Master's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Economics and Management
Dept. of Industrial Economics and Technology Management

Ragna Kristine Randeberg

Coopetition towards a circular fashion industry

A qualitative study of collaborative circular oriented innovation between companies in Norwegian fashion and textile networks.

Master's thesis in Industrial Economics and Technology Management
Supervisor: Arild Aspelund
Co-supervisor: Fanny Hermundsdottir
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Kunnskap for en bedre verden

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Abstract

The overconsumption of fashion clothes and textiles is a dramatic reality in the last decades, linked with world economic growth. To deal with these issues, fashion companies are now trying to innovate towards circularity, but are facing several barriers. Thus, collaboration between companies and network innovation is pointed out as both an enabler and a prerequisite for circular oriented innovation. However, there is little evidence on how this is performed in practice, and fashion companies face tension when entering collaborative setups as they also compete for market share and profits. The aim of this study is therefore to enlighten how the balance between cooperation and competition plays out in circular oriented innovation networks, drawing on coopetition and industrial network theory from strategic management literature. Empirical evidence is based on qualitatively analyzed interview data from five Norwegian fashion or textile companies with circular ambitions, along with five resource persons facilitating the networks. The main contribution of this thesis is a theoretically constructed and empirically developed framework, which suggests why competing companies seek collaboration, as well as how competitive mechanisms affect the collaboration in terms of resources shared, activity patterns, and the actors' perception of each other in the network. Another key finding is that the companies' current approach to innovation and competition will not lead to a circular transition without coordination in the form of regulatory change, demand, and control.

Sammendrag

Overforbruket av moteklær og tekstiler har vært en dramatisk realitet de siste tiårene, knyttet til økt velstand og økonomisk vekst i verden. Som en konsekvens av disse problemene prøver moteselskapene nå å finne en løsning gjennom sirkulær innovasjon, men har møtt mange barrierer. Samarbeid mellom bedrifter og innovasjonsnettverk har dermed blitt pekt ut som både en mulighet og en forutsetning for å lykkes med sirkulære innovasjoner. Likevel finnes det lite forskning på hvordan samarbeidene kan utføres i praksis, i tillegg til at samarbeid mellom motebedrifter er ekstra utfordrende da de samtidig konkurrerer om markedsandeler og fortjeneste. Målet med denne studien er derfor å belyse hvordan balansen mellom samarbeid og konkurranse utspiller seg i nettverk som samarbeider om sirkulære innovasjoner, i en kontekst av industriell nettverksteori av 'coopetition' fra strategisk ledelseslitteratur. Det empiriske grunnlaget består av kvalitativt analyserte intervjudata fra fem norske moteselskaper med sirkulære ambisjoner som samarbeider i nettverk, og fem ressurspersoner i bransjen som fasiliterer disse nettverkene. Hovedbidraget i denne oppgaven er et konstruert og empirisk utviklet teoretisk rammeverk, som antyder hvorfor konkurrerende selskaper søker samarbeid, samt hvordan konkurransemekanismer påvirker samarbeidet når det gjelder hvilke ressurser som deles, aktivitetsmønstre og aktørenes oppfatning av hverandre i nettverket. Et annet viktig funn er at selskapenes nåværende tilnærming til innovasjon og konkurranse ikke vil føre til en sirkulær overgang uten koordinering i form av regulatoriske endringer og økte krav.

Preface

This master thesis is the concluding work on my Master of Science degree at the Norwegian University of Science and Technology (NTNU). It has been written during the spring of 2021 for the Strategy, Innovation, and International Business Development section at the Department of Industrial Economics and Technology Management. The choice of writing about circular innovation stems from my passion for contributing to a sustainable future, along with the increased global focus on circular economy.

During the fall of 2020, a systematical state-of-the-art review on circular business model innovation was conducted as preparatory work for this thesis, which led to the direction and aim to investigate collaborative processes further. As this thesis is focusing specifically on the fashion and textile industry, its findings have implications for both practitioners and policymakers. Moreover, other circular economy scholars might find the application of strategic management literature in a circular context useful.

Finally, there are many people that I would like to thank for their involvement regarding the work with my master's thesis. With your help, contributions, and support this has become a very interesting and educational semester.

First of all, I would like to thank my supervisors, Arild Aspelund and Fanny Hermundsdottir for their advice, guidance, and feedback throughout the project. Your contributions are highly appreciated!

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Trondheim, 10. June 2021

Ragna Kristine Randeberg

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List of Abbreviations

ARA	Activity, resource, actor
CE	Circular Economy
CBM	Circular business model
CBMI	Circular business model innovation
COI	Circular oriented innovation
CFS	Circular Fashion Summit
EMF	Ellen MacArthur Foundation
EU	European Union
HQ	Headquarters
IN	Innovation Norway
NDA	Non-Disclosure Agreement
NF&TA	Norwegian Fashion and Textile Agenda
NTNU	The Norwegian University of Science and Technology
SDG	Sustainable development goal
UN	United Nations

1 Introduction

The negative effects from years of population and economic growth as well as "take, make and dispose" linear consumption patterns are threatening the stability of our environment and ecosystems (EMF, 2013; UN, 2015). The fashion and textile industry is the 4th largest value creator, but also one of the worst industries when it comes to consumption and among the most polluting industries in the world (CFS, 2020). According to the latest projections of population growth, the equivalent of almost three planets could be required by 2050 to provide the natural resources needed to sustain current lifestyles (UN, 2019). This calls for a fundamental change that addresses the entire life cycle of economic activities, "for a world beyond next season" (Lehman et al., 2019, p. 18).

The fashion industry is facing an environment where profit margins are increasingly pressured by rising costs and lower pricing power (Deloitte, 2017). To stay relevant in the competitive landscape, fashion companies have increased the number of collections offered per year, while the price it is offered at has gotten relatively lower (Swartz et al., 2016). The result is what we call 'fast fashion', and a system for producing, distributing, and using clothes that operates in an almost completely linear way (EMF, 2017). Large amounts of non-renewable resources are extracted to produce clothes that are often used for only a short period, and it is estimated that more than half of fast fashion produced is disposed of in under a year (Swartz et al., 2016). Therefore, fashion companies are found to play an important role both when searching for causes and solutions to environmental challenges.

The Circular Economy (CE) has received increased attention recently as a potential solution to overcome the current production and consumption patterns (Ghisellini et al., 2016; Merli et al., 2018). The CE has been defined in various ways in the literature but is most commonly defined in accordance to the Ellen MacArthur Foundation's (EMF) definition as: "an industrial economy that is restorative or regenerative by intention and design and aims to keep products, components, and materials at their highest utility and value at all times" (EMF, 2013, p. 23). Even though CE is placed high up on the agenda within both public and governmental institutions (European Commission, 2020; Zhu et al., 2019), the innovation and adoption of circular business models in the fashion industry seem to diffuse rather slowly (Lehman et al., 2019; Stål & Corvellec, 2018). An explanation for this slow uptake is that these issues are too complex and far-reaching to be solved solely by the individual companies in the industry (Lehman et al., 2019). Moreover, Cantele et al. (2020) argue that the effectiveness of circular implementations largely depends on the combined efforts of the other actors in the industry. Therefore, collaboration is agreed by scholars and practitioners as a critical success factor for circular oriented innovation (COI) (e.g. Brown et al., 2019; Gusmerotti et al., 2019; Lehman et al., 2019; Tura et al., 2019).

Even though fashion companies depend on collaboration to succeed in the circular transition, they also need to maintain their competitive interests such as market share and profits. Thus, the fashion companies that aspire to innovate their business models towards circularity faces tension. To break out from the profitable business model of fast fashion, and move towards an industry based on circular business models, the initial cost of change is too large to be paid by single actors. Moreover, there are indirect costs of change by foregoing the potential profits that may come from continuing with the fast fashion model.

To stay competitive, there is a need for competitors to take on the same changes at the same time. This interplay between cooperation and competitiveness has not yet been empirically investigated within the context of collaborative COI. Therefore, this thesis aims to fill current research gaps by assessing COI networks in the light of 'coopetition', which the management literature refers to as companies that cooperate and compete at the same time (Bengtsson & Kock, 2000).

1.1 Research question

Common for the networks on which the focus of this thesis is set, is that they consist of fashion or textile companies with a desire to become more sustainable. Therefore, many of the network participants compete in the same market, which leads to the following research question for this thesis:

RQ: *Why do competing companies seek collaborative COI, and how do competitive mechanisms affect the collaboration?*

The why part of the question is directed towards the strategic objectives the companies may have for seeking collaboration, while the how part looks for how the competitive mechanisms between the companies affect the activity patterns, resources shared, and the actors' view on each other within the network. Since the main focus in this thesis is fashion and textile companies, they will hereafter be referred to only as companies for simplicity reasons and better readability. The same goes for collaborative COI networks which hereafter are referred to as networks.

