



# SUPPLY CHAIN COLLABORATION AS AN ENABLER TO TRANSITION TO A CIRCULAR ECONOMY

A case study from the textile sector.

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Master Thesis

MSc Environment and Society Studies  
Corporate Sustainability  
Nijmegen School of Management  
Radboud University  
May 2021

# SUPPLY CHAIN COLLABORATION AS AN ENABLER TO TRANSITION TO A CIRCULAR ECONOMY

A CASE STUDY FROM THE TEXTILE SECTOR.

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ETHICALNOMADS

# Summary

The linear economy of the past decades has pushed the planet to its limits. The textile industry is a big part of this model, accounting as the second biggest polluter. The aim of this master thesis entitled “Supply chain collaboration as an enabler to transition to a circular economy” is to analyse the role of collaboration in the shift from linear to a circular economy for companies at the niche level of the textile industry, in order to enhance the literature by relating transition theories with supply chain collaboration and multiple value creation as the centre of circular business model, while at the same time identifying the barriers.

The study consists of a single case study of the company Ethical Nomads, a small manufacturing studio where I conducted my internship. For the purposes of the research, fifteen companies of various positions in the supply chain were interviewed along with three experts on the field.

This thesis first examines the understanding circularity and current practices of the companies and presents the results. In the second stage I examine the degree of collaboration between them and their supply chain as well as the value creation towards their stakeholders. Moreover, barriers as perceived by companies were presented and new barriers were classified concerning the size of the company and logistics. Finally, solutions and strategies were indicated where the results showed a need to focus on building communication and trust within the supply chain.

The results of this study showed that supply chain collaboration is certainly the key to the transition to a circular model. However, companies still need to rethink the core of the definition of circular economy in accordance with their business model and their value creation as well the way it affects all their stakeholders. This study was affected by the COVID-19 pandemic and therefore, the data collection was limited. For this purpose, further research is needed including more participants or more stages of the supply chain. However, early indications show that the situation of the pandemic can also be considered as an opportunity to encourage the shift to a circular economy.

**Keywords:** *Circular Economy, Transition, Supply chain collaboration, Value Creation, Textile industry.*

# Preface

Before you lies the thesis “Supply Chain Collaboration as an enabler to transition to a circular economy”, the basis of which is a case study from the textile sector that was conducted. It has been written to fulfill the graduation requirements of the Environment and Society Studies of Nijmegen School of Management in Radboud University. I was engaged in researching and writing this thesis from April 2020 to April 2021.

The project was undertaken with the collaboration of Ethical Nomads, a manufacturing studio based in Amsterdam, where I undertook an internship and served as the case study company of my study. My research topic was formulated with the help of both my academic supervisor Dr. Mark Wiering and my internship supervisor Judith Bosveld. The research was long and difficult, but conducting extensive investigation has allowed me to answer the question that we identified. Fortunately, both my supervisors were always available and willing to advise me and answer my questions.

I would like to thank my supervisors for their excellent guidance and support during this process. I also wish to thank all of the interviewees and all the companies that participated, without whose cooperation I would not have been able to conduct this analysis. A special thanks is dedicated to the three experts I met and interviewed for all the information and the insight on different aspects of the issue.

To the people of Ethical Nomads: I would like to thank Judith Bosveld for giving the opportunity and always support me in so many ways and Mamo Bonilla Manila for believing in me and kept me motivated. My two friends and colleagues, Ageliki Karydi and Anna Spiliotopoulou, deserve a particular note of thanks: it was always helpful to bat ideas with you and if I ever lost interest, you kept me motivated.

I hope you enjoy your reading.

Eleni Droutsa

Amsterdam, April, 2021

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# Chapter 1

## Introduction

Textiles and clothing are a fundamental part of daily life and a significant sector in the global economy. According to the Ellen McArthur Foundation (2017), globally, more than 300 million people work in the fashion clothing industry along the value chain; almost 7% of all employees are occupied with the production of cotton in some low-income countries. In the last 15 years only, garments production has nearly doubled (Ellen MacArthur Foundation, 2017). Meanwhile, the textile industry is the second biggest polluter globally, after oil (Malik, Akhtar, & Grohmann, 2014). Additionally, the fashion industry alone contributes 10% of global greenhouse gas emissions due to its long supply chains and energy intensive production (UNFCCC, 2018).

Therefore, it becomes apparent that textiles and clothing hold internationally a key role in the public discussion on climate change, chemical use, water shortage, and human rights. Many of the challenges concern several common practices and the role of various and often conflicting values linked with production and consumption (Boström & Micheletti, 2016). In terms of sustainability these challenges have been identified to be numerous and they concern the entire supply chain. Some of the main challenges are environmental which vary from fibre to fibre, such as significant energy and water usage, along with textile waste management coupled with landfill shortage and non-degradable textile materials, financial costs of sustainable production and general economic issues in the entire supply chain, fast fashion cycles, consumer behaviour, human rights (including working conditions and child labour) and health and safety issues (Muthu, 2017). At the moment the supply chain is designed by companies to mainly reduce costs and remain competitive (Tokatli & Eldener, 2004). This 'fast fashion' business model has resulted in a continuous cycle of producing cheap clothes that they turn to waste very soon.

This fast-fashion business model was introduced in the 1980s; during the next decade the drop of clothing prices started to affect customers behavior and expectations. Fashion companies began to aggressively cut costs and streamlined their supply chains (Koszewska, 2018). To that end major changes occurred in the fashion environment over the past 30 years with the most crucial the globalization of the market. Thus, this was the turning point for companies to initiate the outsourcing of their manufacturing function to developing countries (Perry, Fernie & Wood, 2014). This caused the prices of garments to decline even more which made clothing more affordable. From their part, companies started launching new collections more frequently and to support this move clothing today is made to be disposable sooner and less durable (Koszewska, 2018).

Many historic steps have been made that led to contemporary ideas of ethical and environmental responsibility since the 1950's in fashion (Wallinger, 2015) but at the moment the fashion industry seems to experience more and more pressure on the sustainability issues mainly by media and consumers (Yongjian, Xiukun, Dan & Xiang, 2014). Especially since the collapse of the Rana Plaza garment factory in Bangladesh in 2013, which killed thousands of workers, the fashion industry's interest in sustainable and ethical fashion has grown enormously (Black, 2015). However, this transition is still small partly due to the absence of shared language ideas and terminology (Wallinger, 2015). On top of that, there is little to no regulation from the government to address this issue. Especially



developing countries do not have the organizational structures in place to hold apparel manufacturers accountable for pollution (Kerr & Landry, 2017). As the population is growing and the middle class is expanding this trend will continue (Koszevska, 2018). The Circle Economy (2017) estimates that an 84% increase in the demand for textiles in the next two decades will pull resources to their breaking point.

## 1.1 Problem statement

The issue of the fast fashion industry includes a great variety of complications and that exactly makes this problem wicked: it is impossible to describe it all. Wicked problems are seen as complicated systems with numerous actors, which makes the situation politically and technically complex (Peters, 2017). But most importantly, the problem of fashion and textiles constitutes an issue related to governance. A large number of different actors and institutions from the corporate, governmental, civil society, media, and private spheres are involved contributing to the complexity of the issue. However, businesses and consumers are recognised to be the main actors, because of the nature of the fast textile and fashion industry (Boström and Micheletti, 2016). Taking into account Steurer's (2013) triangle of governance, which consists of the three spheres of state, market and civil society, this research examines the sphere of market and business.

Hence, to attempt solving the wicked problem of fast fashion and to battle the great environmental problems we are facing, such as climate change, there is an urgent need for transition. The current linear system of extract-produce-use-dump has touched its limits. The answer to this unsustainable global linear flow of materials is an alternative system that creates cycles where the flows are reversed: the concept of circular economy (Korhonen, Honkasalo & Seppälä, 2018). The circular economy model has recently gained much attention globally from scientists and businesses. However, the transition to a circular economy requires radical changes in both production and consumption models (Geissdoerfer, Savaget, Bocken & Hultink, 2017). To move towards change, textile companies already use mostly three major forms of initiatives to contribute to environmental sustainability: (a) corporate social responsibility (CSR), (b) green supply chain management (GSCM), and (c) eco-design (Lee, 2017). However, companies with great market share could play a great role if enabling circularity into their business models. The business model of a company is seen as the connection between the strategy of a business and the operations of that business (Zott, Amit & Massa, 2011). The shift to a circular business model has become a demand and in the following years industries will have to adapt their business models, which could create redistributive effects in the economy (Ellen McArthur Foundation, 2013). This change of business model is a relatively new and complex concept in the academic literature.

As mentioned, this research focuses on the production model and not on the consumption. It revolves around the production of textiles and fibres and it is held in collaboration with Ethical Nomads company, a private label and sustainable textiles company based in Amsterdam, Netherlands. More specifically it addresses not only the issue of circular business model design but also its integration into the supply chain, because sustainability management requires inter-organizational cooperation between the involved supplier and customers firms (Korhonen, Honkasalo & Seppälä, 2018).

## 1.2 Research Aim and Research Questions

The main aim of this research is to identify in which way companies can shift from a linear to a circular business model and the role of supply chain collaboration in facilitating this process. Internal changes in the core of the business model have to be made along with changes in the way they perform in their

supply chain. However, parties on every side of supply chain need incentives in order to form networks working for a common goal. I will argue that collaboration and creation of multiple values that benefit all the stakeholders is key to achieve this transformation. This is a complex process that requires the coordination of all the actors involved. Also, this shift requires recognizing the potential obstacles that companies face and will need to overcome. Therefore, to achieve a transition to a circular economy I need to identify the strategies that can bring on internal changes in companies and affect the way they perform in their supply chain. In order to elaborate, the following main research question has been formulated:

*How can companies promote a transition to circular economy through supply chain collaboration?*

The main research question is constituted of a synergy of complex and distinct elements. To better understand them and naturally produce answers as well as valuable recommendations I have formulated three sub-questions that will help lead the research.

1. What are the current understanding and practices of companies at the niche of the textile industry in terms of circularity?
2. What does it take for these companies to engage in supply chain collaboration?
3. What are the barriers companies face when experimenting with circularity?
4. What are the strategies to overcome the barriers and the incentives to transition to a circular model?

### 1.3 Scientific Relevance

To begin with, Korhonen, Honkasalo and Seppälä (2018) identify that the concept of Circular Economy is at its infancy in general. They have also detected that the concept of circular economy is mostly expanded by practitioners rather than the scientific community (Korhonen, Honkasalo & Seppälä, 2018). Only recently, the concept started growing attention and researchers now begin slowly to explore the aspects of Circular Economy. Moreover, academics generally agree that there is not a commonly accepted definition of circular economy and that leads to misinterpretation and lost opportunities for collaboration (Rizos et al., 2017). As a result, within this literature though, only a small number are dedicated to the construction of business models for the Circular Economy (Jonker, Stegeman & Faber, 2017). While scholars have analysed and established business model concepts and definitions, there is a significant gap on what resource efficiency strategies and changes in material flows classify a business model as “circular” (Nußholz, 2017). Even when the benefits of such models are apprehended it is difficult to perceive the implications of circularity in the organisation of supply chains (Nandi, Hervani & Helms, 2020). Consequently, scholars have not widely examined the ways a company can persuade its stakeholders, customers as well as the government that this new model can be equally profitable and beneficial for the environment and convince them to be part of this transition (Korhonen, Honkasalo & Seppälä, 2018).

Furthermore, the most investigated practices, within the concept of circularity, are related to cleaner production rather to a change of the socio-economic system as a whole. That is why, only during recent years, Circular Economy has expanded to express a new socio-economic paradigm which needs to be

examined (Merli, Preziosi & Acampora, 2018). The fact that the societal aspect is mainly overlooked within the concept of circular economy, which would involve radical shifts of thinking, comes also in accordance with the debate about the relationship between Circular Economy and Sustainability (Lazell, Magrizos, Carrigan, 2018). At the same time, concerning sustainable supply chain academics also focus on the environmental aspect and logistics and disregard the social part (Nußholz, 2017).

All the above makes it apparent that there is a gap formed in the scientific knowledge about the concept of circular economy and particularly the ways to achieve the transition to a new circular paradigm. In addition to this, the related business models and the integration of circularity in the supply chain is still not developed enough. Therefore, this research focuses on the combination of the concept of circular economy, which for the scope of the study is considered as a part of sustainability, with the new business models and supply chain management. The goal is to see in practice the ways that the transition can be achieved without overlooking the position of the societal aspect that consists of one of the pillars of sustainability. In that way, I seek to contribute to the better understanding of the circular economy as a new paradigm and to link it with the concept of value creation as part of supply chain collaboration by incorporating this missing societal aspect. All these are expected to be viewed through the lens of the market and business which is in the centre of this study.

On top of that, this study aims to contribute to the existing scientific knowledge of transition theory in regard to Circular Economy by improving the theories around it. The ambition of the researcher is to identify how people in the textiles industry manage their supply chains and distribute value to all their stakeholders. At the same time, there is an intention to classify the obstacles and the strategies people believe are needed to make the transition and position them all in the MLP model.

## 1.4 Societal Relevance

Climate change and depletion of raw materials are two of the greatest modern challenges. Through rising scarcity of materials and supply uncertainty, prices increased over the years. Therefore, companies but also entire economies which are dependent on those raw materials, face the risk of becoming unstable (Ellen MacArthur Foundation, 2013). Therefore, there is an urgent demand to change the way we treat resources and establish a different circular system, where raw materials do not end up in waste but are reused in loops extending endlessly their lifetime. In order to accomplish this transition, it is essential to change the existing system holistically.

In the context of the textile industry, cooperation between companies within and between supply chains is one of these changes which is necessary to close the loops (Jonker, Stegeman & Faber, 2017). For the transition to be met it is crucial for companies to rethink their model and redefine their principles and goals to align with the imperative demand for change. It is important to revise the way they proceed and design services and products. It is also crucial to understand the key role of supply chain collaboration and the essence of value creation beyond monetary value. As mentioned above, this research is an effort to capture the way companies distribute their value creation to their stakeholders and especially their supply chain partners. Therefore, the societal aspect of circularity and its association with sustainability plays a decisive role in this study.

This research demonstrates not only academic but also societal relevance. I am proposing the idea of changing the business model of a company as a transition towards a better global environment. This research paper is a tool to support this idea and persuade businesses that they can achieve economic, environmental and societal change. Yet, people remain in the centre of interest of this study, especially

because the textile industry apart from the biggest polluters globally, it is also associated with the most unethical practices such as inequality, inappropriate working conditions and child labour especially in developing countries. Therefore, the study aspires to identify the ways companies ensure that not only these practices are ruled out but also create value, other than financial, for the people of their supply chain. Hopefully this research can be used as a tool for companies that want to have a better understanding about their decision making and their impact on their stakeholders.

## 1.5 Reading guide

This thesis is structured as follows. In chapter 2, a theoretical framework relevant to this research will be discussed resulting in a conceptual model. After the detailed description of all the relevant concepts and models is mentioned, the conceptualisation of their application for the analysis of the data will follow. In chapter 3, the methodology will be given including the research philosophy, research strategy, data collection and data analysis methods. In chapter 4, the analysis will be elaborated and the findings will be shown and compared to the theory mentioned in chapter 2. The final chapter combines a discussion and reflection on the different theoretical insights with the results of this research. The main research question will be answered and a number of recommendations will be drawn in order to assist Ethical Nomads but also similar small companies at the niche in their future planning. This chapter will also present the limitations of this research project as well as suggestions for further research.

# Chapter 2

## Theoretical Framework

In this chapter the effort is made to identify all the relevant concepts and theories to the research questions. The concept of Circular Economy pervades all the aspects of this research and it will be initially given. At that point it is important to examine circular economy as an example of a paradigm shift arguing about the transition from a linear to a circular system according to transition theory. Continuing, Circular Business Models are relevant for this study and therefore they will be analysed together with stakeholder theory. Furthermore, the concept of supply chain collaboration will be discussed. Subsequently the concept of value creation which prevails both circular business models and supply chain collaboration will be mentioned. However, it is also crucial for the study to identify the barriers that companies face when creating a circular supply chain. Finally, the conceptualisation will be given as a guideline for the research.

