**Kaunas University of Technology**
School of Economics and Business

# The Resilience of Global Value Chains to the COVID-19 Pandemic: The Case of the Apparel Manufacturing Sector

Master's Final Degree Project

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**Kaunas, 2023**

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International Business (6211LX029)

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**Summary**

COVID-19 pandemic had a significant impact on businesses and their global value chains. Restrictions forcing businesses to close, uncertainty, changing consumers behaviour, lack of materials, and bankruptcies are just several examples of the COVID-19 outcomes. Supply chains and whole networks were disrupted, costs of transportation and materials increased. Companies were struggling trying to maintain the business. Although, pandemic also brought some opportunities, such as digitalization or growth of e-commerce. Companies, which managed to take these opportunities, were able to benefit from the current situation and grow.

Companies operating in apparel sector were not an exception and were heavily affected by the disruption, as well. As majority of global value chain activities in apparel industry are based in Asian markets, companies faced serious challenges. Factories in Asia were closing, shortages of materials began, issues related with transportation of goods occurred. To continue the operations, apparel companies had to take certain decisions and reorganize their global value chains.

COVID-19 proved the importance of global value chain resilience. However, literature analysis demonstrated that there is lack of empirical evidence on characteristics of resilient global value chain. For this reason, an empirical study is conducted in this work.

**Research aim** is to identify the characteristics of resilient global value chain which helped apparel companies overcome the COVID-19 pandemic.

There are four **research objectives** to achieve this goal:
1. To justify the problematics of apparel companies global value chain resilience in the context of the COVID-19 pandemic;
2. To analyse theoretical aspects which concern the concept of global value chain, global value chain configuration and management, characteristics of resilient global value chain;
3. To develop a research methodology which helps identify the resilience building strategies that apparel companies were using during the COVID-19 pandemic;
4. To perform an empirical research on apparel companies' global value chains during the COVID-19 pandemic and provide recommendations for building up a resilient global value chain within the apparel industry.

**Research method**. Content-analysis method of qualitative approach was applied. Data from official reports was analysed using the text coding and processing program "MAXQDA".

**Outcome of the study**. The study revealed main actions which apparel companies should take in pursuance to build resilience in their global value chains. Theoretical research distinguished two main

approaches that companies take with such intention: business resilience strategies and global value chain resilience strategies. Theoretical approach suggests that business resilience is built focusing on market orientation, supply chain optimization, strategic corporate reorganization, innovations, and business model transformation. Moreover, global value chain resilience is built via working on the supplier base, financial stress-testing, planning capabilities, manufacturing adaptability and customer spending. Empirical research confirmed the theoretical findings. Specific actions suggested for companies with intention to build resilience in their global value chains were assigned to theoretically analysed strategies. Empirical researched revealed that main actions which apparel companies should focus on are supply chain digitalization, decrease of portfolio complexity and inputs substitutability, shift in manufacturing and inventory strategy, rethinking number and diversification of suppliers, regionalization, growth of e-commerce, responsiveness to shifting consumers behaviour, focus on cashflows and ROI, building redundancy in supplier network and strengthening relationships with company’s suppliers.

Simaitytė, Ernesta. Globalių vertės grandinių atsparumas COVID-19 pandemijai: drabužių gamybos sektoriaus atvejis. Magistro baigiamasis projektas / vadovė prof. dr. Jurgita Sekliuckienė; Kauno technologijos universitetas, Ekonomikos ir verslo fakultetas.

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Reikšminiai žodžiai: atsparumas, globalios vertės kūrimo grandinės, drabužių sektorius, COVID-19.

Kaunas, 2023. 74 p.

## Santrauka

COVID-19 pandemija turėjo reikšmingą įtaką įmonėms ir jų globalioms vertės kūrimo grandinėms. Apribojimai, verčiantys įmones užsidaryti, neapibrėžtumas, besikeičianti vartotojų elgsena, žaliavų trūkumas bei bankrotai yra tik keletas COVID-19 pasekmių, su kuriomis susidūrė verslai. Paveiktos buvo ir tiekimo grandinės, augo žaliavų bei transportavimo kaštai. Įmonės buvo priverstos ieškoti būdų, kaip išlaikyti verslą. Vis dėlto, nepaisant neigiamų aspektų, pandemija sukūrė ir tam tikrų galimybių, tokių kaip elektroninė prekyba ar skaitmenizavimas. Įmonės, kurioms pavyko šiomis galimybėmis pasinaudoti, iš esamos situacijos gavo naudos ir augo net krizės laikotarpiu.

Tekstilės pramonės įmonės buvo ne išimtis ir COVID-19 krizės įtaka joms taip pat buvo reikšminga. Dalis iššūkių buvo susiję su tuo, kad dauguma globalių vertės kūrimo grandinių veiklų šiame sektoriuje vyksta Azijos šalyse. Kadangi gamyklos Azijoje pandemijos metu buvo priverstos sustabdyti veiklą ir užsidaryti, įmonės susidūrė su žaliavų trūkumo ir prekių transportavimo iššūkiais. Tam, kad toliau vykdytų veiklą, tekstilės pramonės sektoriuje veikiančios įmonės buvo priverstos ieškoti naujų sprendimų ir perorganizuoti savo globalias vertės kūrimo grandines.

COVID-19 pandemija įrodė globalių vertės kūrimo grandinių atsparumo svarbą. Vis dėlto, atlikus literatūros analizę, nustatytas empirinių duomenų trūkumas apie veiksnius, įtakojančius globalių vertės kūrimo grandinių atsparumą. Dėl šios priežasties magistro baigiamajame darbe atliekamas empirinis tyrimas, kurio **tikslas** – identifikuoti globalių vertės kūrimo grandinių atsparumo veiksnius, kurie padėjo drabužių sektoriaus įmonėms įveikti COVID-19 pandemiją. Siekiant tikslo, iškelti keturi **uždaviniai**:

1. Pagrįsti globalių vertės kūrimo grandinių atsparumo veiksnių drabužių gamybos sektoriuje COVID-19 pandemijos kontekste problematiką;
2. Išanalizuoti globalių vertės kūrimo grandinių koncepcijos, konfigūracijos, valdymo bei atsparumo veiksnių teorinius aspektus;
3. Parengti drabužių gamybos įmonių globalių vertės kūrimo grandinių atsparumo didinimo strategijų COVID-19 kontekste empirinio tyrimo metodologiją;
4. Atlikti drabužių gamybos įmonių globalių vertės kūrimo grandinių COVID-19 kontekste empirinį tyrimą ir pateikti rekomendacijas apie veiksnius, didinančius globalių vertės kūrimo grandinių atsparumą šiame sektoriuje.

**Tyrimo metodai.** Empiriniam tyrimui atlikti naudota kokybinė analizė, taikant turinio analizės metodą. Duomenys iš oficialių šaltinių apdoroti naudojantis teksto kodavimo programa „MAXQDA".

**Tyrimo rezultatai.** Tyrimas atskleidė esminius globalių vertės kūrimo grandinių atsparumo didinimo veiksnius. Teorinė analizė išskyrė du pagrindinius metodus, kuriuos įmonės taiko: verslo atsparumo didinimo strategijos ir globalių vertės kūrimo grandinių atsparumo didinimo strategijos. Verslo

atsparumo didinimo strategijos sutelkia dėmesį į inovacijas, tiekimo grandinės optimizavimą, orientaciją į rinką, strateginį įmonės perorganizavimą bei verslo modelio transformaciją. Globalių vertės kūrimo grandinių atsparumo didinimas yra susijęs su tiekėjų baze, finansiniu testavimu nepalankiausiomis sąlygomis, planavimo gebėjimais, gamybos pritaikomumu ir klientų išlaidų analize. Empirinis tyrimas patvirtino teorines prielaidas. Konkretūs veiksmai, skirti globalių vertės kūrimo grandinių atsparumo didinimui, buvo priskirti prie teoriškai išanalizuotų strategijų. Empirinis tyrimas parodė, kad, siekiant padidinti atsparumą, įmonės turėtų orientuotis į tiekimo grandinės skaitmenizavimą, prekių asortimento mažinimą ir žaliavų pakaitalų didinimą, pokyčius gamybos ir atsargų strategijose, tiekėjų skaičiaus įvertinimą ir jų diversifikavimą, regionalizaciją, elektroninės prekybos auginimą, greitą reakciją į kintančius vartotojų poreikius, pinigų srautus ir investicijų grąžą, atsarginių tiekėjų paiešką bei santykių gerinimą su esamais tiekėjais.

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# Introduction

## Relevance

The world faces disruptions all the time. However, the COVID-19 pandemic was a crisis from which certain industries have still not recovered (McKinsey Global Institute, 2020). It caused bankrupts, decrease of foreign investments, inflation, lack of materials, etc. (Castañeda-Navarrete et al., 2021; OECD, 2019; Roper, 2021). One of the industries which was significantly affected by the COVID-19 pandemic is apparel industry. Having many global value chain activities based in Asian markets put apparel companies in risk during the global pandemic (Castañeda-Navarrete et al., 2021). Factories in Asian countries were closing because of lockdowns staged by governments, there was lack of materials, transportation became difficult because of closures (Hossain & Alam, 2022). Unfortunately, many apparel companies took unethical decisions and cancelled the production orders, which led to high numbers of job losses in Asia (Business & Human Rights Resource Centre, 2020). Besides that, apparel companies benefited from situation by signing unfair contracts with their suppliers. However, that did not provide apparel companies with the pursued resilience. Even by taking all the mentioned actions, in order to continue the operations, apparel companies were forced to come up with new decisions and even change their strategies, for instance, start to manufacture personal protection equipment - face masks (Bacchetta et al., 2021). There are many literature sources analysing the concept and characteristics of global value chain (Das & Dey, 2021; Dünhaupt & Herr, 2020; Gereffi & Fernandez-Stark, 2016; Hernández & Pedersen, 2017). However, during the COVID-19 pandemic, more attention had to be paid to global value chain adaptability, resilience, and responsiveness. The importance of having a global value chain which is resilient to disruptions was realized.

## Problem

Analysing the past actions performed by apparel companies during the COVID-19 pandemic, considering cancellation of even already prepared orders, benefiting from unfair agreements with suppliers, the weakness of global value chain resilience becomes obvious (Business & Human Rights Resource Centre, 2020). In theoretical research, global value chains are mostly being studied via their governance and disruptions, such as COVID-19 pandemic (Mcwilliam et al., 2019; Paliokaitė et al., 2021; Szalavetz, 2019). However, there is not much empirical evidence on these. There are certain apparel companies' cases which are analysed more comprehensively, such cases as Bangladesh and Indonesia (Hossain & Alam, 2022). Nevertheless, a gap in scientific research can be noticed as European cases are not studied sufficiently. Also, there are not many studies focusing on actions which companies should take while seeking to build resilience. Therefore, this paper focuses on two aspects: theoretical solutions and empirical research for building the resilience of apparel companies' global value chains.

**Subject matter of research** is resilience of global value chains.

**Research aim** is to identify the characteristics of resilient global value chain which helped apparel companies overcome the COVID-19 pandemic. There are four main **research objectives** to achieve this goal:

1. To justify the problematics of apparel companies global value chain resilience in the context of the COVID-19 pandemic;

2. To analyse theoretical aspects which concern the concept of global value chain, global value chain configuration and management, characteristics of resilient global value chain;
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4. To perform an empirical research on apparel companies' global value chains during the COVID-19 pandemic and provide recommendations for building up a resilient global value chain within the apparel industry.

**Methods of the research.** First, scientific literature and statistics portals are analysed to understand the context of problem and theoretical solutions for it. Afterwards, a qualitative analysis is performed using a content-analysis method. Data for empirical research is collected using official reports.

**Structure of the research.** First, this master's final degree project reveals the issues concerning the resilience of global value chains in apparel industry during the COVID-19 pandemic. Afterwards, theoretical analysis is conducted, and main approaches related to building resilience during the disruptions are revealed. Thirdly, a methodology of empirical research to test the theoretical findings is developed. Eventually, results achieved during the empirical research are presented and recommendations for building global value chain resilience in apparel industry are provided. The master's final degree project consists of 4 parts, 75 pages, 27 figures, and 13 tables. 59 sources of literature were used in this study.

## 1. Problem Analysis

As the world faces disruptions all the time, companies must redesign their strategies periodically. Probably, there is no industry which would not be affected by any kind of disruption. Disruptions cause such issues as inflation, increase of cost in energy sector, unemployment etc. So, in order to survive, companies must react quickly and adapt their strategies to the changing situation.

COVID-19 is one of the disruptions which had a huge impact worldwide. The SARS-CoV-2 virus (coronavirus) caused millions of diseases worldwide, high percentage of these resulting in deaths. Difficult situation in the world going across the national borders increased anxiety about the future and paused social life for a while. World Health Organization (WHO) labelled this disease as global pandemic. In 2020, United Nations called the COVID-19 pandemic a social and economic crisis of whole humanity. Unfortunately, the impact of pandemic did not pass businesses. A lot of problems for global value chains were caused.

### 1.1. COVID-19 Impact on Global Value Chains

To understand the significance of the COVID-19 pandemic for businesses, Fig. 1 below illustrates the dynamics of gross domestic product growth rate before pandemic and after it.

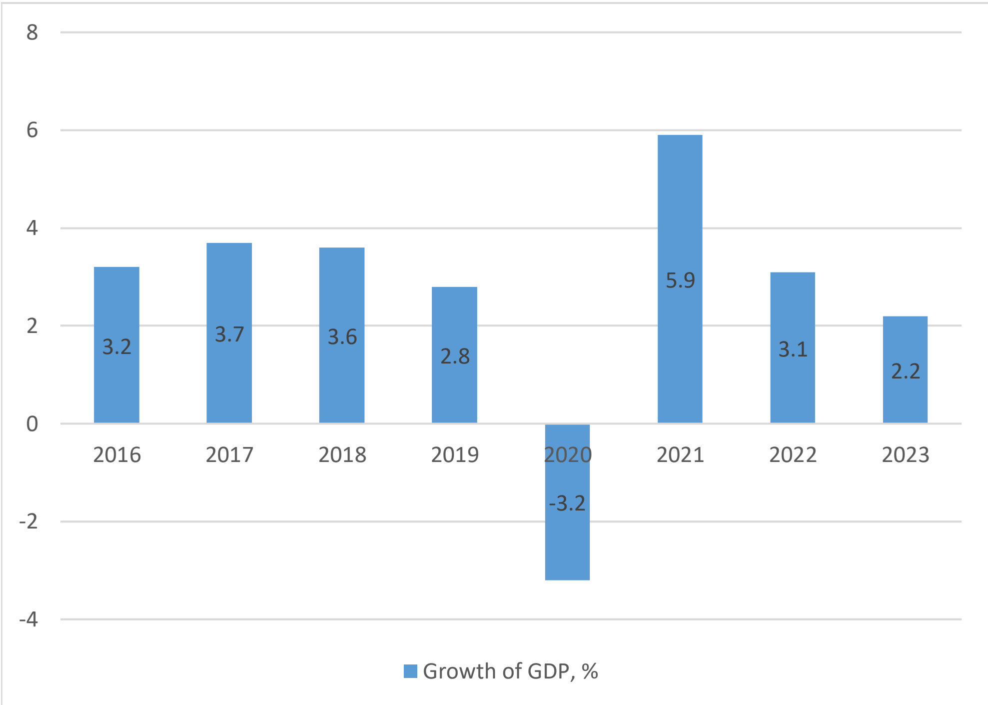


**Fig. 1**. Annual growth of GDP (OECD, 2019)

All the years before pandemic, world's gross domestic product was growing by average 3,5% each year. However, 2020 was a year of breakdown. Instead of growing as forecasted, gross domestic product decreased by 3,2%. Stagnation took place. Many companies were forced by governments to close to stop spreading the disease. There were companies which could not survive during the lockdown, therefore, bankrupted (Fig. 2). The number of bankruptcies in US increased by 69% in year 2020, so there is a strong relation to the Fig. 1. Companies were closing; therefore, money were not being generated anymore.

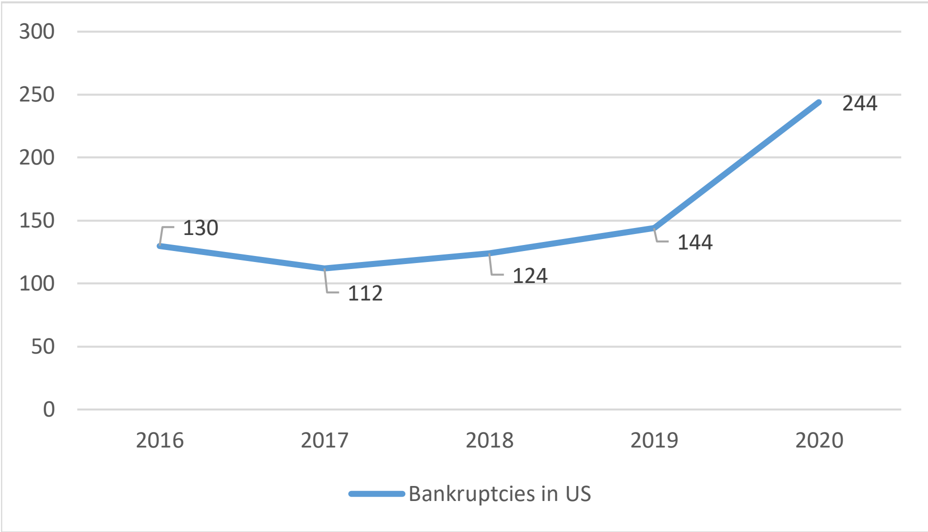


**Fig. 2**. Bankruptcies in US, 2016-2020 (Statista, 2021)

Therefore, it is crucial for companies to be able to reconfigure their strategies in order to survive such disruptions. Table 1 below represents what sectors were affected by the COVID-19 and how many years it should take for them to recover and get back to the same gross domestic product level.

**Table 1**. Estimated sector recovery time after COVID-19 (McKinsey Global Institute, 2020)

| **Sector** | **Estimated time to recover, years** |
|---|---|
| Arts, entertainment, and recreation | 1+ |
| Accommodation and food services | 1,3+ |
| Educational services | 2,3+ |
| Other services | 3+ |
| Transportation and warehousing | 4,3+ |
| Manufacturing | 4,6+ |
| Mining, quarrying, and oil and gas extraction | 1,3 |
| Wholesale trade | 2,3 |
| Administrative and support services | 2,3 |
| Utilities | 2,3 |
| Finance and insurance | 2,3 |
| Construction | 2,3 |
| Retail trade | 2 |
| Management of companies and enterprises | 2 |
| Real estate, rental, and leasing | 2 |
| Professional, scientific, and technical services | 2,9 |
| Information services | 1,6 |
| Healthcare and social assistance | 1 |

It is forecasted that it will take most time to recover for two sectors – transportation and warehousing and manufacturing. During the pandemic, transportation and warehousing sector started suffering lack of drivers which is still a huge problem today. The World Road Transport Organisation (IRU) called current driver shortage a "chronic and serious global issue". According to the data announced in September 2022, 10% of truck driver positions are not filled and lacking employees. This number is even forecasted to grow up to 14%.

Fig. 3 below illustrates the workforce shortages in general before and after the COVID-19 pandemic. Even though from 2009 each year more companies reported about shortage of labour, until 2019 this growth was not significant, approximately 2% by year. However, 2019 was year of breakdown. Comparing 2019 with 2018, growth is 9%. In 2021, number of companies reporting lack of employees increased by 15%, comparing to 2019. Finally, 2022 results showed that even 75% of interviewed companies confirmed that they experience shortage of employees. Obviously, the COVID-19 had a significant impact on labour.

