace environment as this would encourage the presence of innovative ideas, which can be enhanced even further by ensuring the proper resources required for this process is at the employee's disposal (Chapman, R. L. et al., 2003).

Another argued solution within the cognitive abilities of organizational resilience is constructive sensemaking, which is proposed as an enabler for organizations and the employees within to create meaning of disruptive events and the conditions it may cause. The constructive sensemaking is used throughout the language use of the organization such as: words used, images shown, and stories told. These elements are used to construct meaning, describe situations, show, and understand the emotional state of the company (Lengnick-Hall, C.A. et al., 2011). For an organization to develop cognitive balance within their constructive sensemaking it has to focus on being confident, and an expert to the actors within the organization. To eliminate factors such as skepticism and caution (Lengnick-Hall, C.A. et al., 2011). Under such developments it is crucial for companies to identify the given situation, due to the uniqueness of disruption effects on each individual organization.

It is crucial for organizations to contradict conventional answers or administrations, when building resilience within the cognitive elements. The mindset has to enable the organization to work flexibly with a use of expertise, opportunism, innovativeness and forward progression despite being in disruptive times. This is crucial when convincing actors towards new solutions (Lengnick-Hall, C.A. et al., 2011).

A behavioral orientation within organizations' future development of resilience, must include the idea of being resourceful. To use what is at hand, to solve challenges, is the type of behavior which likewise contributes to resilience. Organizations can develop such ability throughout resourcefulness training, behavioral preparedness, and useful habits (Lengnick-Hall and Beck, 2005).

By combining resourcefulness training, preparedness and a set of useful habits revolved in these elements, it has been argued that organizations develop abilities to generate new ideas,

gather knowledge and information regarding innovative solutions. These elements create the foundation for companies to be innovative while undergoing disruptive times and be useful for their own resources (Sheremata, 2000).

Preparedness has been argued to be an element crucial for organizations not only to be prepared in disruptive situations, but to enable the organization's employees for change. The ability to change behaviors and take actions upon new opportunities in order to respond to disruptions is a key element, furthermore it is argued that organizations with no developments within these elements are at risk of jeopardizing resilience due to lack of preparedness (Lengnick-Hall, C.A. et al., 2011).

6.2.4 Information Security

Information security exists with the purpose of protecting privacy and reliability of information when it is being transferred, but also when it is stored. Firms are reliant on accessing different platforms for information sharing such as cloud services (Panwar, R. et al., 2022), which also accounts for the creation and sharing of information. The current approach for companies is to utilize these platforms, but security upon these has multiple flaws and loopholes (P.N., S., 2021). Security was once solely a technical problem, but has turned into a behavioral concern, which is due to the intertwinement of people and online processes. The biggest threat to unwanted use of information is therefore often due to the individuals involved, which can happen by accident, but also intentionally or from simply neglecting the firm’s policy due to carelessness (P.N., S., 2021).

Information has become a vital resource in value chains, which enhances the need for protection, but swiftness and accessibility are paramount aspects of information sharing (P.N., S., 2021). Increasing the level of resilience within factors can be done by dividing them into three different segments and thereby managing them accordingly (Eloff, M. . & von Solms, S., 2000). The technical aspect is the resource applied to access the information, which is computers and smartphones, whereas the solution is to implement applications or likewise systems that require authentication (Luo, Y., 2021). The second part is managerial and requires issuing policies to ensure protection, which can be increased additionally by acquiring employees solely dedicated to the area of security. The last aspect revolves around the cultural and humane part of security, whereas standardization is of the essence alongside performing regular measures (Eloff, M. . & von Solms, S., 2000).

6.3 Technology

Within the database and references gathered in the process of quality assessing, technological solutions emerged as a commonly discussed factor of strategy towards protecting companies supply chains from disruptions (Hald, K. S. & Coslugeanu, P., 2021). A wake-up call for all companies, stating supply chains as we know them, had become vulnerable for external shocks. It was likewise suggested that digitalization within the supply chain and the appliance of technologies is needed more than ever (Hirata, E. & Matsuda, T., 2021). In this section the literature regarding technological solutions will be reviewed and identified, under the scope of which drivers lead companies to stronger and more resilient global supply chains.

Drivers	**Application**	**Effect**	**Context**	**Sources**
Flexibility Solutions	**IoT** (Internet of Things) - Product lines - Delivery systems **AI** (Artificial Intelligence) - Machine Learning **3D-Printing** - To produce small objects	Preparedness, flexibility, agility, adaptability	1x Case study 5x Literature reviews	Panwar, R. et al., 2022; Hirata, E. & Mastuda, T., 2021; Chowdhury, 2020; Pla-Barber, J. et al., 2021; Zhu, et al., 2020; Shih, 2020
Visibility/Transparency Solutions	**Monitoring**: - Communication - Knowledge **Track and trace** - AI-tracking - Satellites - QR codes	Flexibility, agility, preparedness	1x Case study: *Multiple MNEs on GVCs* 8x Literature review	Christopher, M. & Holweg, M., 2017; Gunasekaran, et al., 2015; Xu, Z. et al., 2020; McGrath. P, et al., 2021; Das, et al., 2021;

				Buatios, E., 2020; Sharma, M. et al., 2021; Hirata, E. & Mastuda, T., 2021 Kwak, D.-W. et al., 2018
Automation Solutions	**AI & Automation** - Trigger warnings **Robotics** -Production relocation	Preparedness, adaptability	1x Case study: 1x Literature review:	Das, et al., 2021; Chowdhury, 2020; Shih, 2020; Pla-Barber, et al., 2021; Enderwick, P. & Buckley, P., 2020
Technological Innovation	**Digital innovations** - Data gathering	Preparedness, adaptability	1x Case study: 1x Literature review:	Quayson, M. et al., 2020; Rengarajan, S. et al., 2022

(Table 6 - technology based drivers, effects, and sources - Elaborate context found in Appendix 8)

The overall digital theoretical solutions to ensure resilience in supply chains regards the following: flexibility, connectivity, visibility, information, and agility factors which includes resilient capabilities, enabling MNEs to prepare for future disruptions (Belhadi, 2020; Chowdhury, 2020; Shih, 2020; Luo, Y., 2021). Under the enablement of technology within the GVCs, knowledge can be seen as the factor which causes companies to be prepared. These resilient capabilities have the ability to develop knowledge within management of

resilience, risk, and crisis (Banalieva & Dhanaraj, 2019). Furthermore, the implication of technology allows MNEs to develop alternative strategies, building response processes and create just-in-case situations (McKinsey, 2020), to prevent or manage supply, demand or operational disruptions (Zhan, J. X., 2021).

6.3.1 Flexibility Solutions:

Flexibility can be defined as one of several factors of resilience in GVCs, and hereby it can be seen as crucial for certain companies to ensure the usage of flexibility regarding resilience management. With the usage of technology, flexibility can be ensured in the supply chain by using elements of IoT (Internet of Things) (Panwar, R. et al., 2022; Hirata, E. & Mastuda, T., 2021). An example would be IoT production lines have the ability to increase the production capacity, and further a IoT delivery system has the ability to optimize logistics with the purpose of creating knowledge of possible bottlenecks within delivery or transportation (Chowdhury, 2020; Shih, 2020). The overall monitoring of physical objects within a production can enable the possibility of analyzing processes, whereas this process is even further enhanced by the rise of the 5G Network (Panwar, R. et al., 2022). This can be combined with the usage of AI (Artificial Intelligence) and further machine learning with the purpose of using alternative solutions in distress, such as suppliers using machines (Zhu, et al., 2020). Flexibility solutions likewise suggest how companies can migrate their productions of smaller low volume products under times of distress, using 3D printing with the purpose of minimizing transportation costs (Pla-Barber, J. et al., 2021). This solution enables the MNE to become more independent of its smaller suppliers (Shih, 2020) and further create control of costs, meanwhile reducing the distance of their production closer to their operating markets (Pla-Barber et al., 2021).