### 2.1 Circular Economy

#### *2.1.1 Origins of the concept and definition*

Winars, Kendall and Deng (2017) describe the Circular Economy concept as “*the valuation of materials within a closed-looped system with the aim to allow for natural resource use while reducing pollution or avoiding resource constraints and sustaining economic growth*” (Winars, Kendall & Deng, 2017, p.825). Although the concept of circular economy draws attention at the moment because of the urgent need for a transition from a linear to a circular system, it has its roots in many old schools of thought, starting already in the late 1970s (Ellen MacArthur Foundation, n.d.). In the 1980s Stahel addressed the environmental impact of a shortened product-life and supported the extension of the product life as a solution to the depletion of natural resources (Stahel, 1982). The origins of circular economy can also be found in plenty of scientific disciplines, such as industrial ecology, environmental science and ecological economics. Moreover, CE has no clear boundaries with other concepts such as Green Economy and Bio-Economy, with whom it shares the objective of integrating environmental, economic and social issues (Merli, Preziosi, & Acampora, 2018). In the 1990s McDonough and Braungart (1998) introduced the cradle-to-cradle concept which sees all materials used in the industrial system as useful elements (McDonough & Braungart, 1998). The Ellen MacArthur Foundation states that regenerative design, blue economy, natural capitalism, biomimicry and industrial symbiosis also contributed significantly to the evolution of the concept circular economy (Ellen MacArthur Foundation, 2013).

#### *2.1.2 Characteristics of the Circular Economy*

According to Ghisellini, Cialani and Ulgiat (2015) circular economy can be found at all levels of organization: at macro level (e.g., city or state), at a meso-level and at a micro level (e.g. company or consumer). Circular Economy is most frequently illustrated as a combination of reduce, reuse and recycle activities, known also as the “3Rs” (Kirchherr, Reike & Hekkert, 2017). But, the current understanding of the Circular Economy and its practical applications to economic and industrial systems has expanded to incorporate a variety of concepts that share the idea of closed loops (Geissdoerfer,

Savaget, Bocken & Hultink, 2017). However, this study adopts a scientific approach to the concept of CE by critically considering the Circular Economy from the perspective of sustainable development and its three dimensions, economic, environmental and social. That is due to the fact that many academics approach Circular Economy as a notion highly economic and environmental, considering less the social dimension (Purvis, Mao & Robinson, 2019) which stays very relevant especially to the controversial textile industry which is often associated with the various malpractices mainly in the stage of manufacturing. The issue of meeting the needs of current and future generations as sustainable development dictates is also often missing from the narrative of Circular Economy (Lazell, Magrizos, Carrigan, 2018). Similarly, Moreau, Sahakian, van Griethuysen and Vuille (2017) explained that taking into account the social element can enhance the development of a CE by tackling social inequalities and investing in a more inclusive economy. They argue that an economy based on solidarity considering shared profits will address societal needs by taking into account both current and future generations (Moreau, Sahakian, van Griethuysen., & Vuille, 2017).

Thus, the definition by Korhonen, Honkasalo and Seppälä (2018) below is used:

*“Circular economy is an economy constructed from societal production-consumption systems that maximizes the service produced from the linear nature-society-nature material and energy throughput flow. This is done by using cyclical materials flows, renewable energy sources and cascading-type energy flows. Successful circular economy contributes to all three dimensions of sustainable development” (p. 39)*

Additionally, the Ellen MacArthur Foundation (2013, 2015) has early enough identified five indispensable features of a pure circular economy: (1) the elimination of waste by design where biological materials return to the soil and technical are recovered in eternal loops, (2) build resilience through diversity where the bigger businesses bring the volume and the smaller the alternative when crisis happen, (3) the use of energy from renewable sources, (4) think in a system where all businesses or people are related and linked and (5) the prices reflect the true costs otherwise the absence of transparency can become an obstacle to the transition to a circular economy.

Nevertheless, it is of essence to mention here the ReSOLVE framework which was designed by The Ellen MacArthur Foundation (2015) as a tool of actions in order to support companies and governments during the adoption of circular policies. This framework, shown in figure 1, identifies six different ways to be circular: 1) Regenerate, 2) Share, 3) Optimize, 4) Loop, 5) Virtualize, 6) Exchange (Ellen MacArthur Foundation, 2015).

Finally, European Commission points out that the circular economy is a concept of dual meaning. It is divided into a) Cradle to Cradle, a concept and developed originally by Braungart & McDonough (2002) of which the main idea is to create industrial systems by designing processes and products the materials of which can return endlessly to the biological and technical sphere accordingly and b) Industrial Symbiosis which emphasises on the significance of collaboration between different stakeholders undertaken within the integral value chain and cycle of products (Stratan, 2017). This last element of collaboration is widely highlighted in this study and will be further analysed below.



Figure 1: Ellen MacArthur Foundation (2015)

The concept of circular economy is the cornerstone of this study and will be the basic element of analysis. It will become the lens to my analysis as well as the endpoint. The essence of this research is to identify the best ways of transitioning to a circular economy especially in the textile sector. It is at the same time the starting point of Ethical Nomads that is about to launch its production from recycled cotton. The intention is to transition from a sustainable to a circular production along with their supply chain. Hence, it will become an example of this change and how it is achieved but also perceived.

### *2.1.3 Circular Economy as a shift paradigm in a Multi-Level Paradigm*

Diving into the characteristics and practices of circular economy, it becomes clearer that the textiles industry is a perfect example of the take-make-dispose paradigm which needs to change by narrowing, closing (by recycling) and slowing (with reuse, slow consumption, remanufacturing) loops (Bocken, Miller, Weissbrod, Holgado & Evans, 2018). The aim of this study is to identify the way businesses mainly SMEs and startups like Ethical Nomads would be able to change the current textile sector which is based on this old system of production and consumption. The environmental problems such as resource depletion, loss of biodiversity and climate change in general, related to this take-make-waste model of a linear economy, form societal challenges that need to be addressed from a more holistic perspective (Grin, Rotmans, & Schot, 2010; van den Bergh & Bruinsma, 2008). To transition from a linear economy to a circular economy in order to deal with such massive challenges demands socio-technical transition occurring at a large scale, consequently leading to a shift of the dominant economic paradigm by reforming the existing methods of production, technologies, institutions and values towards a state that is based on the principles of CE. Such enormous systemic changes involving so

many different types of actors and mechanisms are described as Socio-Technical Transitions (STTs) (Geels, 2004, 2010, 2011).

According to Geels (2002) the perspective of integrating the different levels is defined as the Multi-Level Perspective (MLP). It is argued that in MLP transitions are the outcome of interactions between processes at three levels (see figure 2). These levels where changes occur are: the niche, the sociotechnical regimes and the sociotechnical landscape.

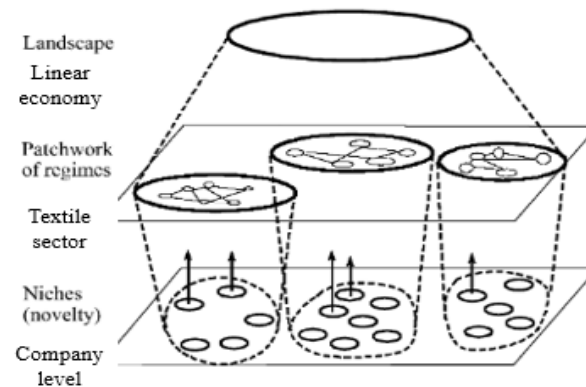


Figure 2: MLP (Geels, 2002) adjusted by author

To begin with, the niche is where the innovations occur and are represented at the micro-level. At the niche level novelties and new developments emerge away from the norms of the regime. There is the space also for committed actors to create networks that will support these novelties like supply chains (Geels & Schot, 2007). The innovations of the circular economy can be placed at this level as well as companies, SMEs or start-ups, experimenting with circular business models and circular products. SMEs in this study are defined as every company from 1-50 (small) and 51-250 (medium) employees. (European Commission, 2015). These companies formulate smaller supply chains of sustainable and circular production where they share the same values.

At the meso-level lie the sociotechnical regimes which represent a set of rules and norms that form the current dominant status quo carried by multiple groups of actors and are well established. Sociotechnical regimes have the ability to stabilize existing regulations and standards, patterns and fixed ways of working, and infrastructures (Geels, 2002). The current regime in this study is represented by the textile sector which is a stable regime ruled mainly by multinational companies like Inditex and H&M that have built a production model and have set norms and almost monopolised the entire sector as people tend to prefer them due to their aggressive marketing techniques and for their cheap prices. Norms and standards such as payment arrangements, production time schedule and the intensity of introducing new lines that come up to 24 per year are introduced by these companies (Koszewska, 2018).

At the higher level lies the sociotechnical landscape. While regimes refer to a set of rules that enable actions within communities, the landscape refers to wider socio-technical factors. The context of landscape is even harder to shift than that in case of regimes. Landscapes are able to change too, but this is a slower process in comparison to regimes (Geels, 2004). So, in other words, the landscape features the bigger picture which in this case is the linear system as it has been established before based on political and economic developments as well as cultural archetypes. This linear system is where the



regime of the textile industry has operated the past decades as one of the sectors embedded in this system.

The important point of MLP is that the advance of the new technology emerges from the niche but at the same time, there are also processes at the existing regime and landscape that may put pressure (Geels, 2004; Geels & Schot, 2007). New changes at the landscape level might influence the regime and create ‘*a window of opportunity*’ in order new technologies to emerge (Geels, 2002). It is important to mention that the window of opportunity is created by interactions at all three levels. Niche remains the key level where the change occurs but only if it is linked to growing processes at the other two levels (Schot & Geels, 2008).

It is worth mentioning at this point the role actors play in transformative changes. Although the Multi-Level Perspective does not explicitly mention the role of actors in the transition, Schot and Geels (2008) argue that social networks support developments at the niche and the involvement of multiple stakeholders is necessary to facilitate the transformation (Schot & Geels, 2008). On the other hand, De Haan and Rotmans (2018) highlight that transitions are decidedly affected by actors especially when they form networks on the basis of shared values. Transition is hence, the result of a series of intentional actions of networks (De Haan and Rotmans, 2018).

In this research the argument is the following: if such niches were constructed appropriately, they would act as building blocks for broader societal changes towards circular economy. In order to set in motion a shift of an economic paradigm, the companies at the niche experimenting with circularity adopt either circular business models or choose to adopt some circular practices or produce circular products. For this, it is valuable first to examine what is a circular business model and later how they form networks and collaborations within their supply chain.

#### *2.1.4 Circular Business Models*

Business models are the financial and organizational architecture of a business and their essence is to create value, mainly economic. Currently, the business models are structured in a way to refine resource usage in a more efficient way (Stratan, 2017). In 2008 Richardson suggested a framework for a business model revolving around the concept of value (Richardson, 2008). He presented a trilateral framework consisting of the value proposition, the value creation and delivery system, and value capture. The value proposition refers to the final product or service the firm provides to its customers. This includes the offering, the customer and most importantly the basic strategy to attract them and acquire competitive advantage. The value creation and delivery system indicate the resources and capabilities of the business, the organisation such as the value chain and various processes as well as the position that firm possesses in its value chain and network of partners. The last component of Richardson's framework is the value capture that concerns the economics of the business (Richardson, 2008). It was later widely applied by researchers and academics and has been modified to a great extent to fit the principles of sustainability and circularity (Oghazi & Mostaghel, 2018). Another framework widely applied in the literature is the one of Osterwalder and Pigneur (2010), known as “Business model Canvas”, claiming that a business model translates to how a company creates, delivers, and captures value.

The transition to a Circular Economy demands change of business management and subsequently the generation of new business models that promote working with closed loops and collective value creation as well as sharing created value (Jonker, Stegeman & Faber, 2017). “*A circular business model is how a company creates, captures, and delivers value with the value creation logic designed to improve*

*resource efficiency through contributing to extending the useful life of products and parts (e.g., through long-life design, repair and remanufacturing) and closing material loops”* (Nußholz, 2017, p.13). Jonker, Stegeman and Faber (2017) identified three main features of Business Models for Circular Economy. BMCEs are characterized by (1) the closing of raw material chains, (2) a transition from ownership to the provision of services, and (3) a more intensive utilization of the functionality of products (Jonker, Stegeman and Faber, 2017).

In terms of organisation of circular business models there are two aspects needed: internal and external (Jonker, Kothman, Faber & Navarro, 2018). Considering the internal change, the perception of resources, technological processes and strategies need to alter. In order the transition to occur it is crucial first to have a structure that allows both linear and circular model to coexist until the transformation occurs. That means that rethinking the vision and overcoming operational challenges. At the same time, the establishment of an interdisciplinary team is essential to help organising and reassess the value creation of the company (Hofmann & Jaeger-Erben, 2019). As of the external organisation, a transforming circular company needs to orient or even lead networks that have shared principles and interests so as the processes are managed in a way that forms a cycle. It can be also important to incorporate some steps of the cycle within the company’s processes, if it is necessary in order to ensure quality and balance (Jonker, Kothman, Faber & Navarro, 2018).

In the fashion and textiles industry especially, it is imperative to redesign the business models by creating value for the society and the environment besides their customers, which can be achieved by applying a multiple-stakeholder approach.

### 2.1.5 CBMs and stakeholder theory

As established, value creation constitutes the core of a business model. Relevant to the concept of value creation is the stakeholder theory developed by Freeman (1984). It is argued that stakeholder-oriented management enables managers to carry out four significant and highly interrelated activities: (1) creating value, (2) innovating, (3) dealing with the inclusivity and interconnectedness of various relevant groups and individuals, and (4) better addressing ethical issues (Freeman, Harrison & Zyglidopoulos, 2018). According to Freeman (1984) successful companies always have the mentality of “how to better serve the customer” and he argues that generalizing this perspective leads to the approach of “how to better serve my stakeholders”. The reason for companies' existence is to serve not only their internal environment but also their external. Otherwise, the company becomes irrelevant and eventually fails because there will always be competitors that will serve both environments better (Freeman, 1984). The success is always the result of the combined work of all the stakeholders. Every stakeholder carries out a different activity that contributes to the success. Therefore, it is important to acknowledge the relationships between the company and its stakeholders. Consequently, value should be created both with and for different stakeholders (Freudenreich, Lüdeke-Freund & Schaltegge, 2019). In figure 3, the relation between circular business models and the stakeholder perspective is shown.

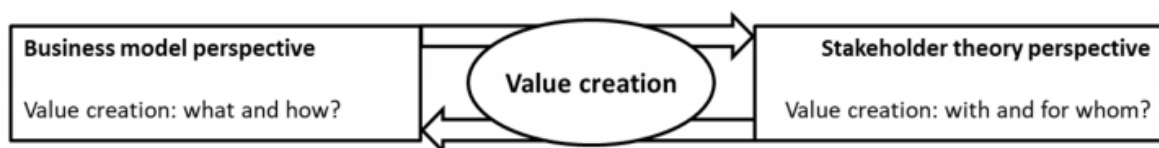


Figure 3: The relationship between business models and stakeholder theory (Freudenreich, Lüdeke-Freund & Schaltegge, 2019).

When mentioning stakeholders, this involves anyone that is affected or affects the company (Freeman, 1984) and that includes consumers as well. Although, in the linear system, consumers are considered as passive actors, in the circular economy consumers become part of the supply chain by taking part in the recovery of the products. Companies in the past years have been influenced by consumers to pursue more environmental practices. However, companies also need to raise awareness and educate their customers in order to engage them, perhaps with a reward system that does not necessarily focus only on monetary compensation (González-Sánchez, Settembre-Blundo, Ferrari & García-Muiña, 2020).

## 2.2 Supply chain collaboration

As the literature examined so far suggests, the collaboration between all actors involved is the key element to lead to a societal transformation. Chen et al. (2017) claims that supply chain collaboration is a fundamental strategy for businesses to accomplish sustainability targets. Similarly, Jonker (2013) has broadly perceived Circular Business Models from the perspective of collaboration, that is deeply related to CE. He specifically argues that there are five pillars for successful collaboration: ambition, interests, relationships, organization and processes, which can guide businesses when facing internal and external challenges (Jonker, 2013).

To elaborate, supply chain collaboration is a process between companies that work to achieve common goals (Cao, Vonderembse, Zhang & Ragu-Nathan, 2010). Moreover, it is also a close, long-term partnership between businesses throughout the supply chain (Cao, Vonderembse, Zhang & Ragu-Nathan, 2010) in which they share information, create strategic alliances to increase their efficiency, and decrease primarily costs and inventories (Chen et al., 2017) but also risk and reward sharing. The fundamental goal for supply chain collaboration is to build up a company's competitive advantage (Vanathi & Swamynathan, 2014).