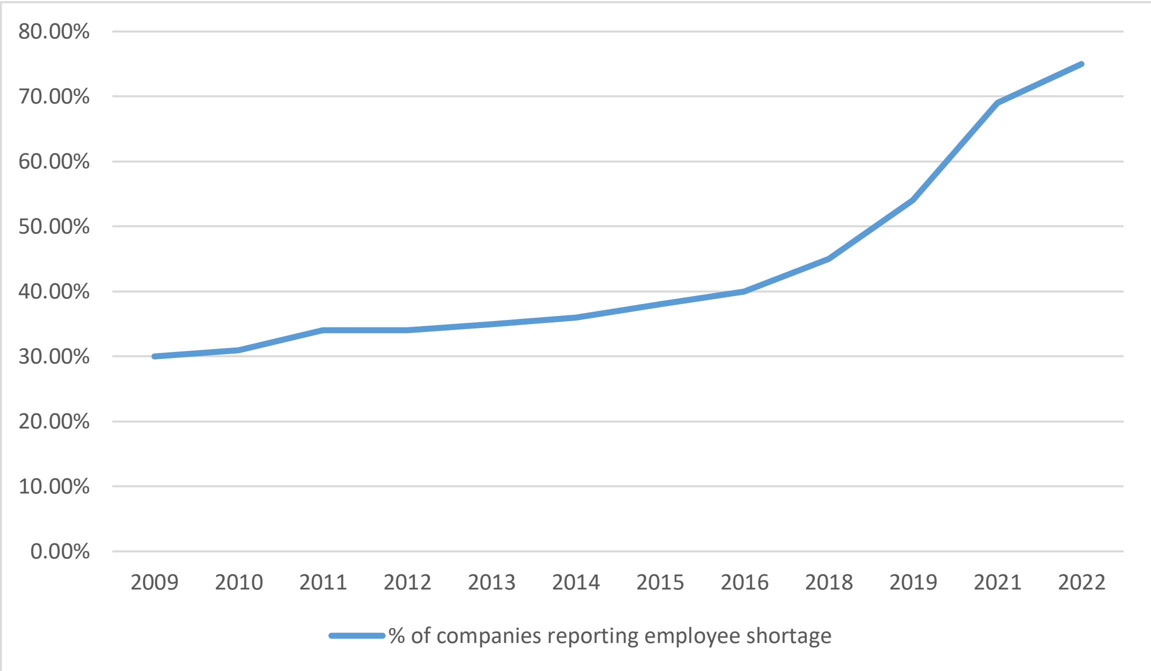


**Fig. 3**. Share of companies reporting employee shortage (OECD)

In the meantime, manufacturing sector was impacted by various reasons as well, but one of main is previously mentioned lockdowns. Companies who operate via global value chains started lacking certain materials as foreign suppliers started to close temporarily. Baldwin & Freeman (2020) emphasize three main impacts on manufacturing because of the COVID-19 pandemic: direct supply disruptions, supply chain "contagion" and demand disruptions. Direct supply disruptions are associated with reasons for interfering the manufacturing. It usually starts in one region and spread into the others. The second impact – supply chain "contagion" in some terms also mean the snowball effect. Even these countries which were less affected by disease, faced issues acquiring materials from more affected countries, the costs for doing so increased. Finally, demand disruptions might be influenced by decrease of demand for macroeconomic reasons, consumers delay to buy and companies delay to invest (Baldwin & Freeman, 2020).

It may take even more than 5 years for companies operating in these two industries (transportation and warehousing, manufacturing) to start generating same domestic product as it used to. All other mentioned industries were also significantly impacted by various reasons influenced by the COVID-19; however, their recovery time is shorter.

In general, the COVID-19 outbreak has deeply influenced the global network of suppliers, manufacturers, and distributors, causing immediate disturbances as well as enduring effects on how corporations function and communicate with each other on a worldwide scale. Key impacts:

1. **Disruptions to supply chains.** The pandemic has disrupted global supply chains, causing shortages of critical inputs and components, and delays in shipping and logistics. Lockdowns, quarantines, and travel restrictions have made it difficult for companies to move goods and personnel across borders, leading to disruptions in production and distribution.
2. **Increased costs.** The pandemic has also increased costs for businesses, as they have had to implement new health and safety measures and invest in technology to enable remote work and communication. These increased costs have put pressure on profit margins and may lead to higher prices for consumers.
3. **Shifts in demand**. The pandemic has also caused shifts in demand, as consumers have changed their purchasing habits and preferences. For example, demand for goods such as personal protective equipment, medical supplies, and home entertainment products has surged, while demand for other products, such as travel and hospitality services, has plummeted.
4. **Increased protectionism.** The pandemic has led to increased protectionism, as countries have implemented export restrictions and other measures to protect their domestic industries and ensure the availability of essential goods and services. This has disrupted global trade and could lead to a fragmentation of global value chains.
5. **Opportunities for digitalization**. The pandemic has also created opportunities for digitalization and automation, as companies have had to find new ways to operate in a remote and socially distanced environment. This could lead to increased efficiency and resilience in global value chains but could also result in job losses and other challenges for workers.

### 1.2. COVID-19 Impact on Apparel Sector

One of the sectors which requires more attention is apparel sector. Most of multinational apparel companies have certain amount of their global value chain activities based in Asian countries, it is a cost-efficient decision. This industry does not require high-skilled employees; therefore, manufacturing activities are frequently outsourced in developing countries because of attractive wages in there (Castañeda-Navarrete et al., 2021). Furthermore, there are lower requirements for working conditions, therefore, companies have to invest less in these aspects. To understand the significance of outsourcing activities in Asian markets, China still produces the highest amounts of apparel and textiles globally (Castañeda-Navarrete et al., 2021). According to the authors, in 2018, it was responsible for 30% of world’s apparel exports and for 38% of world’s textile exports.

Key manufacturing countries of apparel sector and impact of COVID-19 for them are represented in Fig. 4 below. China and Vietnam were the first ones impacted. However, despite the fall, these countries seem to have recovered quite fast and effectively. Vietnam experienced the least drop in production volumes (18,3%). Other countries struggled more and had much higher volume losses (Bangladesh 77,6%, Mexico 75,8%) (Castañeda-Navarrete et al., 2021).

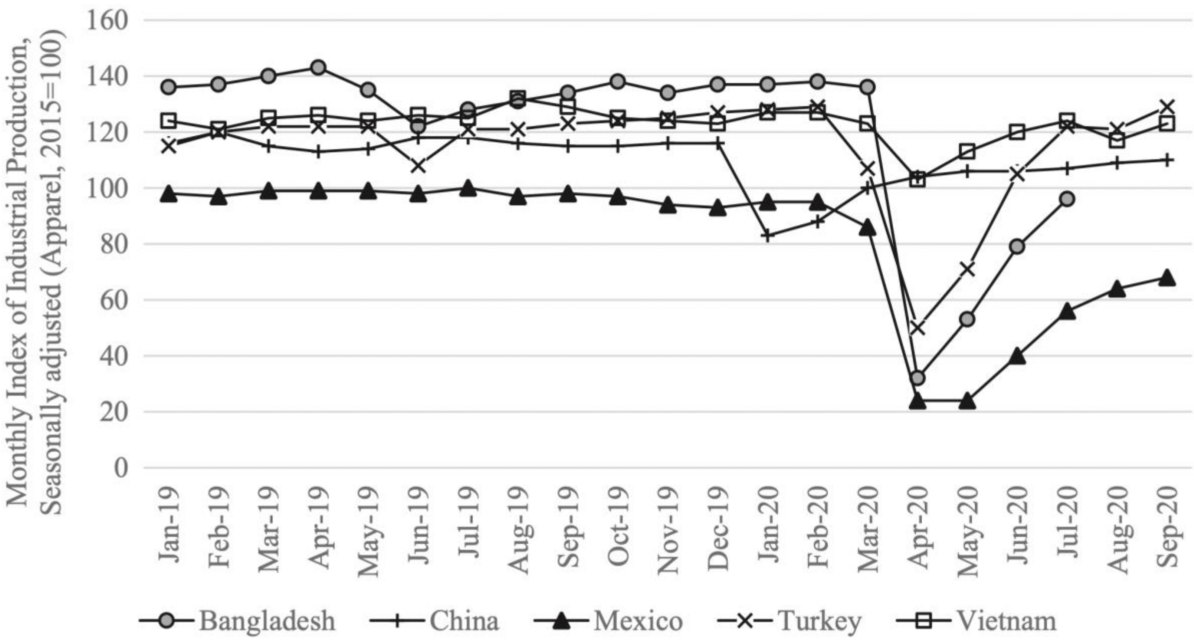


**Fig. 4**. COVID-19 impact on key apparel manufacturing countries (Castañeda-Navarrete et al., 2021)

However, even though recovery in Fig. 4 looks fasts, in 2020, Business & Human Rights Resource Centre noted that the financial situation of several million textile workers in Asia was made worse by the business tactics adopted by apparel firms in reaction to the COVID-19. Even after contractors finished producing the products which they ordered, many of apparel companies and merchants have cancelled orders without taking any financial responsibility. Such actions caused many job losses in Asia countries. Also, the Business & Human Rights Resource Centre (2020) emphasized that companies used this situation for their benefit and took an advantage making unfair deals with suppliers. It means that apparel companies arbitrarily extended their payment terms, refused payments in advance and prevented the possibility to negotiate. Moreover, apparel companies started to demand discounts for products shipped several months ago. All these actions stress the issue that the global value chains in apparel industry were not resilient enough and companies were not aware what actions should be taken during such disruption.

COVID-19 pandemic had a huge impact for apparel industry in Europe, as well. The peak of pandemic - Q2-Q4 of 2020 was tremendously difficult for this industry. Statista (2021) provides main indicators and their variation within the quarters (Fig. 5). Statistics are provided comparing quarters of 2020 to the same quarters of 2019.

It can be noted that almost all key indicators dropped during the Q2-Q4 of 2020. Production in Q2 dropped by 26,9%, and in Q3 by 6,9%, compared to 2019. It can be explained by closure of factories and decreased demand as people were forced to stay at home. Analysing the employment, impact was not so significant, however, during the Q2, some people lost jobs and employment dropped by 2,8%. That is also related with closures of physical stores and factories. However, a small recovery can be noticed in Q3 – there is an increase of employment by 2,9%. It can be explained by reopening of factories, furthermore, companies found new ways to continue their operations.

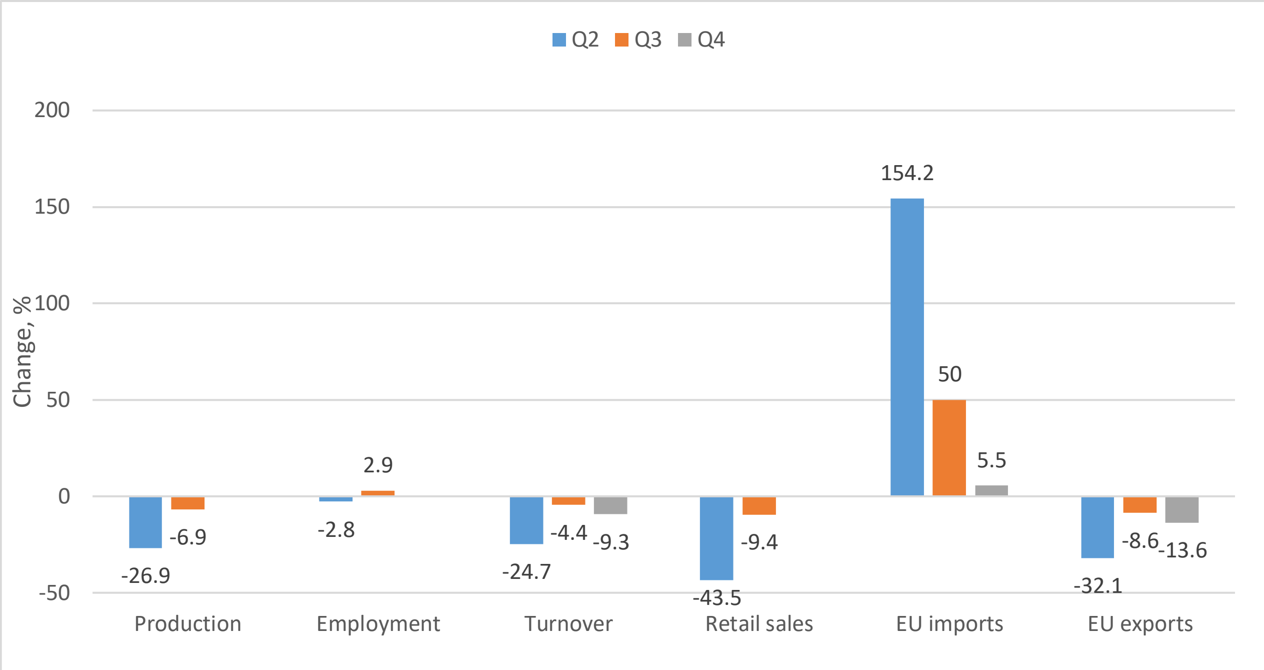


**Fig. 5**. COVID-19 impact on apparel sector in Europe (Statista, 2021)

Turnover and retail sales were impacted significantly, as well. During the Q2, turnover in apparel sector dropped by 24,7%, while retail sales, because of closure of physical stores, dropped by 43,5%. In Q3, turnover dropped by 4,4% and in Q4 – by 9,3%. Retail sales dropped by 9,4% in Q3. However, although the numbers were still declining, it can be noted that Q3 and Q4 were better for apparel sector as companies found new ways to operate, such as e-commerce. It helped them to continue the operations. Lastly, Statista (2021) provides data on EU imports and exports. These indicators are opposite to each other. EU imports in Q2 increased by 154,2%, while exports dropped by 32,1%. In Q2, imports increased by 50%, and exports dropped by 8,6%. Eventually, in Q4, EU imports increased by 5,5%, compared to Q4 2019, and exports decreased by 13,6%. The main reason for increase of EU imports was import of personal protective equipment, such as face masks. As they were mandatory to wear in most of Europe countries, the amounts of imported personal protective equipment were tremendous. Meanwhile, drop of exports can be explained by closure of factories and decreased demand because of shifting consumers behaviour.

Apparel industry can be analysed via the aspects mentioned by Baldwin & Freeman (2020). *Direct supply disruptions* were caused by government regulated lockdowns, with intention to stop the disease from spreading. At first, apparel manufacturers stopped their activities in China. After the disease kept spreading globally, more countries (such as Bangladesh, India, Mexico and Pakistan) shut down production, including apparel (Castañeda-Navarrete et al., 2021). Unfortunately, *supply chain "contagion"* had impact on more healthy countries. As mentioned, China is world's biggest apparel and textile exporter, therefore, shortages appeared during the lockdowns in this country. Of course, shortage of materials means increase of price, and these "healthy countries" were forced to pay more for same products. Eventually, *demand disruptions* were also impacted by lockdowns worldwide. People lost their jobs, got less income, other started working from home. The demand decreased naturally for various reasons – there was less need to buy new clothes and for people, who were struggling financially, clothes and textile were not the first necessity goods (Castañeda-Navarrete et al., 2021).

It is clear that the apparel industry faced a lot of issues because of the COVID-19 pandemic. Regarding the previously mentioned lockdowns, manufacturing companies were forced to close in China and other countries. It caused serious disruptions in clothing and textile companies. Therefore, companies were forced to adapt and come up with new, innovative decisions. As the COVID-19 was announced global pandemic and demand of personal protective equipment appeared, there were apparel companies which took new opportunities. They started making face masks from textile. It was a new niche for companies which helped them to survive the tough period with decreased demand for their usual production.

To conclude, some of the ways in which COVID-19 has affected the apparel industry are:

1. **Supply chain disruptions:** the pandemic has disrupted global supply chains, leading to factory closures, transportation disruptions, and delays in the production and delivery of apparel.
2. **Decreased consumer demand:** with many people staying at home and avoiding social gatherings, there has been a decrease in demand for apparel, particularly for formal wear and occasion-specific clothing.
3. **Store closures:** many physical retail stores have been forced to close temporarily or permanently due to lockdowns and social distancing measures, leading to a decrease in sales for apparel companies.
4. **Shift to online sales:** with physical stores closed, there has been a significant shift towards online sales. However, this has also created challenges for companies that were not previously equipped for online sales, leading to issues such as delayed deliveries and customer service issues.
5. **Financial losses:** the combination of decreased demand, supply chain disruptions, and store closures has resulted in significant financial losses for many apparel companies. Some companies have been forced to lay off employees or close down entirely.
6. **Changes in consumer behaviour:** the pandemic has also led to changes in consumer behaviour, with many consumers placing greater emphasis on sustainability and ethical production practices. This has forced some companies to re-evaluate their supply chains and production processes.

The apparel industry is likely to continue facing challenges as the pandemic continues to affect global supply chains and consumer behaviour. Disruptions bring uncertainty and certain losses for the businesses. However, if a company's global value chain is resilient, open, and able to adapt to changes, business might find new opportunities in these disruptions. For this reason, this master's final degree project focuses on revealing actions which are ethical and help to build the resilience in apparel companies global value chains.

## 2. Theoretical Solutions for Global Value Chain Resilience

Each operating company has its own value chain. Therefore, there is a lot of literature on this topic. The authors analyse value chains comprehensively: from the basic concept and its characteristics to configuration of a successful value chain.

Therefore, the concept of the global value chain and its characteristics will be investigated in this chapter. The literature findings on the importance of the global value chain resilience and its models will be discussed, as well.

### 2.1. Concept of Global Value Chain

The term "value chain" refers to the complete range of activities that companies carry out to acquire a product from its conception to its final application, as well as any subsequent actions that may be necessary (Gereffi & Fernandez-Stark, 2016). All these tasks could be operated in one place. However, as globalization takes place nowadays, usually these tasks are not based in a certain firm but spread globally. In this case, the concept of the global value chain emerges (Hernández & Pedersen, 2017). The concept of global value chains was changing over the years. Table 2 below represents a few ideas of the authors that describe global value chains in different periods of time.

**Table 2**. Concept of global value chain

| Concept of global value chain | Author |
|---|---|
| "Global value chains stand for the associated tasks involved in taking a product from conception to usage, including design, production, distribution, and support on a global scale." | Schmidt et al., 2021 |
| "Global value chain is a governance arrangement which makes use of various governance models for various, geographically distributed value chain segments inside a single structure. Global value chain is the hub of interrelated activities and processes that enable the worldwide production, distribution, and consumption of products and services." | Kano et al., 2020 |
| "Global value chains describe the entire scope of tangible and intangible activities, performed by companies' networks globally, to take a product or service all the way from the idea to the end user, and beyond." | Szalavetz, 2019 |
| "Global value chains are world economy's backbone and central nervous system." | Cattaneo et al., 2010 |
| "The main idea of global value chain is vertical relationship between supplier and buyer, as well as circulation of product from manufacturer to consumer." | Ponte & Gibbon, 2006 |
| "Global value chain is a sequence of economic operations which add value and result in a finished product." | Gereffi & Korzeniewicz, 1994 |

As the table provides, the significance of global value chains was observed in the 20th century already. Over the years, the concept was understood and described more comprehensively. However, the main idea reiterates in almost all of these concepts – global value chain is about the journey of a product or service via several stages which add value to it and are spread globally. The reason for staging different tasks worldwide is the desire to gain a competitive advantage and operate as efficiently as possible.

**Activities of global value chain**

Porter (1985) was the first author to classify value chain tasks. He divided them into two sections: primary and support tasks. These tasks are provided in Fig. 6.

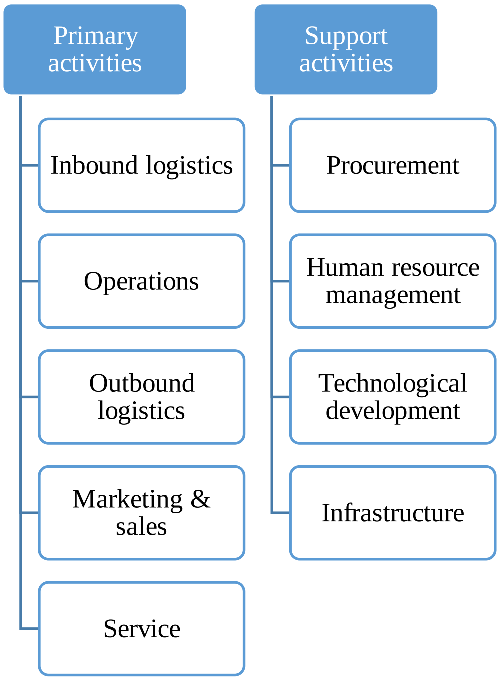


**Fig. 6**. Activities of value chain

Inbound logistics defines the way raw materials and other commodities are brought into the company. It includes all aspects, such as receiving of the goods, storage of them in the warehouse, and distribution within the company. During "Operations" activity, raw materials are transformed into final product which is sold to customers. Outbound logistics means the delivery of final goods to customers. Marketing and sales mean promoting the product and, finally, service stands for post-sale maintenance.