To clarify the direction of the research, the following sub-questions are constructed:

SQ1: *How does the companies' view on COI affect their view on collaboration?*

SQ2: *What are companies' motivations for joining networks?*

SQ3: *How do companies within networks decide which activities to collaborate on, and which resources to share?*

SQ4: *What view do companies have on competition in a COI setting?*

To enhance the understanding of these matters, there is a need to study the companies in transition, who has joined innovative networks. By qualitatively studying COI networks within the Norwegian fashion and textile industry in the light of coopetition, this thesis increases the understanding of the underlying collaborative COI processes, and how competitive tensions affect the collaboration.

1.2 Structure and content

In the next chapter, the background and theoretical context for this thesis are presented. This entails presenting central terms and ongoing discussions within the research field, along with the research gaps that led to the current research questions. This chapter also presents a constructed, initial framework that is used to assess why and how companies collaborate. Chapter 3 provides information on how the study was conducted, along with methodological choices made and reflections on the quality of the study. The empirical findings are presented in Chapter 4. In Chapter 5, the research question with sub-questions is answered, and a revised framework is suggested. Further, the implications of the findings for practitioners and theory are discussed before the chapter is completed with limitations and suggestions for further research. Finally, in Chapter 6 the thesis is concluded.

2 Background and theoretical context

To answer the research question, it is necessary to define and clarify the terms and concepts used. Therefore, central terms such as 'circular oriented innovation' are described first along with its antecedents and the related concepts. Then, in section 2.2, the theoretical context for this thesis is presented more thoroughly, by describing network theory and the coopetition concept as well as how they might be combined. Finally, the theoretical framework that is used to structure and analyze the findings is presented.

2.1 Background

2.1.1 Sustainability

The term sustainability has been defined in various ways, but the most widely recognized definition is "development focusing on meeting the needs of the present without compromising the ability of future generations to meet their needs" (WCED, 1987). On the company level, corporate sustainability includes the company performance and is defined as "meeting the needs of a corporation's direct and indirect stakeholders without compromising its ability to meet the needs of future stakeholders as well" (Dyllick & Hockerts, 2002, p. 131). Even though this thesis mainly focuses on circular innovations, the term sustainability is also used when talking about the companies' general sustainability strategies as the interviewees did not always divide between circular and sustainable.

2.1.2 Circular economy

CE is included in the wider concept of sustainability, focusing on the economic system and processes around production and consumption. Further, CE can be explained as a contrast to the traditional linear (open-ended) economy, where the product life cycle starts with conceptualization and design, through development and production, use and ends with disposal (Ghisellini et al., 2016). The ultimate CE goal is therefore to decouple economic growth from resource consumption (Geissdoerfer. et al., 2017; Ghisellini et al., 2016). The CE helps optimize natural resource use by increasing efficiency towards a transition from open to closed cycles of materials and energy and less wasteful industrial processes (Ghisellini et al., 2016). The Ellen MacArthur Foundation (EMF) bases the CE upon a few, but simple principles, which are illustrated in Figure 2.1.

The principles clarify how each company is a part of a larger system, and thus the importance of understanding each part's influence upon another as a whole (EMF, 2013). First, CE aims to design out waste. Thus, products are designed and optimized for a cycle of disassembly and reuse in tight cycles that set them apart from disposal, and even recycling if large amounts of energy and labor have been put into their production. Second, there is a need to differentiate between the consumable and durable components of a product. Consumables should be made of biological ingredients or "nutrients" which can be safely returned to the biosphere directly or in a cascade of consecutive uses. Durables are on the other hand made of technical nutrients unsuitable for the biosphere, such as metals and many plastics. They should therefore be designed from the start for reuse. Lastly, the energy put into this cycle should be renewable to reduce resource dependence and increase system resilience (EMF, 2013).

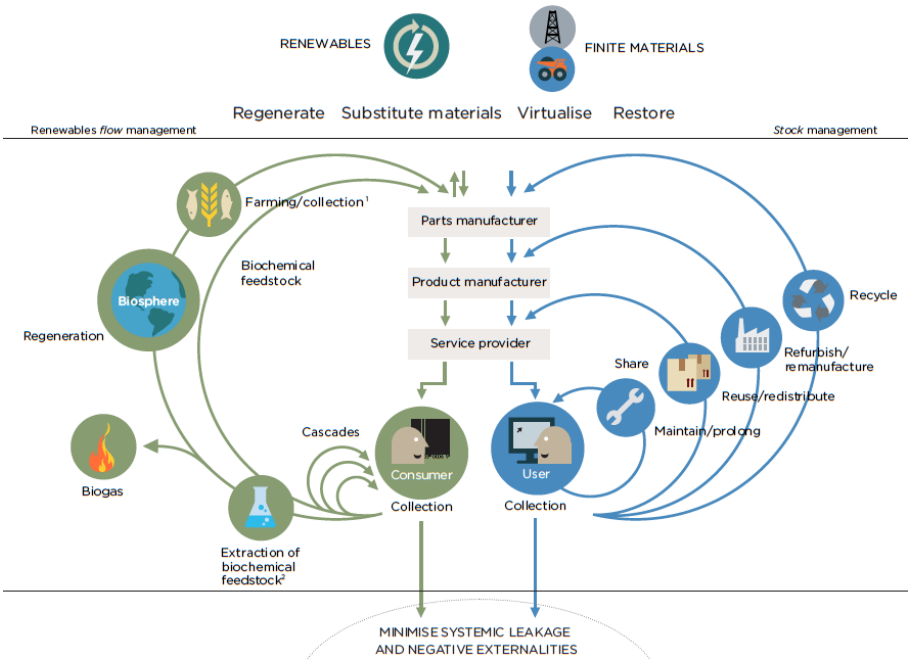

Figure 2.1: The principles of the circular economy industrial system. From *Towards the Circular Economy: Economic and business rationale for an accelerated transition,* by the Ellen MacArthur Foundation, 2014.

Circular strategies

To make it easier for companies to adopt circular principles and governments to define CE policies, the EMF (2015) has translated the circular principles into a set of six business actions: Regenerate, Share, Optimize, Loop, Virtualize and Exchange. Together these actions constitute the ReSOLVE framework, which identifies concrete actions for companies to be circular, as shown in Figure 2.2. The actions in the ReSOLVE framework are used to define what is categorized as 'circular' in this thesis, which further guided the selection of case companies and business networks, which is described in 3.3.1.

Regenerate	Shift to renewable energy and materials.
Share	Keep product loop speed low and maximize utilization of products, by sharing them among different users, by reusing them through their entire lifetime, and by prolonging their lifetime through maintenance, repair and design for durability.
Optimize	Increase performance or efficiency of a product, remove waste in production and the supply chain (from sourcing and logistics, to production, use phase, end-of-use collection etc.).
Loop	Keep components and materials in closed loops and prioritize inner loops. For finite materials it means remanufacturing products or components and recycling materials. For renewable materials it means anaerobic digestion and extracting biochemicals from organic waste.
Virtualize	Dematerialize resource use by delivering utility virtually.
Exchange	Replace old with advanced non-renewable materials, apply new technologies and choose new products or services.

Figure 2.2: The ReSOLVE framework. Adapted from *Delivering the Circular Economy: A toolkit for policymakers,* by The Ellen MacArthur Foundation, 2015.

According to Ghisellini et al. (2016), CE has most often been considered only as an approach to more appropriate waste management. Also Rosa et al. (2019) state that CE research mainly has evolved as research on waste generation, resource use, and environmental impact, while neglecting business and economic perspectives. Such a limited point of view may lead CE to fail, as the implementation at the industrial level has been inhibited and the advantages for industries are still not explicit (Lieder & Rashid, 2016). The EMF (2015) states that the CE provides multiple value creation mechanisms that are decoupled from the consumption of finite resources. Moreover, the EMF (2013) argues that the actual transition towards a fully-fledged CE depends on companies' successful adoption and implementation of circular principles. This thesis thus contributes to the CE research field by applying a business strategy perspective.

2.1.3 Circular business models

In essence, a business model defines of how a company delivers value to customers, gets paid for that value, and converts those payments to profit. According to Teece (2010), it thus reflects "a management's hypothesis about what customers want, how they want it, and how the enterprise can organize best to meet those needs, get paid for doing so and make a profit" (p.191). Easier said the way a company conducts its business (Wit, 2017). Since companies' success depends on gaining a competitive advantage over rival organizations operating in the same business area, business models and competitiveness are closely intertwined (Wit, 2017). Indeed, the business model represents for companies a driver for competitiveness, defining how to position in the market against competitors (Chesbrough, 2007).