The textile industry produces enormous pollution in all stages of the supply chain. Waste is produced in both the phase of manufacturing (post production waste) as well as after the use (post-consumer waste) (Koszewska, 2018). Therefore, the transition to a circular supply chain based on the cradle-to-cradle system is crucial. According to this concept, the lifecycle of every product stems from the design. In other words, it is designed in a way that it can return to the cycle in order to be recycled or reused. Hence, a closed loop system is created (Kazancoglu, Kazancoglu, Yarimoglu & Kahraman, 2020). The difference between conventional and circular supply chains is the necessity of closing or diminishing of material and energy flow in the latter (Geissdoerfer, Morioka, Monteiro de Carvalho & Evans, 2018). Therefore, the supply chain collaboration has to be seen holistically in terms of circularity, reaching beyond the boundaries of the textile sector and involving stakeholders outside of the traditional supply chain which simplifies the need for exchange of by-products, materials and energy between stakeholders (González-Sánchez, Settembre-Blundo, Ferrari & García-Muiña, 2020). An overview of the circular textile supply chain is seen below in Figure 4.

However, the question that arises is how companies select their partners in the supply chain. According to Ageron, Gunasekaran and Spalanzani (2012) the criteria for choosing a sustainable supplier is in order of preference the following: Quality, price, reliability, service rate, delivery, flexibility, size, certification, confidence, associated services, long term relationships, geographic proximity, environmental issues, economic dependency, personal relations, IT and finally social responsibility (Ageron, Gunasekaran & Spalanzani, 2012). Although communication seems to be repeated as a criterion for the selection of a supplier, it is also the primary cause of problems in the supply chain collaboration (Cao, Vonderembse, Zhang & Ragu-Nathan, 2010). A newer and recent research by

Kannan, Mina, Nosrati-Abarghoee & Khosrojerdi (2020) divides the criteria between economic, social and circular. Each of this category has sub-criteria but it is important to examine the circular as new addition which includes: Air pollution resulted from production and recycling products, utilizing eco-friendly and recyclable raw materials, respecting environmental standards and regulations in the process of production and recycling products, employing proper and clean technologies in production and recycling products and Using recyclable materials in packaging products. Similarly, social criteria include occupational health and safety systems, the rights of stockholders, the interests and rights of employees, Job creation and Information disclosure. The economic criteria are more traditional and comparable to those mentioned in the study by Ageron, Gunasekaran and Spalanzani (2012). It is remarkable though that this study does not mention the location of the supplier as part of the criteria, whereas when applying circular practices in the supply chain management, it is important to take into account the proximity of the company's partners in order to reduce the transport and hence its environmental impact (González-Sánchez, Settembre-Blundo, Ferrari & García-Muiña, 2020).

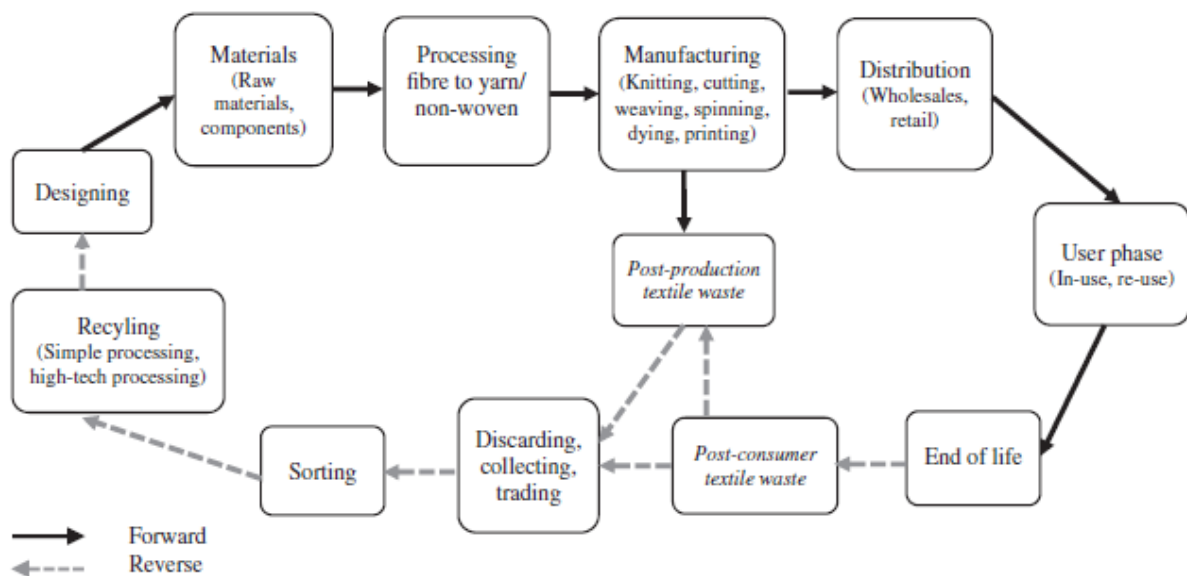


Figure 4: Circular Textile Supply chain (Kazancoglu, Kazancoglu, Yarimoglu & Kahraman, 2020)

Following the importance of the supply chain for business models and more crucially the collaboration in it, it becomes of essence, in order to achieve a circular supply chain management, to incorporate features of sustainable supply chain management by creating both financial and non-financial value in the framework of a long-lasting multiple stakeholder perspective (Geissdoerfer, Morioka, Monteiro de Carvalho & Evans, 2018). Therefore, the concept of value will be examined as well as its interrelation with circular business models and circular supply chain management.

### 2.2.1 The concept of value creation

A recurring theme in theories about both circular business models and sustainable supply chain management is value. For circular business models the concept of value plays a crucial role as it consists of integral part of the definition. In the linear system companies are driven only by financial value, although every business creates several values besides that as they are less accountable to the final target of financial value creation (Jonker, Kothman, Faber & Navarro, 2018). In circular business models the value proposition includes a product/service that uses a circular strategy in order to create value. That strategy is built in the essence of preserving the economic and environmental value embedded in

products and materials. As a result, the resource efficiency is expanded and closed-loop resource flows are achieved (Nußholz, 2017). Hvass and Pedersen (2019) claim that to optimise circularity within the business model it is important to make a clear value proposition, which also needs to be aligned with the firm's strategy, and communicate it to customers in order to engage them.

Accordingly, in the Circular Economy, value creation becomes an inter-organizational task between the involved stakeholders (Jonker, Stegeman & Faber, 2017). Thereby, it is essential to understand local culture and integrate into communities, through collaborations, in order a sustainable business model to create value that not only benefits the business itself but all of its stakeholders (Antikainen & Valkokari, 2016). Sharing value (Porter & Kramer, 2011) or multiple creation value means to be beneficial for the entire system outside the traditional boundaries (Jonker, 2013). Closing the loop is not a feasible goal without cooperation between all parties in order to create collective value. According to Jonker, Kothman, Faber and Navarro (2018) multiple value creation is the epicentre of the circular business model and the circular supply chain management and includes together social, environmental and financial value. That way the circular economy becomes more related and relevant to the sustainable development from which it derives. However, since applying circular economy strategies will often depend on collaboration between different stakeholders, it is crucial to comprehend different interests and interpretations and align them to circular business model processes (Mentik, 2014). However, research shows that although cooperation is the way to transition to a circular system, this is where companies mostly fail (Jonker & Faber, 2017). In the current situation of a pandemic that is now taking place along with this research, stakeholder perspective and multiple value creation becomes even more relevant in terms of resilience and durability. When crises like this occurs, not only individual companies but the whole textile supply chain is being affected. So, it is important to build strong relationships and think with the perspective of the network as a whole.

So far, it is established that companies experimenting with circular business models and products need to apply supply chain collaboration and strive for multiple value creation in order to succeed in changing the regime. Nonetheless, this is not an easy process as, through their journey to circularity, they face barriers that prevent them from thriving. Consequently, in the next paragraph barriers will be examined.

## 2.3 Barriers to the circular economy

After diving first into the concept of circular economy as a shift paradigm that could bring a techno-social transition and later intensifying the way to achieve it by supply chain collaboration, now it is important to look closely at the obstacles that companies face in this process of changing the regime. In this way, it can be comprehensively understood from every aspect the mechanism that will lead to change from a linear to circular system. Within the scope of the study, the obstacles are identified as drawbacks that can be overcome by effective supply chain collaboration but also by efficient management within the company.

To classify all the factors and barriers in the bibliography, it takes much time and resources. Studies on barriers, opportunities and challenges for the transition towards Circular Economy in the textile sector are diverse. For this reason, and after searching thoroughly the academic literature (for example Rizos et al., 2015; Rizos et al., 2016, Ritzén & Ölundh Sandström, 2017; Tura et al., 2019; de Jesus & Mendonça, 2017; Korhonen, Honkasalo, & Seppälä, 2018; Salvador et al., 2020; Franco, 2017) regarding the barriers I have chosen the framework by Kirchherr et al. (2018). It was selected as it is a relatively new study and it has taken into account over 40 case studies leading to 80 interviews and 150 academic articles (many of whom were found during the research and are summarised here) regarding

CE barriers that have been analysed to conclude to a distinction of fifteen characteristic barriers for CE divided in four categories: cultural, regulatory, technological and market barriers as seen in table 1.

Coding framework of CE barriers.

Barrier	
Cultural Lacking awareness and/or willingness to engage with CE	Hesitant company culture
	Limited willingness to collaborate in the value chain
	Lacking consumer awareness and interest
	Operating in a linear system
Regulatory Lacking policies in support of a CE transition	Limited circular procurement
	Obstructing laws and regulations
	Lacking global consensus
Market Lacking economic viability of circular business models	Low virgin material prices
	Lacking standardization
	High upfront investment costs
	Limited funding for circular business models
Technological Lacking (proven) technologies to implement CE	Lacking ability to deliver high quality remanufactured products
	Limited circular designs
	Too few large-scale demonstration projects
	Lack of data, e.g. on impacts

Table 1: Barriers to CE by Kirchherr et al. (2018)

Indubitably there is an interrelation between the barriers and they are not independent from each other. For instance, limited data can lead to limited investments which will force products to be more expensive and consumers to be less interested and hesitant. They form a chain reaction that could possibly bring an CE failure (Kirchherr et al., 2018). Another considerable argument in this framework is that despite the majority of literature indicating technical barriers as the main impediment for the indication of circular economy (de Jesus & Mendonça, 2017), the study by Kirchherr et al. (2018) comes to the conclusion that it is not technical obstacle but rather cultural barriers that hold Circular Economy back from being implemented. The suggestion from Kirchherr et al. (2018) is that the technology for implementing circular economy exists but that circular economy as a concept has not been convincing enough yet to be adopted by the majority of companies. This is another reason for selecting this framework as it aligns with the previous argumentation that effective supply chain collaboration management and subsequently multiple value creation is the key to the transition. It also lines up with the claim that the most considerable difficulty for supply chain collaboration is communication between the parties (Cao, Vonderembse, Zhang & Ragu-Nathan, 2010).

That means that if all the stakeholders in the supply chain have some value to gain and share the goals and the risks, then the transition to a circular paradigm can be more easily facilitated leading eventually to a change of regime. Recognising and classifying the barriers is the first step to this process and from then the strategies can be drawn to properly promote the adoption and development of circular innovations at the niche level.

## 2.4 Conceptualisation

The combination of all the theories of this chapter that are represented in figures 1 to 4 and table 1, leads to the integration of one final framework presented in figure 5 that functions as the fundamental structure on which the analysis will be based in order to build a constructive argument for answering the research question. The transition theory by Geels (2002) offers an excellent argument on the circular paradigm shift where the niche is represented by companies experimenting with circular business models. Accordingly, if we want to achieve this transformation, then the supply chain collaboration is the preferred action and especially when it comes to multiple value creation for all the stakeholders. This notion is supported by the fact that the major barrier consists of cultural elements like hesitant companies and consumers, lacking willingness to engage in a circular economy model (Kirchherr et al., 2018).

More specifically, this study argues that small and medium companies like Ethical Nomads explore the possibilities of circular strategies and circular business models. These companies are at the niche trying new technologies and innovations around circularity on their way to change the current regime. The regime lies in the middle of the figure 5 which in this case represents the existing textile sector mainly dominated by multinational companies like Inditex and H&M. However, between niche and regime there are a few important steps that will lead to the transformation. To achieve a circular model business, companies need to cooperate very closely, involve their stakeholders by creating multiple values (Freeman, 1984; Jonker, Kothman, Faber & Navarro, 2018) and create networks based on shared values (De Haan and Rotmans, 2018). This is of essence mainly because circularity has to be taken into account holistically and it does not concern each individual company separately. Nevertheless, to be able to change the regime, companies must ensure that the change goes through the whole supply chain and does not stop with them. Stakeholders in this new model definitely involve consumers too, who are undoubtedly becoming more and more aware, as they turn into part of the closed loop process. (González-Sánchez, Settembre-Blundo, Ferrari & García-Muiña, 2020). Consequently, after carefully choosing the supply chain, the company along with their partners have to also overcome the barriers. The selection of partners itself can prove a challenge where limited companies actually are willing to cooperate or are hesitant to the concept itself. After surpassing this, various market barriers such as high starting costs, resource prices or limited funding, and technological barriers like limited manufacturing ability or circular designs, as well as lack of data need to be battled (Kirchherr et al., 2018). If everything between niche and regime aligns perfectly there is a considerable chance to be led to a change.

Undeniably, these barriers are not placed exclusively between niche and regime and hence in figure 5 they are placed again between regime and landscape. Some of these (cultural and market) barriers rise at this level like operating in a linear system or lacking standardization. There also regulatory challenges can be found like lacking a global consensus and obstructing laws and regulations. In this study, as mentioned before, landscape represents the linear system of take-make-waste. There lie all the existing regulations, the values and the culture developed in the past years where people consume without considering the impact of their actions. It represents the capitalistic system and the existing market. Elements like climate change and depletion of the environment occur and influence this stage. These

along with the beginning of the environmental awareness movement that led to more conscious consumers are pushing the landscape to change. However, according to Geels (2002), many elements put pressure on the regime but there is a window of opportunity that might be determinant for this change to occur. In this case, it is argued that the current pandemic and the way it transformed the world this year as well as the impact it made in the textile sector and the internationalised supply chains in general (ILO, 2020) can be considered as a window for the current linear system to change.

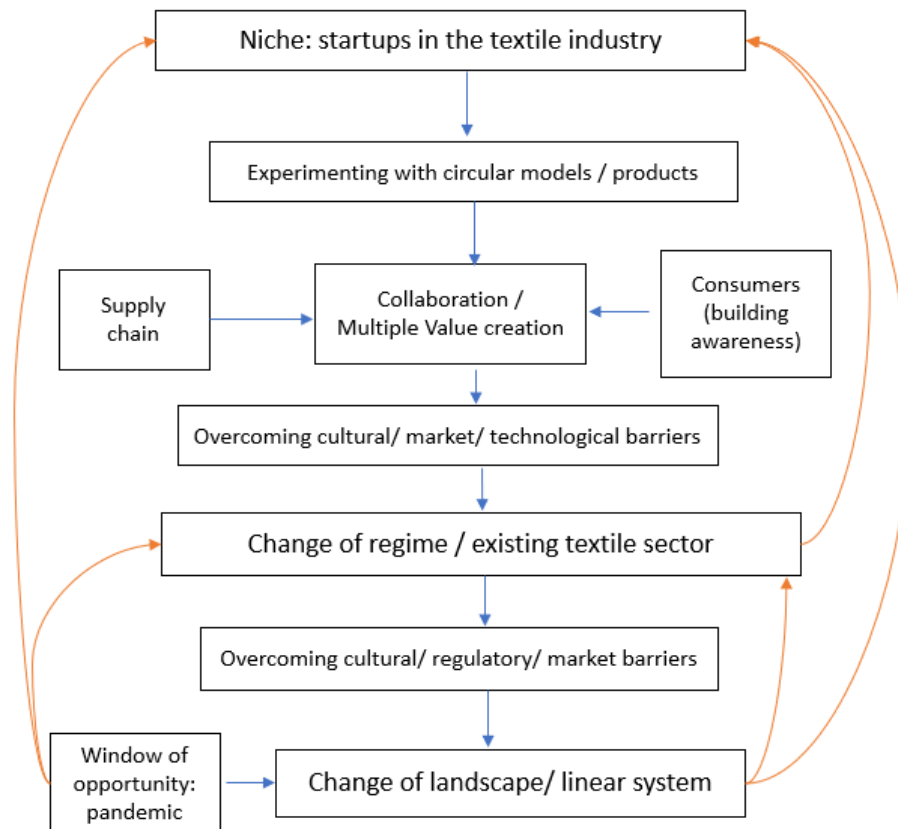


Figure 5: Conceptual Framework (Author’s creation, partially adjusted from MLP (Geels. 2002)

Lastly, it is important to understand that all the above interrelate and thus the figure should not be regarded vertically. Landscape influences back the regime as well as the niche by putting pressure continually. At the same time, the situation of the pandemic is put on the landscape level as it occurred on a global scale. Nevertheless, it has seriously affected mostly the entire textile regime but also companies at the niche.