As for support activities, procurement has one main task: to discover suppliers for raw materials and negotiate the best possible deals. As people are crucial part of every business, human resource management must take care of hiring, training, and keeping employees. Technological development is responsible for information and knowledge management. All kinds of infrastructure allow for the daily work of business.

To summarize Porter's activities in global value chain, it can be emphasized that primary activities are those that create visible value for the product. Support activities are not so obvious and evident; however, businesses could not operate without these activities.

However, while analysing the literature, it becomes obvious that Porter's model is not the only one. The concept of value chain evolved with time and other authors have also deeply analysed value chains and provided their ideas regarding its activities. Table 3 below illustrates their main findings. It is noticed that authors tend to use different classification for value chain activities.

**Table 3**. Classification of value chain activities (Hernández & Pedersen, 2017)

| **Criteria** | **Type of activities** | **Description of activities** | **Authors** |
|---|---|---|---|
| Function in the value chain | Upstream | Involved in design, basic and applied research, or the commercialization of creative pursuits, or those who are close to the exploitation of raw materials and natural resources. | Mudambi, 2008; Mudambi and Puck, 2016; Nicovich et al., 2007; Pananond, 2013; Singer and Donoso, 2008; Verbeke et al., 2016 |
| | Middle end | Production activities: manufacturing and logistics. | |
| | Downstream | Bringing value to the product: producing or customizing it; after-sales services, brand management, marketing, and advertising. | |
| Potential for competence creation | Exploration-related | Those that expand the firm's capabilities and make use of novel resource combinations to develop new areas of competence. | Cantwell and Mudambi, 2005; Cantwell and Piscitello, 2015; Ha and Giroud, 2015 |
| | Exploitation-related | Activities that are based on current companies' capabilities. | |
| Potential for being a source of competitive advantage | Core | Unique and essential for competitive advantage activities. | Espino-Rodríguez and Rodríguez-Díaz, 2014; Gilley and Rasheed, 2000; Linares-Navarro et al., 2014; McIvor, 2000; Quinn, 1999 |
| | Essential | Complementary and essential for competitive advantage activities. | |
| | Non-core | Important activities, but those which bring little value to the company. | |

## Reasons for going global

In literature, OLI paradigm is widely analysed as a theoretical concept explaining such internationalization of companies (Mcwilliam et al., 2019). According to authors, O stands for ownership advantages and explains the reasons why companies to take part in global activities. These advantages can be distinguished into three separate groups: asset, transactional and firm – specific advantages (A. Das & Dey, 2021). The main idea is that companies use certain specific assets which they have or generate in order to invest in foreign countries. L - location advantages correspond to where exactly companies engage. It can be used for exploitation of the non-transferable materials which are specific only to some certain foreign country and can not be utilized in home country. Also, there might be other institutional advantages, such as cheaper work force in the host country, more convenient law, etc. Finally, I stands for internationalization advantages which relate to how companies manage relevant international actions. This paradigm is important to understand the reasons why companies decide to spread activities of their value chains' globally. Table 4 summarizes the main ideas of OLI paradigm.

**Table 4**. OLI paradigm (Das & Dey, 2021)

| **Ownership advantages** | **Location advantages** | **Internationalization advantages** |
|---|---|---|
| Benefits of exclusive ownership and use of assets that generate income | Exploit non-transferable materials or assets that are specific to the host region | Internalize economic transactions for the creation or use of assets, creating value to them in the process. |
| Some assets' capacity to manage significant activities across international borders, such as managerial abilities | Utilize the institutional advantages associated with the host nation | |
| Benefits of enterprise values and principles and the institutional environment of the home country's influence on the firm | | |

According to Dünhaupt & Herr (2020), specialization of global value chain can be horizontal or vertical. Table 5 below summarizes key aspects of these strategies. Horizontal specialization is more common in developed countries, where most attention is given to economies of scale and leadership in technologies. Outsourcing to specialized businesses is common in this case. Comparative advantage in developed countries is high – skilled tasks.

**Table 5**. Specialization of global value chain

| **Horizontal specialization** | **Vertical specialization** |
|---|---|
| Outsourcing to specialized businesses | Developing countries |
| Economies of scale | Reducing costs |
| Leadership in technologies | Regulations |
| Developed countries | Simple low-skilled tasks |
| High – skilled tasks | |

Analysing vertical specialization, which usually occurs in developing countries, comparative advantage become low-skilled tasks which are simple and easy to perform. Most attention is given to reduction of all kinds of costs and the use of regulations. Actively or inactively joining global production, sales and recycling processes, participating in value-added processes such as design, innovation in products, production, advertising, shipping, usage, support after the sale, and final recycling, and excelling in those fields, allows developing nations to join global value chains (Wang et al., 2021).

Participating in global value chains is extremely important for developing countries. It enables nations to concentrate on the production of specific goods, boost industrialization, expand the service sector, gain access to technology spill overs in the form of global labour division and cooperation, and subtly raise technological standards and production efficiencies (Wang et al., 2021). In other words, it might even help developing countries to achieve social upgrading which refers to improving the rights of employees and quality of their work environment (Hernández & Pedersen, 2017).

However, it is very important for countries to balance between seeking to become attractive for global investors and taking care of the country itself. According to (Wang et al., 2021), some developing nations have passed relatively lax environmental laws in an effort to spur economic growth, which has made them more appealing to polluting industries and intensified domestic environmental pollution. So, in these cases, countries increase their gross domestic product, but, on the other hand, they become highly environmentally polluted.

To summarize this chapter, there are valid reasons for each company to go global and spread the activities of its value chains troughout the world. Effective global value chain configuration, value appropriation from global value chain, and benefits from global value chain diversity not only support business expansion and innovative performance, but also encourage the modernization of manufacturing capabilities and procedures. Global value chains encourage the construction of multinational factories in developing countries, the growth of locally held businesses in emerging economies, and the expansion of outsourcing and offshoring agreements managed by multinational corporations from advanced economies (Das & Dey, 2021). Whether going global is associated with cost efficiency, technological development, or other factors, it brings a lot of benefits for the company. However, from the point of view of a host country, it is very important to be able to balance between being attractive for investments and taking care of own issues (for example, pollution).

**Global value chain management**

After learning the concept of global value chain and reasons for going global, other very important aspects are configuration and management of global value chains. Schmidt et al. (2021) mention two main parts of global value chain management:

– Global value chain governance;
– Global value chain upgrading.

Main aspects of both parts will be discussed in this chapter.

### 2.1.1. Global Value Chain Governance

Global value chain governance can be explained as organization and control. According to McWilliam et al. (2019), organization refers to the composition and traits of firm-firm interactions across various value chain activities. Same authors define that control results from institutional and market pressures as well as the power relationships between enterprises. After analysing global value chain governance via the OLI paradigm, McWilliam et al. (2019) mention three key aspects:

– Transaction difficulty;
– Knowledge of production that is codifiable;
– Capabilities of company's suppliers.

All these aspects are of high importance to companies that distribute their value chain activities worldwide.

In general, global value chain governance means relationships of authority and power that control the flows of resources such as money, materials, and people within the value chain (Hernández & Pedersen, 2017). Authors emphasize that the past situation when there were only two governance modes (based on hierarchy or on the market) changed and currently there are more possibilities of governance (Fig. 7).

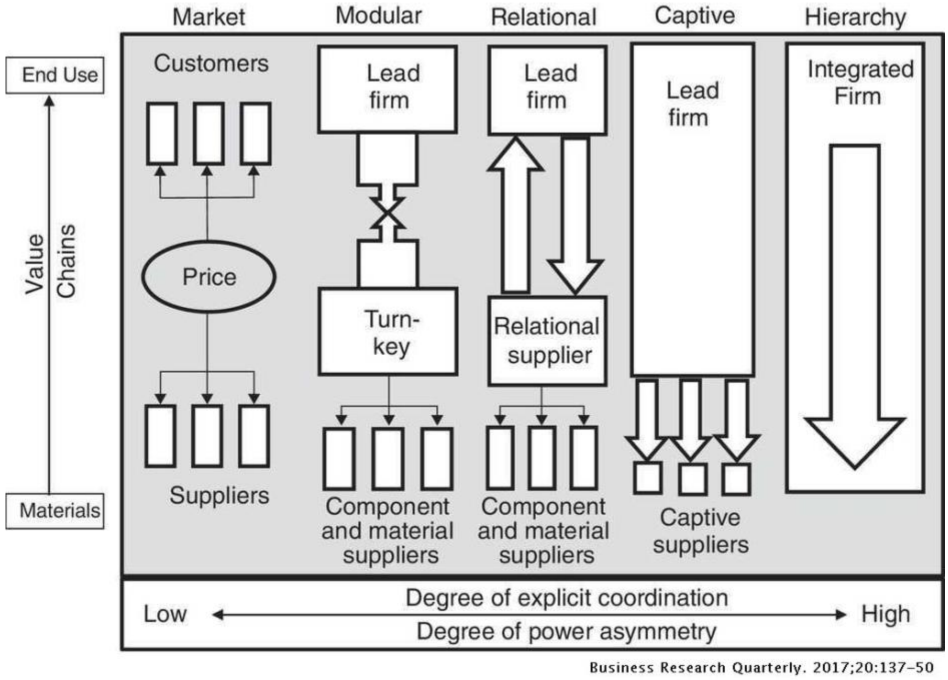


**Fig. 7.** Governance modes (Hernández & Pedersen, 2017)

There are still two old modes illustrated: market governance mode and hierarchy governance mode. The first scenario suggests fairly straightforward business transactions between the parties. Under this system, there is minimal need for coordination between buyers and suppliers at various stages of the value chain, and it is economical for both parties to switch to new partners if necessary. The means through which a bargain is made is price. However, there is a trend toward increasing interconnectedness among businesses along the global value chain, resulting in a network of independent businesses that are directed or coordinated by a dominant corporation and that offer a framework of authority and confidence in uncertain settings. (Hernández & Pedersen, 2017). The governance mode, which is based on vertical integration and control within the firm, is found at the other extreme of the spectrum. This topology is based on foreign direct investment decisions, even if it becomes less usual to see businesses integrating the entire value chain. When previously mentioned aspects are complicated, codification is challenging, and qualified suppliers are difficult to find, this structure is increasingly common (Hernández & Pedersen, 2017). Between these two modes, there are three middle ones: modular, relational, and captive. A large volume of codified information flow is implied by modular governance, which states that suppliers produce goods in accordance with lead company specifications while the lead firm focuses on developing, expanding, and defending markets for finished goods. In a modular setting, suppliers are frequently very skilled, offering whole packages of services and taking over responsibility for particular phases, like manufacturing, through turn-key agreements. Conversely, when information is complex, challenging to transfer, and when there is a greater need for interaction and knowledge exchange based on trust and social connections, relational governance is more probable. It suggests that social connections and accepted standards structure coordination. Additionally, adopting reciprocity-based dispute resolution standards enables lead companies and suppliers to react swiftly to altering circumstances. Finally, a captive governance is a governance model where suppliers are more dependent on the lead corporations and work under their strict supervision. This shows that even though suppliers are less likely to bargain for better selling prices, businesses are better able to get assistance from lead firms (Hernández & Pedersen, 2017).

## Internal and external factors, influencing governance structures

There are a few aspects which have influence on each of these governance structures, while configuring the global value chain (Hernández & Pedersen, 2017). They can be internal or external, as provided in the Table 6 below.

**Table 6**. Factors influencing governance mode (Hernández & Pedersen, 2017)

| **Internal factors** | **External factors** |
|---|---|
| Buyer-driven or producer driven | Life cycle of the industry |
| Company size | Degree of company's innovativeness |
| Company capabilities | Entry barriers |
| Abilities to manage value chain | Demand |
| | Stability of the industry |
| | Technological progress |

Starting from external, it depends whether the company is innovative and tends to enter the market early or waits until it becomes less risky, are there any entry barriers (requirements for licenses, certain permits, etc.), what is the balance between supply and demand in the industry, how much the technology evolves in time and what is the life cycle of products in certain industry (Hernández & Pedersen, 2017). Meanwhile, internal factors are mostly based on the capabilities of the company. Such aspects as size and if it is buyer or producer driven matter, but a lot depends on whether company has the abilities to manage the global value chain itself, or not (Hernández & Pedersen, 2017). Being able to coordinate, manage or network decides which governance mode will be applied. Decision may also be based on the capabilities which company has – whether it is stronger in standardized activities (manufacturing) or, for example, in innovative ones (marketing).

## Decision on geographics

Another interesting aspect which is associated with governance mode is geographical distribution of activities within the world. Literature emphasizes a few potential ways if doing so. First one is transfer of production to certain regional blocks. According to scholars, there are three of them: Factories Asia, North America and Europe (Hernández & Pedersen, 2017). According to authors, companies are willing to have a smaller number of suppliers which have high capabilities and are regionalizing in certain locations within the globe, which are most strategically convenient.

However, as mentioned before, companies go global to gain competitive advantage. Therefore, some scholars claim that multinational companies choose foreign locations based on these criteria and do not pay much attention to regions and amount of suppliers.

Furthermore, while deciding how to spread the activities globally, as mentioned before, a lot of attention must be paid to analysis of the host country (Hernández & Pedersen, 2017). All political, social, environmental, economic, technological, and legal factors must be evaluated. The required level of adaptation must be determined in advance. Also, adaptation period must be as short as possible. Knowledge must be transferred as quickly as possible, and economies of scale achieved effectively.

Finally, authors (Hernández & Pedersen, 2017) mention that there are some undefined criteria which might have impact on company's decision to go global. Some host countries have established entry barriers for certain industries, to protect their own companies from competition. Therefore, even though a company is interested to move its certain activity into chosen country, it might not always be possible. For example, for a company operating in food industry, it might be difficult to transfer manufacturing activities into other countries, because of different and strong regulations in this sector.

To conclude, if a company decides to go global, to succeed, it must have global mindset, cultural sensitivity, geographic adaptability, managerial and technical skills. Activities can be dispersed globally or regionally, up to the company's strategy.

**Organizing activities distributed worldwide**

Once decisions on activities distribution is made, a new issue arises. How to coordinate activities worldwide, what level of replication should be applied? Authors who were analysing this topic mention differences of coordination between dispersed and concentrated global value chains (Hernández & Pedersen, 2017). Table 7 below emphasizes the main differences of them.

**Table 7**. Advantages and disadvantages of dispersed and concentrated global value chains (Hernández & Pedersen, 2017)

| | **Advantages** | **Disadvantages** |
|---|---|---|
| **Dispersed global value chain** | Decreased cost of coordination and less subordination | Increased replication costs |
| | Fit local responsiveness | Impossible to reach economies of scale |
| **Concentrated global value chain** | Utilization of national difference arbitrage | Extra costs of transportation, possible delays with supply |
| | Specialization and disaggregation | Costs of realization |
| | | More resources needed – lots of communication and coordination |
| | | Too dependant |

The main idea of dispersed global value chain is replication. A company replicates its activities into the host countries, one by one. After doing so, subsidiaries operate on their own, independently. Therefore, the cost of coordination is very low, as there is almost no subordination. Each subsidiary mostly cares only about local responsiveness (Hernández & Pedersen, 2017). On the other hand, there are drawbacks, as well. To replicate activities in host countries, company faces increased costs. There is lack of standardization and scale of economies is not possible to reach, as well.

Meanwhile, the idea of concentrated global value chain is different. In this case, activities are more network based. Company establishes subsidiaries, each having a vast regional reach that goes beyond a local market. These subsidiaries cooperate within a network. If a company is highly concentrated, it may happen that each activity of its value chain takes place in different countries, being operated by different subsidiaries. Countries for performing activities are chosen by offering the best competitive advantage, therefore, advantage of specialization and disaggregation derives. However, disadvantages, compared to the dispersed global value chain, derive here, as well. If different activities are spread so globally, it means that there is a lot of transportation between units required. So, company gets a lot of extra cost, also, it must have its processes well organized and be prepared for possible transportation delays. There may also be some unplanned costs, which are associated with implementation of these affiliates. Finally, if there are many business units which must be coordinated, it may rise difficulties trying to control whole network. To summarize, in this case, there is a lot of dependence between separate business units (subsidiaries).

### 2.1.2. Global Value Chain Upgrading

According to Cambridge dictionary, word upgrade stands for improving the quality or usefulness of something. While speaking of upgrading the global value chain, it comes to transferring attention from lower–value to higher–value tasks (Paliokaitė et al., 2021). Authors distinguish four types of upgrading:

- Upgrading of process;
- Upgrading of product;
- Niche upgrading;
- Functional upgrading.

Process upgrading means rearranging the production system in order to effectively convert inputs into outputs. Upgrading of products specializes in working on the products which are most high-valued. Niche upgrading defines the process during which knowledge gained from certain processes is used to expand activities in new markets or industries. Functional upgrading is the addition of new, superior functionalities to the chain.

However, analysing the literature, it can be noticed that some authors pay most attention to the process upgrading (Hernández & Pedersen, 2017). Furthermore, one of the most important aspects is that most of the time, lead firms can make impact on upgrading other business units within the value chain. Several aspects might have impact on upgrading processes:

- Industry in which company operates (linear or non-linear upgrading),
- The balance of input – output,
- Type of global value chain.

Industry defines if the upgrading should be performed taking one activity after another or using the non-linear way. Also, the type of global value chain matters a lot – whether it is dispersed or concentrated. Companies operating dispersed global value chains might have impact on upgrading their local partners and impacting developing countries.

Most of times, certain types of companies use same upgrading strategies. Table 8 below illustrates this idea. Companies are distinguished into three types: foreign owned firms, locally owned firms and born globals.

**Table 8**. Upgrading strategies of companies. (Paliokaitė et al., 2021)

| Company type | Strategy of upgrading |
|---|---|
| Foreign owned firm | Process and functional;<br>Product and functional |
| Locally owned firm | Niche upgrading |
| Born global | Global market from beginning |

Parent companies usually give their foreign owned companies (subsidiaries) a chance to create their own network of local firms that cooperate with them. For this reason, they can shift their focus to improvement activities, such as R&D and product design. In that case, there are two strategies that they combine together: processes and functional or product and functional. Locally owned businesses that have succeeded in establishing a global presence and elevated to the top of the production and service networks on a global scale, usually use niche upgrading. They have intentions to extend their activities more broadly. Finally, companies for which mentioned upgrading strategies could not be applied, is born globals. These are the businesses which function globally from the very beginning. Such type of companies frequently are the ones to create disruptive innovations.

Each mentioned upgrading consists of two dimensions: capital and labour dimensions (Szalavetz, 2019). In the first case, labour can be upgraded from low-skilled work to highly technology and knowledge based (with some intermediate levels between these two extremes). A very important aspect in this case is competitive advantage, as companies, while upgrading their labour dimensions, acquire new capabilities and develop the existing ones (Szalavetz, 2019).

Upgrading is a continuous process and affects all the actors within the global value chain. For instance, a parent company may have part of its value chain activities based in a certain company abroad. If this subsidiary evolves and becomes able to take care of more sophisticated and higher value-added activities, it allows the parent company to re-design their structure and concentrate in other activities, in order to catch more value (Szalavetz, 2019).

**Impact of digital technologies for upgrading global value chains**

As the world constantly evolves, corporations are compelled to upgrade their global value chains, in order to keep up with the newest technologies. Internet of Things (IoT), large-scale data analysis, remote computing services, virtualisation, artificial intelligence and other newest technologies, referred to the Industry 4.0, provoke companies to redefine their strategies and redesign their global value chains (Szalavetz, 2019). According to Szalavetz (2019), all the discussed aspects of global value chains (governance, upgrading, specialization, geographic choices) depend on digital technologies.

As Szalavetz (2019) mentions, there are three main factors which define the re-structurization of global value chains:

- Complexity of transactions,
- Ability to codify transactions,
- Capabilities of supplier.

Higher possibilities of upgrading the global value chain appear in terms of complex transactions and high capabilities of suppliers. On the other hand, codifying the transactions prevent global value chains from upgrading, as specialized knowledge-intensity is reduced (Szalavetz, 2019).

But what is the relationship between the digital technologies and the variables mentioned? It depends on the point of view and may have both positive and negative aspects. First of all, implementation of some digital technologies makes transactions more complex. The need of higher capabilities emerges. It means that more qualified employees are required, costs might increase, as well. However, in certain cases, it might allow to transform data into knowledge which might be used to standardize activities (Szalavetz, 2019).