Business models are viewed as a key lever to implement the concept of CE on the organizational level as it allows for a systemic shift in the core logic of businesses and the alignment of incentives of different stakeholder groups (Geissdoerfer et al., 2020). It requires the design and implementation of business models that are based on using as little resources as possible for as long as possible while optimizing the value creation in the process (Ghisellini et al., 2016). Consequently, a circular business model (CBM) can be understood as a business model that enables a prolonged useful life of products and components and aims to close material flows (Bocken et al., 2019). The aim of CBMs is thus to reconcile the creation of commercial value with adoption of circular strategies (Nußholz, 2018). In contrast to linear business models, where products are downgraded after a single use phase, circular business models aim to generate profits by preserving the embedded value of products at the highest possible level of utility (Guldmann & Huulgaard, 2020). Gusmerotti et al. (2019) view the CE as a way to reduce the conflicts between the competitive and environmental priorities within a company, making it more competitive, while at the same time reducing its environmental footprint. Many authors agree that by closing the material loop, companies maximize the value of their resources while reducing their resource use, which is good both for the company and the environment (Jensen et al., 2019; Konietzko et al., 2020b; Nußholz, 2018; Pieroni et al., 2019).

From the principles of CE, the (EMF, 2013) has further identified four sources of value creation in the circular system setup. This implies that business models for circularity could create value from the inner circle, circling longer, cascading use, and utilizing pure circles, as illustrated in Figure 2.3.

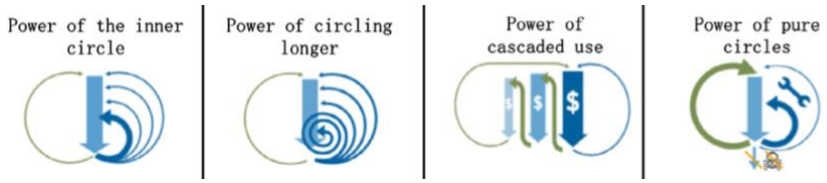

Figure 2.3: The four sources of circular value creation. From *Product-service systems business models for circular supply chains*, by Yang et al., 2018, Production Planning and Control (https://doi.org/10.1080/09537287.2018.1449247)

The *power of the inner circle* refers to minimizing material usage and reducing cost through the inner circles such as production, reuse, and refurbishment, and then through outer circles such as recycling. The *power of circling longer* aims to maximize the number of circles as much as possible and prolong the product's longevity. The *power of cascaded use* is about applying "waste-is-food" logic and suggesting a different utilization of the used products through symbiotic approaches. Lastly, the *power of pure circles* is about using uncontaminated material streams so that the redistribution efficiency and material productivity could be increased (EMF, 2013).

Circular business models in the fashion industry

Circular business models within the fashion industry follow the same principles as described in the general CE literature. For fashion products (i.e. apparel, footwear, accessories) to be circular, the EMF (2020) suggests they need to be; used more, made to be made again, and made from safe and recycled or renewable inputs, which coincides with the circular strategies in 2.1.2. To use the clothes more, they suggest clothing rental or offering clothing repair and increase the sale of used clothing. To be able to use the clothes more, they must be designed and manufactured in a way that they can be disassembled and repaired, remade, or recycled. For old clothes to be used again or recycled, it requires a functioning system in which clothes could be delivered in and thereafter sorted, so-called take-back systems (EMF, 2020). According to Lehman et al. (2019), most fashion companies still have a long way to go to achieve a circular industry as described by the EMF (2020). Lehman et al. (2019) found that fashion companies are not implementing sustainable solutions fast enough to counterbalance the negative environmental and social impacts of the rapidly growing fashion industry. To accelerate the transition towards a CE, additional research within the industry is required to better understand what issues concern fashion companies when it comes to the implementation of circular principles.

2.1.4 Circular oriented innovation

According to Brown et al. (2021), circular oriented innovation (COI) explores combinations of product design, business model, and value network configurations to investigate how to operationalize CE strategies. As the companies in this thesis both focus on the broader range of circular innovations and innovation of circular business models, both terms will be used in this thesis. Thus, the term COI will be used when talking about the broader range of circular innovations, while circular business model innovation (CBMI) is used when explicitly discussing business models.

Innovation

Innovation has since the early work of Joseph Schumpeter (1912), been viewed as the main driver of economic growth and development (Tidd & Bessant, 2018). Simply said, it is about identifying or creating opportunities, serve existing markets in new ways, growing new markets, rethinking services, meeting social needs, or improving operations (Tidd & Bessant, 2018). Hence, innovation can take many forms, and it is important to state the

definition used in this thesis. By definition, innovation can be both the activities and the result of the activities (OECD/ Eurostat, 2018). Since most circular business model innovations are still at the development stage, innovation activities are used instead of innovation (the result). Thus, 'innovation' in this thesis refers to "all developmental, financial and commercial activities undertaken by a company that are intended to result in an innovation for the company", while 'an innovation' is "a new or improved product or process that differs significantly from the units previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)" (OECD/ Eurostat, 2018, p. 20).

Although innovation is challenging for firms, it is vital to keep up with competitors and rapidly changing market demands (Chesbrough, 2010). Furthermore, it is acknowledged as a pathway to creating a competitive advantage (Teece, 2010; Wit, 2017). While a competitive advantage can come from size, possession of assets, and so on, the pattern is increasingly coming to favor those organizations that can mobilize knowledge and technological skills, and experience to create novelty in their offerings and how they create and deliver those offerings (Tidd & Bessant, 2018). To profit from innovations, they must be sufficiently integrated with an appropriate business model design. Without a well-developed business model, innovators will fail to either deliver or capture the value from their innovations (Teece, 2010).

Circular business model innovation

Business models can be both a vehicle for innovation as well as a subject for innovation (Zott et al., 2011). Business model innovation refers to the process of changing the way of doing business beyond the individual redesign and optimization of existing products and practices (Chesbrough, 2007). Thus, it involves the implementation of new mechanisms to create, deliver and capture value to drive corporate transformation and enhance competitive advantage (Chesbrough & Rosenbloom, 2002; Osterwalder & Pigneur, 2010; Zott et al., 2011). Following these definitions, circular business model innovation (CBMI) can thus be defined as the conceptualization and implementation of circular strategies in business models (Geissdoerfer et al., 2020). It can also be seen as the fundamental driver for the transition to a CE (EMF, 2013; Yang et al., 2018), as elaborated in 2.1.2.

2.1.5 Barriers to circular oriented innovation

Given the slow uptake of circular business models, an increasing number of scholars have investigated the barriers to implementing circular business models across different industries (Guldmann & Huulgaard, 2020; Gusmerotti et al., 2019; Linder & Williander, 2017; Tura et al., 2019). Having a clear picture of what types of barriers exist is important to understand why companies seek collaborative innovation.

Risks and uncertainties

A prominent barrier in the CE literature is unsure market demand. Lack of information regarding market supply and demand makes it challenging to estimate future sales and profit margins (Aid et al., 2017; Tura et al., 2019; Veleva & Bodkin, 2018). Moreover, CBMs also require customers to change their actions and behavior, by for example recycling products or changing their shopping habits. Additionally, Tura et al. (2019) found that it was difficult to convince customers of the CE potential, while Gusmerotti et al. (2019) found that some customers simply are not aware. Further, since the cost structure in a CBM is dependent on the economic value remaining in products after use, the prediction of future cost savings is more challenging than in a linear model where one only needs to predict costs for one manufacturing of the product. In a CBM on the other hand, one needs

to predict customer demand not only for initial sales but also for sales after recirculation (Linder & Williander, 2017). Moreover, CBMs entail extra costs due to product/waste-take-back and handling and have a longer return on investment due to breakeven delays and negative initial cash flow (Veleva & Bodkin, 2018). Combined with high investment costs, and uncertain profitability margins, CBMs is associated with financial risk (Guldmann & Huulgaard, 2020; Linder & Williander, 2017). This risk is considered a barrier since expected economic return often is the prioritized objective for companies (Tura et al., 2019). Also, Lieder and Rashid (2016) state that if industrial businesses do not see the economic advantages of CE, they will be reluctant to pursue CE initiatives.

Other scholars also mention market dynamics as a challenge, meaning that companies worry about the ability to make changes and keep their market share instead of being outcompeted. This is especially a problem for the established companies, where circular business model innovations require a large turnaround associated with big investments (Nußholz et al., 2019; Sousa-Zomer et al., 2018; Whalen et al., 2018). Moreover, most companies depend on their suppliers and customers to adopt similar solutions for their circular business to be truly circular, and a lack of fitting infrastructure would thus be a barrier (Tura et al., 2019). Furthermore, many supply chains are heavily invested in other solutions, and the companies might not have the possibility to rearrange their solution (Geissdoerfer et al., 2018).