6.3.2 Visibility / Transparency Solutions:

The visibility or transparency within GVCs is considered an important resilience capability, the ability to monitor the flow and communication of knowledge within parts of the GVC (Christopher, M. & Holweg, M., 2017). This will increase the transparency and knowledge sharing, thereby enabling abilities of better corporations (Gunasekaran, et al., 2015) and rapid responses that are cost friendly (Xu, Z. et al., 2020). The technological costs connected to a transparent GVC can cause challenges due to both hardware and software developments are important to maintain transparency (McGrath. P, et al., 2021; Das, et al., 2021)

The speed of information enables the company to respond adequately to potential disruptive events. The department of logistics should be based on the previous approach to enhance their focus on developing innovation within the practice of the supply chain. Implementable enhancers of risk management within this area would specifically be updating information and logistics to be using radio frequency identification systems (Kwak, D.-W. et al., (2018).

Transparency can be increased by the ability of track and trace. This function can be created by technologies such as: geolocation or satellites. Track and trace can be combined with AI to ensure a real-time tracking of products through transportation which can increase the company responsiveness, systems which helps enhance resilience within the supply chain, and further enables the ability of discovering disruptions within the chains of suppliers (Cordon & Buatios, 2020; Sharma, 2021).

Capabilities and infrastructures within suppliers and sub-suppliers can be crucial for the corporation and is likewise a relevant factor when choosing suppliers, when looking into the national and local information technology (IT) infrastructure, due to its function of sustaining transparency systems between actors (McGrath. P, et al., 2021).

The workings of (McGrath. P, et al., 2021) presented a technological system which incorporates hardware and software into a wide spectrum of digital technologies, from blockchain (Hirata, E. & Mastuda, T., 2021), artificial intelligence (AI) and quick response (QR) codes. They found transparency as a factor within the supply chain which needs improving, among their case studies, companies supported the idea of creating higher transparency. Furthermore, the system offers different technological solutions to creating transparency within the supply chain, which can contribute to the solutions of creating resilient supply chains.

6.3.3 Automation Solutions:

Advanced processes of automation and AI technologies have in recent years increased within big data organizations supply chains. This can help trigger warnings immediately under circumstances which are costly for the companies. It likewise helps to mitigate risk and further improve companies' profits. Automation and Ai technologies enable the opportunity to assess information faster and more accurately and likewise enable the ability to deal with information and capabilities in uncertain times. These functions assist companies with analytical capabilities and can further warn the supply chain members with what areas in the

supply chain where resilience has to be reworked into, with the purpose of creating a resilience network and better decisions (Das, et al., 2021). Furthermore, it is seen that elements of automation within labor capacity of manufacturing, delivery or monitoring can serve the purpose of an increased efficiency and likewise create higher resilience (Chowdhury, 2020; Shih, 2020). The ultimate automation with the usage of robotics can contribute to the relocation of MNEs productions, closer to their home countries and markets (Pla-Barber, et al., 2021). The implementation of technological functions such as automation and robotics will likewise be favored in the future, due to the effects of reducing labor components within the production and furthermore how technologies can affect competitive advantages (Enderwick, P. & Buckley, P., 2020)

6.3.4 Technological Innovation:

Increased technological investments within the functions of the GVC can assist the progression and development of resistant chains, an example from the works of (Quayson, M. et al., 2020) An example of technological innovation between farmers in countryside areas has improved with the usage of digital innovation, farmers can benefit from web portals on mobile services which has enabled both higher productivity and earnings. Such innovations can assist the lower parts of the supply chains in developing countries and thereby create resilience in supply chains (Quayson, M. et al., 2020).

Due to the corona-19 pandemic, digital innovations which help farmers ensure a reduced human interface and further help build resilience in the movement of the supply chain. Related to other crises, technological innovations such as these will be important for supply chain partners and can ensure operational farmers (Quayson, M. et al., 2020). The innovations developed within GVCs can be linked to the amount of data gathered from technologies, assisting in the identification of which elements of the supply chain need re-configuration. This can be individual for each company, but data is required in all circumstances, a hybrid data strategy of big and small data is crucial for the re-configuring of Global Value Chains after covid-19. This will serve the purpose of assisting executives in reassuring resilience and efficiency, by increasing visibility within the value chain, creating ground for decision making (Rengarajan, S. et al., 2022).

6.4 Primary activities

The primary activities of the value chain are the divisions correlated with producing and selling the product, but the findings of this study's literature review only has research regarding the production, which is in- and outbound logistics. These will be described as the previous sections with the assumption of intertwinement between the other links of the value chain, since multiple aspects also could be argued for to be within the management section as the strategies derive from that department.

Driver	**Application**	**Effect**	**Context**	**Sources**
Inventory control strategy	Predicting demand and adjusting the supply order or production	Preparedness, agility, flexibility	1x Longitudinal case study: 1x Case study: 6x Literature reviews	Sharma, M. et al., 2021; Panwar, R. et al., 2022; Gereffi, G. et al., 2022; Das, D. et al., 2021; Xu, Z. et al., 2020; Khalili, S. M. et al., 2017; Chowdhury, M. M. H. & Quaddus, M., 2017
Distribution transparency	Creating trust and transparency towards the	Preparedness, adaptability	1x Literature review	Raj, A. et al., 2022

	consumers.			Mishra et al., 2021
Monitoring logistics	Monitoring in- and outflow of material **TPLs** (Third Party Logistics) - Transportation **APIs:** - Real time tracking -analysis of disruption	Preparedness, flexibility	2x Literature review:	Raj, A. et al., 2022; Singh et al., 2020
Distribution channels	**Omni-channel models** -Pickup points in B&M stores -Distribution network	Agility, adaptability	1x Literature review:	Sodhi et al., 2021;

(Table 7 - primary activity-based drivers, effects and sources - Elaborate context found in Appendix 9)

6.4.1 Distribution and inventory

The performance of the global supply chain can also be enhanced by examining the strategies regarding distribution and inventory (Sharma, M. et al., 2021). The inventory control strategy refers to the process of being able to handle the unpredictable spikes in demand (Xu, Z. et al., 2020; Panwar, R. et al., 2022; Das, D. et al., 2021). The ability to successfully be able to anticipate the demand of goods is difficult and requires collaboration and knowledge, which is useful in order to reduce or completely prevent a situation without any stock (Sharma, M. et al., 2021; Xu, Z. et al., 2020). Redundancy in terms of additional inventory is suggested as one of the first responses from an organization towards a disruption as eliminating the risk of no inventory is essential for survival (Khalili, S. M. et al., 2017), but might only be a viable solution to prevent shortage within a short period of time (Sodhi, M. S. et al., 2021), yet it will be a worthy trade-off for multiple organizations to reduce the efficiency compared to solely depending on a singular supplier (Gereffi, G. et al., 2022).