To conclude the chapter, global value chain governance is related to how industries are structured globally. Global value chain upgrading shows how market players maintain or strengthen their strategic positions in tactical manner (Schmidt et al., 2021). All businesses depend on their own subsidiaries and a network of suppliers, which together make up a global value chain.

To understand the impact of digital technologies on upgrading global value chains, Szalavetz (2019) proposes a framework (Fig. 8).

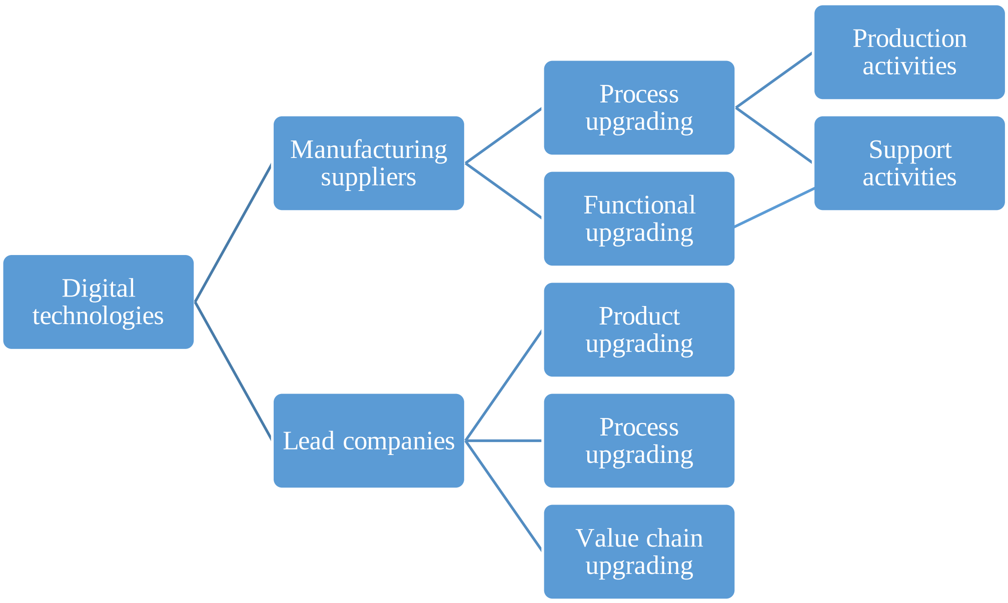


**Fig. 8**. Digital technologies driven global value chain upgrading (Szalavetz, 2019)

The main idea of this framework is that upgrading, which is driven by digital technologies, is co-evolutionary process (Szalavetz, 2019). For instance, a manufacturing company applies digital technologies to their daily routine. Most common benefits are efficiency of resources, cycle time, operational quality, and equipment effectiveness. It means that process upgrading is takes place, as the efficiency of taking inputs into outputs increases. All processes are affected by digitalization: core and support ones. In this model, support activities have important role to upgrading functions. It means that once support activities are upgraded and efficiency has increased, suppliers are able to pay more attention to other functions and upgrade them.

In the meantime, model presents a little bit different role for the lead companies. As manufacturing processes are concern of manufacturing suppliers, lead companies can focus on upgrading the existing products and developing new ones. Process upgrading exists here as well, but in this case, it is about preparing, maximizing, observing, and managing the supply chain. Big data allows to understand customer needs and track key performance indicators of the company. Finally, the presented value chain upgrading means that companies, using digital technologies, are enabled to redesign their business models and maintain the competitive advantage (Szalavetz, 2019).

To conclude, digital technologies allow companies to work more efficiently, constantly evolve and to achieve the desired results.

## 2.2. Analysis of Business Resilience

One of the most important elements which companies must reconfigure in terms of disruptions is global value chains. A responsive global value chain helps companies to face the challenges and continue operations smoothly. Probably most important criteria of a responsive global value chain is resilience.

### 2.2.1. Concept and Levels of Resilience

The concept of resilience was being defined in the 20th century already. Same as the concept of global value chain, the concept of resilience became more complex within the time (Table 9). However, all of definitions are basically about the same – reactions to disruptions.

**Table 9**. Definitions of resilience

| Definition | Author |
|---|---|
| "Resilience allows company or system to plan, absorb, sustain, and adapt to shocks and disruptions. It is strongly affected by global value chain governance and state policies." | Gereffi et al., 2022 |
| "When a disruption interrupts a business's operations, its ability to endure, recover, and flourish is known as business resilience." | Huang & Farboudi Jahromi, 2020 |
| "Resilience define or evaluate how people, communities, or systems respond to disruptive occurrences." | Marquis, 2019 |
| "Resilience is about systems that continue to function despite internal and external disruptions." | Brand & von Gleich, 2015 |
| "Resilience is a system capability to create foresight, to recognize, to anticipate, and to defend against the changing shape of risk before adverse consequences occur." | Woods, 2005-2006 |
| "Resilience refers to the inherent ability and adaptive responses of systems that enable them to avoid potential losses." | Rose & Liao, 2005 |
| "Resilience is the result of a system preventing adverse consequences, minimizing adverse consequences, and recovering quickly from adverse consequences." | Westrum, 2006 |
| "Resilience engineering is a paradigm for safety management that focuses on how to help people cope with complexity under pressure to achieve success." | Hollnagel & Woods, 2006 |
| "Resilience is the ability of a system to absorb external stresses." | Holling CS, 1973 |

The resilience topic is still very important and widely analysed in the literature, so there also are latter definitions. For instance, according to Cohen & Kouvelis (2021),  a long-term resilience is about being proactive and able to forecast the "new normal" and adapt to it. Furthermore, as authors mention, some disruptions may even force companies to rethink the existing values and create new ones (focus on sustainability, social responsibility, etc.). In today's changing world, more attention is being paid to the diversity of people, and some companies even implement rules what should be the percentage dispersion of people from different categories (age, gender, skin colour, orientation, disability). All these requirements come from certain movements and incidents, which could be also called a certain kind of disruption. In order for companies to adapt to changing customers' needs (and values, as well), they must reshape the value propositions of products and services.

Resilience also means capability of a company (or a system) to "plan, absorb, sustain, and adapt to shocks and disruptions" (Gereffi et al., 2022). The authors emphasize that both are very important: being able to keep operations going as usual after disruptions and keep them going during disruptions.

According to Castro et al. (2020), who performed a literature review on concept of resilience, definitions vary from macro (participants of units in regional environment) to micro (individual level of one unit) points of view. Fig. 9 below illustrates this idea.

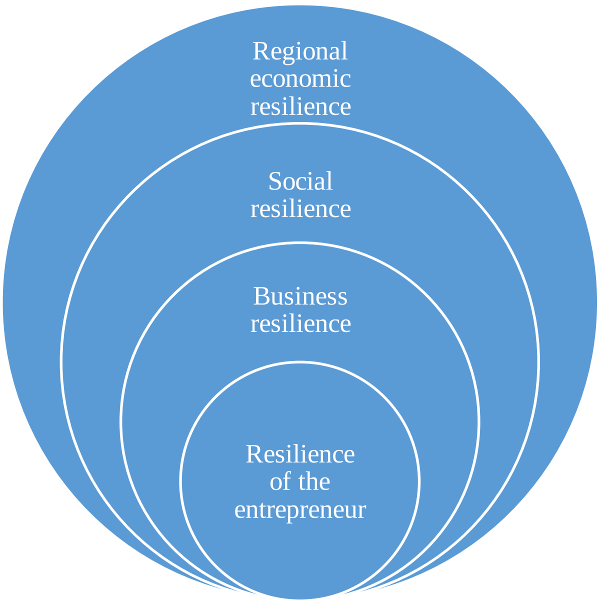


**Fig. 9**. Concepts of resilience (Castro et al., 2020)

According to other authors (Gereffi et al., 2022), resilience can be defined on three levels: company level, global value chain level and country level (Table 10).Company level is about adaptation to disruptions in company's production network (Gereffi et al., 2022). In order to be resilient, companies must focus on the capabilities of all network actors, including lead firms, suppliers, etc. A lot attention must be paid to managing the risks, being flexible to the changing environment and being able to recover from disruptions. However, the most important aspect is to be able to adjust and respond to the disruptions which impact value chains.

Global value chain level becomes more complicated because more actors appear here. Companies stage their activities in different countries and the more countries there are, the more vulnerable the global value chain becomes. In this case, there are more possible kinds of disruptions which could have effect on the value chain, including natural disruptions (hurricanes, floods, etc.). The question is, how well designed the global value chain is and whether it is resilient from snowball effect. If something happens in one country, where certain part of product is manufactured, what impact will it have on other actors of the global value chain? Integration within the strategies (company-level) and structure of the global value chain itself are crucial.

**Table 10**. Levels of global value chain resilience (Gereffi et al., 2022)

| **Company level** | **Global value chain level** | **Country level** |
|---|---|---|
| Manufacturing networks | Activities staged in different countries | Role in global value chain |
| Capabilities of network actors | Various kinds of disruptions | Direct/indirect participation |
| Risk control | Snowball effect | |
| Adjustment and responsiveness | Structural approach | |
| | Integration | |

Analysing country level, as Gereffi et al. (2022) note, there are four roles of it in global value chains: “facilitator, regulator, producer and buyer”. Facilitation means that a country helps actors of global value chains via reducing taxes, offering subsidies, etc. Regulation means that country sometimes may start controlling export or import, in other words, start controlling trade. Role of production is associated with energy sector and actors which are owned by the country. Country as a buyer is related to public procurement. First two roles are indirect and last two – direct, as the level of participation is higher.

In the further analysis, most attention will be paid to company and global value chain levels of resilience.

### 2.2.2. Key Components of Resilience

After understanding the concept of resilience, it is very important to understand what the key elements are to measure it. Castro et al. (2020) performed a systematic literature review and purified main factors:

– Attitude towards disruptions,
– Entrepreneurial characteristics,
– Business characteristics,
– Social and human capital,
– Strategic management,
– Challenges that companies are facing,
– Relationships with institutions.

Castro et al. (2020) also performed a systematic literature review on studies about the actions which are taken by entrepreneurships during the times of disruptions. Results are summarized below (Table 11).

**Entrepreneurial characteristics** elements may be causing resilience of companies directly or indirectly. Lifestyle of entrepreneur may have impact on business failure, if emotional attachment is high (Castro et al., 2020). Motivation, perseverance, positive attitude toward learning and other factors are also very important. Previous experience of an employee helps to adapt to new situations easier, as he is aware of good and practices.

**Strategic management** emphasizes that rapid intervention during the disruptions is crucial. It is very important to make fast short and long-term decisions. Proactive planning and ability to be innovative are important. as well. Much attention should be paid to quality of products.

Speaking of **relationships with institutions**, important element is communication with other participants of entrepreneurial ecosystem, especially, government and civil society. Public – private strategies mean government's intervention into private business by helping it to recover. Finally, integration in community is crucial, as cooperation with other business units may improve processes.

**Social and human capital**. The employees which company is hiring must be flexible, qualified, and able to adapt to the changes. Nowadays, people who are conservative and not willing to change their daily routine, become less attractive to the employers. As for social capital, a network of social connections and contacts is very important for support. Family resources are important in terms of family business, and they can be distinguished into three sections: human, social and financial (Castro et al., 2020).

**Table 11**. Actions during disruptions (Castro et al., 2020)

| **Actions during the disruptions** | | | | | | |
|---|---|---|---|---|---|---|
| **Entrepreneurial characteristics** | **Strategic management** | **Relationships with institutions** | **Social & human capital** | **Attitudes** | **Business characteristics** | **Risks** |
| Lifestyle | Rapid interventions | Entrepreneurship ecosystem | Flexible staff | Diversify products | Create opportunities | Increasing costs |
| Motivation | Planning | Government | Social connections | Adopt new business models | Renew and reorganize | Effects consumers |
| Perseverance | Quality of products | Civil society | Local & international contacts | Offer quality products | Customer loyalty | Loss of capital investments |
| Learning | New solutions | Public-private strategies | Family resources | New marketing strategies | Employee suggestions | Stress, vulnerability, uncertainty |
| Self-efficacy | | Integration in the community | | Proactivity | Future envisions | Loss of personal property |
| Adaptability | | | | Positive attitudes | Flexibility, innovation | |
| Previous experience | | | | | Local identity | |

Analysing **attitudes**, it is noticed that positive attitude is a very important element in terms of disruptions. During the crisis, it is crucial to diversify the products and be able to adopt new business models. As mentioned in the previous chapter, digitalizing business model may open up new opportunities. For instance, during the COVID-19 pandemic, when most of businesses were physically closed, some of them decided to adopt new business model. In this case, shops, even restaurants, went online, and it was very successful. Some of them even remained online, as it generates lower cost. As mentioned in strategic management, quality of products matters here a lot, as well. Furthermore, companies must work on their marketing strategies. Nowadays, the more provoking marketing strategy is, the bigger effect it creates. Finally, being proactive is necessary, in order to prepare for the crisis.

As for **business characteristics**, even the size of a company matters. Unfortunately, it is easier to recover for small businesses than to medium or large ones (Castro et al., 2020). Smaller business is always more adaptable, there is less bureaucracy, less control. Small business can react to the crisis faster than a large business. Company who intends to keep up their operations during the crisis, must be innovative, flexible, able to renew and to reorganize. Also, local identity and customer loyalty are very important. Also, the motivation of employees is very important, so company must be open to the suggestions which employees offer. And, of course, reorganizing, creating new opportunities, strategies - it all must be based on the future envision.

Finally, **risks** that companies face during the disruptions. It might be increased costs - for example, increase of fuel increases the costs of transportation. Effects on consumers, as well. During such inflation, which happens currently, the purchasing power of consumers decreases. Therefore, if company produces commodities not of first necessity, the risks of losing clients appear. Another risk is loss of personal property or planned capital investments, stress, vulnerability, and uncertainty (Castro et al., 2020).

To conclude, there are a lot of factors which influence the resilience of companies. It means that each company must focus on many aspects to keep their operations normal during and after the disruptions. However, despite the fact that disruptions sound frightening and require a lot of preparation and resources, there are positive aspects, as well. If a company is resilient towards the disruption, it can generate opportunities from them. Creating new business models, strategies, even products, getting knowledge which can be adapted to the future crises are new possibilities for the company. Furthermore, companies might learn to be proactive, flexible and adaptable.

### 2.2.3. Resilience Building Strategies

The COVID-19 pandemic, as already discussed, had impact on huge number of companies worldwide and that's the reason why resilience is crucial for each company. Authors Huang & Farboudi Jahromi (2020) provide a framework of five resilience – building organizational strategies. Although they are more oriented to service companies, they can also definitely be adapted to product companies (including analysed apparel sector).

- **Market orientation**

As the definition suggests, market orientation is "the organization-wide development of market intelligence relevant to present and future consumer needs, diffusion of the intelligence across units, and company responsiveness to it." (Huang & Farboudi Jahromi, 2020). As authors mention, there are three key elements: collection and distribution of market intelligence, as well as the ability to respond to market trends and changes (Fig. 10).

The study performed by Lettice et al. (2014) showed that law companies which were more oriented to market performed better than others during the 2008-2009 crisis. The gathering of market intelligence helped the businesses understand the condition of the existing markets, the competition, risks, opportunities, and the expansion potential of emerging markets and services. Service-oriented businesses should establish a structured approach for gathering market intelligence, which combines information from different sources such as the internet, media, industry networks, stakeholders, regulatory bodies, and financial transactions. They should also utilize a range of data analysis methods and technologies to improve the effectiveness of market intelligence collection.


**Fig. 10**. Market orientation resilience strategy

Second very important aspect is market intelligence dissemination. According to (Huang & Farboudi Jahromi, 2020), service firms can employ the following five methods to boost their ability to disseminate market knowledge and create a shared view of the market:

1. Sharing performance results, reports, presentations with internal stakeholders;
2. Creating an intelligence management team within a company and centralizing the knowledge;
3. Customizing market intelligence depending on user group's existing market perceptions;
4. Utilizing empathic learning techniques so that each member of organization would be aware with the customer portfolio and other stakeholders of the company;
5. Promoting the use of experiential learning techniques, such as direct consumer engagement, to teach organization members about the worlds of customers.

Finally, allow them to promptly react to market needs during a crisis; for instance, they might expand their customer networks and diversify their services, service delivery channels, and technology based on the current and future needs of their clients (Alves & Hao, 2020). Performance of businesses is boosted by proactiveness to foresee client needs amid a crisis in addition to responsiveness. To be more precise, being proactive enables firms to take measured risks in order to meet unfulfilled customer needs, while being responsive allows companies to utilize existing market data to satisfy customers' present demands (Petzold et al., 2019).

Huang & Farboudi Jahromi (2020) mention several factors which help companies increase their market orientation:

- Departmental;
- Managerial;
- Structural;

– Employee-related.

Research performed by (Martin-Consuegra et al., 2008) showed that significant departmental connections decrease internal strife and improve market orientation. Also, the authors mentioned that managerial approach and market orientation is extremely important, as well. Structural category of factors is composed of centralization, formalization, market-oriented training and market-based reward systems. In case a company emphasizes centralization and formalization, it would have an adverse effect on market orientation. Market-oriented training and reward system motivates employees and helps companies achieve the desired results.

- **Supply chain optimization**

Supply chain optimization helps companies properly manage and recover from disruptions, as well as reduce their sensitivity to disruptions. To optimize the performance, companies should strengthen their supply chain agility and resilience (Fig. 11).

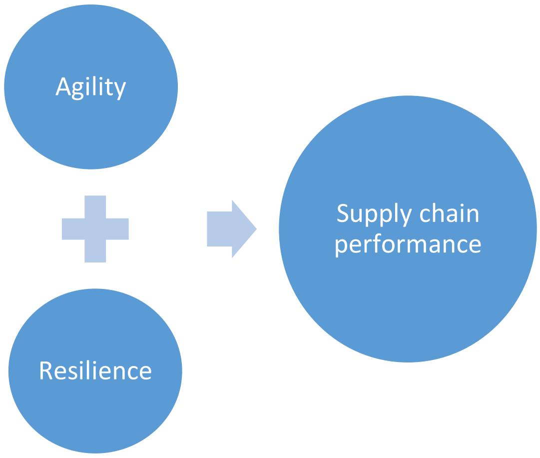


**Fig. 11**. Supply chain optimization resilience strategy

According to Altay et al. (2018), agility is the ability of the supply chain to respond to changes quickly and efficiently, whereas the capacity of the supply network to absorb shocks and recover from them is known as supply chain resilience. Flexibility in procurement and distribution increases both: agility and resilience. The term "procurement flexibility" describes the availability of a variety of options for obtaining higher quality goods and services, as well as the aptitude to efficiently utilize these options to satisfy shifting market demands. When it comes to the storage and transportation of goods to customers, there are variety of options available. Distribution flexibility is the capacity to efficiently use these options in response to changing market conditions.

Both types of flexibilities can be assured by several strategies:
1. **Agility capacity.** When the primary capacity is interrupted, agility capacity at the parent company can offer goods; but, if the parent firm is considerably impacted by the crisis, agility capacity cannot be used.
2. **Risk mitigation inventory.** When the parent company and all of its capabilities are completely disrupted, a separate site from the parent firm's inventory may be used instead.
3. **Capacity subcontracting.** With this technique, service businesses purchase a particular item from a third party, who may be domestic or foreign.

4. **Increasing supply chain visibility.** Transparency in following products from their origin to their end location by gaining access to crucial supply chain data. Businesses may invest in a dependable Enterprise Resource Planning (ERP) system that enables them to provide real-time information on different supply chain components including inventory, manufacturing, and shipping in order to boost the visibility of supply chains.
5. **Information sharing.** Through the use of connected databases, businesses may share operational data between divisions and vendors, reducing the bullwhip effect, which is the term for supply chain inefficiencies and inventory variations brought on by fluctuating client needs.

- **Strategic corporate reorganization**

Strategic corporate reorganization consists of three strategies (Fig. 12). An acquisition takes place when one business purchases another and becomes the new owner, whereas a merger involves two existing firms joining forces to form a new, single firm (Hayes, 2020). A strategic alliance is a legal relationship between two companies that allows them to share resources including intellectual capital, technologies, as well as trademarks. A joint venture is the creation of a new third company through the legal collaboration of two or more companies (Kenton, 2022).