Regulatory barriers or lack of regulations promoting CE is also a frequently mentioned issue (e.g., Tura et al.,2019; Nußholz et al., 2019, Whalen et al., 2018). For instance, taxation of labor makes labor-intensive circular activities such as reuse, repair, upgrade, remanufacturing, and recycling activities expensive compared to the manufacturing of new products (Guldmann & Huulgaard, 2020). Therefore, if CE solutions are not as cheap and efficient, the companies face the risk of being outcompeted by companies utilizing more linear business models.

Lack of capabilities or resources

In addition to the risks associated with CBMI, the lack of resources is also a barrier for some companies. D'Amato et al. (2020) and Guldmann and Huulgaard (2020) mention that the lack of financial resources also makes it difficult for companies to invest in COI. Moreover, Heyes et al. (2018) mention that some companies might not have the ability to adapt to short-term changes in the operating environment. Also, Weissbrod and Bocken (2017) found that despite the company's stated need for fast learning through project experiments, the projects were not executed quickly because "overall, the corporate mindset of economic value creation, and the desire to plan project activities still dominated" (p.2663). As adopting CBMs require substantial changes to the current business practice and product designs, the lack of know-how and dynamic capabilities can thus be a barrier for companies to move beyond their traditional value chain (Nußholz et al., 2019). There might also be other challenges related to the lack of compatible technologies, both related to change in product or service and the entire supply chain (Diaz Lopez et al., 2019; Tura et al., 2019).

2.1.6 Collaborative circular oriented innovation

The CE is a systemic concept (Konietzko et al., 2020a), and innovating towards circularity thus requires fundamental changes in widespread economic structures (Lieder & Rashid, 2016). Understanding the necessary degree of complementarity of circular innovations is according to Brown et al. (2020) a key element for its success. This is because complementarity dictates whether external supply chain or competitor participation is

needed. As mentioned, circular solutions are often more than the market offering, which means there is a need for understanding how business models can operate to narrow, slow and close resource flows across multiple lifecycles. Brown et al. (2020) argue further that this could be done through collaborative and open innovation, where knowledge is passed through organizational boundaries. Collaborative innovation involves actions of collective learning to enhance the joint creation of novel ideas, products, services, processes, or business models by combining expertise, capabilities, and resources of the participating organizations and individuals (Brown et al., 2021).

Incentives to collaborate

According to the literature, there are several reasons why circular business model innovation is important for today's fashion and textile companies. These reasons affect all companies, therefore, they face common challenges. The environmental challenges affect the very foundation on which they are built, and ultimately the profitability of the industry is at risk. The *pulse of the fashion industry* report projects that, by 2030, fashion brands would see a decline in earnings before interest and tax (EBIT) margins of more than three percentage points, if they were to continue business as usual. This would translate into a profit reduction of approximately EUR 45 billion (USD 52 billion) for the industry (Lehman et al., 2019). Additionally, the negative impacts of the industry are becoming more transparent and understood by digitally-enabled customers, leading to reputational risks for brands and to regulatory trends that could affect the profits of businesses that fail to respond (CFS, 2020). According to Lehman et al. (2019) "even the most advanced brands face limits to what they can achieve in isolation" (p.16). They thus state that a strong ecosystem of collaboration is required to identify the best practices and innovative solutions. This is necessary to overcome the barriers and achieve more substantial improvements that lead to a systemic change (Lehman et al., 2019).

While there are many incentives, there are also several barriers to the adoption of circular innovations as elaborated in 2.1.5. Moreover, the fashion industry has its specific challenges. According to Lehman et al. (2019), fashion companies must push harder, with more focused and coordinated efforts, to overcome technological and economic limitations that hinder progress. As mentioned, the profit margins are increasingly pressured by rising costs and lower pricing power (Deloitte, 2017). Therefore, the companies have fewer resources to invest in innovations and experience tough competition from fast fashion, which makes scholars and practitioners debate whether it is possible to make the fashion industry both sustainable and profitable (Swartz et al., 2016). As mentioned, the massive changes required in the companies' business models and value chains are also associated with investment risk, since the future profits of circular business models are more uncertain and difficult to calculate (Linder & Williander, 2017).

Along with market dynamics and constant competition of market share, these risks lead to significant first-mover disadvantages, compared to doing business as usual. Aspelund et al. (2021) describe this as a 'coordination problem', due to the need for simultaneous and coordinated adoption of circular innovations from multiple actors within and across value chains. They argue that adoption needs to be coordinated to ensure that adopted innovations are compatible, and that adoption needs to be simultaneous to make actors profit from them. These issues reveal the importance and necessity of collaboration, even with competitors, to resolve the coordination problem, beat the fast fashion model, and ensure fair competition.

The role of collaborative structures – why collaborate for CBMI?

As the definition in 2.1.3 makes clear, truly circular business models encompass entire systems and value chains. The scope of circular business models is determined by the resources committed, trust and knowledge flows, and the involvement of different partners which enables the closing of the loop (Zucchella & Previtali, 2019). Thus, as one rarely observes vertically integrated companies, collaboration becomes an important enabler for circular adoption. Since circular oriented innovation aims to change how systems operate, increasingly collaborative and systemic innovation activities should be pursued. These types of innovations require a higher degree of complementary activities, across different levels of system interaction, to generate or facilitate value creation, delivery, and capture opportunities by connecting the business models of different actors (Brown et al., 2020).

Tura et al. (2019) found that lowering the barriers for CE calls for collaborative actions, sharing of resources and knowledge between academia, business, and government. Many of the barriers presented in 2.1.5 could thus be solved by collaborating. For example, by investing in innovation activities together, the investment risk for the single companies gets lower. Moreover, as many companies lack the know-how or capabilities to adopt circular principles, they can figure things out together. Brown et al. (2019) found that the primary motive for exploring collaborative innovation is to increase the knowledge flows. They also found that other commonly held motives include considerations for increased competitiveness and the market share of innovations, as well as access to resources, new markets, or enhanced skills. These pursuits may thus be related to increased company performance, as well as a reduction in costs and time to market. Collaborative innovation also allows for the ability to share associated risks (Brown et al., 2019).

Collaboration in strategic management

There are also other, more strategic perspectives as to why companies should collaborate. The objectives for inter-organizational cooperation can also be viewed as "sources of synergy" Wit, 2017, p. 296). According to Dyer and Singh (1998) and Preece (1995), the way organizations deal with one another is strongly influenced by what they hope to achieve. Therefore, when two or more companies seek to work together, they generally do so because they expect some value added.

There are many ways that synergies could be achieved by collaborating, such as leveraging resources, integrating activities, or aligning positions (Wit, 2017). By sharing resources, companies can improve either the quantity or quality of the resources they have at their disposal. Resources can be leveraged for mutual benefit by either 'learning' or 'lending'. When the objective is to exchange knowledge and skills or to engage in the joint pursuit of new know-how, the relationship is said to be learning-oriented. When one company owns specific resources that it cannot make full use of, or another company can make better use of, it may be attractive for both companies to lend resources to one another. There are two general ways for companies to integrate their activities with others. The first, and most common, type of relationship in business, and is a vertical link between a buyer and a seller, also known as 'linking' (Wit, 2017). Most companies have many linking relationships, both upstream and downstream, because they want to focus only on a limited number of value-adding activities, but require a variety of inputs as well as clients to purchase their goods. Second, where companies bring together their similar activities to gain economies of scale, the relationship is said to be oriented towards 'lumping'.

Even when companies want to keep their value-adding activities separately, they can coordinate their moves in the environment to strengthen each other's position. These position-enhancing relationships can be further subdivided into two categories. The first

one is called 'leaning' because when companies get together to improve their bargaining positions towards other industry actors, it is said that they lean on each other to stand stronger (Wit, 2017). Leaning may be directed at building up a more powerful negotiation position towards suppliers, or offering a more attractive product and service package towards buyers. At the same time, the cooperation can be directed at weakening the position of an alternative group of companies or even heightening the entry barriers for interested industry outsiders. Companies can also cooperate to gain a stronger position vis-à-vis contextual actors, 'lobbying'. These relationships are often directed at strengthening the company's voice towards political and regulatory actors, such as governments and regulatory agencies (Wit, 2017).

Due to the advantages a collaborative relationship might provide companies, Kanter (1994) calls it a "collaborative advantage" (p.96). Thus, a well-developed ability to create and sustain fruitful collaborations gives companies a significant competitive leg up (Kanter, 1994). Even though collaborations grant access to the required knowledge, the company's ability to exploit this knowledge is a critical component of its innovative capabilities. According to Cohen and Levinthal (1990), the ability to evaluate and utilize outside knowledge depends on the level of prior related knowledge. This prior related knowledge confers an ability to recognize the value of new information, incorporate it and apply it to commercial ends. These abilities collectively constitute what Cohen and Levinthal (1990) call a company's "absorptive capacity" (p.128).