# Chapter 3

## Methodology

This chapter focuses on the methodology that is used in this research. First the adopted research paradigm is mentioned in terms of ontology and epistemology. The research design of the study follows. Then, I will go into depth concerning the methods used for this research followed by an overview of the case study. Finally, the last section is dedicated to the presentation of the way the results will be assessed in the next chapter as well as the validity and reliability of the study.

### 3.1 Research Philosophy

A paradigm or philosophy is a way of thinking about the world. Guba and Lincoln (1985) identify the research paradigm as a basic belief system based on ontological, epistemological and methodological assumptions. So before going into methodology and data analysis it is wise to delve into the research philosophy that is adopted as they are well connected.

Ontology refers to the way we perceive reality (Creswell, 2013). It relates to the assumptions either external or internal we hold about the world or a phenomenon (Jonker & Penninik, 2009). To gain a better understanding about companies putting effort into changing their business model from sustainable to circular and what they struggle with in this process, it is necessary to look into the different stories of each company that takes part in the research. Therefore, this research will be conducted from a post positivist ontological perspective. According to critical realism as it is labelled, there is one reality but it is not easily or perfectly perceived as people are often biased. The reality that any of the participants understands needs to be critically examined in order to come as close as possible to the reality (Guba and Lincoln, 1985). Critical realism in comparison with naive positivism where the researcher is sure about the reality that sees, here the researcher focuses on explaining what she sees externally and independently. On the other hand, critical realism does not go as far as constructivism that apprehends multiple realities depending on the individual (Saunders, 2016).

According to critical realism reality exists and has to be examined critically although this will never be perfect as all observations can be fallible (Trochim, 2006). Critical realists also believe that all observations are theory-laden and that researchers are present by being inherently biased by their cultural experiences and world views. For instance, cooperation throughout the supply chain arises from people's interactions, thus the information the researcher can collect from actors active in the supply chain, will be biased and therefore subjective as the reality of the research is imperfect. As cooperation can differ between domains and industries, there is no reality as a whole to understand and a way to seek objectivity is by data triangulation.

In terms of epistemology, it is important to define the relationship between the researcher and the reality (Creswell, 2013). Epistemology refers to the amount of knowledge the scientist has before and what it is thought to be true and how it can be validated. Hence, it determines the kind of contribution the study will have in the end (Saunders, 2016). In the philosophy of post positivism, dualism is abandoned but the focus is on objectivity. The emphasis is given to the results and their place and relation with pre-existing knowledge (Guba and Lincoln, 1985). Therefore, the theories serve as a leading tool already predetermined. In this way the ultimate goal is to confirm or not the theory by empirically examining

the preset hypotheses (Trochim, 2006). Searching for the conditions to achieve a circular business model and a circular supply chain I will attempt to identify first the existing practices in order to establish the basis on which the recommendations and strategies will be built at the end.

## 3.2 Research Design and Strategy

The two criteria for choosing a specific research strategy are the main research question and the amount of existing knowledge (Van Thiel, 2014). In order to answer the main research question and the sub questions, many theories have been analysed. Hence, the subject is approached in a pluralistic way. As Yin (1994) states, “*case studies are the preferred strategy when ‘how’ or ‘why’ questions are being posed [...] and the focus is on a contemporary phenomenon within some real-life context*” (Yin, 1994, p.1). In this research, the aim is to understand how transition to a circular model can be achieved, if collaboration in the supply chain is a key direction and what are the barriers that held the textile industry behind so far. In this thesis the case study is chosen as the most suitable strategy and the focus is at the niche companies such as Ethical Nomads, where my internship took place. More interesting is the fact that Ethical Nomads is an already established sustainable company trying to become circular by introducing a recycled cotton programme in the progress of which I, as an intern, participated. As mentioned before, the idea of transforming a sustainable business to circular is not extensively analysed by scholars yet, especially in the textile sector (Merli, Preziosi and Acampora, 2018). It is also a small company consisting only of two people like the majority of the companies at the niche. Another important factor is the position of the company in the supply chain. It consists of an agent company with no direct communication with consumers which was not the aim of the study but stands in between and interacts with both manufacturers and fashion brands. This provides great access and insights about the supply chain management and collaboration. Naturally, the research is conducted in the interest of Ethical Nomads too and their recycled basics programme.

To conclude in specific results and recommendations for Ethical Nomads but also any other company that can benefit from this study, a conceptual framework is formulated that guides the researcher throughout the process. Qualitative research is conducted and the methods that have been used are mixed, including semi-constructed interviews, constructed interviews as well as three interviews with experts in the topic. To a smaller extent the use of content analysis of documents has been made including reports from other companies and organisations and a few new studies on the matter of the pandemic. To formulate the conceptual framework, the deductive research approach was used although inductive analysis was adopted in a later stage when the interviews were conducted and obstacles and opportunities for the companies were identified. Based upon these facts, then general conclusions were drawn regarding the research question and the sub-questions concluding with recommendations for Ethical Nomads. The use of multiple data sources led to data triangulation. The data collected in the field research is compared with the results from the literature study.

The model on which the collection of data is designed in accordance with the building blocks of a circular business model by Jonker, Kothman, Faber and Navarro, 2018, as it is depicted in Figure 6. The model consists of seven building blocks, namely: (1) Cycles, (2) Value creation, (3) Strategy, (4) Organisation, (5) Revenue, (6) Parties and (7) Impact (Jonker, Kothman, Faber & Navarro, 2018). The fundamental idea is that businesses come together to a collective value proposition which aligns with everything mentioned in the theoretical framework, meaning that circularity demands supply chain collaboration. In their workbook they have created questions and activities for companies to enable them to create a circular business model. The idea is to make the participants rethink their business model by combining all the elements of the circle (Jonker, Kothman, Faber & Navarro, 2018). This

model is not mentioned in the theory as it does not provide more insight than already exists and it is used in this research as a method. Therefore, these questions will be the basis for the data collection from all the participants but not exclusively.



Figure 6: Building blocks of a circular business model by Jonker, Kothman, Faber & Navarro (2018)

### 3.3 Case Study

The research followed a longitudinal, in-depth single case study method. Case studies have traditionally been a common approach in research on sustainable business models, which is a complex field, still in early stages (Dentchev et al., 2018). Single case studies are recommended when the aim is to examine a contemporary topic thoroughly, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2018), and in circumstances where little empirical evidence is available (Eisenhardt, 1989). The single case study method was chosen because there are not many companies experimenting with the recycling of textiles and take back systems while this research takes place. However, it is acknowledged that a single case study also comes with limitations in terms of, e.g., generalizations (Van Thiel, 2014), which makes it difficult to transfer the results to other types of businesses or industries, other circular economy initiatives (e.g., sharing) or other geographical contexts (e.g., USA).

The case study in this research aims at observing the ways and less the aims and causes in order to learn (Moses & Knusten, 2012). In this project, I am going to look into the example of Ethical Nomads, a sustainable manufacturing studio based in Amsterdam, the Netherlands and its supply chain partners. The company serves as an agent company and produces garments and fabrics from certified organic cotton mainly in India for other sustainable fashion brands and individual designers. For the past year, the company has been preparing to launch its Recycled Cotton Programme for basics (T-shirts, sweaters and tote bags). The concept of the programme is to produce garments of a blend of 30% recycled cotton and 70% organic cotton. This decision has been made in order to maintain the good quality of the end product. Their idea is to specialise in basic garments because they have a timeless demand and it is the garment the majority of people wear for the longest period of time, while at the same time, the quality of the product is better ensured. That way they aspire to be a big part of consumers' demand now and in the future.

The study's ambition is to look closely at the structure of companies and the organization of the supply chain. However, Ethical Nomads is a small company with limited supply chain partners. For this reason

and in order to serve the purposes of validity and reliability, the research was extended to actors and companies beyond Ethical Nomads' supply chain, but with the potential of becoming partners they all fit to Ethical Nomads' mission and activities. Additionally, some of the companies selected to be studied are companies that are acclaimed for excelling in circularity and thus they will provide great insight and best practices.

## 3.4 Data Collection

A literature review has been organised in the preparatory phase of this study. The theoretical framework was based on scientific articles and reports and the goal was all the relevant concepts and theories to the research to be thoroughly mentioned in order to provide the basis upon which the conceptual framework was developed. In case study research, multiple methods are common and all of them have equally their advantages and their weaknesses, however none of the sources is considered stronger than the other (Yin, 2018). In my research, semi-structured and structured interviews are planned, which consists of the most common method in a case study (Van Thiel, 2014), in order to give the opportunity to people to share their ideas and points of view about transition in circularity. Unfortunately, and mainly because of the pandemic the companies approached were multiple but not all of them responded positively to an interview. Instead, four companies sent their sustainability report. Although it does not respond to all of the questions meant to be asked by the researcher, they still remained a valuable source of information in terms of current circular practices and the relationship of the companies with their stakeholders. A supplementary desk research was conducted including reports and policy documents from the EU and the Netherlands where Ethical Nomads is based and a small amount of new research studies showing recent evidence and insight on COVID-19 crisis in the textile industry. Finally, observations from brainstorming meetings as well as from the daily work with the company, also contributed to the results.

### *3.4.1 Interviews*

Both founders of Ethical Nomads and various partners in their value chain took part in the interviews, However, Ethical Nomads consists of a small company with limited suppliers and clients. Consequently, in order to achieve the necessary validity and reliability, more interviews were planned with people outside the value chain of the company. In this way, the results will be enhanced and more data will be included. Nine interviews were from within the supply chain of Ethical Nomads and the rest six were potential clients or very successful examples of circular companies. The semi-structured interviews in this research were designed in a way that broad questions were incorporated based on theoretical findings and can be found in Appendix I. These companies were chosen based on a few criteria. All companies selected are SMEs and already sustainable or experimenting with circular business models, at the niche. Furthermore, the effort was put to find companies in the Netherlands, so as to eliminate the differences in terms of regulations and market. In this way, the results will be enhanced and more data will be included. Finally, for the companies not in Ethical Nomads supply chain, businesses that have incorporated different aspects of circularity such as leasing clothes, producing from leftovers and the establishment of a take back system were selected.

The aim of this study was to obtain at least 20 interviews. Instead, only 15 interviews have taken place. Although they were initial communications with more than 50 companies in total in order to arrange an interview, many companies refused due to the situation of the pandemic. Even more, a few examples of start-up companies paused entirely their activities or postponed their launch because of the current

situation. The problems faced in the study will be described extensively in the limitations. For every interview, a request for recording the interview was made, but not all were agreed upon resulting in three non-recorded interviews. As of the non-recorded interviews, transcripts were formed based on researcher's notes for convenience purposes at the stage of coding. The interviews lasted on average 60 minutes and were fully recorded with an audio recording programme for the people that consented. The audio files of the interviews are transcribed word for word. In this study, the names of the interviewees and the interviewees' companies will remain anonymous. Anonymity is safe-guarded through a coding system. Interviews are coded based on the means that the interview took place. As a result, V means that it happened through video call and P means that happened in person. The interviews coded as P consist of Ethical Nomads' founders which I met in person and worked with. The numbers symbolise just the order that they took place.

Concerning the structured interviews, a few companies did not agree on an interview but preferred a form of questionnaire. The researcher evaluated that although it affects the reliability of the study, it would be better to include them so as the participation and consequently the validity is increased. The structured interviews followed the list of questions for the interviews, which can be found in the Appendix I. This decision was made in order to achieve collecting similar data from both semi-structured and structured interviews as much as possible and therefore comparable. They were all sent and received via email. They are coded as S interviews because they were structured. All transcripts are, due to the size, added in a separate from thesis appendix document. The voice recordings of the interviews will be also handed in separately as well as an extensive list of the data used for this research. Table 2 shows all conducted interviews.

Interview	Active in	Role	Country	Recorded
V1	Clothing	Founder/ Designer	NL	Yes
V2	Clothing	CEO	NL	No
V3	Fabrics Retail	Owner/ Designer	NL	Yes
V4	Clothing	Founder/ Designer	NL	Yes
V5	Clothing	Director of Renew Programme	USA	Yes
V6	Manufacturing	Business Development Manager	India	No
V7	Manufacturing	Manager Directing	Turkey	No
V8	Clothing	CEO	Italy	Yes
P1	Agent Company	Founder	NL	Yes
P2	Agent Company	Founder	NL	Yes
S1	Recycling of textiles	Project Assistant	NL	Structured
S2	Textile Processing/ Dyeing	Business Development	NL	Structured
S3	Clothing Imprinting	Owner	NL	Structured
S4	Clothing	Owner	NL	Structured
S5	Clothing	Owner	NL	Structured

Table 2: Conducted interviews

### 3.4.2 Expert Interviews

Besides the companies three expert interviews were also held. The first is an expert in supply chains management working at an international consultancy who gave me a great insight on the way supply chains operate by her own experience and research. The second interview was with a freelance consultant. She is an expert in sustainable fashion and works closely with both companies and the Dutch government. Hence, I acquired a good idea about the missing part of government in my research but also how companies think about circularity in general. For the last interview, I had the opportunity to talk with a sustainability expert currently working for a non-profit organisation that blends entrepreneurship with social responsibility based in India. Most importantly, she used to work for EPEA company which supports companies and organizations by developing Cradle to Cradle solutions for the entire value chain. They were all three recorded and transcribed the same way and added in the separate document.

## 3.5 Data Analysis

All recorded interviews have been transcribed by the researcher. When coding, I analysed the transcripts in order to detect all the essential parts in order to answer my research questions, being also aware of potential unexpected data. During the coding process, numerous dimensions have been set up that categorize trends in answers by frequency and key phrases coupled to a certain code family. Under the general code families, related codes served as a demonstration for each concept. The code families are the result of frequent answers that relate to the conceptual framework and the research questions. These categories guided my analysis and served as building blocks for the structure of my results (Bryman, 2012). The coding was done by hand and will be also included in a separate document due to its volume. The main families or concepts identified are the following: (1) understanding and practices of circular economy, (2) engagement to supply chain collaboration, (3) barriers and (4) strategies. All the coding families as well as examples and subcategories can be found in Appendix II.

## 3.6 Validity and Reliability

The reliability and validity criteria will assure that the study is adequately done and the results are scientific. Assessing reliability and validity for a qualitative study is challenging as they feature a '*contextual uniqueness*' (Bryman, 2012, p. 392) which makes the evaluation complicated. According to Van Thiel (2014, p. 48) "*in the social sciences, though, research often concentrates on people, either as units of study or as a source of information*". Repeatability will improve the reliability of the research, as it enhances the certainty of the results (Van Thiel, 2014). However, the problem with single case studies consists of the fact that they cannot be easily generalized. Accordingly, the findings of qualitative research are to generalize to theory rather than to populations. This is what Yin (2009) calls '*analytic generalization*'. Furthermore, ethics play a significant role in research. When doing interviews, I reassured the consent of the interviewees consent, the fact they understand this research and its purpose, and that they will stay anonymous (Rapley, 2004).

Validity refers to the suitability of the methods, certainty of the analysis of the results and generalisability of the outcome. (Saunders, 2016, p. 202) In this study, the use of multiple methods (interviews, observations, archival data) will reassure the reliability of the project but also validity. Finally, by including different stakeholder opinions and by applying different methods, it is feasible to reduce the bias in the research.

To increase the validity and reliability of the study the effort for data triangulation has been made. Various and different data have been included in order to enhance the research and raise the participation of the companies. Besides this though, the final draft of this dissertation is forwarded to the experts reviewed so they can assess it and provide their invaluable feedback.

# Chapter 4

## Results

In this chapter I will analyse the results from the interviews both structured and semi-structured in accordance with the themes found during the coding process. Moreover, findings from data triangulation will be also discussed here. This chapter has been formulated in a way that answers the subquestions posed in chapter 1 and with the aim to draw several conclusions in order to answer the research question meaning first the concept of circular economy itself will be discussed followed by the engagement of companies in supply chain collaboration. Moreover, the identification of barriers will be next presented along with the classifications of additional barriers. Furthermore, the proposed strategies will be viewed. Finally, some early data will be given that suggest that current pandemic can be interpreted as a window of opportunity for the textile sector to change and will be the link to the next final chapter.

### 4.1 Understanding and practices of Circular economy

To better understand the solutions and strategies that will lead to a transition to a circular paradigm there is a need to first focus on the comprehension companies have in terms of circularity. In other words, it is important to see how familiar businesses are with the definition of circular economy and what it consists of. This topic was one of the first to be asked to the interviewees in order to create a basis on the discussion that followed. Here, the comparison is made with the definition given in chapter 2 by Korhonen, Honkasalo and Seppälä (2018) and by also taking into account the very similar five features of circular economy by Ellen MacArthur Foundation (2013). By combining these, a few elements can be drawn: thinking in holistic production-consumption systems, creating endless loops which results in zero waste, usage of renewable energy, cascading and finally including a social aspect.