Within the category of machine learning there exists multiple tools that can assist in predicting demand in less than a month, observing retail trends and hereby quickly adjusting the inventory forecast accordingly (Panwar, R. et al., 2022). The resilience of the multinational corporation can also be increased by adjusting the current distribution network strategy, which includes expansion of current distribution channels to adjust to the current situation or to meet the increased surge of demand and thereby increase the rate of survival (Sharma, M. et al., 2021). An alternative strategy to meet the requirements of increased demand would be for a production firm to incorporate flexibility alongside the manufacturing process, which would allow the company to focus the production of the goods towards the ones in most demand (Sodhi, M. S. et al., 2021; Chowdhury, M. M. H. & Quaddus, M., 2017). This strategy can besides the actual product also contain the quantity of the product, which could result in the quantity of the product also will be flexible in terms of either units or weight (Sodhi, M. S. et al., 2021).

It has been stated, the effects regarding uncertainty of demand, such as change in buying behavior, misinformation on products and customer overstocking (Raj, A. et al., 2022). Corporations can short term implement a new strategy when discovering change in buying behavior due to disruption, and more specifically when it is discovered in combination with transportation. A transparency solution has been argued, which implies visibility to customers could create trust and cooperation towards customers (Raj, A et al., 2022). Due to covid-19

and its effects a buying behavior change has happened, and example could be MNEs informing their customers regarding transportation, how goods are safely and hygienically transported (Mishra et al., 2021).

6.4.2 Logistics

It has been argued capabilities within logistics have to change, due to the unavailability and delays within the transportation and distribution networks experienced during the pandemic. The delays and unavailability within these networks have caused organizations to focus on the capabilities connected to these, with the purpose of creating sustained strategies for the future. Issues of challenge within logistics are vehicle unavailability and delays (DVU) and Delay in Delivery (SDD)(Raj, A. et al., 2022).

Undergoing the consequences of Covid-19 a direct focus upon the transparency within the material in- and outflow and the machinery connected to these has been deemed important (Raj, A. et al., 2022). A general solution towards distribution challenges has been innovative alternatives, such as omni-channel models, which could include solutions being able to be implemented short-term as smart pickup points in brick-and-mortar stores. This has proven to create the distribution network resilient due to the customers having options for ordering products (Sodhi et al., 2021).

MNEs in possession of their own transportation vehicles must consider that logistics is one of the primary elements of their operations, and therefore must maintain its transportation suitable to potential disruptions, which often will be a long-term strategy (Raj, A. et al., 2022). In some cases, an automatization of transport could be a solution in times of disruptions and a point-to-point automatization of goods could create less dependence on human capital (Singh et al., 2020). Firms that do not possess their own transportation vehicles, a solution could be a reconfiguration of logistic systems within the internal supply chain. In the aftermath of covid-19 MNEs has been looking into Third Party Logistics (TPLs) to ensure the transportation of goods, despite the disruptions. With the usage of TPLs the MNEs has the opportunity to focus entirely upon their core competencies and secure their logistics elsewhere (Raj, A. et al., 2022).

In correlation to the two previous sections, whether the corporation owns transportation or not, technology solutions have been suggested. The Application Programming Interfaces

(APIs) can assist MNEs in real-time tracking and enable them to analyze disruptions within their own logistics (Raj, A. et al., 2022).

6.5 Political factors

Drivers	**Applications**	**Effects**	**Context**	**Sources**
Political influence	Stimulus checks and governmental support for selected MNE's to reshore.	Robustness, adaptability	2x Case studies: 1x Literature review:	Das, D. et al., 2021 Liu, Y. et al., 2020 Kano, L. et al., 2022 Sodhi, M. S. et al., 2021

(Table 8 - political based drivers, effects and sources - Elaborate context found in Appendix 10)

Resilience can also be achieved outside the value chain, which is based on the political influence. Multiple exogenous shocks cause a significant impact to several countries around the globe, which enforces governments to yield support in order to continue the daily operation of organizations. The assistance provided can have a significant impact when a company experiences a catastrophic event, and the business-friendly declarations can be used for a company to avoid bankruptcy. The implementation of these policies does often concern companies regarding their size as they all contribute to growth and stabilizing the nationwide economy (Das, D. et al., 2021). The stimulus checks are furthermore being distributed to minimize the effects of the disruption and thereby increasing the rate of recovery, but also enhances the resilience on a social level of the country and organization (Liu, Y. et al., 2020). The concept of financial support also inspires encouragement to endure the crisis and recover the supply chains, which also may occur in terms of lowered tariffs to maintain the global connections of the firms within the country (Liu, Y. et al., 2020).
The political influence is varying depending upon the market where the corporation operates, but if it is involved in medicine or likewise a key activity that can assist in solving the disruption. Throughout the pandemic, collaboration within the health area has been heavily

influenced by governments, WHO, and several research institutes. These have aided the process of producing the required products for downscaling and recovering from the exogenous shock (Kano, L. et al., 2022).

The political support after the outbreak of Covid-19 is also affecting aspects of manufacturing (Sodhi, M. S. et al., 2021), as Joseph Biden has proposed to employ drastic reforms to relocate the production of critical products within the United States. His goal is to ensure that America does not experience a lack of vital goods when the next crisis emerges and intends to deploy all available assets and power to reach this agenda (Biden, 2022). On a smaller scale, states such as South Carolina and Texas are motivating organizations to reshore a proportion of their overall outsourced manufacturing sites (Sodhi, M. S. et al., 2021).

As the nature of global value chains is based on efficiency it might not be a financially viable solution to simply inshore every aspect of manufacturing, which leads to performing a more hybrid strategy being more lucrative based on political involvement and incentives. This can be obtained by establishing a domestic facility with the capability to endure health emergencies and yet in stable times primarily achieving economies of scale by utilizing from the outsourced manufacturing sites (Sodhi, M. S. et al., 2021). An important factor to consider as a corporation is the responsiveness the company has towards surging demands, which means that those who produce and sell vital goods for a society to thrive should prioritize partly reshoring higher than companies providing non-essential goods (Sodhi, M. S. et al., 2021).

7. Discussion

The aim of this research is to derive applicable strategies from the located theories, drivers and factors in the findings section that can enhance the level of resilience for corporations. Furthermore, the findings do not cancel each other, which enables the possibility for a MNE to implement almost all of the suggested changes. The contribution of the findings will also include their weight of evidence, which is based on how the individual studies within the findings section was conducted, whereas the requirement has been determined being various research methods as literature review, case, cross-sectional, experimental, or longitudinal study.

The literature is scattered, whereas the general impression after conducting this study is due to the concept of resilience being a collection of multiple business-related areas and this makes it hard to grasp firmly by just one term. Resilience is constructed by different terms and phases as previously mentioned in the conceptualization and theory section, but also regarding the different disruptive events, which also affects different parts of the organization. To apprehend this multidimensional complex structure and simplify it, in this discussion section the firms will firstly have to identify their need for resilience, which is an essential prerequisite. After assessing this the table of sufficient evidential drivers can be applied to achieve the sought effect to increase the level of resilience within this area. An important note is that the effect described in the figures vary depending on when the firm begins the process of becoming resilient, which can be referred to as whether the corporation is acting pro- or reactively. Nearly all drivers can be categorized as contributing to the preparedness of the corporation if implemented before the event occurs but will not fit into that specific category if implemented during a shock.

7.1 Risk assessment

The first step towards becoming more resilient or robust as an organization is determining the need for resilience, which is done by assessing the potential risks of disruption (Colicchia, C. et al., 2019). The assessment will, due to recent increase of interest, most likely be based on the pandemic, but can also be due to the organization having identified change in the environment. The last aspect does however require that the firm has installed measurement tools, policies or contact with the entire supply chain in order to detect these changes (Colicchia, C. et al., 2019;Scharte et al., 2014).