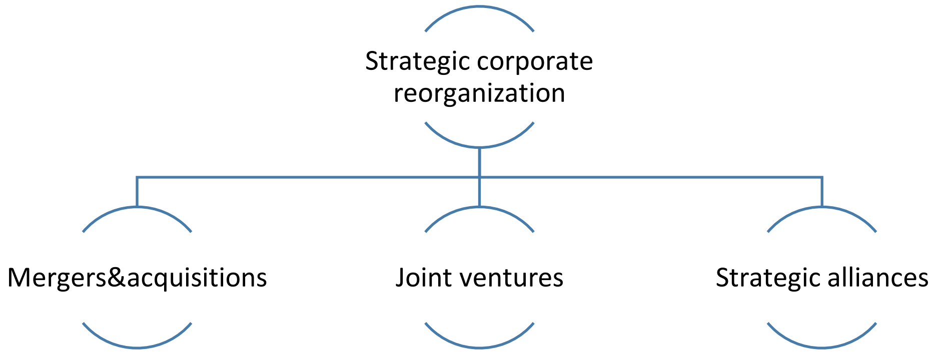


**Fig. 12**. Strategic corporate reorganization resilience strategy

If choosing this strategy, companies must consider several crucial factors. They can be separated into two categories: pre-partnership and post-partnership. Pre-partnership factors are the following:
- Strategic and functional fit with the prospective partner;
- Similar company size;
- Experience in previous partnerships;
- Communication efficiency with prospective partner;
- Assessment of potential partner’s future capital needs;
- Paying appropriate price for the partnership.

Authors Huang & Farboudi Jahromi (2020) also mention post-partnership factors which must be considered:
- Acceptable partnership strategy which meets both functional and organizational criteria;
- The right pace of partnership;
- Formation of a post-partnership coordination team;
- Clear decision on business direction and leadership towards it;
- Good communication during the partnership;
- Management of cultural differences;
- Management of human resource problems.

More vulnerable companies (for example, start-ups), usually tend to look for partnerships during the disruptions. The main their intention is to reduce the costs and stronger establish in the market. Although, companies which are already well-established in the market and have many resources are more interested in acquiring other businesses in order to grow and boost revenue.

- **Innovations**

During a disruption, most businesses quickly go into emergency mode and start trimming expenses on everything from daily operations to labour and R&D. Although that may assist some companies in overcoming the disruption, a sole focus on cost-reducing may result in a variety of issues, including a drop in quality of product, customer discontentment, a lack of post-crisis development, and employee emotional responses of pessimism and disempowerment. Consequently, a combination among cost-cutting and investment is required to get businesses through the disruption and help them prosper after it (Huang & Farboudi Jahromi, 2020). According to Jung et al. (2018), the Schumpeterian model states that economic recessions destroy less inventive businesses while giving more innovative ones a chance to survive and develop.

There are four types of innovation (Fig. 13). Product (or service) innovation is the creation of a brand-new product or service or a significant upgrade to the existing product’s components or features. This type of innovation is rarely used during the disruptions because of common cost-cutting policies. Process innovation refers to the occurrence of innovation in a product's or service's method of production or delivery. Several service companies have altered their method of service delivery due to the pandemic. For instance, digital platforms have been utilized by the leisure, educational, and healthcare service industries to offer their clients remote services (Huang & Farboudi Jahromi, 2020).

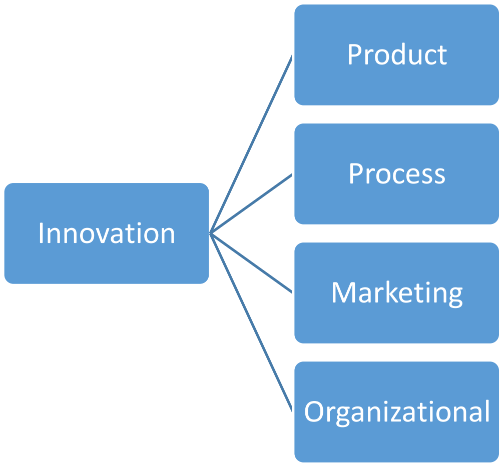


**Fig. 13**. Innovation resilience strategy

Significant changes in the marketing mix, such as those in product design, location, promotion, or pricing, are referred to as marketing innovation. During the pandemic, a number of service businesses have utilized online platforms to retain their consumer relationship. To advertise their services, some of them have even employed social media influencers. Ads that highlight a company's social conscience have been developed in relation to the use of digital marketing. Eventually, organizational (or managerial) innovation refers to implementing "new business techniques, knowledge management systems, techniques of workplace organization (for instance, decision-making systems), and management of external interactions." (Huang & Farboudi Jahromi, 2020). The organization's performance, efficiency, and dynamic capability might well improve with the verification and application of the new practice or procedure. As a result of widespread layoffs triggered by the pandemic, some businesses implemented new procedures to support employee remote work, while others established new regulations to protect their clients.

As discussed above, innovation can take many different forms. Companies may choose to use one or more of these forms during the pandemic, but they must also pay attention to the elements that encourage innovative processes. Organizational aspects at companies that favourably affect innovation include minimal centralization and low formalization.

- **Business model transformation**

Creating and capturing value for a company's stakeholders, such as customers, personnel, vendors, shareholders, and society, is described as having a business model (Huang & Farboudi Jahromi, 2020). Disruptions might lead business models to failure. To avoid that, some changes must be made to the models themselves. Even small changes might help companies to emerge in new markets and find new revenue sources. However, in order to secure growth after the disruption, more radical changes should be considered.

Using new technologies and putting an emphasis on innovation can revolutionize business models (Fig. 14). It should be highlighted, nevertheless, that business model innovation does not merely entail technological adoption. Transformation connects a new technology with consumer needs. According to Kavadias et al. (2016), usage-based pricing as a complementary pricing strategy, asset sharing, customized goods and services, and a cooperative ecosystem are all excellent components of business model transformation.

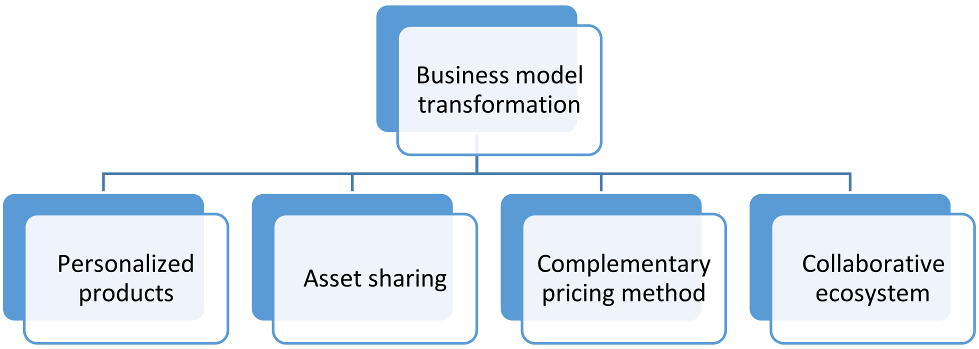


**Fig. 14**. Business model transformation resilience strategy

One possibility of the effective business model transition - personalized products or services - offers a better fit between consumer wants and service quality, satisfies the hedonic or emotional demands of customers, and provides greater value to customers (Huang & Farboudi Jahromi, 2020).

According to the authors, another possible business model transition – asset sharing – refers to the distribution of tangible and intangible assets within the stakeholders and may be one of the three forms:

– Business-to-consumer access-based services (economical and technical advantages);
– Peer-to-peer sharing (financial, social, emotional advantages);

– Business network asset sharing (financial, social advantages, growth and innovation possibilities).

Third possible business model transformation is complementary pricing method which is usage-based. It means that clients pay according to the usage of service. However, as this method is more suitable for services instead of products, it will not be analysed further.

The last option is growth of collaborative ecosystem. It stands for improving interactions between partners, suppliers, consumers, and employees that enables businesses to handle complex problems, encourage creativity and expansion, and achieve a competitive edge with greater efficiency (Smith, 2015). Furthermore, it has a positive impact on company values and stakeholders.

During the disruptions, companies tend to go into poor decision making. It results because of financial concerns and uncertainty. For example, COVID-19 was a major disruption which triggered negative economic repercussions and caused considerable mental issues for business executives. In this circumstance, executives might be unable to decide appropriately regarding the present and future state of their businesses, which could have a detrimental effect on how well such organizations perform. In addition, in times of economic turmoil, business leaders may demonstrate a strong inclination to avoid losses and decline proposals that necessitate significant investments, regardless of the potential for long-term gains (Huang & Farboudi Jahromi, 2020). Loss aversion refers to people's tendency to prevent losses twice as much as they would like to get a significant return. An example of that – avoiding investments during uncertain times, even if there are high chances of financial return.

To conclude, the switching viewpoint in dynamic capabilities, that highlights the inevitability of organizational change and underlines their usefulness during shocks, forms the foundation of the five resilience-building techniques (Huang & Farboudi Jahromi, 2020). Supply chain optimization and market orientation require less organizational change than innovation, business model transformation and strategic corporate reorganization. The last three, which are related to more significant changes, not only require more preparation, but resources, as well.

### More actions to manage disruptions

Talking about management of disruptions in general, authors Huang & Farboudi Jahromi (2020) share some more important ideas. The first is, that companies must create crisis management and plan-ahead teams once the disruption takes place. The roles of these teams are provided in Table 12 below.

**Table 12**. Management of disruptions – teams' formation (Huang & Farboudi Jahromi, 2020)

| Crisis management team | Plan-ahead team |
|---|---|
| Daily tasks | Long-term planning |
| Preservation of cash | Evaluate potential consequences of disruption |
| Supply chain management | Action plan for each possible scenario |
| Safety procedures | Harshness, volatility, and malleability - evaluation |

As authors mention, crisis management team work on daily, operational tasks, such as putting safety procedures in place for both staff and customers, making sure that company has enough of working capital and taking care of any disruptions of supply chain. Plan-ahead team, on the contrary, is more strategically oriented and takes care of long-term planning. It is responsible for possible consequential scenarios creation and evaluation of these to business. Each scenario must be backed up with a resilience-building strategy (as discussed above). Also, each scenario must evaluate the significance of harshness (degree of scarcity), volatility (degree of uncertainty), and malleability (ability to influence and shape the business) in business environment. Regarding to the different degrees of these three factors, specific action plans for scenarios could be assigned.

According to McKinsey Global Institute (2020), there are even more actions that companies could consider while dealing with disruptions. These are the following:

- Reshoring manufacturing;
- Improving risk management skills;
- Enhancing transparency;
- Adding backup to procurement and transportation networks;
- Keeping more inventory in hand;
- Simplifying products;
- Developing ability to shift production between sites.

As highlighted by McKinsey in their report, enhancing resilience does not require sacrificing efficiency, but rather entails modifying the structure and function of the worldwide network of suppliers, manufacturers, and distributors. Additionally, the concept of "techno-nationalism" was introduced, which suggests that governments may become more involved in the management of global value chains following the pandemic, particularly for intricate products, by incentivizing the development and expansion of local expertise.

## 2.3. Global Value Chain Resilience and Reconfiguration

According to the World Trade Organization (2021), “global value chains were progressing in important ways and played an important role in supporting economic recovery during the COVID-19 pandemic”. The main reason for it is that global value chains managed to remain resilient during the disruption. As the World Trade Organization mentions, global value chains will also have a significant impact on restoring the trade system in general. Therefore, current focus of organization is on understanding how exactly the value is created and distributed between the actors of the global value chain.

However, working on improving trade system is only one side of the coin. Another one is to keep building the resilience of global value chains. As World Economic Forum (2023) notes, COVID-19 was only the beginning of disruptions. It was followed by high inflation numbers, lack of competent workers, shortage of resources, order backlogs, energy crisis, climate issues, also, new legislations about sustainability in order to reduce waste. Global value chains constantly face new issues. Therefore, it is important to have a resilient global value chain which is able to cope with them.

World Economic Forum (2023) came up with five strategies which can help manufacturing companies build the resilience. First two suggestions are critical and three last ones are strongly recommended:

1. **Supplier base**. To increase resource accessibility, the supplier base can be expanded, and geographic risk can be dissociated. Also, as mentioned above, environmental, social and governance regulations are constantly changing, so manufacturers are always forced to verify their suppliers according to these legislations. The more suppliers company has, the less vulnerable it is.

2. **Financial stress-testing**. In order to prepare for potential recession resulting in demand decrease or bankruptcy, companies should perform a regular financial stress-testing on their cashflows, suppliers and customers. Also, considering rising interest rates, assessing inventory along the entire value chain can assist in lowering operating capital costs.
3. **Planning capabilities**. Creating end-to-end visibility across the global value chain can assist manufacturers in identifying component shortages, environmental, social and governmental concerns, and changes in consumer demand with their extensive planning skills.
4. **Manufacturing adaptability**. Companies can take advantage from increased manufacturing adaptability to quickly adapt their production schedules to evolving customers' needs and availability of raw materials. This quality is relevant in terms of uncertainty in demand markets, resulting from potential new COVID-19 wave and recession risk.
5. **Customer spending**. With the uncertain economic future, consumer spending may shift. To detect and be ready for rapid shifts in demand, developing demand scenarios based on the evolution of inflation rates, evaluating projections, and maintaining regular contact with customers might be helpful.

As the COVID-19 pandemic started, studies forecasted a systematic and fundamental change in the ownership and location methods applied on global value chains, used by leading multinational corporations (Kano et al., 2022). According to them, global value chains would most probably have a limited geographic reach, reshore more tasks, and hence rely less on outsourcing. However, authors Kano et al. (2022) performed a study on global value chains and distinguished several main suggested aspects on reconfiguration of the global value chain. First, long term governance decisions should be preferred instead of short-term ones. It necessitates routinely assessing the expenses, risks, and possibilities for value creation of the current managerial and institutional governing processes and making the required corrections. Also, companies should pay more attention to ensure the value creation in the global value chain and constant improvement of capability. It could be performed by promoting prompt, trustworthy information flow and protecting commitments. Despite pre-pandemic trends that push global value chains toward structural reconfiguration, managerial governance solutions are more likely to play a significant role in lowering information costs, boosting efficiency, and improving the long-term resilience of global value chains.

To sum up, resilience in global value chains refers to the ability of a company or supply chain to withstand and adapt to disruptive events or shocks, such as natural disasters, geopolitical instability, or pandemic. Key characteristics of resilience in global value chains include:

1. **Redundancy**. A resilient global value chain has redundant components, such as multiple suppliers or transportation routes, so that if one component fails, there are alternatives to fall back on.
2. **Flexibility**. A resilient global value chain can quickly adapt to changing circumstances by reconfiguring its operations, production processes, or supply sources.
3. **Transparency**. A resilient global value chain has clear and timely communication channels among all actors in the chain, so that everyone can quickly respond to disruptions or emergencies.
4. **Diversification**. A resilient global value chain is not overly dependent on a single market, supplier, or customer, and instead has a diversified portfolio of partners and clients.
5. **Collaboration**. A resilient global value chain is characterized by a high degree of collaboration and trust among all actors, who work together to identify and address potential risks and challenges.

6. **Innovation**. A resilient global value chain is constantly seeking to improve its processes, technologies, and practices to stay ahead of potential disruptions.
7. **Risk management**. A resilient global value chain has effective risk management strategies in place. This can include identifying and assessing potential risks, developing contingency plans, and regularly testing and updating these plans.

Overall, resilience in global value chains requires a combination of strategic planning, flexibility, and collaboration to effectively adapt to and recover from disruptions. By being so, companies and supply chains can better withstand and recover from disruptive events and ensure continuity of operations and delivery of goods and services to customers.

## 2.4. A Conceptual Framework

Based on the literature analysis, a conceptual framework was developed (Fig. 15).

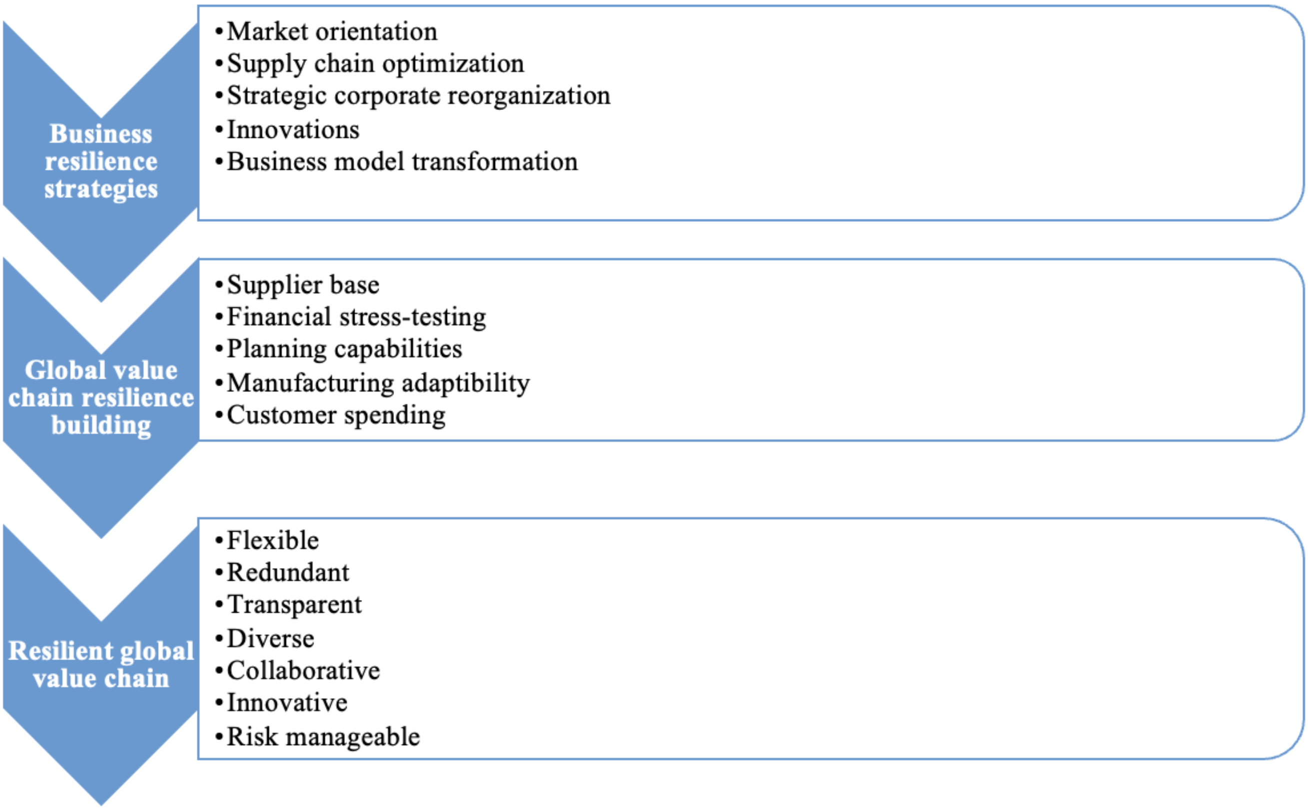


**Fig. 15**. Conceptual model

The goal of this model is to propose a framework which describes the process of building up a resilient global value chain.

Each company chooses their own business resilience strategy. There are five possibilities which company can choose from:

– Market orientation;
– Supply chain optimization;
– Strategic corporate reorganization;
– Innovations;
– Business model transformation.

According to the strategy chosen, company adapts its global value chain to it. It is crucial to keep building the resilience of the global value chain, which can be carried out by extending supplier base, performing financial stress-testing, improving planning capabilities, taking advantage of manufacturing adaptability and constantly maintaining relationship with customers. Performing all that, as a result, company builds a resilient global value chain which key characteristics are flexibility, transparency, collaboration, diversification, risk management, redundancy, and innovations.

Therefore, empirical research will be applied to find out which strategies were mostly chosen by apparel companies during the COVID-19 pandemic in order to build up a resilient global value chain.

## 3. Research Methodology for the Resilience of Global Value Chains

**Research aim** is to examine the resilience strategies which apparel companies were implementing on their global value chains during the COVID-19 pandemic. The **objectives** of this research are the following:

1. To perform an empirical research on apparel companies' global value chains during the COVID-19 pandemic;
2. To provide recommendations for building a resilient global value chain for apparel companies.

The process of empirical research is represented below in Fig. 16.


**Fig. 16**. Process of empirical research

**Research question** is "What strategies did apparel companies apply to their global value chains to become resilient to the COVID-19 pandemic?".