Overall, all participants but one, were familiar with some elements of the definition of circular economy, the distribution of which can be seen in figure 7. This interviewee, the company which she represented is part of the Ethical Nomads' supply chain, was given the definition used in chapter 2 when asked about their circular practices. The measurement is related to the times each of the elements was mentioned. The majority of the companies associated the circular economy with maintaining a zero-waste production and recycling. Recycling is the most common strategy in the textile industry so far and that is evidently shown in this case too. Undoubtedly, the elimination of waste is one of the most important elements of the circular economy definition. In second place, two other aspects were equally found: reuse and upcycle. Those are all very common aspects of the circular economy but mainly refer to strategies and less to characteristics. Upcycling is the "*process of converting materials into new materials of higher quality and increased functionality*" (Ellen MacArthur Foundation, 2013, p. 25). This is mainly related to the technical sphere where improvement is possible. In the case of natural textiles, such as cotton, that come from the biological sphere, we could mostly refer to cascading where for example apparel cotton can become fibrefill for furniture and, later on, insulation material before returning it as a natural element into the biosphere (Ellen MacArthur Foundation, 2013). All these are forms of closing the loop but not everyone related the concept of closing the loop with the direct strategies of recycling, reusing and upcycling. At the same time, two very different aspects of circularity, namely the collaboration in and out of the supply chain and the design of the products in a way that they will be circular, were also mentioned by three people. Lastly, the least mentioned aspect



was that circularity equals healthy people (either workers and consumers) and healthy products while the latter can be also linked to the circular by design element.

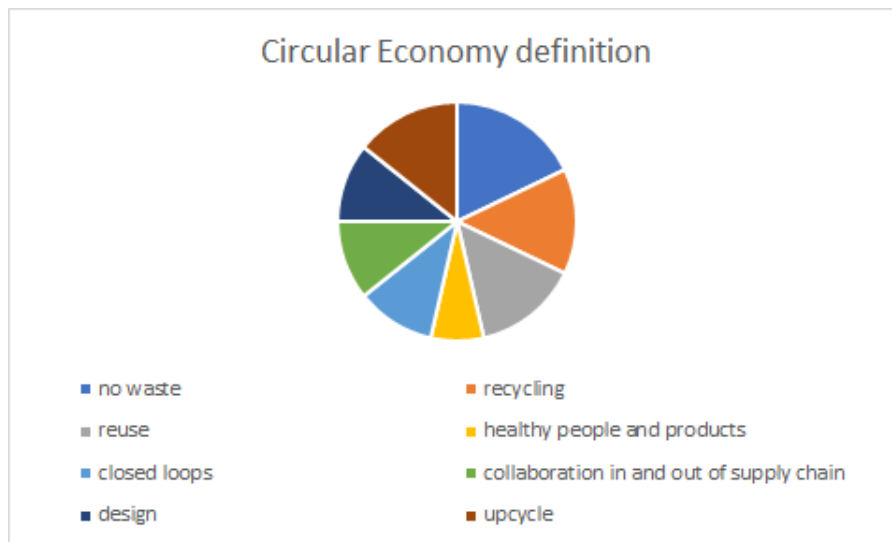


Figure 7: Understanding of circular economy by interviewees

It is crucial to highlight that none of the participants managed to mention all the elements of the definition. Moreover, as two of the experts pointed out, most companies in the textile industry relate circularity with recycling and they do not have the complete knowledge of what it entails to be circular (interview E2) and thus they recycle in a way of postponing the moment that the products end up in waste by adding a few years on the lifespan or use span of the materials (interview E3).

#### 4.1.1 Circular Practices

All the above bring us to the activities that the participants choose to implement in terms of circularity. From the answers given seven categories of activities were identified, an overview of which can be seen in figure 8. Again, in this case, participants sometimes mentioned more than one activity that they have incorporated and it is considered circular. As expected, different answers were given between brands and companies on the manufacturing side of the supply chain but this did not impact significantly the results. The previous indication on recycling is again confirmed as the most preferred strategy for the majority of companies. The reuse of materials and leftovers as well as used of natural organic products for garment production were mentioned by five participants. Nevertheless, there is a need to distinguish that only one of the brands has incorporated the use of the leftovers into its business model (interview V4) while the rest of the companies do it as a secondary activity.

In addition, three of them have implemented a take-back system in which they receive their own clothes, either repair and resell them or recycle them in order to be “*responsible about what happens to our clothes*” (Interview V5). Most companies expressed a desire to carry out a system like this but they face many challenges in the realization. Also, three companies claimed that they design their clothes to be circular meaning that they will easily break down and recycle without overcomplicated materials, blends or additional accessories like buttons. For instance, one brand states that they work only with five fabrics and one type of button (MUD Jeans Sustainability Report, 2019) and another claims that they produce clothes to last longer and they can be repurposed in a positive way (Kuyichi Sustainability Report, 2019).

Lastly, two companies mentioned that they implement practices concerning water management which were both on the manufacturing side (Interviews P2 and S2), one of which has incorporated in their

business model a chemicals and water free dyeing technology (Interview S2). One company also alluded to leasing clothes as a circular strategy which also is partly integrated in their business model (Interview V2).

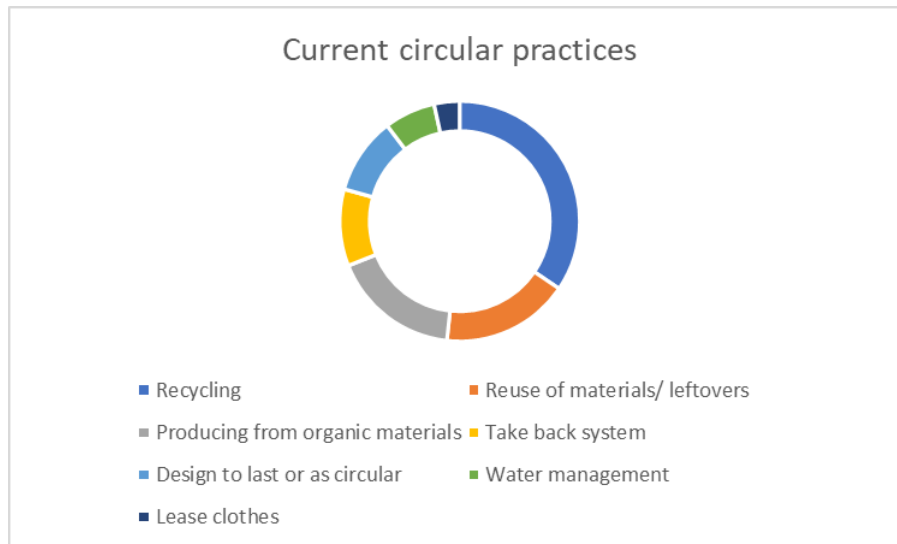


Figure 8: Current circular activities by companies interviewed

However, one of the experts, confirming the results, claimed that the strategies that companies choose are still very insufficient. Most companies only buy recycled fabrics from cotton or from PET bottles and sometimes they try to implement a limited take back system for the things they have produced (interview E2). Businesses in the textile industry and mainly brands focus first and foremost on recycling and recycled materials. Only few have included multiple practices to enhance circularity in their business and it seems that the vast majority does not embody a holistic approach that penetrates the core of their value proposition. According to the ReSOIVE framework (figure 1), many of the practices were overlooked by the participants such as the shift to renewable energy or digitization of processes of the company.

## 4.2 Engagement to supply chain collaboration

### 4.2.1 *Criteria of selecting partners*

After setting the ground of this analysis by exploring the understanding of participants on circularity and their practices, it is now important to discuss to what extent they take into account their supply chain when designing their value proposition. According to the framework, as argued before, collaboration is the way to transition to a circular economy. Subsequently, the second theme that will be analysed is the engagement of participants in their supply chain and the degree of collaboration that has been accomplished. First, companies were asked about the criteria with which they choose their partners. That was an initial approach to observe how they structure their supply chains. It is also interesting to draw some conclusions later on about companies' practices concerning their supply chain management.

Criteria	
Sharing values	8
Trust	7
Certifications	7
Personal relationship	6
Communication	6
Transparency	5
Working conditions/ CSR practices	4
Technical Skills	4
Price	4
Quality	4
Willingness to collaborate	4
Honesty/ ethics	3
Willingness to innovate	3
Proximity	3
Sustainability	3
Range of materials	3
Volume	2
Flexibility	2
Delivery time	2
Financial stability of the partner	2

Table 3: Criteria of selecting supply chain partners

Interviewees gave multiple answers on that subject. From their answers, twenty criteria were identified and can be found in table 3. They were categorized again based on times mentioned by participants as the number indicates. Sharing values comes first, pointed out by the majority. This closely fits the idea of De Haan and Rotmans (2018) on formulating networks on the basis of shared values as a means to transition to a circular economy. *“It is important to have the same values with your suppliers”* said one participant (Interview V2) and another agreed that it is necessary to *“have the same understanding of the world, same values and goals”* (Interview V7). It was widely seen that sharing values was mentioned by a large number of participants despite their position in the supply chain.

It must be remarked that, right after sharing values, trust and certifications were equally mentioned by interviewees. That is because they consist of the two almost opposite ideas of trusting their partners while asking for the security that certifications provide in order to collaborate with them. They follow personal relationship, communication and transparency. Significantly, price and quality come only after all the social criteria. This contradicts the study by Ageron, Gunasekaran and Spalanzani (2012) where these two criteria come first and then the communication criteria follow. It seems that companies have the will to trust and create bonds with the people they cooperate with and as a result form their supply chains. That becomes even more evident by the fact that eight of the criteria found are more related to the relationships formulated between the partners and less to the financial or environmental criteria. There are of course some technical criteria such as the range of materials offered, the volume and delivery time but they do not score high in the list.

Another interesting observation is that environmental and more specifically circular criteria in the way Kannan, Mina, Nosrati-Abarghooee and Khosrojerdi (2020) stated in their study are not particularly pointed out by the participants. Three of the interviewees declared that the level of sustainability is one

of the criteria to begin a collaboration. However, at this point we should take into consideration that certifications include a large number of environmental standards and processes.

While discussing certifications it is important to say that in the first interview the question regarding whether the company trusts and uses certifications arose, although it was not a subject that was initially included in the interview guide. However, I observed that companies continued to often refer to both certifications and trust as criteria so this question became necessary to better understand the relation between them.

Participants were asked whether they include certifications or not when choosing their partners. The 71% of the interviewees reported that they use them regularly while the rest 29% said that they do not find it necessary if you maintain trustful and meaningful relationships with your supply chain. One of the interviewees said “*Certifications, I am not interested. I am really critical of those things. Organisations have to do the right thing*” (Interview V4). On the contrary a participant from a manufacturing company said “*We consider certification as the most important thing in our business*” (Interview S3).

An essential suggestion from some of the participants is that certifications are not useful if you have a personal relationship with your partners but their importance derives from the fact that they stand as an international common language (Interview V8 and V7) or as a global system of regulations (Interview P1). Experts also gave significant insight to the matter. One suggested that certifications are needed in a system of mistrust, a linear system (Interview E2) and another mentioned that they are useful as a guide for a company to keep track of its processes but there are so many already in the textile industry that it has started being confusing for companies and consumers (Expert E1). However, one of the experts that has done intensive research on certifications and audits, shared that certifications in terms of materials have a great value but they become very problematic when trying to measure social issues, human rights and labour rights. Companies think that it is a good first impression but it does not give the right focus and a fair picture. Apart from that brands mainly use them as a tool for marketing reasons, which is also very questionable (Interview E3).

#### *4.2.2 Multiple value creation*

So far, I examined what companies expect from their partners. But what happens when companies share value with their stakeholders? In this paragraph I will examine what the participants answered when asked who they consider as a stakeholder and what they do in order to enhance multiple value creation.

As expected, most brands referred to the manufacturing companies as their stakeholders and vice versa. Interestingly, only three participants mentioned their employees as their stakeholders. At the same time, three of the companies regard other companies with similar values as stakeholders, regardless if they partner with them and specifically: innovation and sustainability driven companies (Interview S1), small and individual start-up brands (Interview P1) and various other organisations that have the same goals (Interview P2). This indicates the desire to create a network of companies and people with similar values as well as the recognition of companies at a niche level.

Only two companies mentioned consumers as their stakeholders, mostly due to the fact that they advertise and promote their work through online platforms and social media, so they have a direct interaction with them on a constant basis (Interview S3, V1). It is interesting that the company that declared leasing clothes as part of their business model was not among these two. In addition, other actors of the supply chain were mentioned namely delivery companies, farmers, and funders.

Now that the stakeholders have been identified it is important to dive into which kind of value businesses create for them. Participants reported that the value they try to enhance the most is raising awareness because *“to get the message across is the most important value”* (Interview V1). Raising awareness is targeted both on other companies in the supply chain in order switch to sustainable materials and ways of production (Interviews P1 and P2) and on customers especially via social media or blogs (Interviews V1 and V8), or other media like documentaries (Interview S4). Financial value comes right after in value creation, which was mentioned by five participants. Financial value undoubtedly is a primary value and goes beyond circularity and sustainability. However, even though most companies claimed that they raise awareness as a value to their customers, when asked about their supply chain, they referred almost exclusively to financial value. This motif indicates that companies think that the only way of creating value for other companies in their supply chain is through monetary value.

Furthermore, the support of the local community and various social and environmental projects were found next. In the case of the Italian brand reviving and enhancing the old recycling tradition of Prado in Italy this argument is very strong. The local community is benefited widely and many jobs are provided according to the CEO of the company (Interview V8). This serves the purpose of staying locally and strengthening the community of Prado while at the same time it keeps alive an old tradition. Ethical Nomads' founders mentioned their goal to support India's little communities as much as possible with empowerment projects even if that goes against proximity. They prefer to enhance suppliers and their regions with which they have an old stable relationship than change suppliers just in favour of staying local (Interview P1 and P2). Sharing new technologies and training programmes was also mentioned once. Meanwhile, one company stated that value creation is to be responsible for what you produce and the end of life of your products with for instance a take-back system (Interview V5).

An expert with experience of working with companies building circularity commented that *“in many cases partners are not even there for the monetary value, they are there for the circularity. The whole circularity journey is not necessarily there for the economic value only but to work together, to co-create, to learn, to be ahead of their competitors, to spread knowledge”* (Interview E3). However, most brands do not focus on that as another added. *“What businesses do is to hold their supplier accountable”* (Interview E1).

At this point it is useful to present the opinion of companies regarding consumers. As discussed above, companies put first raising awareness. Therefore, with this measurement I wanted to understand to what extent the companies think that consumers have changed or not and to what degree they are aware. As a result, six companies replied that consumers have made an enormous change throughout the last decade and that this was the driving force for start-ups and SMEs to start experimenting more and more with sustainable solutions. As they say *“consumers already have an interest in being more eco-friendly and want to contribute to a better world”* (Interview S4). Also *“a few years ago nobody asked for it[...]It is a changing trend. It is a good thing to see”* (Interview P2). However, many of the participants agree on the fact that consumers still need to be educated and they have a lot to learn about sustainability in fashion. One said that *“there are different gradations in their interest and how educated they are”* (Interview S4) while another is more critical by saying *“in the past years a lot of companies in the whole supply chain are doing innovative things ...[but] the thing is that consumers do not have the education to actually buy them”* (Interview V4). One of the participants concluded that first of all *“there is a need of awareness for the value of the clothes we own”* (Interview V3).

### 4.2.3 Financial risk

In this section of results, it will be useful to also present a topic that I find very related to the multiple value creation especially considering the way in which these results have been formulated. This topic refers to the financial risk in terms of sharing risks and costs with their supply chain. According to the workbook of Jonker, Kothman, Faber & Navarro (2018) a question included was about who has the most risk and how companies evaluate that in terms of changing their revenue model. The great majority of the participants, as seen in figure 9, replied that the greatest financial risk belongs to the manufacturing companies as they are presented in figure 4 by Kazancoglu, Kazancoglu, Yarimoglu and Kahraman (2020). Far from that and in the second place come the farmers, mentioned by three people. Two interviewees responded that brands have the most risk but it is important to clarify that they were both representing brands. Equally, two people said that it depends on the business model of the company and the way they cooperate with their supply chain in order to distribute the risk evenly (Interview V8). One company replied that businesses, especially start-ups and SMEs that are operating at the niche level have the most risk as they struggle with funding and in advance investments (Interview V1). Similarly, one manufacturing company recognised that everybody in the supply chain has the same financial risk (Interview V6).