The chance of experiencing a pandemic or a likewise event with the same effects again is very low based on history of the past century (Srinivas, n. d.), but the cost is also significantly higher than merely experiencing a few suppliers losing electricity for a week or a shipment of cargo being delayed by a month.

7.2 Which drivers should companies implement?

Drivers:	Preparedness	Robustness	Flexibility	Agility	Adaptability
Collaboration	X	X	X	X	X
Redundant resources		X	X		
Knowledge	X			X	
Asset management			X	X	
Just-in-case	X	X			
Crisis team	X			X	
Dynamic Pricing				X	
Reshoring	X				X
Local sourcing				X	
Multi-sourcing	X	X			
Global Talent Management	X				X
Hiring	X		X	X	X

Common purpose	X				X
Information security	X	X			
Flexibility solutions	X		X	X	X
Visibility/transparency	X		X	X	
Automation	X				X
Technological innovation	X				X
Inventory control strategy	X		X	X	
Political influence		X			X

(Table 9 - Proposed implemented drivers)

The above standing table can be seen as a pick and choose depending on the need of the company based on the effect that needs to be enhanced in order to gain resilience towards the risk identified throughout the risk assessment.

Creating collaboration between the parties with interest and aligning creates the foundation for establishing the strategy and level of resilience the corporation wants to achieve, which eventually can be influenced by the risk assessment and can therefore potentially contain all aspects of resilience. Nevertheless, this driver is not solely used to create resilience as it is very general, but it is more a general approach that could be the solution to several issues within a MNE. This driver could be interpreted as a prerequisite as it would be hard to implement resilience if those who lead the corporation have divided interest, which would

lead to disagreements with multiple other drivers as establishing a base of redundant resources to cope with disruptions.

The conceptualization of resilience defines the term robustness as a prerequisite for becoming resilient, but the sole contribution of robustness, which could be redundant resources. However, it is only sufficient enough to enable the firm to endure a minor shock, but this may also only be the risks assessed by the corporation. Establishing a general reserve of redundant resources is a step towards resilience since it will allow the firm to short-term operate as usual as there is now a possibility to alternative sourcing due to liquid assets or consuming the storaged critical goods. Choosing other suppliers also leverages the firm's degree of flexibility, but this most likely increases the cost of goods, which may result in the corporation needing to implement dynamic pricing. The prices and possibility of sourcing will vary depending on the suppliers' experiencing disruptions, as it will rarely be possible to simply source advanced technological goods of major importance from secondary suppliers, which is why storing important parts is important. Nevertheless, storage will eventually be depleted, especially if the duration is at the same length as the pandemic.

Solving this issue will require the firm to reconfigure parts of the physical aspect of their value chain, which can be done by reshoring the manufacturing of vital goods or sourcing it from different geographical locations. Companies could potentially also source it locally, but there might not be a company with the scale being able to fulfill this demand, which is an analysis each MNE must do for themselves alongside the cost-benefit analysis of reshoring versus not being able to have that product. It is a large equation and is very dependent on the specific situation but avoiding the case of the German automobile industry during Covid-19 is however essential, as not being able to complete any products for a year is for most companies too damaging (Ewing & Clark, 2021). If the MNE supplies vital goods for the functioning of their country, there might also be political incentives for the relocation.

MNE's often has a very high number of suppliers, whereas the risk can be mitigated by adapting the firm and hereby implementing advanced technological tools such as AI and 3D-printing, whereas the last one mentioned will allow the corporations to either baseline produce some of the parts, but also just to produce the exact components that are delayed. It might result in increased up-front cost but becoming less dependent on suppliers and saving transportation cost make it an efficient and resilient implementation. The effect of this strategy will furthermore be enhanced by applying an IoT solution that closely monitors the

trends and hereby readjusting the produced/supplied quantity, which however only is possible for non-technological goods. Hiring supply chain agents is an alternative or complementary solution in addition to the inventory control but can however also report other occurring irregularities, it is however also more costly. Whether or not supply chain agents will be a part of the resilience strategy, the findings emphasize upon the need for increased transparency alongside the value chain, whereas these agents can enhance this suggestion, but it can also be generated through IT-systems and

This effect is also being created or enhanced by the previously mentioned drivers as inventory control as it enables the firm to rapidly respond to volatility, but the focus needs to be regarding all the information flow to even the smallest suppliers as their goods are relevant to have a thriving system. Increased monitoring and IT systems in general will function as warning systems, which will reduce the level of human interaction and hereby also reduce the risk of employees creating internal errors that lead to malfunctioning. If a disruption occurs and the issue instead concerns not being able to distribute the goods, then dynamic competitiveness can be regained by creating smart pick-up points, vice versa if the customers usually pick-up the goods at pick-up locations and are not able as seen during the pandemic, an agile response would be to deliver the goods at the doorstep. Furthermore, if the firm is experiencing high volatility, it can apply a dynamic pricing strategy to mitigate the risks involved.

To enhance the rate and chance of recovery the corporation needs to leverage the resources and capabilities the firm possesses. The dynamic managerial capabilities refer to the act of collaboration internally and allowing the managers to create as much value as possible from the existing resources, but also enabling the generation of new ones. Increasing the value of the firm can be done by directing the focus onto stable markets and hereby reducing the uncertainty. Another aspect of improving the degree of resilience is through HR, whereas the key aspect is preparing the employees. Monitoring the rapid flow of information and knowledge contributes to a more effective unit as it can be applied to train the subsidiaries and can be acquired externally as well but gaining local knowledge to properly adjust to the environment. Utilizing the online platforms also increases the risk of security breaches, which already is a significant risk for multiple MNE's, especially if they operate with sensitive personal or R&D data, whereas this threat can be mitigated by introducing policies and authentication. Increasing the human capital is generating innovation and hereby performance as it allows the developed knowledge to be utilized, which results in increasing both

resilience and efficiency. The findings suggest that the effect of human capital is enhanced if the company manages to create an identity with strong values and purpose.

7.3 Which drivers require further research?

Drivers:	Preparedness	Robustness	Flexibility	Agility	Adaptability
Co-opetition	X				
Postponement strategy		X			
Dynamic Environment			X		X
Risk sharing		X			
Locating facilities					X
Protection	X	X			
Constructive sensemaking	X				
Behavioral training	X				
Distribution transparency	X				X
Monitoring logistics	X		X		
Distribution channels			X		X

(Table 10 - Further research drivers)

Throughout the conducted literature review and in the identification of drivers, a set of insufficient evidential drivers has been acquired. It is worth discussing these drivers within the conceptualized aspects of resilience, to gather knowledge of gaps within the literature. As mentioned in the systematic literature approach this study has been based on a set of search terms and furthermore the usage of references to discover gaps within the primary conducted search. A reason for keeping these drivers relevant towards the identification of resilient drivers, is based on the possibilities of both gaps within the searched literature and the possibilities of these drivers being used outside the conducted search scope. The drivers found could function as a guide for further research, for the purpose of other study areas than MNEs and global value chains combined. It could be argued that the foundations for these drivers such as, preparedness and robustness could be used with another purpose than resilience to global value chains.

This section includes the driver dynamic environment, which is an exception based on how this study has weighed the evidence. Adapting to the current environment is a vital part of recovering, which was seen frequently during the pandemic as the physical interaction moved to online platforms and the employees started working from home. Even though this topic was not examined sufficiently throughout the literature, it was a common approach used by corporations, which might be due to how basic the concept is.