**Research unit** is resilience of global value chains.

**Research method.** As the research question focuses on understanding the specific characteristics which built resilient global value chains of apparel companies, a *qualitative* research method is applied in this case. Research unit is abstract and not measurable; therefore, it suggests the qualitative approach. This method allows to better understand the environment and phenomenon which is studied. Study will be performed by *content-analysis* on secondary data.

**Research sample** is 13 official reports.

**Data collection.** Data was collected from official reports. A Google search for the official reports covering relevant topic was performed. Search queries were the following:

1. ["global value chain" "resilience" "COVID-19" "apparel" site:mckinsey.com]
2. ["global value chains" "resilience" "COVID-19" "apparel" site:wto.org]

Search results were limited to 2019.01.01-2022.12.31 publication date range.

Research was performed using qualitative analysis software – MAXQDA. In total, 13 official reports were analysed. Data retrieved from reports started to reiterate, therefore, it was decided that the amount of collected data is valid. For this reason, reports from only two consulting companies were analysed.

After analysis of all reports, 11 codes with 39 sub-codes in total were set. Codes are based on a conceptual model (Fig. 15). The code system is provided below (Fig. 17).

| Code System | |
|---|---|
| **1. Date** | |
| | 1.1 2020-08 |
| | 1.2 2020-09 |
| | 1.3 2020-11 |
| | 1.4 2021-01 |
| | 1.5 2021-03 |
| | 1.6 2021-04 |
| | 1.7 2021-06 |
| | 1.8 2021-11 |
| | 1.9 2022-01 |
| | 1.10 2022-06 |
| | 1.11 2022-10 |
| | 1.12 2022-11 |
| | 1.13 2022-12 |
| **2. Market orientation** | |
| | 2.1 Focus on digital marketing |
| | 2.2 Building operational teams |
| | 2.3 New strategies development |
| **3. Supply chain optimization** | |
| | 3.1 Supply chain digitalization |
| | 3.2 Visibility improvement |
| **4. Strategic corporate reorganization** | |
| | 4.1 Formation of strategic alliances |
| | 4.2 M&A |
| **5. Business model transformation** | |
| | 5.1 Increase of personalization |
| | 5.2 Decrease of portfolio complexity |
| | 5.3 Regionalization |
| **6. Innovations** | |
| | 6.1 New product innovations |
| | 6.2 Changes in organizational structure |
| | 6.3 Growth of e-commerce |
| **7. Customer spending** | |
| | 7.1 Responsiveness to shifting customers behavior |
| | 7.2 Strengthening relationship with customers |
| **8. Manufacturing adaptability** | |
| | 8.1 Automation of manufacturing |
| | 8.2 Shift in manufacturing and inventory strategy |
| | 8.3 Fostering flexible production |
| **9. Financial stress-testing** | |
| | 9.1 New investments |
| | 9.2 Focus on cashflows and ROI |
| **10. Planning capabilities** | |
| | 10.1 Scenario planning |
| | 10.2 End-to-end visibility |
| **11. Supplier base** | |
| | 11.1 Building redundancy in supplier network |
| | 11.2 Subtier mapping |
| | 11.3 Rethink number and diversification of suppliers |
| | 11.4 Strenghten relationship with suppliers |

**Fig. 17**. Code system

Each action (sub-code) which was provided by official consulting organizations was assigned to a certain strategy, related to business resilience or specifically global value chain resilience (code). 160 fragments were retrieved and assigned to sub-codes.

**Future research and limitations.** This research is focused on one (apparel) industry. For the future research, a deeper analysis of companies from different industries could be performed. Also, analysis could be performed taking different regions and their differences into account. Moreover, analysed reports were from two sources – McKinsey Global Institute and World Trade Organization. 13 reports were enough for this research as data started to reiterate, however, for the future research, more reports from various official sources could be analysed. Also, for the future research, mixed methods approach could be applied. It would be advisable to make questionnaires and collect additional data from companies about the actions that they take during disruptions.

## 4. Results of Empirical Research

After qualitative analysis, excluding code "Date", 147 fragments with pure information about recommended actions for building global value chain resilience were retrieved. The frequency of sub-codes is provided in Table 13 below.

**Table 13**. Sub-code frequency

| Sub-code/action | Frequency | Percentage |
|---|---|---|
| Supply chain digitalization | 17 | 11,56 |
| Decrease of portfolio complexity | 13 | 8,84 |
| Shift in manufacturing and inventory strategy | 11 | 7,48 |
| Rethink number and diversification of suppliers | 10 | 6,8 |
| Regionalization | 9 | 6,12 |
| Growth of e-commerce | 9 | 6,12 |
| Responsiveness to shifting customers behaviour | 9 | 6,12 |
| Focus on cashflows and ROI | 6 | 4,08 |
| Building redundancy in supplier network | 6 | 4,08 |
| Strengthen relationship with suppliers | 6 | 4,08 |
| M&A | 5 | 3,4 |
| Fostering flexible production | 5 | 3,4 |
| New strategies development | 4 | 2,72 |
| Increase of personalization | 4 | 2,72 |
| New product innovations | 4 | 2,72 |
| Strengthening relationship with customers | 4 | 2,72 |
| Automation of manufacturing | 4 | 2,72 |
| End-to-end visibility | 4 | 2,72 |
| Visibility improvement | 3 | 2,04 |
| New investments | 3 | 2,04 |
| Focus on digital marketing | 2 | 1,36 |
| Building operational teams | 2 | 1,36 |
| Changes in organizational structure | 2 | 1,36 |
| Scenario planning | 2 | 1,36 |
| Sub-tier mapping | 2 | 1,36 |
| Formation of strategic alliances | 1 | 0,68 |
| TOTAL | 147 | 100 |

In general, top actions which were recommended for apparel manufacturing companies to improve resilience were mostly related to such business resilience strategies as business model transformation and supply chain optimization, also, innovations. Most popular and often recommended global value chain resilience building actions were mostly related with focusing on supplier base, manufacturing adaptability, and customer spending.

All other strategies were also mentioned several times and are important for companies in order to remain resilient, however, these six strategies, compared to the others, were mentioned in 80% of all retrieved segments.

## 4.1. Results of Business Resilience Building Analysis

In this section, main findings concerning business resilience building strategies are discussed.

### 4.1.1. Market Orientation

As the COVID-19 pandemic started, consumer behaviour started to change dramatically. Therefore, one of key things for companies to survive was to remain market oriented.

8 fragments out of 147 (5,44%) were assigned to market orientation (Fig. 18). Most attention within the reports was paid to the new strategies development (4/8). Less times (twice each) were mentioned such aspects as importance of focus on digital marketing and building operational teams.

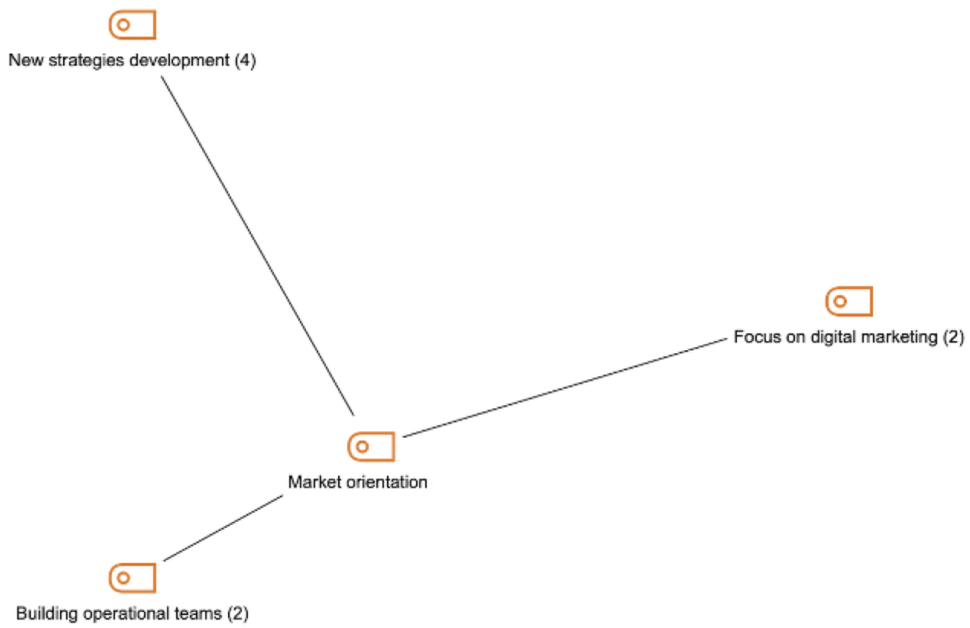


**Fig. 18**. Market-orientation sub-codes

**New strategies development**

The industry's transition towards casualwear, and the ongoing pressure on luxury are just a few of the potential short-term issues that apparel companies may face (Amed et al., 2020). Therefore, several authors (Amed et al., 2020; Das et al., 2022) emphasize importance of being courageous and not afraid of realizing new, revolutionary strategies. Instead of focusing on volume and discounts, companies must establish unique tactics for their product offerings or assortments that emphasize value, profitability, simplicity, and smaller collections.

Amed et al. (2020) provide an example of focusing on different strategies in their report. Authors mention several apparel brands which were not impacted by the pressure to decrease price, on the contrary to their competitors. Some market players decided to keep their inventories up in the hope of a rebound next year. Meanwhile, other companies found **innovative** ways to eliminate excess inventory. They started cooperation with certain platforms and outlets which sell collections from past seasons at affordable prices (Amed et al., 2020). Instead of waiting and hoping for the best, they took a pro-active approach and succeeded even during the time of disruption.

Another approach that manufacturing companies took and which was recommended by such organizations as McKinsey and WTO, was sustainability. Companies in Europe and the United States have committed to ambitious targets for reaching net-zero emissions, adopting sustainable polymers, and reducing water use for extended periods of time (Das et al., 2022). In these sectors, Asia has historically trailed behind the rest of the globe. As Das et al. (2022) mention, companies begin to focus sustainability across the value chain, with a focus on minimizing waste throughout the life cycle of products from source to consumer, as customer preferences steadily shift to sustainable, natural, and organic alternatives. The second-hand market rises in various areas, including luxury and fashion, with increased interest from Asian buyers, particularly younger ones.

**Focus on digital marketing**

As consumer behaviour is changing, newest trend and one of key approaches is focus on digital marketing. COVID-19 kept all people at home; therefore, companies were forced to find new ways to promote their products.

Amed et al. (2020) note the importance of corresponding to customer preferences. According to the authors, companies must use technology and analytics to monitor consumer mood prior to manufacturing to better match these preferences. Certain brands already successfully use the digital marketing and develop products based on consumer insights.

In 2022, Amed et al. noted that corporations must leverage the year of 2023 to **innovate** their digital marketing strategies. Resources should be reallocated to alternative paltforms, including retail media networks, that may provide a greater return on investment than sponsored social media advertising while also establishing stronger brand communities. This will have an impact on distribution networks as brands seek greater revenue and obtain additional first-party consumer information.

**Building operational teams**

As important as focus on digital marketing or developing new strategies, is understanding the significance of people within a company. To remain resilient during disruptions, attention must be paid to employees, as well (Amed et al., 2020; Felix et al., 2022).

Two main aspects are emphasized by the authors. First, building talent itself (Felix et al., 2022). The talent pool in the consumer goods supply chain was not designed to function in this new context. Building new capacities is an essential requirement, whether it is through the formation of teams of engineers and data analysts or through the integration of skills (Felix et al., 2022). Amed et al. (2020) also note that companies should establish cross-functional teams. Each team should be aware of strategic objectives and provide companies with the **agility** needed to respond fast and perceive all opportunities in the market (Amed et al., 2020).

### 4.1.2. Supply Chain Optimization

Supply chain optimization strategy was coded (Fig. 19) with two sub-codes – supply chain digitalization (frequency 11,56%) and visibility improvement (frequency 2,04%).

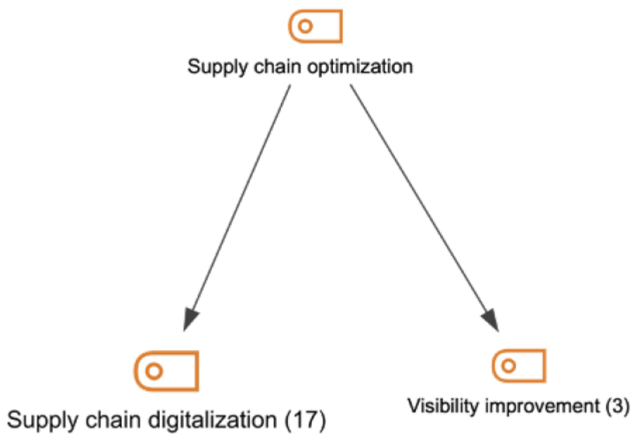


**Fig. 19**. Supply chain optimization sub-codes

As authors Lund et al. (2020) note, in case of disruptions, supply chain can be a contributor to vulnerability or resilience. It all depends on company's ability to assess **risk**, execute mitigation methods and build business continuity plans. According to the authors, vulnerabilities can be inherent to industry or can be a consequence of internal decisions.

**Supply chain digitalization**

Most attention within the analysed reports was paid to the digitalization of supply chain. Several different aspects were emphasized by the authors regarding this topic.

Once the COVID-19 pandemic started, companies were forced to speed up the implementation of digital technologies (the Internet of Things, advanced robotics, analytics, and artificial intelligence, as well as digital platforms) in order to survive (Amed et al., 2022; Lund et al., 2020; Mischke et al., 2021; Solingen et al., 2021). The application of digital and other technologies increased during the pandemic, and under the right circumstances, it has the potential to increase productivity by replacing workers or increasing output per worker as businesses worked to address urgent pandemic-related issues, lessen in-person contact and the risk of infection, and create strategies to combat the virus itself. As businesses took prompt action to address the disruption, digitization accelerated quickly (Mischke et al., 2021). According to McKinsey Global Economic Conditions study released in December 2020, businesses increased their investment in technology and digitization during the pandemic (Mischke et al., 2021). McKinsey Global Institute researchers Amed et al. (2020) also note that businesses with significant exposure to digital platforms will have a better future. Businesses can experience considerable gains in **visibility**, **traceability**, and **agility** by investing in digitizing their supply chains (Felix et al., 2022; Lund et al., 2020). By raising margins over time, the initial costs may pay for themselves (Felix et al., 2022).

Importance of information systems implementation are emphasized, as well (Bacchetta et al., 2021; Das et al., 2022). According to Bacchetta et al. (2021), utilizing information systems that deliver precise real-time information about inventory levels and production across the supply chain can establish resilience, which is crucial for the provision of vital commodities (such as masks during a pandemic). Having certain data available, designers of fashion brands become more adept at using it. It means that analytics and artificial intelligence will gain importance in the process of product development (Amed et al., 2020). Das et al. (2022) and Amed et al. (2022) complement that investments in technology, data, and analytics can facilitate the provision of better information to decision-makers. Leveraging these insights, a dedicated team can overcome immediate obstacles and contribute to the long-term expansion of suppliers. These measures can mitigate the impact of price increases, control transportation costs, and ease supply bottlenecks in transportation routes (Das et al., 2022).

In general, in the fashion sector, digital opportunities inspire **innovative** approaches to marketing, design, and new revenue streams (Amed et al., 2020). As authors emphasize, creating supply chain **transparency** through digitization may increase efficiency and resilience. It allows to identify any vulnerabilities hidden within the network's lowest layers. For example, Nike, the apparel company, was able to quickly redirect products from physical retail stores to e-commerce warehouses in China, thanks to their digitized supply chain system, when the COVID-19 outbreak initially arose (Amed et al., 2020). It thus minimized the income loss.

There are three ways that businesses should use digital technologies. To compete with consumers who are increasingly comfortable with technology, merchants must provide a superior omnichannel experience by digitizing the consumer's journey (Das et al., 2022). To adapt to changing consumer behavior, consumer goods companies need to find new ways to reach their customers. In addition, due to factors such as labor shortages, pandemic-related economic effects, and rising inflation, companies are compelled to digitize their value chains. By automating manual processes that are not necessary, businesses can reduce costs and increase efficiency. Finally, companies must equip their workforce with digital skills and provide them with data analytics tools to make better decisions. This includes using advanced analytics to manage procurement costs, streamlining supply chain operations to minimize waste, and ensuring that products are available in the right place at the right price with effective marketing support. These are some of the key areas that require attention (Das et al., 2022).

nnovation and progress in technology provide advantages as well as challenges. For example, analytics and artificial intelligence are now useful tools for creating value and can have a significant impact on both physical and digital spaces. However, if a suitable business model is not in place, they can exacerbate problems like disorganized processes, lack of expertise, or technical incompatibilities (Carr et al., 2021). In order to meet these difficulties and increase their competitiveness, businesses will probably need new strategies.

**Visibility improvement**

In general, visibility improvement is related to similar aspects as digitalization. Bacchetta et al. (2021) note that particular supply chain management techniques can lower **risks** and improve production resilience, according to some empirical findings. Coordination, information exchange, and company contingency plans are some of these tactics. Therefore, companies should adapt and coordinate their supply chains in such manner, to assure the share of information within the whole supply chain.

Another solution to increase supply chain **visibility**, besides information sharing, is to reduce the complexity of supply chain and carefully manage the expenses associated with shocks (Bacchetta et al., 2021). In other words, it means companies should configurate their supply chains in the most basic manner. That would improve visibility and help manage the expenses.

Creation of **transparency** within a supply chain is essential to enable a thorough picture of the supply chain, with intention to spot elements that expose vulnerability. Without complete transparency, for example, businesses might not be aware of their dependence on suppliers in unstable areas (Felix et al., 2022).

### 4.1.3. Strategic Corporate Reorganization

Regarding strategic corporate reorganization, two main actions were suggested by all analysed reports (Fig. 20). Mergers and acquisitions were mentioned 5 times (3,4%), while formation of strategic alliances was mentioned once (0,68%).

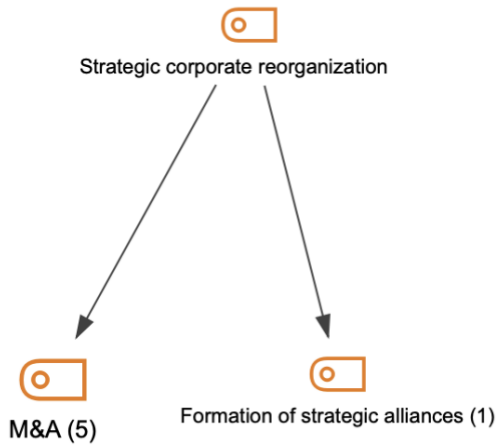


**Fig. 20**. Strategic corporate reorganization sub-codes

**M&A**

One of the possibilities that companies can take during the disruption is mergers and acquisitions. There are several factors which encourage companies to choose this option. Obtaining or strengthening new channels to market, gaining novel competencies, and consolidating for share of market via new categories or regions are the main ones (Amed et al., 2020). Stronger businesses will concentrate on geographical and categories expansion, targeting competitors from specific markets that have strong recognition and a varied footprint. In order to facilitate integration, acquirers frequently target businesses with corresponding business models or channel concentrations (Amed et al., 2020). According to Amed et al. (2020), in a small but considerable number of situations, the reason for M&A is intention to acquire new expertise related to technology, payments, supply chain operations. It becomes popular within premium fashion brands.

According to Carr et al. (2021), mergers and acquisitions contributed for 40% of the consumer packaging goods industry's growth between 2015 and 2018, enhancing firms' top lines, but leaving many seeking to boost efficiency, decrease complexity, and optimize supply-chain costs. In some instances, the acquisition's expenditures were so enormous that they refuted the original argument that had justified it. Even when mergers and acquisitions is moderately well-integrated, one of its typical aftereffects is the accumulation of supply chains, which is difficult to manage and makes it challenging to extract efficiencies and synergies (Carr et al., 2021).

According to Carr et al. (2021), once the M&A deal takes place, companies should prioritize their business models and make sure they are:

- Fast and **flexible**: to reduce the lead time from customer’s order to the delivery of product;

- Granular and **segmented**: to satisfy varied demand in various categories and geographic marketplaces, while taking into account discounts and other variables that enhance instability;
- Personalized and technology-driven: fulfilling increasing customer requirements, such as for fast personalization, is made possible by emerging technology and expertise;
- Integrated: to guarantee a positive user experience throughout channels (via superior physical flows, sophisticated planning, and dispersed order processing);
- Economically efficient: to promote investment and growth.