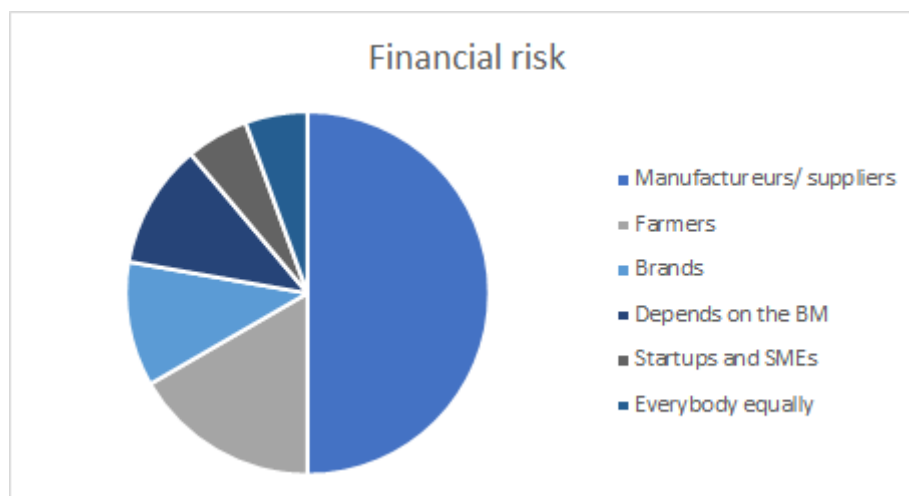


Figure 9: Opinion on who has the most financial risk

Experts pointed out when commenting on this topic that most of the time in the discourse of financial risk, the ones that are the most underestimated are the farmers. Often companies do not include farmers in their open dialogue and exclude them from decision making even if they strive for sustainable solutions. One of them said that *“the back of the production you go, you become more replaceable. If not this farmer, then the other and so on. Very replaceable and very fragile”* (Interview E3). Another added *“[farmers] accept contracts way below their operational costs and get extra loans to get their business running. So, it is a very insane model...So they bear huge financial risk”* (Interview E1).

On the contrary when companies asked about their revenue model and if they have considered changing it in any way in order to share risks, costs but also benefits with their supply chain, half of them replied that they have not considered it. It is remarkable that although they recognise that the financial risk burdens specific actors in the supply chain and mainly manufacturers and farmers, they do not take it into account when operating financially. Four companies said that they try to be flexible and consider their supply chain in financial terms.

### 4.3 Barriers for transitioning to a circular model

At this point, the barriers as they have been identified through the interviews are discussed. As mentioned in the framework, barriers are important in the process of transition to a circular economy. My hypothesis takes into account that even if we achieve a successful supply chain collaboration there are multiple obstacles that hold this transition back. Therefore, it is essential to dive into what difficulties companies face and find complicated to overcome.

As it can be seen in figure 10, the results are generally in accordance with the framework by Kirchherr et al. (2018) where the cultural barriers outweigh the other three categories by far. The various market barriers that were mentioned are in second place. Without great difference some technological obstacles are in third place. The least mentioned were regulatory barriers.

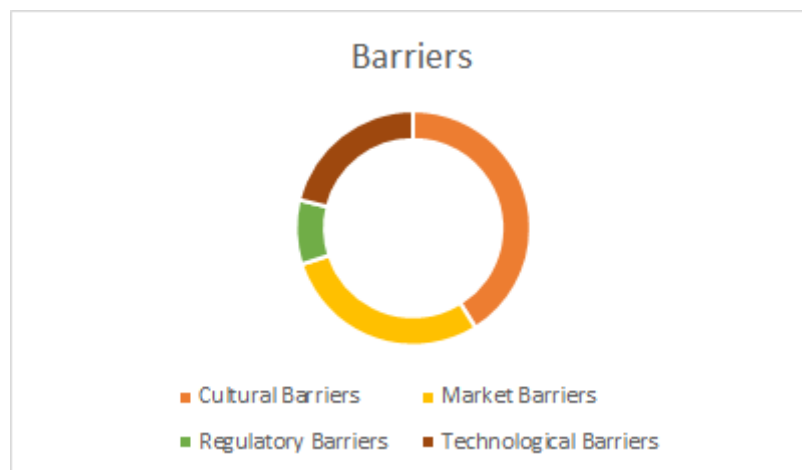


Figure 10: Barriers on circularity mentioned by participants

However, it is useful to underline the order of the barriers and how the specific topics score in general. Although cultural barriers scored higher as a group, the topic most mentioned by the participants is in fact a market barrier and refers to high upfront investment costs. Multiple participants replied that their main difficulty is the costs resulting from their high expenditure when launching their business whether they are new or well established, brands or manufacturers. There are three companies which stated that the high costs of the company force them to maintain a second job in order to sustain themselves and the company fully (Interviews V1, V4 and S4). They reported that to overcome this and make profit they need to push the production in a way that is not sustainable anymore. However, even more established company confirmed the financial matter remains the biggest obstacle as it is challenging to fund a business in the beginning and find investors to believe in something entirely new (Interview V2).

Second barrier according to the answers given is the limited willingness to collaborate in the value chain. One of participants identifies the problem in retailers because of their profit-oriented and traditional attitude and their lack of flexibility (Interview V4). Another agreed but also mentioned that manufacturing companies, especially when they are based in eastern countries, have different perspectives on circularity in terms of cooperation (Interview P2). One of the experts emphasises that *“this system is based on mistrust, on the fact that we are not transparent, that we hide things from each other”* (interview E2). Another confirms that *“willingness to work together is what I find also a bit of a challenge. We have the mindset of competition rather than working in cooperation and co-creation”* (Interview E3).

In the third place a cultural barrier is again found and more specifically the hesitance of companies. One of the interviewees describes that “[start-ups and SMEs] they are still very careful and [it is] very challenging for them to do the step” (Interview P1). As for bigger companies, they are “purely individual companies, money driven” (Interview V4). An expert comment on the issue “Unfortunately CEOs still only look at the profit and margins”, so even if they want to go circular, they hesitate to change their initial mindset (Interview E2).

Furthermore, a technological barrier scores fourth and specifically the lacking ability to deliver high quality remanufactured products. That was naturally a great concern for more companies as they are directing their activities mainly towards recycling as identified before. Therefore, multiple people gave an indication that either it is difficult to recycle all the available materials properly (Interviews V6 and V7) or that the ending product, the recycled yarns, are of poorer quality than the virgin materials (Interviews V8, V7 and P2). Elastane (or spandex) is also a very useful material because of its elasticity and flexibility that cannot be recycled or reused as it breaks easily and loses its features (Interviews V4 and V5).

Lacking consumer awareness comes next. This topic was also discussed in the previous paragraph as consumers in this study are taken into account as stakeholders. Several companies were specifically asked about the difficulties they face, mentioning that the majority of consumers are not ready yet to buy or engage in sustainability mostly because of lacking awareness for the real price of garments (Interview V3) and because it is still way cheaper to buy fast fashion (Interview V4).

Scoring barriers	
High upfront investment costs	16
Limited willingness to collaborate in the value chain	13
Hesitant company	12
Lacking ability to deliver high quality remanufactured products	10
Lacking consumer awareness	9
Limited circular designs	5
Limited funding for circular business models	5
Lacking standardization	4
Obstructing laws and regulations	3
Lacking global consensus	3
Operating in a linear system	3
Lack of data, e.g. on impacts	3
Limited circular procurement	2
Too few large-scale demonstration projects	1
Low virgin material prices	1

Table 4: Barriers as scored based on the interviews

The limited circular designs and limited funding for circular business models followed. One of the participants mentioned that the biggest problem “is finding the resources, the funding” (Interview V1) and two others agree that funding is a struggle (Interview S4 and V3). However, one interviewee suggested a different opinion by saying that “there is [funding] in the Netherlands and the EU especially for circularity. [...] Funding is available if you want it” (Interview V4).



Lack of standardization scored next. When experimenting with new business models such as producing from leftovers, there is not *“a solid distributor, or manufacturer”* hence it becomes difficult to plan ahead (Interview V4). On this note, one of the experts commented that the setup of the market is not built in a way that facilitates this experimentation. For now, the old system of production, demand and supply prevails raising obstacles for the companies (Interview E1).

Three different categories of barriers equally mentioned followed. Regarding operating in a linear system, the textile supply is a complex field with many actors (Interview S2) and the way the system works at the moment, quality cannot be ensured especially when working in a long supply chain (Interview V1). Nevertheless, for the first time some regulatory challenges are found, namely lacking a global consensus and obstructing laws and regulations. Ethical Nomads' founder commented that although the Netherlands is ahead in the transition towards circularity, in many countries such as India or the USA (where they maintain suppliers and clients accordingly) the idea or the level of circularity is completely different (Interview P2). It is important to underline here that there is not a global regulation on circularity or the fashion industry in general. The EU that has previously established regulations concerning the use of chemicals (Kudel, 2019), now aims at the 2050 climate neutrality goal under the Green Deal while last year proposed a new Circular Economy plan which puts waste management in the centre. Specifically, on textiles the focus is on microfiber loss and the management of water use (European Parliament News, 2021). However, the problem remains that most garments are not produced in Europe. The Netherlands accordingly promotes a very ambitious plan on enhancing circularity with a goal to fully integrate it by 2050. Regarding textiles, the roadmap focuses mainly on closing the textile value chain in terms of materials and funding by 2025. On the other side, it mentions that it is up to companies to incorporate sustainability and circular strategies and initiatives (Rijksoverheid, 2016). Nevertheless, as professor Niinimäki (Kudel, 2019) states, *“even the best legislation is useless if it's not applied or monitored in the countries where textiles are actually produced”*. Concerning obstructing laws and regulations, bureaucracy was mentioned as a challenge (Interview S1). One of the experts also added that Dutch government is not very involved and *“the word ‘circularity’ is really a step too far”* in the textile industry (Expert E2). The last barrier is a technological one and more specifically the lack of sufficient data. Knowledge is not enough (Interview S4) and recycled fabrics is still a new concept on which more research is still necessary (Interview S5). Expert confirmed that *“in terms of infrastructure we don't have the knowledge at the moment”* (Interview E2).

Lastly, in the final positions they are found the limited procurement, low virgin materials and two few large demonstration projects. Regarding procurement the way it is managed, procurement steps on old linear system's mistrust for other partners. Companies said that buyers are still operating in a way they are *“money driven”* (Interview V4) and with a focus only to create a beneficial contract in terms of price (Interview E1).

In comparison to the study by Kirchherr et al. (2018), the results of the current research are slightly divergent. Scoring in the first two positions are cultural barriers while in this case high investment costs come first. Another finding is that low virgin materials scored high (third) in their survey although in mine were mentioned last. On the other hand, in Kirchherr et al. (2018) survey the lacking ability to deliver high quality remanufactured products comes last whereas in ours is found fourth. Moreover, regulatory barriers overall score higher in their case compared to this. These differences can be explained by the fact that they also interviewed policy makers apart from companies. In a general conclusion, both studies agree on the order of categories but not entirely on individual barriers.

### 4.3.1 Additional barriers

Challenges have been categorized so far based on the answers of the interviews and compared to the study by Kirchherr et al. (2018). However, this study has identified some additional barriers that could not be categorized depending on the framework proposed by Kirchherr et al. (2018). Many participants referred to other difficulties they face on their transition to a circular model, which are distinguished in two groups of barriers: barriers related to the company size and logistics barriers. An overview of the main responses is seen in table 5.

<b>Additional Barriers</b>	
Company size barriers	Difficulties to implement a take back system Scaling up Limitations in volumes Competition Costs higher for SMEs
Logistical barriers	Lack of space Fabric into waste Availability of leftovers Limited volumes
Other barriers	Time to invest

Table 5: Additional barriers classified based on interviews

More specifically, the first group is related mainly to challenges that participants identified that they face due to the fact they are start-ups or SMEs, or that they operate at the niche experimenting with a new type of management. Eight answers were classified in this group. The answers referred to the difficulty to implement a take back system as a small company, competition with high-end brands, difficulty of scaling up, limitations in volumes when producing and the higher financial burden due to limited capability but also general notes that change have to come from big companies. In addition, the second group of supplementary challenges identified is related to logistics and includes in total six answers. The answers referred to lack of space, sometimes derived from the difficulty in financial flow, meeting the volume ceiling production companies set, the extensive use of samples in the whole textile industry where fabric goes to waste and also the limited supply of leftovers. Finally, it is worth saying at this point that among other participants, two participants openly discussed the lack of time as a barrier for the development of their company and the difficulty to gain enough profit in order to maintain a stable salary for themselves (Interviews S4 and V1).

## 4.4 Strategies leading to circular economy

So far, what participants believe about the circular economy, how they manage their supply chain and how they cooperate with other partners have been presented. Furthermore, it is shown which form of value creation they try to achieve and for whom. Moreover, the barriers they face have been identified and some new obstacles have been found. At this point, a classification strategies and solutions that will help them overcome the challenges will be attempted, as they have been mentioned by interviewees.

To start with, I have sorted the answers in groups accordingly and I have distinguished eight categories that can be seen in table 6 below. First of all, the group of strategies that scored higher is the changes in terms of supply chain management, in which the answers of the interviewees were grouped in five sub-categories: building communication and trust, proximity of partners, number of partners, sharing costs and co-ownership. More than half of the opinions listed belong to building communication and trust between partners in the supply chain. Ethical Nomads founders said that it is time to “invest in more sustainable collaborations” where the companies have an open dialogue with their partners instead of demands (Interview P1). It is important to build a network of people and companies but also “build long lasting relationships with your partners...and trust them completely” (Interview P2). In addition, all three experts agree that enhancing the relationship and the communication within the supply chain is the key to achieve a circular textile industry. “A different more holistic approach is needed which makes it more complex but also more interesting where all the partners are interconnected with each other but also need to understand the bigger picture... The whole community needs to be in line. They have to understand the vision and what they are part of” (Interview E3). Another mentioned “the collaboration is very important. Collaborations with your partners in your supply chain, within your company, with other companies, even your competitors” (Interview E2). And also “what you need is to have long term relationships with your suppliers, discuss with them openly” (Interview E1).

<b>Strategies proposed</b>	
Changes in the supply chain management	36
Internal change (within the company)	14
Raise awareness	12
Changes in production	10
Contribute to knowledge	6
Regulatory changes	4
Digitalisation	3

Table 6: Strategies in order as proposed by interviewees.

The next two subgroups of answers negotiate the same issue, the one of choosing your supply chain partners, from two different points of view. The first in order deals with the proximity of partners and the next delves into the number of partners a company chooses. Regarding the proximity of partners five of the participants suggested that a solution to a circular economy is to produce locally (Interview V1, V3, V4, V8 and E2) which is more effective and less expensive (Interview V1) but also supports the local communities and the local materials (Interviews E2 and V8). In the same context, the two founders of Ethical Nomads pointed out that it is more important to have stable long-term partnerships than invest and turn only to local production (Interviews P1 and P2), which contradicts the rest of opinions and the theory about taking distance into account when choosing partners in order to minimise the environmental impact of transport (González-Sánchez, Settembre-Blundo, Ferrari & García-Muiña, 2020). They also stated, along with another participant (Interview V8), the value of working with traditional processes that the country or the community offers (Interviews P1, P2 and V8). Additionally, concerning the number of partners involved in a supply chain, opinions were more divided. To be more specific, only one of the participants working with leftovers claimed that having one stable supplier of leftovers that is trusted can be the solution for reassuring the quality and the constant flow of materials (Interview V4). On the other hand, a supplier company, as expected, suggested creating multiple collaboration projects (Interview S2) and one of the Ethical Nomads’ founders pointed out that having multiple partners could give the company some flexibility especially in times of pandemic (Interview

P2). She also mentioned that it is very important to work with the same partners constantly and improve the collaboration and the skills of the supplier (Interview P2), with which one of the experts agreed by saying that companies turning circular *“have to take their supply chain along with this journey...[because] in the end of the day you want to have long-lasting relationships built in trust and especially when you work with you work with your supply chain for longer time you want this foundation of trust”* (Interview E3). And she continues *“if you are, as a brand, able to take this across in an inspiring way, then the suppliers are very willing to be part of it. ... My experience is positive and many partners love to share and learn from others, visit each other’s factories* (Interview E3). Lastly, one of the participants mentioned that owning your own entire supply chain can be the solution to transparency because then you always know the standards used (Interview S4).