Innovation networks and clusters

The management literature uses many different terms when it comes to collaborative innovation, depending on the type of actors that collaborate and how they collaborate. In this thesis, the collaboration between companies will be studied within networks.

According to Tidd and Bessant (2018), a network can be defined as "a complex, interconnected group or system" (p.258), and networking involves using that arrangement to accomplish particular tasks. They further present four major arguments for using networks for innovation; First, collective efficiency, where networking offers a way of getting access to different resources through a shared exchange process. Second, collective learning, where networking offers not only the opportunity to share scarce or expensive resources. It can also facilitate a shared learning process in which partners exchange experiences, challenge models and practices, bring new insights and ideas, and support shared experimentation. Third, collective risk-taking, which builds on the idea of collective activity networking also permits higher levels of risk to be considered than any single participant might be prepared to undertake. Lastly, the intersection of different knowledge sets also allows for different relationships to be built across knowledge frontiers and opens up the participating organization to new stimuli and new experiences (Tidd & Bessant, 2018).

According to Wit (2017), network of companies must have a strategic center that can act as a builder and a coordinator. As a builder, the strategic center can deliberately design and assemble the network components, and as coordinator it can regulate activities and resolve disputes. The networks studied in this thesis are organized by a fashion and textile industry cluster which leads and facilitates the activities within the networks. Porter (1998) defines clusters as "geographic concentrations of interconnected companies and institutions in a particular field" (p.78).

2.1.7 Research gaps and point of departure

As seen in the previous subsections, there are many incentives for companies to collaborate. However, since there are a lot of takers in the fashion industry, finding the appropriate balance of collaboration between competitors may prove to be a challenge. According to Tidd and Bessant (2018), one of the many challenges of managing innovation networks is related to getting the actors to see the effects on a system-level instead of narrow self-interests, and avoid opportunistic behavior. This argues for further examination of why companies seek collaborative COI.

Even though the concept of collaborative COI is gaining increased attention among practitioners and academics, the concept is still nascent and needs further empirical evidence on how it is performed in practice (Brown et al., 2021). Leising et al. (2018) made a collaborative framework by connecting the predefined elements "visions, actor learning, network dynamics, and business model innovation" to collaborative cases, but did not investigate the underlying collaborative processes. Brown et al. (2019) explored the initial conditions for why collaboration is initiated and went shortly thereafter onto exploring how it could be managed (2020). Yet, an empirical investigation into the overall collaborative innovation processes remained underexplored within COI, until Brown et al. (2021) recently developed a process model to describe the processes companies undertake when designing and implementing collaborative COI. However, the authors stated that "we do not present this model as definitive, rather we see it as a call to action for future empirical research" (p.286). Therefore, the model contains several gaps. For example, it does not explain the companies' strategic objectives and motivation for seeking collaborative COI. Neither does the model include how the companies are collaborating in terms of the type of resources that are shared, what type of activities they collaborate on and how the decisions are reached. Moreover, it does not describe how boundaries are set in terms of e.g., knowledge sharing and withholding, and how the composition of actors and competitive mechanisms within the network affect these things. The aim of this thesis is therefore to contribute to the understanding of the way companies collaborate by filling these gaps.

Therefore, this thesis contributes to CE literature by investigating collaborative COI within a new context, namely networks, as Tidd and Bessant (2018) argue that networks are becoming an increasingly important form of collaborative innovation. Moreover, previous research has focused on a broad sample of cases with companies from many different industries, which also varied in terms of company size. Thus, this thesis contributes to the research on collaborative COI investigating networks within a specific industry. Having a better picture of why companies seek collaboration, as well as how the competitive mechanisms affect how they collaborate is important to create better collaborative structures and progress in the circular transition. Finally, by applying perspectives from the strategic management literature, this thesis can advance the CE research by assessing and integrating strategic management perspectives in a circular context.

2.2 Theoretical context

This section presents the theoretical context that is used to create an initial understanding of why and how companies collaborate for COI in networks. The theoretical context is central for how the research is conducted in terms of data collection and interpretation of findings. First, the ARA model from industrial network theory is explained, followed by the coopetition concept. These theoretical concepts are then combined in a framework, along

with the drivers from the theoretical background (2.1) to establish a theoretical framework that makes the foundation for the analysis in this thesis.

2.2.1 Industrial network theory

According to Håkansson and Snehota (1995), companies must continuously create and develop relationships with a broader range of stakeholders to handle the complexity of today's business environment. From a strategic viewpoint, these relationships affect the nature and the outcome of the company's actions and are their potential sources of efficiency and effectiveness.

The Activity-Resource-Actor (ARA) model

Håkansson and Snehota (1995) suggest that a relationship is a variable that can take on different values and that there is a need to "look at the connected elements in a relationship and the effects produced by the connections" (p.26). The connected elements and the produced effects are further defined in a framework consisting of two dimensions; 'substance' and 'function', as illustrated in Figure 2.4. The first dimension regards what the relationship affects on the two sides - its 'substance' - which is further identified in three layers; activities, resources, and actors. Therefore, the framework therefore goes by the name: the activity-resource-actor (ARA) model. The second dimension regards the effects a relationship has for different actors - its 'function' – which is distinguished into three categories in accordance to whom the relationship affects; each of the individual companies, the 'dyad' or relationship which is the conjunction of two actors, and the other companies involved - the network (Håkansson & Snehota, 1995).

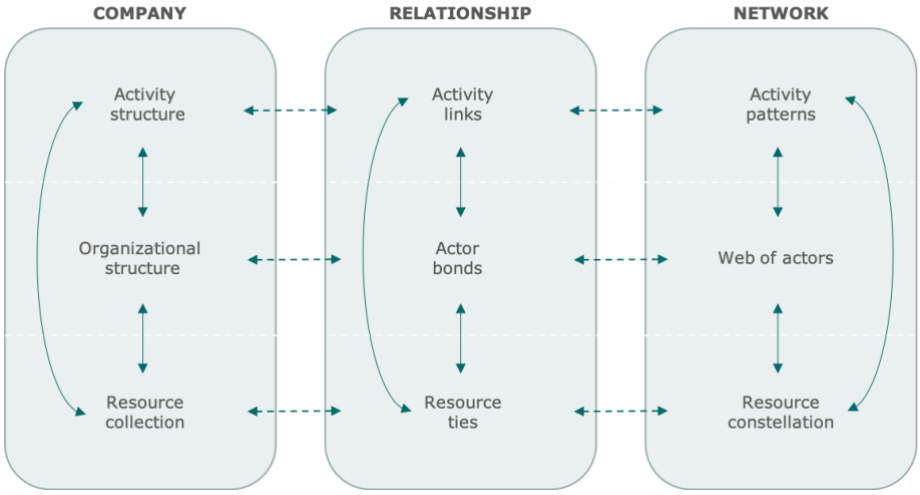

Figure 2.4: The activity-resource-actor (ARA) model. Adapted from *Developing relationships in business networks*, by Håkansson and Shehota, 1995, Routledge.

Even though the ARA model mainly describes single relationships between two actors, the model represents a way to structure the analysis by how companies collaborate in business networks in activities, actors, and resources. Moreover, since the goal is to study the balance between cooperation and competition as well as the strategic objectives of companies, the company level (single actor function) is the main focus in this thesis.

Activities

According to Håkansson and Snehota (1995), a relationship is a function of activities that connect the various internal activities of the parties. Activity links thus refer to the different activities, e.g. commercial, technical and administrative activities, that link a company to

another as their relationship develops. The importance of activity links depends on their type and strength, which may be affected by the companies' ambitions in the relationship, as well as the complexity of their activity structure (Håkansson & Snehota, 1995). If the activity links are coordinated well, the companies may extract synergies from the partnership, through cost reduction and improved effectiveness (Håkansson & Snehota, 1995).

Resources

When a relationship develops, the companies utilize each other's tangible and intangible resources to perform the activities together (Håkansson & Snehota, 1995). Relationships thus consist of a various degree of resource ties, which may tie various resources together, such as technological, material, and knowledge resources as well as other intangibles from different companies. Resource ties stem from the matter in which the relationship develops, and this may in itself be viewed as a resource for a company. Thus, companies often seek other companies with matching resources. Moreover, resources may be combined into competitive combinations over time, depending on how the ties are structured. The process of developing and utilizing resource ties is expensive and time-consuming but can create new opportunities if it leads to better productivity and innovation (Håkansson & Snehota, 1995).