8. Conclusion

The problem definition of this research is: *How can MNE's become more resilient?*

This answer to this has been derived through three research questions and the first was defining organizational resilience, which is a firm's ability to anticipate, endure and recover from uncertainties. These three stages are being leveraged by the MNE's level of preparedness, robustness, flexibility, agility and adaptability. The second question is identifying drivers that can generate or increase the level of resilience, which has been located through conducting a systematic literature review of 90 publications.

Within the publications there have been 31 drivers, which has been used to answer the third question about implementation of these drivers based on evidential weight. Based on this study it has been determined that the drivers needed two varying research methods before it is eligible for implementation, which has resulted in locating 20 drivers and these each have unique traits and concerns different disruptive events and aspects within the corporation. MNE's can become more resilient by firstly performing a risk assessment, which will determine the level of resilience required to continue their operations and will be achieved by implementing the specific drivers enhancing contributing to the firm's desired level of resilience.

The second aspect of the third research question was determining whether additional research was required before the drivers are eligible for implementation based on this study's requirement for sufficient evidence. 11 drivers have been excluded as resilient drivers for now but could become a part of corporations resilience strategies going forward if further research is being conducted.

9. Further research

The study has provided insight and an overview of the fractured literature on resilience, but to provide guidelines with a higher level of evidence requires additional research. This study draws upon enough literature to determine areas that can be used to build and generate resilience within a corporation, but this study was aimed at MNE's and disruptive events in general, which makes the guidelines common instead of firm-specific, which is at what level it will be implemented. The concept of resilience and risk reduction has been around for some time, but it has just recently due to Covid-19 gained a significantly higher amount of interest, which also results in multiple areas not being sufficiently investigated yet. (The primary literature applied in this study is also based on literature reviews, which creates a gap between the theory and practical gathered knowledge. This leads to the term resilience within this area is in need of additional case, cross-sectional, experimental, or longitudinal studies)

Future research could be conducted by examining a specific driver and measuring the effect of multiple firms within the same or different sectors implementing it, as this would create the required knowledge for a higher evidential judging of the effect of the strategy. This could both be done by looking at the increase of the resilience level, but also to what degree the efficiency eventually is lowered within in order to achieve it. Creating this will leave corporations with insight into the cost-benefit equation of each driver, which will make it easier to implement resilience and the most suitable for the corporation's risk profile.

Another aspect of increasing the level of evidence within the IB literature would be to conduct a study and create a list of specific strategies based on potential relevant exogenous shocks, which also works complimentary with the previous suggested potential future research topic. This study has created the foundation of conducting that type of research as it states a long list of potential drivers and categorizing them with the shocks will make the topic easier to apprehend, especially since MNE's possess varying degrees of risk towards events.

Throughout the empirical gatherings within the literature review there has been multiple findings and drivers with a lower degree of evidential weight. Further research could be examining these areas and adding other research methods in order to heighten the weight of evidence.

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11. Appendix

Appendix 1: Literature Review (Primary Search)