The subcategory of sharing costs, which scored evenly with the one previous mentioned, follows. In terms of sharing costs, one supplier company mentioned as a solution the importance of sharing the risk of new green-tech investments (Interview S2) between supply chain partners. Ethical Nomads founders mentioned that companies should not push their suppliers in terms of delivery time and budget issues (Interviews P1 and P2). As one of them notes, bargaining the prices could compromise the minimum wage of employees so there is a need to fully trust your partners (Interview P2). She also added that according to her experience the way sharing the costs is built benefits only the brands and leaves suppliers exposed to financial risk. So, in order to prevent that companies and especially brands need to rebuild their payment system in a more equal way for all the partners (Interview P2). Similarly, a designer agrees and states in a more general note that *“we should work and benefit everybody, that goes for the farmers too, the weaving, the knitting”* (Interview V4).

The final subgroup of the ‘changes in the supply chain management’ bigger category is co-ownership which was mentioned by two participants. One interviewee referred to a business model *“where people are part of the company... have ownership of the company”* (Interview V4). Additionally, one of the experts also mentioned that co-ownership or shared stewardship could be a solution and that would be a very interesting mindset where different business models are considered (Interview E2).

The next category identified by the answers is internal change within the business. This is a broad title because the solutions that it includes are very diverse but at the same time, all refer to decision making in the business itself. It considers changing the business model or the mindset of the company, the way it operates but also less significant decisions such as gaining publicity. An expert said that the major target should be to *“reinvent yourself, your business”* and rethink the essence of the value creation of your company (Interview E2). And in this sense of changing your business model, SMEs have the advantage of switching due to smaller volumes, another participant mentioned (Interview P1). And she added that companies *“have to change mentality and be flexible”* (Interview P1). However, it remains important to design a roadmap of changes towards circularity not only for your company but also for your supply chain, one of the experts suggested (Interview E3). Another interviewee mentioned that it is crucial for a start-up company to find its place in the market, meaning to identify and cover the need of your local market (Interview V3) and another confirms that in order to succeed the company needs to specialise, also find its place within the supply chain and target as bigger part of the market as possible (Interview P2). To accomplish that one of the participants advised to base the value creation of the company on creating easily marketed products that consumers would easily buy (Interview V1). On good marketing techniques are also important as it is believed that publicity will draw investors (Interview V2) or customers (Interviews V1 and V4).

Raising awareness is next category of solutions. This aspect was previously discussed as well along with value creation for the stakeholders where it was found that the majority of companies already aim

at educating their customers. So, it is natural that it will also score high as a proposed strategy by interviewees. Many participants think that companies should target educating their consumers as it will lead to overcoming the barrier of prices. People will learn the real price of their garments and accept the fact that they are more expensive than fast fashion (Interviews S4, V4, S5 and P2). However, there are a few participants that recognise the importance of educating other companies that are either clients that do not realise the price and the environmental impact of being circular (Interview V6) or the broader network of every company (Interview P1). Another idea is the awareness and the engagement of the communities that two interviewees suggested (Interviews S4 and V1).

In addition, there are participants that proposed ideas in terms of changes in the production process that will help them transition to a circular model. The founder of Ethical Nomads underlines the importance of creating circular products by design (Interview P1), and she continues that companies need to also take into account the materials they choose to use and the water usage (Interview P1). Similarly, to work only with specific materials can also ensure the quality of the final products (Interview V1). Another very important suggestion in terms of circularity concerns producing only on demand and not in advance (Interview E2). Consequently, there is a need for producing in smaller volumes (Interview S1) or even more effectively, for production companies to offer combined orders (Interview P2). That involves the fact mentioned previously in barriers, that the current infrastructure cannot yet fully support smaller volumes of production. One of the participants also points out that if you are a small start-up company a solution to many problems could be to undertake the whole or part of the production process to ensure quality and lower prices of the end product and focus on aspects such as improving the packaging of products shifting to a biodegradable choice (Interview V1). One of the experts more generally highlights that in terms of producing companies again need to look beyond recycling and focus on all aspects of the process equally and individually in order to optimise them in a more circular way (Interview E3).

With regard to solutions on knowledge contribution, the answers lean to the direction of solving the lack of data mentioned before. There were three pillars of answers revolving around enhancing our knowledge, as companies and as people individually, on circular economy (Interviews S4 and E2), sharing this information with partners and network (Interview E2), but also investing in innovation and contributing to knowledge (Interviews S5, P2 and E2).

The next group of solutions is the regulatory ones that respond to the related barriers presented before. It is suggested that there is a need for more investments for circular supply chains (Interview S2). Accordingly, one of the experts, having experience with working with the Dutch government, mentioned that *“government needs to take some leadership. It must help companies that are circular and help them be more competitive”* (Interview E2). And another expert added that the government needs to *“redesign [the] economy, what we expect from and how we value businesses”* and continued that there is an urgency for *“political willingness and corporate willingness to change the whole dynamic”* (Interview E1).

Finally, there were three opinions referring to digitalisation that will benefit the standardization barrier. Two of the participants that mainly work with leftovers advised in favour of a platform that anyone can find leftovers in bigger volumes (Interview V4) or in general materials that are difficult to be found such as sustainably made buttons (Interview V4) or measuring tapes (Interview V3). The third idea is to generally become digital as much as possible as a business as it will improve processes such as ordering both for brands and manufacturers without using samples (Interview P2).

To sum up, strategies proposed by participants appear to respond to the barriers mentioned above at a greater extent. There are diverse groups covering a wide range of problems. However, the majority of people interviewed tend to suggest solutions concerning changes in the supply chain and how it is managed, having as a cornerstone the building of communication and trust between partners. It is implied that the conceptual framework proposed in chapter 2, where supply chain collaboration was considered to be the key in order to achieve the transition to circular economy, is also recognised as the main solution by interviewees.

#### 4.5 COVID-19 as a “window of opportunity”

So far, solutions and strategies have been proposed by participants as a response to the challenges they face on their way to circularity. However, according to the theory by Geels (2002) states, in order to achieve transition, the appropriate conditions need to occur in conjunction with a “*window of opportunity*” that will encourage this swift of regimes. In this case, it has been assumed that this opportunity may arise from the current situation of the pandemic which takes place globally for more than one year.

As one of Ethical Nomads’ founders mentioned in the fashion and textile industry, conventionally brands enter with suppliers into agreements in which they pay them weeks or months after the delivery of the products or even worse when they start selling them (Interview P2). This means practically that manufacturers purchase all the materials needed upfront, produce the garments and only then brands buy from them (Fashion Revolution, n.d.). However, due to COVID-19 pandemic the situation has rapidly changed for the industry. Retailers closed their stores and digitization became a necessity because of online shopping. Meanwhile, people were forced to work from home and to minimise their social life and as a result the clothing sales declined. Production has also stopped and supply chains have shut down (Magyar, 2021).

Consequently, major multinational brands cancelled orders and halted all payments towards suppliers, although orders have been placed many months before the outbreak. This had an enormous financial impact on suppliers as well as people working in the supply chains. So, manufacturers were forced to either keep or destroy a stock of unwanted garments and naturally dismiss their workers (Fashion Revolution, n.d.) Bloomberg reports that about 1,089 garment factories in Bangladesh have had orders cancelled worth almost \$1.5 billion due to the pandemic. This situation has affected all stages of the textiles supply chains, from farmers to factory workers and artisan groups and had a tremendous impact on global trade flows (Devnath, 2020). But even in the case of the people that continued working mainly to serve the orders placed from online shopping, things were difficult. According to the Guardian, warehouse workers in the UK asked people to stop buying garments during the crisis as they had to work very hard and social distancing becomes impossible (Pidd & Walker, 2020).

In March 2020, due to the pandemic the global economy was tremendously disrupted. For the textile and fashion industry the changes were rapid as it was mentioned before not only by closing physical stores and cancelling orders but also because of the restrictions in transportations. It became difficult to transport raw materials and finished products from one country to another (ILO, 2020). Recent reports and studies have shown that due to the pandemic there is an ongoing swift to the majority of companies that was caused by a large-scale shock in the fashion industry. According to Sustainable Apparel Coalition (2020) in the short term these disruptions need to be tackled by protecting human and financial capital and strengthening supply chain relationships by assisting their key suppliers. Ethical Nomads founders told us during their interview that they have started fundraising campaign during the first wave

of the pandemic in order to help them cope with the situation (Interview P1 and P2). The brand Patagonia claims that throughout the outbreak, they maintained constant communication with their suppliers ensuring their financial stability and worked slowly according to regulations for the new production (Byars, 2020). Another Australian company, Outland mentions in their Sustainability report that the senior management sacrificed their salary in order to minimise the economic impact on the company and their Cambodian workers to continue to be paid while on leave (Outland Denim Sustainability Report, 2020).

These difficulties and disruptions were also captured in the interviewees conducted for this study. For instance, two of the experts confirmed that there were multiple cases of unpaid suppliers (Interviews E1 and E3) and the other one highlighted that because of the COVID-19 crisis “*the discussion went back to survival. That was the one to deal with now*” (Interview E2). Regarding the businesses interviewed, although it was not an initial idea to bring into discussion the matter of the pandemic, it soon became an important aspect of the conversation. This came as a result of my own observation during the research. More specifically, as mentioned in methodology, many companies declined when asked to be interviewed because of the fact they were too preoccupied putting all the effort to minimise the impact of COVID-19 on their businesses. But as it is shown below, the people who participated also faced difficulties and insecurity due to the situation. To break it down, one of the interviewees said that they were forced to pause all the turn back activities due to pandemic which later on when for a short time retails opened, they faced a logistical problem because of the accumulated volume that they received (Interview V5). Another mentioned that various fairs and events where small companies present or promote themselves were shut down and that had a consequent impact on the already declining sales (Interview V4). As a result, suppliers had also to manage decreased orders from brands, as a participant mentioned (Interview S2). But even when the orders from brands continued, the lockdown imposed in several countries forced suppliers to accept smaller volumes due to limited capacity (Interview S5). Another interviewee said that the company typically launched in 2020 but in reality, it did not (until the moment of the interview) due to the negative impact of the crisis on the market (Interview V1). Lastly, one of the founders of Ethical Nomads acknowledged that not having local partners has made it more difficult to collaborate and help each other in the time of crisis (Interview P2). While at the same time, another participant mentioned that due to proximity of his suppliers the negative impact was minimised (Interview V4).

On the other side, recovery from the pandemic will also bring major changes in businesses in terms of remote work, the rise of e-commerce and delivery services. But also, consumers will seek for more products closely related with well-being and collective good such as nutrition, beauty and fashion as early signs show (Sustainable Apparel Coalition, 2020). A survey in 2020 from McKinsey for the shift in consumer behaviour indicates that the majority of consumers (especially the younger people) will purchase in the future keeping in mind the use of sustainable materials, but also, they will prefer companies that treated their employees and suppliers well during the pandemic. The majority also is in favour of delayed new collections and consider buying more durable garments. The survey concluded that the consumer mindset is not strongly tied to the fashion cycle, so now could be the moment to drive less seasonality in the fashion system (Granskog, Lee, Magnus & Sawers, 2020).

Moving away from multiple seasons of the past years as the survey showed can be a significant game changer for large companies. Having a new collection every week worked as a disadvantage during the crisis for bigger companies that faced, as a result, enormous amounts of unsold garments and excessive stocks. It makes it imperative for companies to change their mindset and organise stocking based on demand and rather invest in online customer experience (McMaster, Nettleton, Tom, Xu, Cao & Qiao,

2020). Gucci, for instance, has already announced that they are planning to reduce their collections from five to two per year, representing an emerging movement in favour of seasonless fashion among big brands (McKinsey Report, 2020). Meanwhile this change will be useful for companies in order to detach themselves from the dependence on discounting as the study by Brydges, Retamal & Harlon (2020) indicates. Another serious problem that arose as a side effect to the stocks is the end of life of the products. More clothes will end up in waste this year considering also that charities do not accept them due to hygienic reasons and people declutter their wardrobes while staying at home (Brydges, Retamal & Harlon, 2020). Circularity can serve as a solution to this massive problem by preventing garments from ending up in landfills or being incinerated (D'Adamo & Lupi, 2021).

The most important issue though remains the supply chain management. The Covid-19 crisis has exposed the vulnerability of supply chains. It is already discussed above that one of the solutions is to immediately support suppliers. In the long term though, according to the McKinsey Report (2020) on the state of fashion, there is a need to build resilience by leaving behind transactional connections and move towards building deep relationships that will bring agility and flexibility. To this end will contribute the fact that now the impact on suppliers became widely known and touched the consumers who now demand fairer treatment and a reasonable share of value (McKinsey Report, 2020). It is now the chance for stakeholders to be seen and recognised but also to invest in new technology in the garment manufacturing facilities (Brydges, Retamal & Harlon, 2020). The evidence shown illustrates that this is the momentum for large companies in the fashion industry to meet their sustainability obligations and establish structural changes in favour of the transition to a circular economic model.



# Chapter 5

This final chapter is divided into four subsections. Firstly, the conclusions of this study will be elaborated with the goal to answer the main research question. Secondly, the chapter continues with a reflection on the entire study. Right after, the limitations that occurred during the research will be presented. The chapter finishes with recommendations given to Ethical Nomads, where I did my internship along with their supply chain partners but also to all similar companies at the niche of the textile industry.

## 5.1 Discussion

Initially, when I was writing this thesis, I intended to identify the role of supply chain collaboration in the process of transitioning to a circular economy. Beforehand, I made the assumption that collaboration is the key to achieve the transition, and thus, I tried to find the ways that can occur, especially in the textile industry. At the same time, I assumed that circular economy can be the solution to the destructive existing linear system, although in reality this argument does not take into account many individual factors. However, for the purposes of this study it is assumed that circular economy is the most preferable and beneficial system for both society and the environment.

The findings suggest that in order to achieve a transition to a circular economy, companies need to focus on supply chain collaboration by rethinking their value creation both internally, within their own company and externally, as the value created for their stakeholders. It is important to reevaluate their understanding of circularity and also reflect internally and determine to what extent their practices are circular.

The circular economy is a complex concept that consists of multiple aspects. The main idea is that all materials produced return in endless loops in the biosphere or the technosphere respectively and subsequently, there is no waste produced (Braungart & McDonough, 2002). To achieve this goal, the careful management of resources such as water or the use of renewable energy is imperative. Moreover, the social factor should not be neglected, as social fairness is an integral feature of the circular economy. Although the majority of the companies understands some important factors of circularity, this study shows that they are not fully aware of what it entails and its characteristics, a fact that was underlined by the experts too. Circular economy is more of a system, a holistic approach where a business needs to apply this thinking from the design of a product to the end of its life. Notably, only few participants appreciate the importance of designing for a circular product that would not end up as waste but could be reintroduced in a loop. Concerning the practices, it is remarkable that no one considered renewable energy as a targeted decision for their processes but rather focused on recycling. Another important observation that can be drawn is on the social aspect of circularity. Although sustainability includes a social dimension, when asking the participants about their strategies, it is understood that the social aspect is not fully considered and sometimes neglected in favor of materials and processes. Circular economy though, it is about producing healthy products for healthy people and it is also about social fairness (Cradle to Cradle, n.d.). When analyzing the results this outcome was not expected as I thought that since all companies interviewed are sustainable and hence accustomed with this model, they would have a better understanding of all the aspects of circular economy and consequently have a better system of decision making.

Concerning supply chain collaboration which incorporates the external multiple value creation, participants highlighted sharing values as a major criterion to start a collaboration. However, second were trust and certifications which are contradictory as certifications are needed mainly due to lack of trust for your partners that they work following specific standards. Unexpectedly, price was fifth in the responses which contrasts with other studies (Ageron, Gunasekaran and Spalanzani, 2012; Kannan, Mina, Nosrati-Abarghoee & Khosrojerdi, 2020) who place it first and of course with the two experts who mentioned that according to their experience companies see it as a priority (Interviews E1 and E2). From this it can be assumed that companies either because they knew the topic of the research, they considered more relevant to mention other criteria, or because they are all sustainable, they understand to a great extent that sustainable products can be more expensive. When addressing value creation, it became obvious that financial value was put above every other value. Meanwhile, the environmental value was also mentioned but the responses were mainly generic without measurable environmental targeted goals. Social value is also underestimated by companies relying on the fact that their partners that hold specific certifications will follow some social standards. In general, it was understood that companies do not design thoroughly their value creation and how they will create value for their stakeholders, for instance in aspects such as training, sharing knowledge or mutual projects of research and development. We can see that building collaborations and networks on the basis of trust and communication seems to be a high priority for the participants as previously suggested by De Haan and Rotmans (2018) that transition needs to be built on creating networks. However, companies still operate to a great extent in a linear way. Again, in these results, I expected companies at the niche level to have viewed efficiently their multiple value creation and whom they consider their stakeholder and hence the recipient of this value.