Actors

As a business relationship develops, actors become connected. The established bonds between the actors affect how the actors perceive, evaluate and treat each other. If the actors become mutually committed to the relationship, the overall understanding between the actors may improve, whether in terms of general perception, knowledge, or understanding of the identity of the other party. This may in turn enable a better learning environment, and increase the possibility of utilizing the resources and performing activities more efficiently. Thus, the strength and nature of the actor bonds are important factors to consider when analyzing a relationship (Håkansson & Snehota, 1995). However, regardless of the extent to which the companies are committed to one another, there will always be uncertainty related to perception, trust, and beliefs (Håkansson & Snehota, 1995).

The single actor function

According to Håkansson and Snehota (1995), a relationship has different effects for each company. These effects depend on what is produced in the relationship, and how it is connected to other internal elements of the company and its other relationships. Furthermore, a relationship is considered one of the resources which may be exploited by the company resources available to the company, and be used in combination with other resources (other relationships) available to the company. Therefore, relationships are an important factor in the development of capabilities of a company and thus for the economic outcomes of its operations. First, relationships affect the resource collection that may be utilized by a company. Second, they also affect the possibilities of carrying out certain production and development activities within the company, that is, its activity structure and its activity potential. Finally, each relationship affects the organization of the company since the total set of relationships determines in this way the competence of the company as well as its productivity and innovativeness (Håkansson & Snehota, 1995). Thus, the cost and benefits yielded from engaging in such relationships are related to the matter in which the relationship affects innovativeness, productivity, and competence for the actor. These implications may in turn stem from the impact that the relationship has on the activity

structure, and the set of resources accessed through the relationship. Håkansson and Snehota (1995) suggest companies develop by exploiting the potential offered by their relationships. Its success depends on the ability to perceive and handle the connectedness in the relationships in which it is directly involved. However, the potential effects might be and often is, a source of possible tension and conflict in a relationship, especially when the goals of the two differ greatly and are imposed in the interaction (Håkansson & Snehota, 1995).

2.2.2 Coopetition

Bengtsson and Kock (2000) define coopetition as the cooperation of companies that compete at the same time. Coopetition is therefore the act of cooperation between competing companies by forming a strategic alliance designed to help both companies.

According to Wit (2017), companies cannot isolate themselves from their environments, but must actively engage in relationships with suppliers and buyers, while selectively teaming up with other companies inside and outside their industry to attain mutual benefit. But while they are collaborating to create joint value, companies are also each other's rivals in terms of dividing benefits. It is therefore mentioned as "the paradox of competition and cooperation" by scholars (Wit, 2017, p. 302). 'Competition' can be defined as the act of working against others, where two or more organizations' goals are mutually exclusive. In other words, competition is the rivalry behavior exhibited by organizations or individuals where one's win is the other's loss. On the other hand, 'cooperation' can be defined as the act of working together with others, where two or more organizations' goals are mutually beneficial. In other words, cooperation is the collaborative behavior exhibited by organizations or individuals where both sides need each other to succeed (Wit, 2017). In many cases, companies need to be able to engage in competition and cooperation simultaneously, even though these demands are each other's opposites, they need to "exhibit a strongly cooperative posture to reap the benefits of collaboration, and they need to take a strong competitive stance to ensure that others do not hamper with their interests" (Wit, 2017, pp. 306–307). While coopetition may combine the best of both worlds of cooperation and competition, it is still an inherent paradox, given the possible tension between value creation and capture (Bouncken et al., 2015).

Drivers for coopetition

Coopetition may be seen as a useful tool for improving the company's competitive profile (Wit, 2017). Hamel et al. (1989) argue that alliances with competitors "can strengthen both companies against outsiders even if it weakens one partner vis-à-vis another" (p.319), and therefore the net result can be positive. Other scholars do not view coopetition as a null-sum game, but rather a win-win situation where the goal is to create added value, or "increase the size of the pie" (p.310) for the benefit of all actors (Wit, 2017). Focusing on successful value creation eases the process of finding an equitable solution to the issue of value distribution (Wit, 2017).

According to Bouncken et al. (2015), inter-organizational collaborations have become an important part of corporate strategy to cope with faster business dynamics and increasing uncertainty, for example, due to the present unstable economic and business developments in the form of market globalization, aggressive economic competition and intensive know-how diffusion among companies. In the rapidly changing and uncertain, modern business environment companies are constantly under pressure to keep up with these changes to remain competitive (Bouncken et al., 2015). Therefore, partnerships with external partners, including competitors, become valuable. Bouncken et al. (2015) further

suggest that the decision on whether to cooperate or compete can be influenced by the relative knowledge structure of companies, due to an increasing need for external knowledge and resources. Competing companies are likely to have a more common or similar knowledge base than non-competitors, which enables successful knowledge sharing and integration more easily and allows for the generation of new knowledge and products (Bouncken et al., 2015). Furthermore, they are generally confronted with the same market conditions, customer needs, and uncertainty problems which support a common perception of future changes and help to develop innovations that are beneficial and profitable for all parties involved. Thus, compared to simple alliances among market players, cooperation between competitors entails crucial benefits for innovation activities (Bouncken et al., 2015).

Competitive mechanisms

According to Tidd and Bessant (2018), the following issues need to be considered by companies that collaborate for innovation. On one hand, the posed tensions around intellectual property should be considered (how to protect and hold on to, and how to access other people's knowledge). On the other hand, one must consider appropriability (how to ensure a return on the investments in creating knowledge). Lastly, the mechanisms to make sure that relevant knowledge can be found and utilized should be considered. In this context, "innovation management's emphasis shifts from knowledge creation to knowledge trading" (Tidd & Bessant, 2018, p. 240). Additionally, collaboration between two or more organizations may give access to resources otherwise unattainable for the parties (Tidd & Bessant, 2018). On this basis, coopetition represents a new perspective on how participation in collaborative networks might be a source of innovation and competitiveness for companies aiming to perform COI.

Risks of coopetition

Despite the tempting advantages, coopetition does not come without specific risks and challenges, which must be considered. This is especially true when it comes to coopetition in innovation activities. According to Bouncken et al. (2015), "coopetition is fraught with the risk of opportunism and knowledge leakage" (p.586). The coopetitive dynamics, therefore, represent a certain vulnerability to companies, which leads to the need to carefully balancing knowledge sharing and integration against knowledge withholding and protection (Tidd & Bessant, 2018).

Hamel et al. (1989) emphasize that companies should not be naive about the real nature of alliances, and states that "collaboration is competition in a different form" (p.134). In their view, an alliance is "a constantly evolving bargain" (p.134), in which each company will be fending for itself, trying to learn as much as possible from the other, while attempting to limit the partner's access to its knowledge and skills (Hamel et al., 1989). In aggregate, research thus far lends credibility to the notion that coopetition is a ''double-edged sword'' (Bouncken & Fredrich, 2012, p. 2060). On one hand, it can be positively related to the company's growth, competitiveness, and innovativeness, as well as its ability to deal with the turbulent business environment. On the other hand, it is fraught with difficulties in the sense that opportunism, misunderstandings, and spillovers can hamper the positive impact of coopetition on performance and innovation (Bouncken et al., 2015). Additional research is thus required to provide empirical evidence on how these mechanisms play out in collaborative COI networks.

2.2.3 Combining the ARA model and coopetition theory

To explain the interplay between cooperation and competition between companies in business networks, the ARA model by Håkansson and Snehota (1995) is combined with the coopetition concept. Coopetition theory is thus used to explain how activities are chosen and the companies' view on resources and other actors. Therefore, strategizing from a network perspective involves "identifying the scope for action within existing and potential relationships, and about operating effectively with others within the internal and external constraints that limit that scope" (Håkansson & Ford, 2002, p. 137).

Activities

According to Bouncken et al. (2015), companies must separate pre-competitive and competitive stages of the innovation process to manage the flow of information, knowledge, competencies, etc. In many cases, a coopetitive relationship between two companies is based on cooperation to develop a new product and create value, then competition to get a share of the market and distribute the returns of the value that has been created (Walley, 2007). Thus, companies in a coopetitive relationship frequently "cooperate in the upstream activities and compete in the downstream activities" (Walley, 2007, p. 17), as illustrated in Figure 2.5.