Article #	Title	Author	RQ/Aim/Purpose	Conceptualization/Theory	Method	Data/Context	Findings	Further Research Suggestions	Themes
Article 1	Where is supply chain resilience rese	Ali, I. & Golgeci, I.	This paper algorithmically and c	Supply chain theory	Research, Literature Review	Qualitative	Supply Chain Resilier	There is gaps within the litera	Supply Chain Resilience, Barrie
Article 2	Internalization theory for the digital e	Banalieva, E. R. &	The study of internationalizatio	Simon's near-decomposability	Literature Review	Qualitatve	Digital networks is lik	N/A	Digitalization, Internationaliza
Article 3	Manufacturing and service supply ch	Belhadi, A. et al.	This study gives insight into imp	Supply Chain Resilience theory	Literature Review	Qualitative & Quantitative	Short and long term	Focus on more empirical evid	Manufacturing, Service, Suppl
Article 4	Innovation in logistic services and th	Chapman, R. L. et	Examines factors that nurture ir	Logistic innovation	Literature Review	Qualitative & Quantitative	Logistic organisations	are redesigning their structures	and relationships and creat
Article 5	A case study on strategies to deal wi	Chowdhury, M. T.	The investigation of impacts fro	ROI, GDP	Multiple-Case-Study in bang	Qualitative	Short-term impacts c	Explore the impacts and strat	Short-term, long-term, covid-1
Article 6	Information Security Management: A	Eloff, M. . & von Si	Clarifying the various approachi	Information Security Mangem	Literature Review	Qualitattive	Framework to addre	n/a	Code of practice, certification,
Article 7	Risk management: the next source o	Elahi, E.	How risk management capabilit	Risk management	Research - examples from d	Qualitative	Firms perspective of	risk management is evloving.	Information Security, Location
Article 8	A Post-Covid Outlook: The Future of	Cordon & Buatois	A post covid-19 outlook and fut	Supply Chain Theory	literature Review	Qualitative	ur goals in the med	N/A	Supply Chain Future
Article 9	Supply chain sustainability: A risk ma	Giannakis, M. & P.	Developing operational perspec	Risk managment process	Mixed Methods	Qualitative & Quantitative -	Endogenous envirme	Advance current study by ex	Literature Review: Supply chai
Article 10	Does firm innovativeness enable effe	Golgeci, I. & Y. Po	Investigate the core of relations	Supply Chain Resilience	Experimental	Qualitative - survey of senio	Both innovativeness	N/A	Innovation, Supply chain risk r
Article 11	Supply risk management and compe	Gualandris, J. & K	To develop a model of congruer	Supply Risk	literature Review	Qualitative (Survey, field int	Competitive davanta	Non-linear relationships betw	Supply risk management
Article 12	Supply chain resilience: role of comp	Gunasekaran, A. e	Complexities and proactive mar	Global Souring Strategies	literature Review	Qualitative	A GS resilience frame	Future research on GS strateg	Global Sourcing, Strategies, re
Article 13	Complementary theories to supply ch	Halldórsson, Á. et	Identifing ways which the theor	Supply chain management	Reserach - Literature review	Qualitative	The multi layed natu	N/A	Reserach, Supply chain manag
Article 14	Managing talent to maximize perforr	Heinen, J. S. & O'I	Factors of talent mangement	Talent mangement strategy	Article	Qualitative	Organizations with lc	N/A	Talent Management
Article 15	Untangling Dynamic and Operational	Helfat, C. E. & Wir	Identification of dynamic and o	Dynamic capabilities	Literature Review	Qualitative	Dynamic Capabilities	Research within how dynamic	Dynamic Capabilities
Article 17	Adaptive Fit Versus Robust Transforr	Lengnick-Hall, C. /	The investigation of how organi	Adaptation, adaptive fit, resilie	literature Review	Qualitative	Alternative response	Better understanding of resili	Resilience capacity
Article 18	Logistics-oriented inventory analysis	Lutz, S. et al.	Employment of operating curve	Logistic Procress	literature Review	Qualitative & Quantitative	Methods for establis	n/a	Logistics, supply chain manage
Article 19	Knowledge management and organi	Mafabi, S. et al.	To report findings of the mediation	effect of innovation in the r	Cross-sectional - Mediation	Qualitative - Uganda	Innovation has an eff	Studies in knowledge manage	Knowledge management, orga
Article 20	GLOBAL SUPPLY CHAIN RISK MAI	Manuj, I. & Mentze	Purpose of the study is to integ	Supply Chain Resilience	Literature Review	Qualitative	Model for supply cha	Address the issue of how the	Logistics, supply chain manage
Article 21	Impact of disruptions in agri-food su	Mishra, R. et al.	Aims to assess the role of suppl	Dynamic Capability Theory	Analysis - Situation-actor-pr	Qualitative - case study (ind	Flexibility amongst a	Focus on rigorous analysis of	India, Case study, Souring and
Article 22	Manufacturing in the Time of COVID-	Okorie, O. et al.	Identifying manufacturing resili	Resilience in manufacturing	Survey - Analysis	Qualitative - Survey on emp	A offer to practitione	n/a	Digital technologies, manufact
Article 23	A production recovery plan in manufa	Paul, S. K. & Chov	Aim to develop a recovery model	for making a decision on the	Mathematical modeling app	Quantitative	The developed recov	Recovery plan, supply chain, (	Recovery, decision making
Article 24	Impacts of epidemic outbreaks on su	Queiroz, M. M. et	How does the Operations and s	Supply Chain Theory	Systematic Analysis	Qualitative - Systematic liter	Framework of OSCM	enrich OSCm by methods fro	Supply Chain, litterature revie
Article 25	Stakeholder Perceptions of Offshorin	Robertson, C. J. e	Examination of how stakeholde	Offshoring, Outsouring theory	literature Review	Qualitative	Using vignettes it is found thath respondents viewe		Information Security, Location
Article 26	Centrifugal and Centripetal Forces in	Sheremata, W. A.	How can organizations become	Product development, innovat	Analysis	Qualitative	Centrifugal and centi	n/a	New production development
Article 27	Global Supply Chains in a Post-Panc	Shih, W. C.	Identifying hidden vulnerabilitie	Resilient networks	Analysis	Qualitative	With the mapping of	n/a	Alternative supply, Product str
Article 28	Impact of COVID-19 on logistics syst	Singh, S. et al.	The study aims to develop simu	Public Distribution System (PD	literature Review	Qualitative & Quantitative	Simulation model cai	Mathematical and statistical	approaches can be adopted to
Article 29	The power of flexibility for mitigating	Tang, C. & Tomlin,	How much flexibility is needed (	Flexibility, Risk reductio	Analysis	Qualitative & Quantitative	Framework and 5 sty	Future research would exami	Supply chain disruption, suppl
Article 30	Identifying risk issues and research	Tang, O. & Nurma	Investigate the research develo	Supply chain risk	Citation/co-citation analysis	Qualitative	Potential risk involve	Quantitative models within Sc	Flexibility, framework, Risk Re
Article 31	Explicating dynamic capabilities: the	Teece, D. J.	The paper identifies the necess	Social and behavioral sciences	Analysis	Qualitative	Dynamic Capabilities	n/a	Innovation Business ecosysten
Article 32	Lessons Learned from the COVID-19	Zhu, G. et al.	Addressing the relationship bet	Supply chain theory	Analysis	Qualitative & Quantitative	To protect supply cha	Comparison of countries whe	Supply chain disruptions, risk
Article 33	A Supply Chain View of the Resilient Ent	Yossi Sheffi, J. B. R. J	The abilities in quickly recovery	Supply chain theory	Case study	Qualitative - Survey - Intervi	The recovering from	n/a	Supply Chain Management
Article 34	How resilience works	Coutu, D. L.	The identification of resilience	Resilience theory	Literature Review	Qualitative	Resilience is neither	N/A	Resilience theory
Article 35	The Power of Moral Purpose: Sandler O'	Freeman, S. F et al.	A case of Sander O'Neill & Partr	Moral Purpose, Resilience	Case study	Qualitative	The term resilience	N/A	Resilience, case study
Article 37	Integrated production–distribution plar	Khalili, Seyed Moham	Aim is to introduce a	Supply Chain Resilience	Literature Review	Qualitative and Quar	novel two-stage scen	Accounting for multiple concur	Distribution Planning, Supply Ch
Article 38	Uncovering the impact of COVID-19 on	Hirata, Enna	This research aims to analyzed through machine learni		Literature Review	Qualitative	The research results i	What measures are necessary t	Machine Learning, Digitalizatio
Article 39	Supply chain resilience: Conceptualizati	Chowdhury, Md Mari	Following a continger	Dynamic Capabilities, Supply Cha	Literature Review	Qualitative	SCRE is a multidimen	Investitage the consequences o	Risk, Measurement instrument
Article 40	Aligning supply chain design for boostir	Sáenz, María Jesús; R	Creating consensus o	Resilience, Supply Chain Design	Survey WorldWide	Qualitative and Quar	a framework that dep	N/A	Supply Chain Vulnerabilities, Di
Article 41	The preliminary supply chain lessons of	Hald, Kim Sundtoft, C	This research seeks t	Technology in Supply Chain Desig	Literature Review	Qualitative	the study contributes	future research should seek to	Supplychain vulnerabilities, six
Article 42	Managing disruptions and risks amidst	Sharma, M., Joshi, S.,	This study attempts t	Assesments of sourcing, lean, wc	Literature Review	Qualitative and Quar	The findings exhibit t	N/A	Technology, Food Supply Chains
Article 43	Building supply chain resilience in the e	Das, D., Datta, A., Kur	The purpose of the p	Multi-criteria decison approach	Case Study	Qualitative	Cost Optimization is themost significant factor, while		Risk Resilient framework, HR (d
Article 44	Supply chain resilience for performance	Chowdhury, Md Mari	Following a continger	Global Supply Chain, RBV, Resilie	Case Study	Qualitative and Quar	revealed that SCRP ai	N/A	Contingent RBV, SCM Performa
Article 45	The impact of information security initi	P.N, Sindhuja.	The purpose of the p	Information Security, Robustness	Cross-Sectional	Qualitative and Quar	Results of this study i	Future studies should exclusive	Information Security, Supply ch
Article 46	Governance of global value chains after	Pla-Barber, J., Villar, C	This article depicts h	GVC, Resilience, reliability, Globa	Literature Review	Qualitative and Quar	In developed econon	Global value chains and the cha	Digitalization, GVC, Governance
Article 47	Research opportunities in preparing su	Sodhi, M.S., Tang, C.S	We begin this paper l	Supply Chain Resilience, Reshorir	Literature Review	Qualitative	propose a research agenda and opportunities to deve		GSC, preparedness, resilience
Article 48	Terrorism as an external threat factor ir	Bader, Benjamin; Sud	To provide a framewc	Resilience Theory, GVC	Literature Review	Qualitative	Resilience theory frai	Long term effects and different	Terrorism
Article 49	COVID-19: Outcomes for Global Supply	Fonseca, L.M., Azeve	(1) What are the con	Supply Chains / Supply chain mai	Literature Review	Qualitative	successful companie	One possible path would be to	Supply Chain Management, Per
Article 50	Rising regionalization: Will the post-CO	Enderwick, P., Buckley	. We believe that the	Globalization	Literature Review	Qualitative	This paper suggests t	N/A	Globalization, Regionalization
Article 51	The rising tensions between efficiency	Gölgeci, I., Yildiz, H.E.	This paper explores t	Efficiency, resilience, GVC	Literature Review	Qualitative	while efficiency and r	N/A	Efficiency, GVC, Resilience Effici
Article 52	Impacts of COVID-19 on Global Supply	Xu, Z., Elomri, A., Kerl	Using a critical readir	Global Supply Chain Resilience	Analysis	Quantatitive and Qu	The analysis pinpoint	N/A	Global Value chain, Resilience
Article 53	The challenges and opportunities of a g	Liu, Yipeng; Lee, Jong	In this paper, we first	Resilience, Strategic Agility, Entre	Case study	Qualitative and Quar	In brief, COVID-19 ha	A deeper understanding of the	CHINA, GVC, Impact on econon
Article 54	Developing a capacity for organizati	Lengnick-Hall, C. A	Investigate organizati	Human Resources	literature Review	Qualitatve	Organizations capacit	A Better understanding of HRM	Organizational Resilience, Strat
Article 55	Outsourcing, offshoring and the c	Strange, R. & Magnar	The identification an	Offshoring, Outsourcing	Literature Review	Qualitative	Technologies become	n/a	Offshoring, Outshoring