At first glance, barriers do not seem to perfectly fit into the concept of transition but this aspect was necessary to be introduced in order to better understand the pathway to transition occurring in the niche. In comparison to the study by Kirchherr et al. (2018), the results of this research are slightly divergent. Kirchherr's et al. (2019) results bring cultural barriers above the rest of the categories and that was also the case in my study. However, when analysing the barriers individually different results have occurred. In scoring, the first two positions in Kirchherr et al. (2018) survey are some cultural barriers, while in this case high investment costs come first. Moreover, regulatory barriers overall score higher in their case compared to ours. These differences can be explained by the fact that they also interviewed policy makers apart from companies. Another dissimilarity is that this study was based mainly in the Netherlands and not the entire EU and has less participants, hence the results can be less heterogeneous.

The last of the findings concerns proposed solutions and strategies and it was very clear from the answers that there is an urgent need to change the supply chain management with the most significant change to the building of communication and trust with the supply chain partners. This reflects the theory and the conceptualisation where the balanced long-lasting collaboration, the shift of the regime and the consequent transition to circular economy can be reached. Meanwhile, the results interrelate with the barriers mentioned before where cultural barriers and challenges regarding cooperation were emphasized. As a result, companies underlined the meaning of ensuring collaboration between partners and second, by a wide margin, was the need to change internally within the company.

Although this study focuses on supply chain collaboration, it is important to point out that the internal change is equally fundamental when referring to transition. This is why this research starts its preliminary analysis with the value proposition and the value creation that niche companies create which is the core of their circular business model. Along with comprehension of the wide definition of circular economy, redesigning the value creation that each company's business model creates is the

basis to evolve and move towards the establishment of a network that is linked by common ideas and trust.

### *5.1.1 Reflections to the theory*

This study aimed to contribute to the literature in many ways. First, as discussed in the introduction, the concept of circular economy and circular business models is relatively new and there are still many aspects not well explored (Korhonen, Honkasalo and Seppälä, 2018). More specifically the social aspect of circularity is nearly absent in the literature (Lazell, Magrizos, Carrigan, 2018) although the concept itself takes into account the social dimension in terms of social fairness and healthy products. This is the reason why this research was viewed from the social perspective considering that supply chain collaboration and multiple value creation is the key to achieve a circular system. However, it should be clarified that supply chain collaboration is not identified only with the social aspect because it undeniably generates an economic and environmental impact. This study though focused on the collaboration by meaning building networks and open communication channels. This argument was supported by the transition theory by Geels (2002) in order to explain the dynamics of this transformation and place the actors and the processes in levels. The findings of this result show that the multi-level paradigm exists and that companies interviewed also perceive the difference between the levels. They understand the existence of a niche of companies that tries to change the incumbent regime dominated by multinational fashion brands. The results also confirm the presence of the links between the levels as demonstrated in the conceptual framework and that is captured mostly by referring to the barriers by Kirzherr et al. (2018).

Obstacles are placed between all three levels and the data shows that participants actually identify challenges of different significance and position in the system. The contribution of this study in this exact theory is not as much the divergence in the results but the classification of additional barriers that companies relate to the size of the company itself and logistical barriers that were posed again mainly due to the size of the company and its production. All in all, companies perceive their small size as an obstacle and as a restraint to many circular processes. This means that this is a dynamic process where the development of the economy and the market continuously leads to new barriers be formulated and some other to be overcome. Therefore, further research is needed to either identify if the new data are the outcome of new developments or if it is needed to deepen more into the existing empirical research.

Furthermore, the value creation in this study played a very critical role to explain and interconnect the concepts. The approach of value was very challenging to me through the whole process of this research, and that was because it is analysed by various academics in very different ways. Richardson (2008) places it in the core of business models and as a result that becomes accordingly relevant for circular business models too. On the other hand, stakeholder theory by Freeman (1984) takes a step forward and refers to multiple value creation that includes other forms of value and that targets not only customers by all the stakeholders. This research aimed to connect all the pieces and produce a third concept where companies reflect both on the value they create as a business model and as part of a supply chain too. However, the data showed that companies see the need for change in their supply chain but they do not exactly perceive the connection of this dual internal/ external reflection of their value creation as an element of the solution.

Finally, this study also put another parameter in the discussion which was imposed by the current situation of pandemic. This was not an initial idea to be included in this research but it became apparent that it is related to a great extent. Geels (2002) mentions in his theory that the change can often come

due to a ‘window of opportunity’ that might occur and cause enormous pressure to the landscape or the regime. This pandemic is definitely placed in the level of landscape as it had a global influence but the pressure was evident in the other two levels too, with slightly more in the level of regime. Big companies of the regime produce at such a pace that this crisis interrupted an enormous part of their production, while companies of the niche were less affected. My opinion is that this pandemic can actually play a role in the change of the regime as consumers’ behavior, as already seen from the past year, has shifted significantly.

### *5.1.2 Limitations*

The fact that this study constitutes of a single case study is already a limitation in terms of validity and reliability. That means that the results can be limited or valid only on this specific example (Van Thiel, 2014). Thus, it becomes difficult to apply in other companies and most importantly in other sectors. Additionally, the total number of participants was generally low, which can be attributed to the fact that Ethical Nomads is a small company with only few partners in their supply chain. To overcome this other companies were included which were selected as carefully as possible in order to be either good examples of circular business models or representative to the niche. Still, the majority is placed in the Netherlands, which means there were limited data from the international situation. Although interviewing three experts within three different areas of expertise (namely supply chains, fashion industry, circular economy) increased the credibility of the data and gave me a good insight from different angles of the topic.

On a more general note, the restricted amount of empirical data from suppliers in India, Turkey and Portugal definitely limited the availability of data but also simplified the process of data analysis and narrowed the scope of this study. Similarly, the incorporation of farmers from one side and consumers from the other was also out of the scope. This would be impossible in terms of data and of the predetermined size of this thesis. Besides that, this choice was made in order to only focus on the managerial aspect and businesses.

It is imperative to mention the huge limitation this pandemic caused to this research. As discussed in methods, many companies were reached in order to participate but the situation changed completely the priorities of companies that were battling financial and logistical issues at the moment. For the same reason, some of the companies, due to lack of time, agreed only to structured interviews instead of semi structured interviews that were planned. This was a choice very consciously made because I strived for more participants and a bigger sample even if partly reduced the reliability of this research.

## **5.2 Conclusions**

This study focused on companies transitioning to a circular model with the aspiration to change the existing regime of the textile industry and most importantly the key role of supply chain collaboration in this process. It consists of a case study based on Ethical Nomads, a Dutch manufacturing studio, categorized as a small company with the aspiration to launch their recycled cotton programme and turn their business into circular. Already from the introduction the main research question was formulated. This has been studied first by the help of academic literature. Additionally, fifteen interviews both structured and semi-structured took place with already sustainable companies experimenting with circular models and products. All companies were either partners of Ethical Nomads or SMEs mainly in the Netherlands placed in the niche of the textile industry.

The main research question, which will be answered below was divided into four sub-questions. The first sub-question is the following: *What are the current understanding and practices in terms of circularity?*

For the definition of circular economy, I chose a definition that will examine circularity as part of sustainability, including the impact on society apart from the environment. With this as a guide I analysed participants' answers and I concluded that companies do not see circularity holistically but they focus mainly on the aspect of recycling. Recycling, of course, is one of the strategies of circular economy but rather the concept describes a whole system. This notion was also reflected in the answers concerning their current practices of circularity. The majority of interviewees promote practices related again to recycling and very few have incorporated the practices of reusing and reducing (from the 3Rs). At the same time, very few have also incorporated in their decision-making water and energy management.

The second sub-question was: *What does it take for companies to engage in supply chain collaboration?*

This was the aspect where the most data referred to as it was the main focus of the study. First, companies were asked about the criteria with which they choose their partners and that was an essential question to begin with in order to better understand their motives of collaboration that subsequently lead to multiple value creation. There we saw that sharing values, trust, communication and good relationship scored very high but surprisingly certifications did as well. The participants were also asked separately about certifications as an effort to understand why certifications are needed more than developing a relationship of trust. The majority of participants were in favor of certifications as it provides a common language and standards that are not easily managed otherwise. The most crucial question was asked in relation to value creation. Companies showed that they design their value either to raise awareness mainly to customers and or to provide financial value to the rest of their supply chain. This means that the multiple value creation is still not widely considered and thoroughly designed by companies. Similarly, when asked about their stakeholders, they presented a very narrow range of them to their answers leaving out many actors that contribute to their business.

The third sub-question was: *What are the barriers companies face when experimenting with circularity?*

For this purpose, the theory of Kirchherr et al. (2019) was used as a foundation for the analysis. All participants were asked about their challenges on their way to circularity and the results were partially identified in the theory. The study confirmed that above all barriers the cultural barriers are the most challenging. That comes in accordance to the previous mentioned lack of value creation design for all the stakeholders. Interviewees evaluated that companies are still hesitant of a circular system and are highly unwilling to cooperate. However, the most important challenge remains the high upfront investment costs. Additionally, a few more obstacles were identified regarding the overall small size of the companies but also some logistical challenges.

The final sub-question was: *What are the strategies to overcome them and transition to a circular model?*

For the final sub-question, companies were asked about strategies that will help them achieve a transition to a circular system. Here, the data showed clearly that companies believe that supply chain collaboration and building trust and communication is the key. Having partners that they develop personal relationships, sharing values but also costs and even co-create together is what they put highest

in the list. Then internal changes in terms of changing the business model and the decision-making were listed afterwards followed by raising awareness for customers.

All in all, this study aimed to provide an answer to the following research question: *What is the role of supply chain collaboration in the transition towards circular economy?*

The study concludes that the supply chain collaboration is the key to achieve the shift of the current regime of the textile sector which will lead to an eventual change of the linear system. For this to happen companies need to consider changes both internally and externally. They need to reevaluate their business model but also what is their added value for all their stakeholders. Although the COVID-19 crisis is estimated to be the biggest challenge of this research, I believe that the current situation of the pandemic can be proven a good window of opportunity for companies to rethink, redesign and reinvent themselves and their relationship with their stakeholders.

### *5.2.1 Recommendations*

In this final section, I will provide some useful recommendations for both further research and some practical advice for businesses.

Several recommendations can be made for future research. As discussed, the limitations of this research leave plenty of space for improvement. Firstly, future research can aim at including more data obtained from a bigger sample of companies. In addition to that, including companies from other European countries or, even better from all over the world will make a huge difference in order to draw more holistic conclusions for the entire textile sector. Both these decisions will also significantly improve the reliability and validity of the argument. Another suggestion is to use the conceptual framework and methodology of this study in order to apply it to different economic sectors, other than the textile which will fully map out the transition to a circular system. As a result, theories and arguments of the current study could be either validated or rejected. Moreover, further studies can focus on other parts of the supply chains, by taking a consumer approach in relation with businesses or include the first levels of the chain (farmers, weavers, ginners etc.) where some more empirical experience might be proven very insightful.

Concerning businesses there are many recommendations to be drawn as a result not only of my long and in-depth research of the topic but also from the experience as an intern for the Ethical Nomads company and the personal contact with many different companies. To be in line with the way the research question was answered, I would like to make suggestions for both the internal and external side of the companies. Regarding the business model of these companies, significant improvement can be made. Companies should first of all rethink the idea of their value proposition. I believe it is important to reevaluate their products and services and make an effort to improve them one step at a time. I have clearly understood so far that a well-established company cannot be completely transform very quickly as it needs to remain profitable and this is why the design of a roadmap that suits each company by putting measurable and feasible targets can be proved very useful. This will help approach circularity more holistically. At the same time, there is a need to comprehend that this process is slow and as a result companies should not reject the circular model because the initial step was not primarily as profitable as it was expected. To the same note, companies when reconsidering their business model and their decision making, it is important to take into account all the proposed strategies that lead to a circular result and not only focusing on recycling or recycled materials. Having an open mind and a will

to innovate can help in identifying the right circular business model for each company. A good example applicable to brands is the decision to de-materialize by not having a physical store.

On the other hand, advice can be given for the external side too. It is essential for companies to apprehend that circularity cannot be achieved by one company individually, so they should strive to involve their whole supply chain especially by investing in research and innovation. The circular system does not promote competition but collaboration, so it is crucial to create a network of companies to help each other close the loop. A fruitful first step towards this direction would be for companies to restart an honest dialogue with their supply chain, at least the part they can influence and share their vision or their new roadmap. In this way they can initiate a collective brainstorming of new ideas that will benefit everyone to understand their limits and overcome their difficulties, but also it will enhance the feeling of trust, continuous communication and equality within the supply chain.

In a secondary phase, companies should also try to expose themselves by participating in initiatives of other companies, NGOs, communities or the government in order to grow the network but also exchange valuable ideas and know-how. Lastly, companies should not forget to always try to educate their customers where the change of consumption behavior can prove to be a key aspect to the transition to a circular economy.

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## Appendix I: Overview of the questions used for interviews

Question 1: Could you please give a short introduction of your company's main activities and if possible, your role in the company?

Question 2: Could you please describe briefly the business model of your company? (A Business model is the way in which the creation of value is organized by companies. This includes what the company offers, the basic strategy to attract customers, as well as the organization of the value chain and the position of the company in it. (Richardson, 2008).

Question 3: What kind of impact, economic, social, environmental or else does your company aim at?

Question 4: The theme of the current research is the circular economy. Could you please explain what your current understanding of the circular economy is in the form of a definition?

Question 5: Taking the definition of Circular Economy into consideration, can you please explain what your company has already done on the implementation of circularity?

Question 6: What are the most challenging barriers your firm has faced, or is facing in trying to implement a circularity? Can you try to give 5 barriers and order them from the most to the least challenging?

Question 7: If any, what solutions or strategies is your company currently implementing to overcome these barriers? Please be as specific as possible about these solutions or strategies.

Question 8: What challenges does your company face in trying to implement these solutions?

Question 9: In terms of choosing your value chain (meaning partners/ suppliers/ clients) what are the most important criteria for you? Please order them from the most to the least important.

Question 10: How important are for your company the certifications as a measurement of reliability? (GOTS, Fairtrade, Cradle to Cradle etc.)

Question 11: Who do you identify as your stakeholders in your value chain? (A stakeholder is a party that has an interest in a company and can either affect or be affected by the business.)

Question 12: In which ways does your company ensure that there is value (economic, social or else) created for all the involved stakeholders?

Question 13: Finally, taking your revenue model into account, do you share costs, risks and revenues to some extent with all the parties involved?

Question 14: Who do you think carries the majority of the financial risk in your value chain?

## Appendix II: Coding

### Coding Families and subcategories:

- 1) Understanding Circular economy
  - CE definition
  - Current CE practices
- 2) Supply chain collaboration
  - Criteria
  - Certifications
  - Value Creation
  - Stakeholders
  - Opinion on consumers
  - Financial Risk
- 3) Barriers for CE
  - Cultural barriers
  - Market barriers
  - Regulatory barriers
  - Technological barriers
  - Additional barriers
- 4) Solutions
  - Changes in Supply chain management
  - Raising awareness
  - Contribute to knowledge
  - Digitalisation
  - Internal change
  - Government
  - Production
- 5) COVID impact

### Coding Examples:

1) You need to be friends with them and then you can give some of your ideas and points of view. But first you need to listen to what they need there. And then we can improve the supply chain.

Code: Good relationship with suppliers

Code family: Building communication → Solutions

2) We came with the idea to create the product circular at first and also all everything that goes in the production to be recycled and the difference is that we are working with far east and they are not so far in circularity as we are here in the west. This is the complexity I am facing now. We are more upfront in the west.

Code: Different perspectives of circularity making collaboration difficult

Code family: limited willingness to collaborate in the value chain → Cultural Barriers → Barriers

3) We think the solution is to make people aware that these low prices are not sustainable for people and planet.

Code: Building awareness

Code family: Raising awareness → Solutions



4)Willingness to work together is what I find also a bit of a challenge. We have the mindset of competition rather than working in cooperation and co-creation.

Code: companies not willing to work due to competition

Code family: limited willingness to collaborate in the value chain→ Cultural Barriers → Barriers

5)That you don't create waste with making your product, because 'the waste' of it can also be used to make something.

Code: no waste

Code family: Circular economy definition → understanding CE

6)At the moment, the fabric partly made of recycled cotton is still a new concept. So, we have questions where research is still necessary. The answer isn't always there already. That's a challenge.

Code: not enough knowledge

Code family: Lack of data→ Technological barriers→ Barriers

7)Before investing in our products we have elaborately researched these certifications and which companies have these certificates, from the packaging to the actual t-shirts and sweaters. The certificates are important to us, since they give us and our customers a quality mark on their sustainability.

Code: In favor of certifications

Code family: Certifications→ Supply chain collaboration