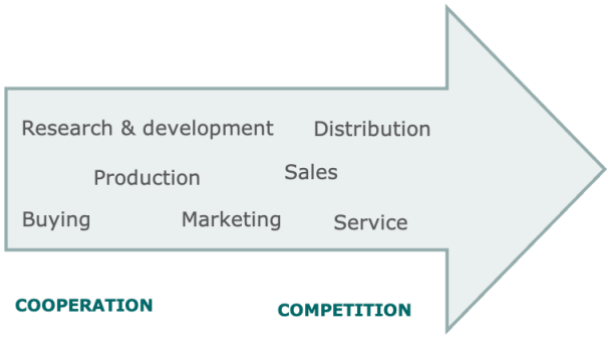

Figure 2.5: Activities in a coopetitive relationship. Adapted from *Coopetition: An introduction to the subject and an agenda for research*, by Walley, 2007, International Studies of Management & Organization (https://doi.org/10.2753/IMO0020-8825370201)

Bengtsson and Kock (2000) stated that the degree of proximity to the customer was a determinant for the distribution of cooperation and competition; companies tend to cooperate on activities far away from the customer (input activities) and compete on activities that are closer to the customer (output activities). In light of these tensions, Bouncken et al. (2015) argue that formal protection mechanisms should be implemented when managing coopetition to enable necessary sharing and integration while hampering harmful leakage of knowledge, technologies, or core competencies.

Resources

Bengtsson and Kock (2000) suggest that the advantage of coopetition is the combination of a pressure to develop within new areas provided by competition and access to resources provided by cooperation. According to Bouncken et al. (2015), coopetition enables companies to take advantage of synergy effects. Not only may costs be shared, risks be mitigated, and economies of scale be realized through mutual activities, involved companies can also pro-actively pool their R&D activities, and get access to external knowledge and resources which they then can apply in their own company (Bengtsson and Kock 2000). This is likely to increase the effectiveness and efficiency for the involved companies and generate a win–win situation with lower overall costs (Bouncken et al., 2015). Moreover, Bouncken et al. (2015) also found that partners can develop a common

knowledge base using both companies' experience and expertise that increases their innovation capacity. These advantages of coopetition can improve the companies' competitive advantage as they can develop products or services which would otherwise not be created, were it not for the coopetitive partner (Walley, 2007).

However, as a result of different resource bases, tensions on the inter- and intra-organizational levels may occur (Walley, 2007). Hence, active management is required to define ''what to share, with whom, when and under which conditions'' (Levy et al., 2003, p. 642). Thus, in managing the competitive/ cooperative tension, Walley (2007) advocates strategic alliances that blend distinct advantages to capitalize on new, not financially insignificant business opportunities. Moreover, Bengtsson and Kock (2000) states that heterogeneity in resources can foster coopetitive relationships, as unique resources can be advantageous both for cooperation and competition.

Actors

According to Bengtsson and Kock (2000), the decision to either cooperate or compete in a specific product or market area needs to be made according to all the competitors' positions and the connectedness between them, as a change in one relationship within the network may affect the other competitors' relationships and positions. As coopetition, by definition, includes cooperative and competitive elements, two different logics of interaction are in place (Bengtsson & Kock, 2000). For the cooperation phase to be successful, a friendly mindset is necessary, while hostility is caused when companies turn against each other, striving to maximize their benefit (Bengtsson & Kock, 2000). Additionally, Walley (2007) argues that the various coopetitive relationships that a company may develop can usefully be considered in respect of the 'value net' by Nalebuff and Brandenburger (1997) (see Figure 2.6). The value net illustrates that the companies' position towards each other in the coopetitive relationship may change according to where their values are derived. Thus, a company's 'suppliers' provide goods or services to the 'customer'. When the customer obtains goods and services from another supplier, benefiting the first company, the other supplier is regarded as a 'complementor'. However, when the goods and services provided by another supplier make the first company's goods and services less valuable, then the supplier is seen as a 'competitor' (Nalebuff & Brandenburger, 1997).

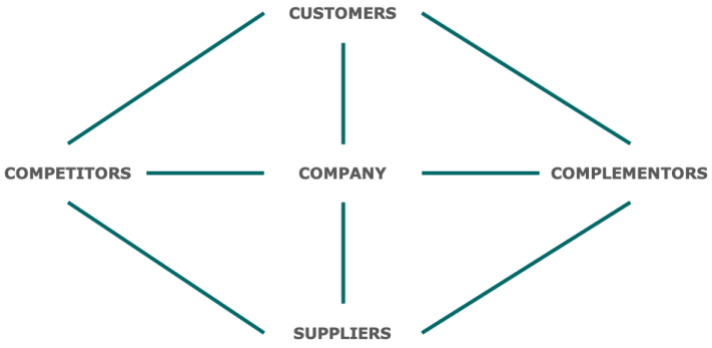

Figure 2.6: The value net. Adapted from *Co-opetition: Competitive and cooperative business strategies for the digital economy*, by Nalebuff and Brandenburger, 1997, Strategy & Leadership (https://doi.org/10.1108/eb054655)

In undertaking both competition and cooperation simultaneously, the nature of the relationship leads to tensions within the companies. The tension arises in many areas, but one particularly important area is inter-organizational knowledge sharing and learning, for which the tensions can affect the dynamics of the learning alliance (Walley, 2007).

2.2.4 Theoretical framework

Based on the theoretical background and context, a framework is constructed to describe coopetition in COI networks, as illustrated in Figure 2.7. The barriers to circular business model innovation in 2.1.5, and the background on collaborative circular oriented innovation in 2.1.6 make up the identified drivers for collaboration in literature. Within the network, the companies' collaborative behavior can be assessed according to a combination of the ARA-model (2.2.1) and coopetition theory (2.2.2) which is combined in 2.2.3 to assess how and why fashion companies collaborate for circular oriented innovation. Further, the competitive mechanisms described in 2.2.2 might affect the dynamics of collaboration.

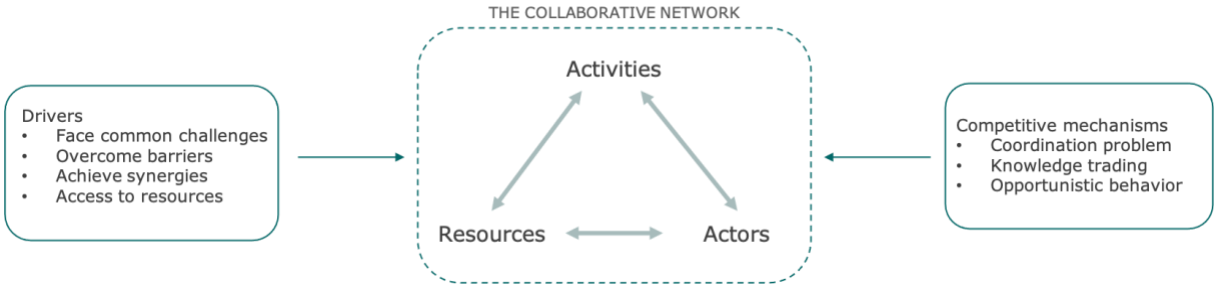

Figure 2.7: The initial theoretical framework describing coopetition in COI networks.

As further elaborated in 3.1.4, this framework functions as guidance when entering the empirical world and is made of combined existing theory. After the findings are presented, they are discussed in Chapter 5 in relation to this framework, before adjustments are made according to the empirical findings.

3 Methodology

In this chapter, the methodology of this thesis is presented. First, the research strategy and process are described, followed by a description of the research design in section 3.2. Section 3.3 describes the chosen research method, while section 3.4 describes the analytic process. Finally, in section 3.5, the chapter is completed along with some methodological reflections and the quality of the study.

3.1 Research strategy

According to Bryman (2016), a research strategy is a general orientation to the conduct of business research, which is based on the researcher's view on the relationship between theory and research.

3.1.1 Research process

The research process of this thesis is illustrated in Figure 3.1. The process was initiated by a systematical state-of-the-art literature review on circular business model innovation, which is elaborated in 3.1.2. The literature review identified knowledge gaps within the field and formed the basis for the research question presented in 1.1. Based on this research question, an additional literature review was performed to find a suitable theoretical context for analysis. The research question and both of the literature reviews then guided the construction of the theoretical framework suggested in 2.2.4, in addition to the choice of research design and methods.

After these choices were made, a sampling process of case companies was conducted, followed by interviews and transcription of these. The interviews were then analyzed and discussed, providing the basis for answering the research question. Even though the process might seem linear by description, it is important to note that the process was iterative, meaning that several early decisions were revised along the way. For example, after conducting the interviews, both the research question and theoretical context were revisited to narrow down and redefine the scope of the study. Moreover, the interview guide was improved many times between interviews. The process of going 'back and forth' from one type of research activity to another, and between empirical observations and theory is further described in 3.1.4.