However, even though M&A can be used as a driver of productivity and can help companies grow and compete with their rivals, statistics showed that, contrary to the forecasts, M&A activity decreased during the COVID-19 pandemic (Amed et al., 2020; Mischke et al., 2021). Volume of these transactions decreased by 21 percent, comparing first three quarters of 2020 with the first three quarters of 2019 (Mischke et al., 2021).

**Formation of strategic alliances**

Analysed reports did not focus on this type of action while building resilience. However, Amed et al. (2020) provided an example of a successful strategic alliances within apparel sector. For example, there might happen **partnerships** between fashion brands and video games, such as one with Ralph Lauren and Snap Inc. that provide virtual branded clothing for avatars (Amed et al., 2020). Another example is a partnership with League of Legends and Louis Vuitton. Companies introduced in-game skins which go along with a real-world capsule collection.

During the disruption, such as COVID-19 pandemic, companies were forced to look for new strategies and such partnerships were beneficial for both sides.

#### 4.1.4. Business Model Transformation

In response to the COVID-19 pandemic, businesses adopted various strategies due to supply chain disruptions. Those that survived and coped better with the initial shock quickly modified their operational strategies. However, according to Carr et al. (2021), most organizations' supply chain business models have evolved through inertia, a sequence of well-intentioned but disconnected decisions, rather than through a conscious and systematic procedure to ensure the chosen model aligns with the organization's goals.

However, according to McKinsey Global Institute’s research (2021), 25 enterprises had market capitalization gains equivalent to a staggering 40% of the market's gains. Digital industry pioneers, semiconductor producers, and platforms for communication and commerce make up most of this group. Several enterprises gained directly from the urgent demands produced by the COVID-19 pandemic - including digital power and online channels to support remote work and the transition to digital commerce (McKinsey Global Institute, 2021). Disruption forced companies to transform their business models.

For all the mentioned reasons, actions related to business model transformation were mentioned most often (Fig. 21). Only 4 reports out of 13 did not provide recommendations related to business model transformation.

Increase of personalization was emphasized with frequency of 2,72% within all recommendations, decrease of portfolio complexity 8,84% and regionalization – 6,12% frequency within all actions.


**Fig. 21**. Business model transformation sub-codes

**Increase of personalization**

As consumers behaviour is shifting, companies must look for the new ways to keep them satisfied and loyal. One of the ways to achieve that, is to increase personalization of production. Amed et al. (2020) emphasize that in order to offer a deeper digital experience, brands will use **innovations**, such as personalization. Das et al. (2022) complement that manufacturers and companies that sell consumer goods should be prepared to adapt to consumers' continuous exploration of new products and experiences. To create customized product offerings, recommendations, and promotions for specific consumers, improved customer segmentation is necessary. As sales become more personalized, the line between marketing and sales becomes increasingly blurred. Technological developments generate new chances for interaction and customization, particularly in premium brands and categories (Das et al., 2022).

Amed et al. (2022) also note that instead of establishing rises in prices that undermine customer trust, merchants should set prices per client and product segment, considering both - profit efficiency as well as readiness to pay. Simultaneously, companies might launch personalized incentives and reward schemes, specifically for products that are highly vulnerable to inflation or essential to customers (Amed et al., 2022). While creating personalization strategies, companies should even take customers' location (region) into account (Amed et al., 2022).

**Decrease of portfolio complexity**

During the COVID-19 pandemic, there were companies which were able to cope with the disruption and build up a strongly resilient supply chain for the future (Felix et al., 2022). One of the reasons is that they were able to reduce the complexity of portfolio. Consumer goods corporations were actively expanding their portfolios before the epidemic to acquire market position and niche markets. Its intricacy has evolved into a weakness that necessitates going back to the fundamentals. To streamline their portfolios and boost accessibility of high-volume products, certain businesses have **collaborated** closely with their clients and suppliers (Felix et al., 2022).

COVID-19 emphasized the need for a change in the profitability attitude after proving that having more items and collections does not always translate into greater financial outcomes. By focusing on demand while developing their assortment strategy, businesses may decrease complexity, identify strategies to promote full-price sell-through, and lower inventory levels (Amed et al., 2020). They can also improve **flexible** in-season responsiveness for both new goods and replenishment (Amed et al., 2020).

McKinsey Global Institute (2020) performed research, considering portfolio complexity. Given that complex assortments are fundamentally challenging, 61% of companies' CEOs in the poll suggested reducing the number of stock keeping units (SKUs) (Amed et al., 2020). According to the authors, excessive variety distract from key items, produce lengthy tails of ineffective SKUs, and lead to network and in-store bottlenecks.

Another goal, besides reduced portfolio complexity, is to decrease complexity of product inputs (Bacchetta et al., 2021; Solingen et al., 2021). As Bacchetta et al. (2021) and Lund et al. (2020) note, companies should invest in inputs which are standardized and easy to replace. Low substitutability causes cascading interruptions that stop the production as a whole; high substitutability allows for quick increases in domestic demand to be matched by external supply (Solingen et al., 2021). According to Felix et al. (2022) and Seong et al. (2022), the strongest defence against being exposed to disruption **risk** may be to acquire the skill to adjust production to replace necessary inputs.

Companies tend to focus on **flexibility** within their supply chains with intention to become resilient to supply and demand fluctuations. Reducing the use of different materials in various product offerings by designing goods using common components can also increase the resilience of global value chains (Lund et al., 2020, Felix et al., 2022).

Companies should also avoid complementary inputs. When manufacturing is organized sequentially and components are complementary, a single negative accident (for example, a plant shutdown) can cause a cascading impact throughout the supply chain (Bacchetta et al., 2021).

**Regionalization**

Another aspect that companies must decide on is regionalization vs localization. Companies incorporate **agility** and **rapidity** to business processes, and supply chain reconfiguration is a top focus in order to remain competitive in this unreliable economy. Leaders think about producing and sourcing locally in order to boost resilience in addition to gaining a cost advantage (Bacchetta et al., 2021; Doheny et al., 2022). On the other hand, another strategy to reduce the supply chain disruption **risk** is to regionalize supply chain operations (Doheny et al., 2022; Lund et al., 2020; Seong et al., 2022). The specific circumstances of each company determine how they decide on regionalization. Industries vary in how well they are positioned. Production transfers are not always feasible, particularly in regions with highly linked value chains or when a country's economic advantage is significant (Doheny et al., 2022; Felix et al., 2022).

The effectiveness of a regionalization strategy is influenced by numerous aspects. For instance, it is necessary to balance possibly cheaper logistical costs, demands for working capital, taxes and duties with greater material and labour expenses. Other important factors include supply availability, productivity, and infrastructure. In some industries, the presence of total capacity and a reasonably established supplier base may be sufficient to tilt the scales in favour of regionalization (Doheny et al., 2022).

Moving may be more difficult for businesses in sectors that require a lot of capital, experience, or whose goods are very complex (Doheny et al., 2022; Felix et al., 2022; Solingen et al., 2021). If leading exporters have already made the change, or in trade-intensive businesses at which demand from the area is already rising quickly, the transition might be easier. Priority industries, as determined by country-specific considerations including national security, competitiveness, and sustainability, can regionalize even more quickly as a result of noneconomic factors and policy initiatives (Doheny et al., 2022). For instance, relocating for apparel sector is conditionally easy because of having labour-intensive global value chains (Lund et al., 2020; Solingen et al., 2021).

Those value chains were already shifting away from their current leading manufacturers, where labour costs have grown, toward other developing countries (Lund et al., 2020). If this tendency continues, certain countries may have a tremendous opportunity.

### 4.1.5. Innovations

Innovations is another important business resilience strategy, which companies should consider, in order to survive during the disruptions. Analysed reports suggest 3 main actions related to innovations (Fig. 22).

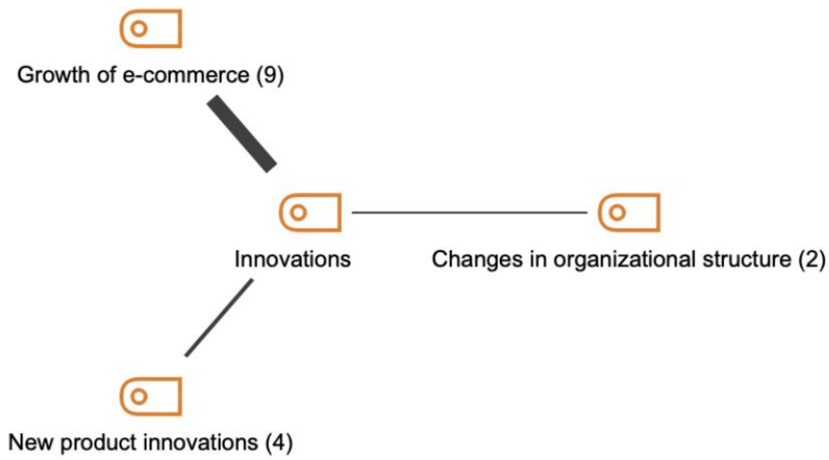


**Fig. 22**. Innovations sub-codes

**New product innovations**

Business and operational model innovation, as well as the development of new goods and services for customers and enterprises, frequently boosts the value produced in the economy, improving productivity growth (Amed et al., 2020; Mischke et al., 2021). The epidemic caused remarkable disruption and reinvention in business structures in just a couple of weeks (Mischke et al., 2021). McKinsey Global Institute (2021) performed research which showed that more than a half of respondents (around 55%) confirm that COVID-19 pandemic forces them to **innovate** – create new products and services (Mischke et al., 2021). Mischke et al. (2021) also emphasize an example of apparel company which was able to arrange a drop-off/pick-up point for consumers only 2 days within closing the physical stores. Business continuity was ensured rapidly.

**Changes in organizational structure**

Amed et al. (2022) analyse that fashion firms will have to reconsider their business models. According to authors, many companies will modernize their organizational structures, adding new positions or upgrading existing ones to better target important growth prospects and **respond to risk**. Brands should decide to **collaborate** with manufacturing partners to improve their supply chain strategy (Amed et al., 2022).

Seong et al. (2022) also note the importance of increased automation, salary changes, and the appearance of **innovative** intangibles hubs, as it will all have an impact on the value chains for manufactured goods. Lighthouse manufacturing facilities might create new hubs in the Fourth

Industrial Revolution by gaining first-mover advantage in scale, logistics, and supply chains (Seong et al., 2022). For instance, new hubs already develop in the apparel sector.

**Growth of e-commerce**

The COVID-19 pandemic has led to a surge in the use of digital technologies such as customer service video chat and social buying, prompting many companies to move their operations online (Amed et al., 2020). Therefore, fashion companies need to enhance their online user experience and channel mix while finding effective ways to incorporate a human element into their digital interactions as consumers demand more advanced and personalized online experiences (Amed et al., 2020). As Amed et al. (2020) noted, digital channels would still serve as the major engine of development in the upcoming year, as individuals in some countries would still be unwilling to congregate in congested spaces. In other words, this change (or innovation) was forced by the current situation. As businesses concentrated on earning income via e-commerce, which was the sole channel accessible in many areas, years of online **innovation** and development occurred in a matter of months (Amed et al., 2020; Felix et al., 2022). Embracing e-commerce allowed retailers to expand their interaction with consumers by meeting them online (Das et al., 2022). In general, digital opened new avenues for customer connection and brand creation for firms that manufacture consumer goods (Das et al., 2022).

However, as Amed et al. (2022) mention, within the years, situation has been changing. Nowadays, distribution channels should be re-evaluated. The direct-to-consumer digital approach that fuelled many firms during the COVID-19 pandemic started to lose its gloss as e-commerce growth returns to normal (Amed et al., 2022). According to the authors, customers have made it clear that they respect online channels but still desire experience of visiting physical stores. This is especially relevant in the premium markets.

## 4.2. Results of Global Value Chain Resilience Building Analysis

This section analyses the results of empirical research related to global value chain resilience building strategies.

### 4.2.1. Supplier Base

While analysing supply chain vulnerabilities, suppliers base is one of the main aspects that researchers focus on. Out of 13 analysed reports, four recommended actions for companies regarding supplier base were purified. These actions and their frequencies are illustrated in Fig. 23 below.

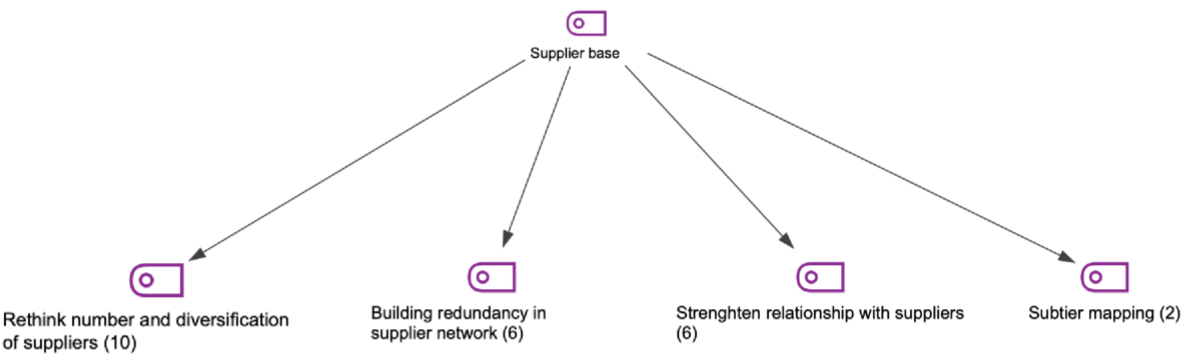


**Fig. 23**. Supplier base sub-codes

**Building redundancy in supplier network**

Building redundancy is related to having a back-up plan, system or procedure, which would be used in case of equipment failure, so that business continues operating and is not disrupted. Therefore, building redundancy in supplier networks is related to having back-up suppliers which could be used in case of any disruption.

In order to achieve **robustness** in supply chain, redundancy must be built within the suppliers network (Bacchetta et al., 2021; Lund et al., 2020; Solingen et al., 2021). Bacchetta et al. (2021) emphasize the importance of having **redundant** ties with suppliers, for example, if any of suppliers is lost. One supplier can be changed by another, and business continues without disruptions. There is less dependency on other companies, and therefore, less **risks**.

In a survey conducted by McKinsey Global Institute in 2020, 93 percent of respondents mentioned that they plan to work on building redundancy in their suppliers network (Lund et al., 2020). COVID-19 had a significant importance in realizing priorities that companies should focus on, in order to create resilience.

**Sub-tier mapping**

A crucial first step in finding hidden connections that enable vulnerability is to map out the supply chain in detail at the sub-tier level. Currently, most global corporations often lack comprehensive knowledge about their suppliers beyond the first tier and may have limited information about their second-tier suppliers (Carr et al., 2021; Felix et al., 2022; Lund et al., 2020). To gain more **clarity** on their suppliers beyond the first tier and possibly some major second-tier suppliers, companies can involve their operational and manufacturing teams to analyse the bill of materials for each product. This analysis can help identify whether critical inputs come from high-risk regions and if there are alternative sources available. Additionally, companies can establish **transparency** by partnering with their first-tier suppliers. **Risk management** teams might be forced to utilize alternative sources of information to conduct their investigation in circumstances when certain suppliers lack **visibility** or view their own sourcing as confidential information. In order for downstream organizations to comprehend their manufacturing landscape, financial stability, and business continuity plans, upstream suppliers must first be mapped (Lund et al., 2020).

**Rethink number and diversification of suppliers**

Lund et al. (2020) emphasize that a complex suppliers base might be a strong advantage for a company's value chain, as it helps to create **redundancy** and **flexibility**. On the other hand, a complex network might cause issues of reduced **visibility**, interrelations, and vulnerabilities (Lund et al., 2020). For this reason, it might be difficult for companies to come up with a supply chain optimization strategy. Having smaller number of suppliers facilitates managing of them. However, the vulnerability during the disruption increases. If one supplier goes down, company most likely would face challenges. Therefore, having many suppliers does not secure visibility, but vulnerability is lower as one supplier can be easily changed by another one (Lund et al., 2020).

The number of suppliers is not the only important aspect in managing suppliers' base. Another crucial matter for companies to consider is the concentration of suppliers (Lund et al., 2020; Felix et al., 2022). To improve global value chain resilience, companies should **diversify** they supply sources

(Lund et al., 2020; Solingen et al., 2021; World Trade Organization, 2021). Having economies of scale in mind, suppliers concentrated in one geography might be more attractive choice, however, it increases vulnerability. COVID-19 was a good example of that, because companies which were producing consumer-goods, realized that they were too focused in certain areas and on certain suppliers, which increased the **risk** they were facing (Felix et al., 2022). If one company or country where components are sourced experiences a negative shock to the labour market, a lack of diversification could cause a supply chain to break down. Additionally, relying too heavily on a single or small number of dominant vendors can expose businesses to the danger of changes in policy in these suppliers' countries (Bacchetta et al., 2021).

An adverse shock to one of the crucial suppliers might have a large effect on the entire supply network, impacting both manufacturers and customers. In contrast, when businesses may source from a **diverse** network of suppliers, a disruption at one plant would not have a substantial impact on the whole supply chain since businesses could simply substitute inputs from another supplier for output that had been affected (Bacchetta et al., 2021). When businesses have diversified their suppliers, the **risk** of a supply chain interruption can be greatly decreased, provided that unfavourable shocks do not coincide.

An example of lack of **diversification** is apparel sector which faced big challenges, associated with lockdowns in Asia countries. Therefore, some companies tend not to concentrate their suppliers geographically, in order to protect themselves from disruptions. However, it is not so easy, because certain materials might be overwhelmingly concentrated and that creates a threat of bottlenecks (Lund et al., 2020; Felix et al., 2022). On the other hand, geographical dispersion also may not always advantageous, especially if manufacturing and sourcing are extended into more vulnerable regions.

**Strengthen relationship with suppliers**

Several authors suggest importance of developing privileged relationships with their suppliers (Amed et al., 2020, 2022; Lund et al., 2020; Seong et al., 2022). It is suggested to use these partnerships to develop supply chain strategies together with suppliers (Amed et al., 2022).

Numerous firms have been capable of enduring the recession because of effective **communication** and **collaboration** with both suppliers and customers (Felix et al., 2022). Regular communication has proven essential for sustaining healthy relationships and resolving any conflicts at the outset, especially as merchants face growing pressure to keep shelves supplied and satisfy customer requests. The suppliers themselves call for a partnership built on a mutual respect. Amed et al. (2020) noted that vendors across all industry sectors start to speak out, asking for fairness, fair sharing of value, and greater contract adherence.

Amed et al. (2020) suggested that fashion industry participants should avoid transactional collaborations in favour of deeper alliances that foster more adaptability and responsibility to prevent future disruptions. McKinsey survey showed that 73% of respondents acknowledged importance of positive relationships with suppliers.

### 4.2.2. Financial Stress – Testing

Financial stress-testing consists of two actions (Fig. 24): focus on cashflows and return on investment (frequency 4,08%), and new investments (frequency 2,04%).

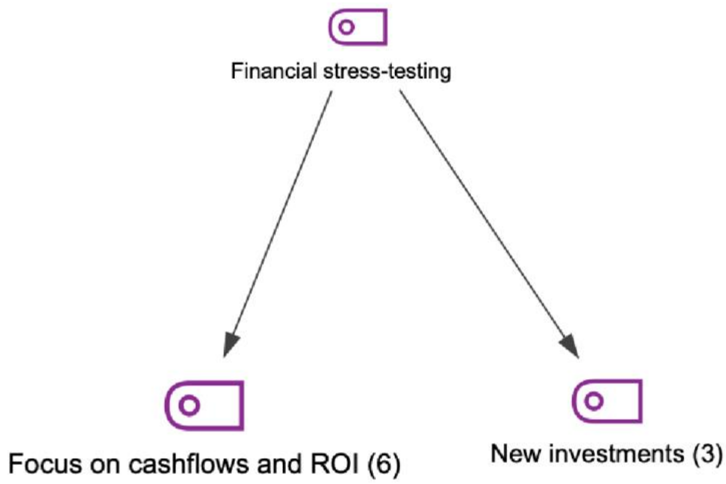


**Fig. 24**. Financial stress-testing sub-codes

**Focus on cashflows and ROI**

One of the most challenging aspects for decision-makers, once the COVID-19 pandemic started, was closure of physical stores. Costs for all enterprises, and especially the ones making consumer items have also gone up due to the COVID-19. The epidemic has forced frequently expensive adaptations, from ensuring the safety of their operations and personnel to responding to intense pressure from retailers on service levels (Felix et al., 2022). To address the crisis in the traditional retail, they had to develop a more sophisticated assessment of stores ROI and adopt a genuinely omnichannel approach on store operations (Amed et al., 2020).