Appendix 2: Literature Review (Articles located in references)

Article #	Title	Author	RQ/Aim/Purpose	Conceptualization/Theory	Method	Data/Context	Findings	Further Research Suggestions	Themes
Article 1	Where is supply chain resilience rese	Ali, I. & Golgeci, I.	This paper algorithmically and c	Supply chain theory	Research, Literature Review	Qualitative	Supply Chain Resilier	There is gaps within the litera	Supply Chain Resilience, Barrie
Article 2	Internalization theory for the digital e	Banalieva, E. R. &	The study of internationalizatio	Simon's near-decomposability	Literature Review	Qualitatve	Digital networks is lik	N/A	Digitalization, Internationaliza
Article 3	Manufacturing and service supply ch	Belhadi, A. et al.	This study gives insight into imp	Supply Chain Resilience theory	Literature Review	Qualitative & Quantitative	Short and long term	Focus on more empirical evid	Manufacturing, Service, Suppl
Article 4	Innovation in logistic services and th	Chapman, R. L. et	Examines factors that nurture ir	Logistic innovation	Literature Review	Qualitative & Quantitative	Logistic organisations	are redesigning their structures	and relationships and creat
Article 5	A case study on strategies to deal wi	Chowdhury, M. T.	The investigation of impacts fro	ROI, GDP	Multiple-Case-Study in bang	Qualitative	Short-term impacts c	Explore the impacts and strat	Short-term, long-term, covid-1
Article 6	Information Security Management: A	Eloff, M. . & von Si	Clarifying the various approachi	Information Security Mangem	Literature Review	Qualitattive	Framework to addre	n/a	Code of practice, certification,
Article 7	Risk management: the next source o	Elahi, E.	How risk management capabilit	Risk management	Research - examples from d	Qualitative	Firms perspective of	risk management is evloving.	Information Security, Location
Article 8	A Post-Covid Outlook: The Future of	Cordon & Buatois	A post covid-19 outlook and fut	Supply Chain Theory	literature Review	Qualitative	ur goals in the med	N/A	Supply Chain Future
Article 9	Supply chain sustainability: A risk ma	Giannakis, M. & P.	Developing operational perspec	Risk managment process	Mixed Methods	Qualitative & Quantitative -	Endogenous envirme	Advance current study by ex	Literature Review: Supply chai
Article 10	Does firm innovativeness enable effe	Golgeci, I. & Y. Po	Investigate the core of relations	Supply Chain Resilience	Experimental	Qualitative - survey of senio	Both innovativeness	N/A	Innovation, Supply chain risk r
Article 11	Supply risk management and compe	Gualandris, J. & K	To develop a model of congruer	Supply Risk	literature Review	Qualitative (Survey, field int	Competitive davanta	Non-linear relationships betw	Supply risk management
Article 12	Supply chain resilience: role of comp	Gunasekaran, A. e	Complexities and proactive mar	Global Souring Strategies	literature Review	Qualitative	A GS resilience frame	Future research on GS strateg	Global Sourcing, Strategies, re
Article 13	Complementary theories to supply ch	Halldórsson, Á. et	Identifing ways which the theor	Supply chain management	Reserach - Literature review	Qualitative	The multi layed natu	N/A	Reserach, Supply chain manag
Article 14	Managing talent to maximize perforr	Heinen, J. S. & O'I	Factors of talent mangement	Talent mangement strategy	Article	Qualitative	Organizations with lc	N/A	Talent Management
Article 15	Untangling Dynamic and Operational	Helfat, C. E. & Wir	Identification of dynamic and o	Dynamic capabilities	Literature Review	Qualitative	Dynamic Capabilities	Research within how dynamic	Dynamic Capabilities
Article 17	Adaptive Fit Versus Robust Transforr	Lengnick-Hall, C. /	The investigation of how organi	Adaptation, adaptive fit, resilie	literature Review	Qualitative	Alternative response	Better understanding of resili	Resilience capacity
Article 18	Logistics-oriented inventory analysis	Lutz, S. et al.	Employment of operating curve	Logistic Procress	literature Review	Qualitative & Quantitative	Methods for establis	n/a	Logistics, supply chain manage
Article 19	Knowledge management and organi	Mafabi, S. et al.	To report findings of the mediation	effect of innovation in the r	Cross-sectional - Mediation	Qualitative - Uganda	Innovation has an eff	Studies in knowledge manage	Knowledge management, orga
Article 20	GLOBAL SUPPLY CHAIN RISK MAI	Manuj, I. & Mentze	Purpose of the study is to integ	Supply Chain Resilience	Literature Review	Qualitative	Model for supply cha	Address the issue of how the	Logistics, supply chain manage
Article 21	Impact of disruptions in agri-food su	Mishra, R. et al.	Aims to assess the role of suppl	Dynamic Capability Theory	Analysis - Situation-actor-pr	Qualitative - case study (ind	Flexibility amongst a	Focus on rigorous analysis of	India, Case study, Souring and
Article 22	Manufacturing in the Time of COVID-	Okorie, O. et al.	Identifying manufacturing resili	Resilience in manufacturing	Survey - Analysis	Qualitative - Survey on emp	A offer to practitione	n/a	Digital technologies, manufact
Article 23	A production recovery plan in manufa	Paul, S. K. & Chov	Aim to develop a recovery model	for making a decision on the	Mathematical modeling app	Quantitative	The developed recov	Recovery plan, supply chain, (	Recovery, decision making
Article 24	Impacts of epidemic outbreaks on su	Queiroz, M. M. et	How does the Operations and s	Supply Chain Theory	Systematic Analysis	Qualitative - Systematic liter	Framework of OSCM	enrich OSCm by methods fro	Supply Chain, litterature revie
Article 25	Stakeholder Perceptions of Offshorin	Robertson, C. J. e	Examination of how stakeholde	Offshoring, Outsouring theory	literature Review	Qualitative	Using vignettes it is found thath respondents viewe		Information Security, Location
Article 26	Centrifugal and Centripetal Forces in	Sheremata, W. A.	How can organizations become	Product development, innovat	Analysis	Qualitative	Centrifugal and centi	n/a	New production development
Article 27	Global Supply Chains in a Post-Panc	Shih, W. C.	Identifying hidden vulnerabilitie	Resilient networks	Analysis	Qualitative	With the mapping of	n/a	Alternative supply, Product str
Article 28	Impact of COVID-19 on logistics syst	Singh, S. et al.	The study aims to develop simu	Public Distribution System (PD	literature Review	Qualitative & Quantitative	Simulation model cai	Mathematical and statistical	approaches can be adopted to
Article 29	The power of flexibility for mitigating	Tang, C. & Tomlin,	How much flexibility is needed (	Flexibility, Risk reductio	Analysis	Qualitative & Quantitative	Framework and 5 sty	Future research would exami	Supply chain disruption, suppl
Article 30	Identifying risk issues and research	Tang, O. & Nurma	Investigate the research develo	Supply chain risk	Citation/co-citation analysis	Qualitative	Potential risk involve	Quantitative models within Sc	Flexibility, framework, Risk Re
Article 31	Explicating dynamic capabilities: the	Teece, D. J.	The paper identifies the necess	Social and behavioral sciences	Analysis	Qualitative	Dynamic Capabilities	n/a	Innovation Business ecosysten
Article 32	Lessons Learned from the COVID-19	Zhu, G. et al.	Addressing the relationship bet	Supply chain theory	Analysis	Qualitative & Quantitative	To protect supply cha	Comparison of countries whe	Supply chain disruptions, risk
Article 33	A Supply Chain View of the Resilient Ent	Yossi Sheffi, J. B. R. J	The abilities in quickly recovery	Supply chain theory	Case study	Qualitative - Survey - Intervi	The recovering from	n/a	Supply Chain Management
Article 34	How resilience works	Coutu, D. L.	The identification of resilience	Resilience theory	Literature Review	Qualitative	Resilience is neither	N/A	Resilience theory
Article 35	The Power of Moral Purpose: Sandler O'	Freeman, S. F et al.	A case of Sander O'Neill & Partr	Moral Purpose, Resilience	Case study	Qualitative	The term resilience	N/A	Resilience, case study