Businesses must have a laser-like focus on financial management, once a disruption takes place. They should constantly perform stress – tests on their cashflows, in order to be aware about real-time situation (Bacchetta et al., 2021). Although, managers at the top of the global value chain have a stake in maintaining the supplier networks that they rely on, as well. For this reason, following the global financial crisis, some businesses accelerated payments or backed bank loans to provide a lifeline to important vendors (Lund et al., 2020).

**New investments**

Over the past 25 years, there has been a steady increase in the investment in intangible assets that support the knowledge-based economy, such as intellectual property, research, technology, software, and human capital. The COVID-19 pandemic has further accelerated this trend towards a dematerialized economy (Hazan et al., 2021). Companies that have invested in all areas of intangible assets, including intellectual property, research, technology, software, and human capital, have progressed further in their digital transformation efforts. They are less vulnerable to disruptions because of their high level of innovation and have a greater chance of attracting and retaining talented employees. These investments have the potential to create value, which is critical, and can withstand significant market and economic uncertainties. (Hazan et al., 2021).

### 4.2.3. Planning Capabilities

Planning capabilities consist of ensuring end-to-end visibility within the global value chain and scenario planning (Fig. 25). End-to-end visibility was mentioned 4 times (out of 147 fragments), while scenario planning - 2 times.

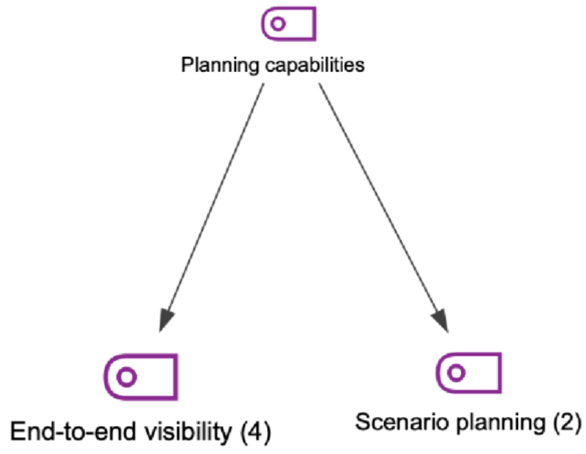


**Fig. 25**. Planning capabilities sub-codes

**Scenario planning**

Amed et al. in 2020 mentioned will still face challenges due to the COVID-19 pandemic and CEOs need to prepare for unexpected events in 2021. To cope with this ever-changing environment, fashion brands should prioritize reliable manufacturing capacity and shift towards a demand-driven approach that they have been delaying for a long time. In other words, constant scenario planning should be applied in terms of disruption, in order to avoid possible issues. It may help companies identify possible **risk** areas where, for instance, **diversification** of customer or suppliers might be a top goal (Seong et al., 2022).

**End-to-end visibility**

Authors (Das et al., 2022) suggest that by attaining end-to-end visibility throughout supply chain, companies “raise their game further”, compared to their competitors. Companies should use data analytics and technology to achieve full visibility of their supply chain (Amed et al., 2022; Solingen et al., 2021). It might allow them to manage inventory as efficiently as possible.

### 4.2.4. Manufacturing Adaptability

Manufacturing adaptability is a strategy which was often reoccurring in analysed reports. After analysis, three actions (Fig. 26) were assigned to it: shift in manufacturing and inventory strategy (frequency 7,48%), fostering **flexible** production (frequency 3,4%) and automation of manufacturing (frequency 2,72%).

**Automation of manufacturing**

Low labour costs become less significant due to the increased use of automation technology in production, and facilities that are more automated may be more **robust** to the pandemic (Lund et al., 2020). Several authors emphasize the importance of automation in manufacturing activities (Lund et al., 2020; Seong et al., 2022; World Trade Organization, 2020). Automated manufacturing becomes a typical response seeking for the global value chain resilience (Solingen et al., 2021).

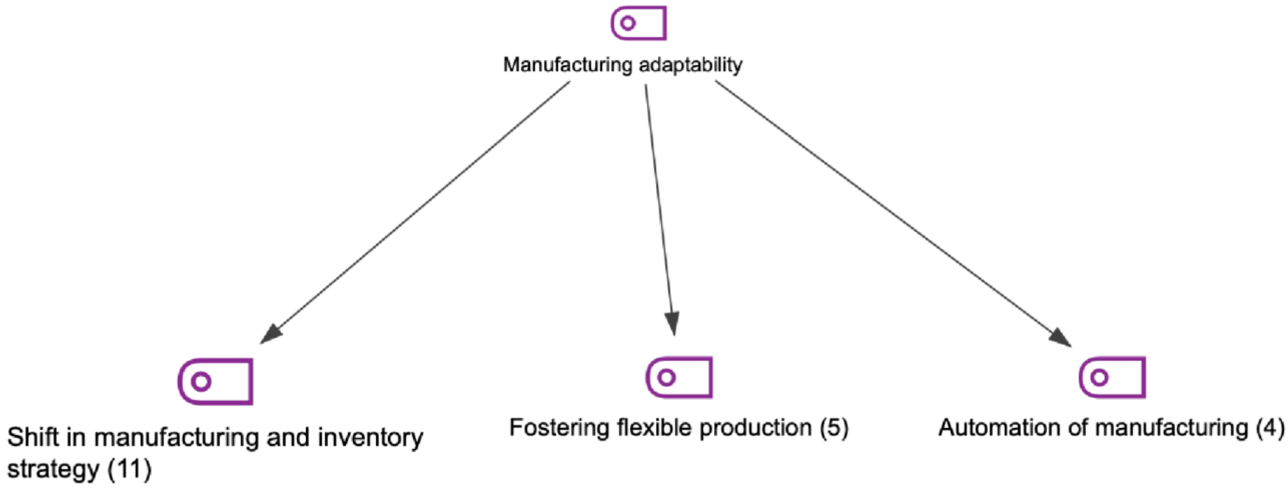


**Fig. 26**. Manufacturing adaptability sub-codes

### Shift in manufacturing and inventory strategy

One of the ways for companies to build resilience is to increase their inventories (World Trade Organization, 2021). Even though some authors (Amed et al., 2020) suggest a demand-led model, majority disagree. Just-in-time and agile production processes have helped businesses become more efficient and use less working capital in the past (World Trade Organization, 2020). Yet, they might now need to find a different way to balance "just in case" with "just in time" (Bacchetta et al., 2021; Solingen et al., 2021). A vital buffer that can lessen the financial impact of disrupted supplies is to have enough **backup** inventories of crucial parts and safety stock. Also, it can prepare businesses to handle unexpected spikes in demand (Lund et al., 2020).

### Fostering flexible production

Once a shock happens, manufacturing can continue if it is possible to **flexibly** shift production between sites and reroute components (Amed et al., 2020; Lund et al., 2020; Mischke et al., 2021; World Trade Organization, 2021). This calls for powerful analytics tools and reliable digital systems that can simulate scenarios according to different outcomes. For instance, apparel company Nike employed predictive analytics to strategically mark down products and limit production once the COVID-19 outbreak struck, in order to minimize effect. The business was also successful in diverting merchandise from physical stores to online sales, which was supported in part via direct-to-consumer online sales. Company's own training software made it possible. Nike's sales decreased less than those of some of its rivals as a result (Lund et al., 2020).

Amed et al. (2020) also provide an example of apparel company which was able to activate a back-up plan once the COVID-19 outbreak began. Company was unable to export goods from China, therefore, it started shipping via Hong Kong to keep the business going (Amed et al., 2020). In this case, having a more complex network and being able to shift production within sites helped companies survive the pandemic.

### 4.2.5. Customer Spending

Lastly, customer spending was assigned with two possible actions (Fig. 27): responsiveness to shifting customers behaviour (frequency 6,12%) and strengthening relationship with customers (frequency 2,72%)

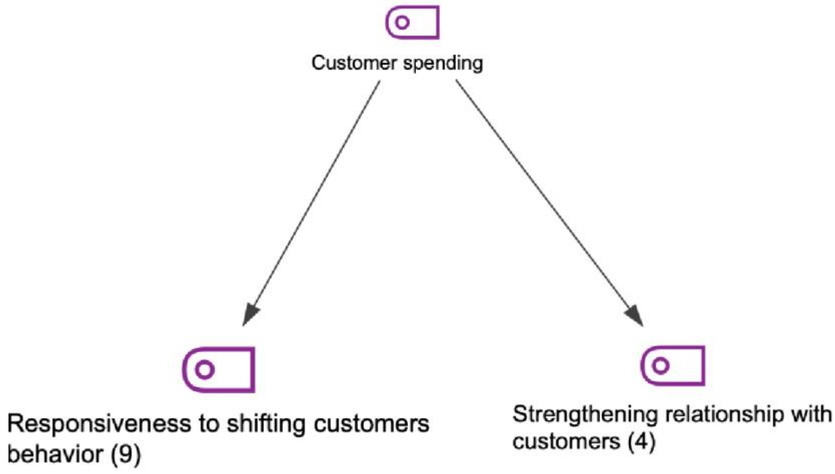


**Fig. 27**. Customer spending sub-codes

**Strengthening relationship with customers**

Similar as already mentioned regarding suppliers, **redundant** ties with customers are essential, as well (Bacchetta et al., 2021). Besides having wide base of customers, relationship with them is important itself. should employ a blend of artificial intelligence, personalized recommendations, and direct interactions with salespeople through customer communication applications and customer relationship management technologies to create a unique experience for each customer (Amed et al., 2020).

**Responsiveness to shifting customers behaviour**

As Felix et al. (2022) emphasize, with the COVID-19 pandemic consumer habits have changed, and many of these changes are expected to last long after the pandemic. Research conducted by McKinsey Global Institute has demonstrated that rising price sensitivity is a result of economic uncertainty (Mischke et al., 2021). New shopping behaviours have resulted from this, such as an increase in deal hunting, switching to less expensive brands or private labels, and using discount merchants more frequently (Carr et al., 2021; Felix et al., 2022). Today's consumers prioritize a pleasant and diverse shopping experience rather than just products. They seek convenience (options for online shopping), uniqueness (personalization and customization), low cost (fast free delivery), and sustainable solutions (Amed et al., 2020; Carr et al., 2021).

Increasing wellness awareness has also resulted in shifts in consumer choice and consumption. Through the pandemic, healthy eating and home exercise investments have persisted, and increased consumer knowledge of health hazards has increased the significance of hygiene in daily life (Felix et al., 2022). It all means that companies must strongly focus on analysing consumer spending, making possible scenarios and keeping up with the market situation.

According to Felix et al. (2022), physical separation has also sped up the development of e-commerce and increased online media consumption. Recent studies demonstrate the way this has worked out in the apparel sector, where businesses have accelerated consumer and corporate adoption of digital technology by five years since the pandemic began.

Focusing on consumer analysis is crucial for each company, especially during the disruptions. All businesses that have prospered during the COVID-19 pandemic have taken an advantage of new opportunities brought on by changes in consumer behaviour. They have responded fast and nimbly to shifts in consumer tastes and still keep an eye out for emerging trends (Carr et al., 2021; Felix et al., 2022).

### 4.3. Discussion and Recommendations

**Discussion.** As a result of analysis, several outcomes were identified. Resilience of global value chains depends on many factors, and each of them help companies overcome disruptions in a certain way. Some trends (such as regionalization, switch to e-commerce, digitalization) had already started to appear even before the COVID-19 pandemic and crisis only accelerated them. However, there were certain trends which appeared only when the pandemic started (related to supplier base, customer spending, financial stress-testing).

Action, which turned out to be the most important for apparel manufacturers during the COVID-19 pandemic, was supply chain digitalization. The benefits that digitalization process provides were mostly related with transparency and higher control of supply chain.

Much attention was also paid for decrease of portfolio complexity. Having less assortment allows to focus on existing products and achieve the economies of scale. Also, it increases chances of input substitutability. It was noted that using non-substitutable inputs is a threat for company's global value chain's resilience.

Empirical research also revealed that concentrated production, long lead times, demand variability and difficulty forecasting, also, sole sourcing are problems which companies faced during pandemic. COVID-19 pandemic also showed that nowadays "just-in-time" production should be switched to "just-in-case" and companies should keep some inventory to have a safety buffer. Lack of suppliers base and focusing only on a few of them, and, on the contrary, lack of supplier visibility were also emphasized as issues.

**Recommendations.** Findings of empirical research might be implicated in practice. Therefore, several suggestions will be provided for apparel manufacturers, related to building resilience in their global value chains.

*Market orientation.* Apparel companies should focus on building talent within the companies and create cross-functional teams which are strategically oriented and work with daily, operational tasks. Companies should also be pro-active, open to changes in strategy, and not afraid to take the risks. Furthermore, one of recommendations would be to start cooperation with outlets and platforms which sell past season outfits. It would help apparel companies to reduce their inventory and decrease the costs. Lastly, focus should be set on digital marketing, as mastering this tool helps to get in touch the consumer anywhere and anytime. Therefore, apparel companies should work on data collection regarding consumer preferences and analytics of it.

*Supply chain optimization.* The most attention apparel companies should pay for digitalization of supply chain. Digitalizing certain processes allows companies to gather more data, share information within the supply chain and achieve transparency. Transparent supply chains allow to identify any vulnerabilities hidden within the network's lowest layers. Therefore, it is suggested for apparel companies to automate and digitalize all the possible processes within their supply chain, including implementation systems which provide a real-time data of inventory, tracking of materials, etc.

*Strategic corporate reorganization.* Apparel companies should consider the possibility of M&A, as it can be a driver of growth. It can expand company’s network with new suppliers, customers, products. If a company struggles with certain elements within their global value chain, M&A, even if it seems costly, can be a solution to all problems. Also, apparel companies should seek opportunities for formation of strategic alliances with companies from different industries, such as video games, etc. It allows them to diversify their activities and generate income from new sources. If a disruption affects certain activity, the other activities may be less affected and support the business operations.

*Innovations.* Besides new product innovations, apparel companies must focus on e-commerce growth. This is the new trend which gains popularity. Apparel companies, which were able to switch to e-commerce during COVID-19, benefited from that. Shopping online is the new normal, and besides the fact, that trend of shopping at physical stores (especially, regarding premium brands) increased lately, a balance between online and in-store retail must be found.

*Business model transformation.* High number of manufacturing activities in apparel industry are still performed in Asia countries. Because of that, not only the risk of lockdown appears, but lead times for transportation are also automatically longer. Companies should focus on regionalization, which would cut transit times, transportation cost and decrease the risks of disruptions. Also, apparel companies should work on decreasing portfolio complexity, increasing inputs substitutability and products personalization. Apparel companies should perform a thorough customer segmentation. It would allow them to set specific prices and promotions according to the segment, instead of generalizing all assortment and applying one strategy for all the products and customers.

*Supplier base.* Apparel companies must find the balance within the number of suppliers and their diversification to protect themselves in unplanned circumstances if any of suppliers suspend their operations. At the same time, while having higher number of suppliers, companies must be able to assure visibility within whole supply chain. Therefore, finding the balance is crucial in this case. Furthermore, each apparel company must perform their sub-tier mapping periodically, seeking to discover vulnerabilities within the supply chain. If mapping proves that many of the suppliers are co-dependant, apparel companies must search for new, independent from other companies suppliers. Furthermore, apparel companies must pay attention to the geographical dispersion of suppliers, as having majority of them in one region poses the business at risk. Lastly, apparel companies must improve their relationships with suppliers and make sure there is a mutual benefit from the cooperation.

*Financial stress-testing.* Apparel companies must invest in intangibles, such as intellectual property, e-commerce, technologies. Moreover, companies must focus on ROI from physical stores, especially once a lot of attention is paid to increase the e-commerce. Lastly, apparel companies might help their suppliers by backing up their bank loans, with intention to improve their relationships. However, it is only recommended once the apparel company continuously performs their financial stress–testing and it is approved by financial analysts that such possibility exists.

*Planning capabilities.* Apparel companies must perform a constant scenario – planning. Scenarios regarding demand or supplier shifts must be constantly evaluated and action plan must be prepared for each scenario. To do that, company must have end-to-end visibility within whole value chain. Visibility can be achieved by investing in technologies and data. It would also allow companies to manage the inventory efficiently.

*Manufacturing adaptability.* Apparel companies, while developing demand scenarios, must switch to "just in case" inventory strategy. When the COVID-19 pandemic started, companies which had enough stock were able to keep their operations going. Meanwhile, others were struggling with getting supplies at place. Therefore, apparel companies should be prepared for worst case scenario and invest in safe inventory buffers. Also, apparel manufacturers must automate their processes as much as possible, to reduce the dependency on human factor. Fostering flexible production is also very important, because it allows companies to keep their operations going even if some issues happen in a certain plant. However, that requires a wide network of manufacturing facilities and partners, therefore, not all companies would be able to do it.

*Customer spending.* Apparel companies should constantly observe their consumer behaviour and be pro-active if any changes are noticed. Latest trends should be followed (for example, sustainability, physical wellness). A lot of attention must be paid to the relationship with customers, with intention to achieve customer loyalty. It is recommended for apparel companies to perform a continuous consumer analysis and communication.

## Conclusions

1. The main issues which companies were facing during the COVID-19 pandemic were explored. Previous research have showed what a significant impact the pandemic had on countries' GDP. Companies were forced by governments to close with intention to stop the disease from spreading. There were enterprises which did not survive these closures and bankrupted. The recovery time after disruptions was analysed by different sectors, as well. In general, key impacts of the COVID-19 pandemic to global value chains were related to disruptions of supply chains, increased costs, shifts in demand, increased protectionism, and opportunities for digitalization. Analysing impact of the COVID-19 specifically for apparel industry, such impacts as supply chain disruptions, decreased consumer demand, store closures, shift to online sales, financial losses and changes of consumer behaviour were discovered. All these consequences emphasized the importance of building resilience of global value chains.
2. Concept of the global value chain was studied. The configuration and activities of global value chains were analysed. Although authors tend to classify activities of global value chains in different ways, main activities remain the same: inbound and outbound logistics, operations, marketing and sales, service, procurement, human resource management, technological development, and infrastructure. Global value chain management was examined in terms of its two elements: upgrading and governance. Four possible global value chain upgrading types were analysed in detail: upgrading of process, product, niche upgrading and functional upgrading. Factors which influence governance mode were also discussed. Internal factors are driver (buyer-driven or producer-driven), company size, company capabilities and abilities to manage value chain. External factors are life cycle of the industry, degree of company's innovativeness, entry barriers, demand, stability of the industry and technological progress. All types of resilience – resilience of the entrepreneur, business resilience, social resilience and regional economic resilience were studied, as well. Key elements to measure resilience were extracted. These are: attitude towards disruptions, entrepreneurial characteristics, business characteristics, social and human capital, strategic management, challenges that companies are facing, relationships with institutions. Eventually, after theoretical research, a conceptual model was developed. It consists of three main parts. First one is business resilience strategy which companies chose (market orientation, supply chain optimization, strategic corporate reorganization, innovations, or business model transformation). After having chosen a certain business resilience strategy, resilience building on the global value chain begins. It can be done via focusing on supplier base, financial stress-testing, planning capabilities, manufacturing adaptability and customer spending. After taking all the required measures, a company has a resilient global value chain which is flexible, redundant, transparent, diverse, collaborative, innovative and risk manageable.
3. The research methodology was constructed with the intention to identify what resilience strategies apparel companies were using during the COVID-19 pandemic. Data was collected from official reports, provided by consulting companies (McKinsey Global Institute, World Trade Organization). Qualitative content-analysis research method was used to test the conceptual model. Limitations and implications for future research were provided.
4. Empirical research on apparel companies' global value chains during the COVID-19 pandemic was conducted. The most common actions, taken by apparel companies during the disruption, were analysed in detail. Recommendations for apparel companies were provided. The most common actions which increase global value chain resilience include supply chain digitalization, decrease of portfolio complexity and inputs substitutability, shift in manufacturing and inventory

strategy, rethinking number and diversification of suppliers, regionalization, growth of e-commerce, responsiveness to shifting consumers behaviour, focus on cashflows and ROI, building redundancy in supplier network and strengthening relationships with company's suppliers.

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