Appendix 3: Finance drivers

6.1.1 Finance	Driver:		Context:
	Collaboration		Cross-sectional analysis of: 102 supply chain executives in Malaysia Literature reviews on: Global Supply Chain Risk, Supply Chain Resilience, Mitigating Strategies, Operational efficiency, Market Effectiveness, Financial Resilience
	Redundant Resources		Case studies, surveys and interviews on: Disruptions in supply chains, Decision making in supply chains Literature reviews on: Robustness approach, Operational efficiency, Market effectiveness, Financial resilience, Covid-19 impacts on global value chains, Risk management

Appendix 4: Capability drivers

6.1.2 Capabilities	Driver:		Context:
	Knowledge		Cross study on: Large scale european firms (eurostat) Cross sectional analysis: Knowledge management & Organizational resilience Survey: Logistics, supply chain & operations managers (US & EU)
	Asset Management		Cross sectional analysis: 854 MNE's regarding dynamic managerial capabilities Cross sectional survey: 600 Supply chain managers Literature review on: In-crisis performance, financial performance Location strategies and supply chain sustainability risk Longitudinal case study: 12 years duration of development in capabilities to achieve flexibility

Appendix 5: Strategic management drivers

6.1.3 Strategic Management	Driver:		Context:
	Co-opetition		Case study: manufacturing employees in Uganda
	Just-in-case		Cross sectional analysis: Effects of innovation on risk management capabilities Literature reviews: Operational performance, Robustness approach in supply chains
	Postponement Strategy		Literature review: Location strategies
	Partner Selection		Survey: Logistics, supply chain and operations managers (US & EU)
	Crisis Team		Case study: 3 automotive manufacturing companies Survey: Logistics, supply chain and operations managers (US & EU) Literature review: Future business operations and strategies in resilience supply chains

	Dynamic enviorment		Case study: 3 automotive manufacturing companies
	Dynamic Pricing		Case study: 1 MNE with significant presence in Asia, Europe and America. Production of over 300 brands. Literature review: Retail supply chains Future business operations and resilience strategies
			Literature review: Location strategies, supply chain sustainability risk Cross-Sectional: Survey with 600 SC Managers
	Risk Sharing strategy		Literature review: Location strategies, Global Value Chains and the impacts of Covid-19
	Location facilities		Literature review: Global terrorism impacts on Global value chains
	Protection		Literature review: Global terrorism impacts on Global value chains

Appendix 6: Location planning drivers

6.1.4 Location Planning	Driver:		Context:
	Reshoring		Case Study: 90.000 employees within medical equipment survey Literature review: Offshoring & Outsourcing, Regionally economic benefits, Alternative Location strategies
	Local sourcing		Survey: World wide survey on 1304 supply chain managers Case study: Multiple case study of companies in bangladesh food and beverage industry Literature review: Covid-19 impacts world wide, Supply chain resilience, Production planning
	Multi-sourcing		Case study: Multiple case study of companies in bangladesh food and beverage industry Literature review: Covid-19 impacts world wide, Manufacturing challenges due to covid-19, Vulnerabilities in supply chains due to covid-19, Supply chain risk and mitigating strategies, Flexibility and supply risk, prolonged shortage of products in the US

Appendix 7: Human resources drivers

6.2 Human Resources	Driver:		Context:
	Global Talent Management		Cross sectional analysis of: 166 Korean MNEs, 1227 foreign subsidiaries, 293 regional headquarters in 49 host countries 103 developing and transition countries Literature review: Talent management Human capital in foreign direct
	Hiring		Cross sectional analysis: 103 developing and transition countries, Effect of innovation on risk management capabilities Literature review: Human capital on foreign direct investments, Operations and supply chain management,
	Common purpose		Literature review: Resilience identifications, innovation in logisitics Case Study: Organizational recovery after 9/11
	Constructive Sensmaking		Literature review: Organizational capabilities for resilience building
	Behavioral Training		Literature review: Organizational adaptation to change and surprises, Organizational ambidextrous in product development
	Information Security		Cross sectional analysis & 112 interviews regarding information security in supply chains Literature review: Robustness and performance in information security, Information security management, Digital risk in global operations, Digital Resilience

Appendix 8: Technology drivers

Technology	Driver:	Context:
	Flexibility Solutions	Case study: Food and beverages industry in bangladesh, impacts of covid-19 Literature reviews: Supply chain planning, Management post covid-19, Vulnerabilities of supply chains under covid-19, Shipping and logistics, Global value chain reconfigurations and location
	Transparency Solutions	Case study: Multiple MNEs on GVCs Literature review: Proactive management, Supply chain resilience, Global supply chain strategies, Risk Reduction, Covid-19 impacts on future supply chains, Shipping & logistics
	Automation Solutions	Case study: 1 MNE with significant presence in Asia, Europe and America. Production of over 300 brands. Literature review: Vulnerabilities in supply chains under covid-19, Global value chain configurations Location Regionally based benefits
	Technological Innovation	Case study: Developing countries Literature review: Digital transformation in resilience, Post-covid-19, Big data & small data, Global value chain decision making

Appendix 9: Primary activity drivers

6.4 Primary Activities	Driver:	Context:
	Inventory Control Strategy	Longitudinal case study: 4 medical supply chains Case study: 1 MNE with significant presence in Asia, Europe and America. Production of over 300 brands. Literature reviews: Future business operations and strategies, Supply chain planning and management, Development of production planning, Dynamic capabilities & Supply chain resilience
	Distribution transparency	Supply chain challenges in manufacturing due to covid-19, Supply chain resilience as a operational excellence view on disruptions
	Monitoring logistics	Literature review: Supply chain challenges in manufacturing, Disruption in food supply chains
	Distribution channels	Literature review: Prolonged shortage of products in the US

Appendix 10: Political drivers

6.5 Political Factors	Driver:	Context:
	Political influence	Case studies: Singapore, korea and china under disruption, 1 MNE with significant presence in Asia, Europe and America. Production of over 300 brands. Literature review: Barriers of relocation and decisions within value chain activities, Prolonged shortage of products in the US