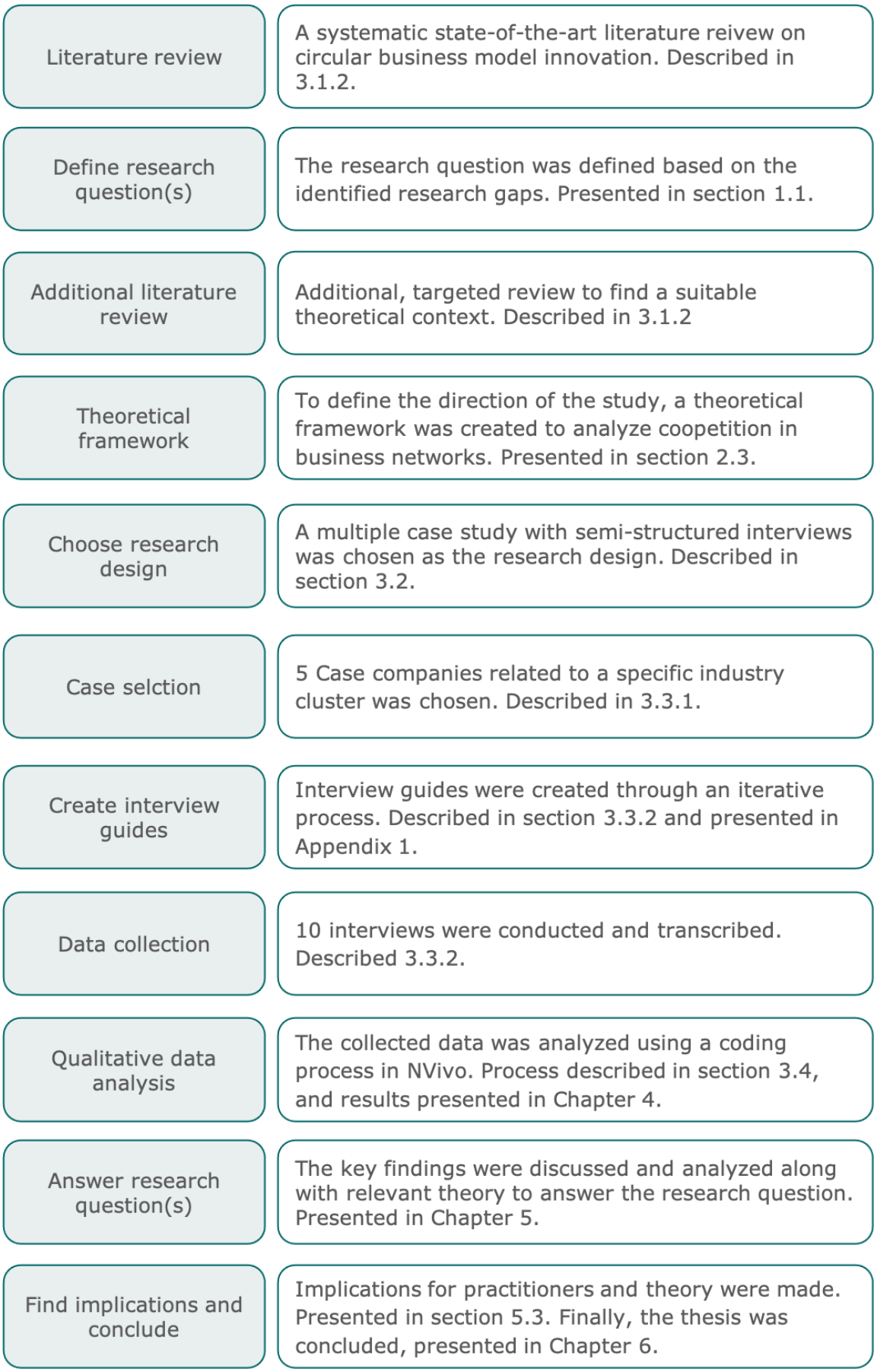

Figure 3.1: The conducted steps in the research process.

3.1.2 Literature search and selection process

The theoretical foundation of this thesis is based on two literature reviews. First, a systematical state-of-the-art review was performed to get an overview of the research field and identify areas in need of further research. Second, a more targeted search within management literature was performed to narrow down the theoretical context for analysis. The theoretical framework proposed in 2.2.4 is based on both these reviews. Since the first review followed a systematical approach and the second a more narrative and targeted approach, these are described in turn.

Initial systematic review

The initial literature review was conducted as a part of the specialization project in the course TIØ4562 *Strategy, Innovation, and International Business Development* during the fall of 2020 at NTNU. This project aimed to study the emerging literature on circular business model innovation (CBMI) to identify agreed-upon areas within the research field, the topics that remain disputed, and most importantly, promising areas for further research (Tranfield et al., 2003). A state-of-the-art review was found appropriate due to its focus on the most current research on the topic by summarizing current and emerging trends, research priorities, and standards in the given field (Jesson et al., 2011). Further, the principles of a systematic review were applied to efficiently identify key theories, concepts, and ideas within the field (Hart, 1998). The conducted steps in the review are illustrated in Figure 3.2, and followed the example of other systematic literature reviews within the field of CE (e.g. Bocken et al., 2019; Geissdoerfer et al., 2020; Ghisellini et al., 2016).

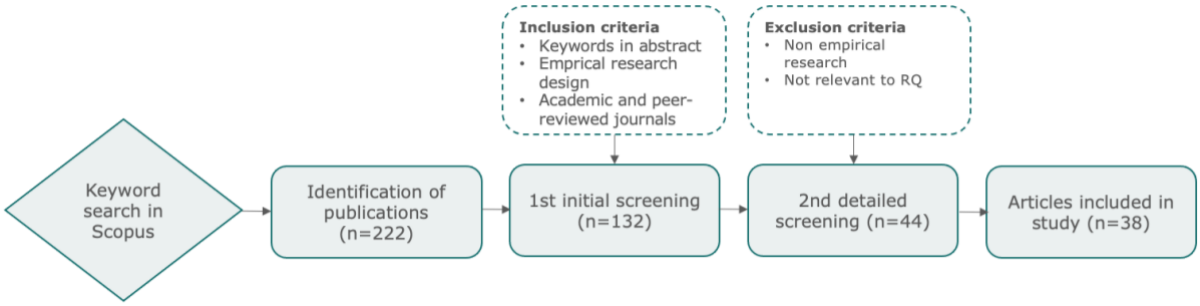

Figure 3.2: Overview of the literature search and selection process.

The process was initiated by a keyword literature search in the Elsevier database Scopus, which was selected because it is the largest abstract and citation database of research literature and quality web resources (Bryman, 2016). Thus, Scopus was considered a reliable database for identifying the most prominent literature on CBMI. Moreover, it was necessary to cover multiple terminologies in one search, which Scopus allows for with its AND/OR functionality. When using a keyword search, there is a risk of not including all appropriate keywords. Therefore, a trial and error approach was used to find the keywords that resulted in an appropriate amount of literature while not excluding central references. Additionally, a reference search was conducted to reduce the chance of missing relevant literature. This entailed following up on references used in articles found in the keyword search and reading other literature reviews on the subject.

By using the keywords 'circular', 'business model' and 'innovation' a manageable number of articles appeared. Truncation (*) of the keywords was also used to avoid omitting relevant articles. To ensure articles of high academic quality the search was restricted to articles and reviews published in academic and peer-reviewed journals. The initial search resulted in 222 documents, where 132 of them were journal articles.

To decide which articles from the search process to keep for the literature review, the articles went through two screening rounds. In the first round, the title and abstract of the 132 articles were scanned according to the following inclusion criteria: keywords in the abstract, an empirical research design, and publication in peer-reviewed academic journals. After the initial screening, the list was narrowed down to 44 articles which then was read more thoroughly. In the second round, the articles were reviewed and checked in relevance to the research question[1]. More specifically, that the focus of the article was focusing exclusively on CBMI. Articles using the term as an argument for something else, or briefly discussing it were discarded. For example, many articles contained research on CE and CBMs but lacked a focus on the innovation part. Other articles that were not considered as quite right for the research question were those focusing on e.g., life cycle costs, environmental efficiency, or material loops. The remaining 38 articles' aim, research question, methodology, findings, and future research needs were systematically registered in an Excel sheet. The articles were then thoroughly reviewed to identify the most important factors and research areas within the field.

Additional review, narrative approach

The additional literature review followed a more iterative process than the initial review. After identifying research gaps and selecting collaborative COI as the direction of this thesis, some of the literature from the initial review was read again along with a reference search within those articles. Then, a targeted search on collaborative innovation and coopetition was performed within the management literature to find a suitable theoretical context to set the analysis in. It has therefore not been a systematic review as the initial one, but rather a targeted literature search for relevant information on a given subject. The literature has been found during the entire research process, along the way when needed, as elaborated in 3.1.4.

3.1.3 Choosing a qualitative research strategy

In this thesis a qualitative research strategy was chosen, meaning that words are emphasized rather than quantification in the collection and analysis of data (Bryman, 2016). This research strategy was chosen due to the epistemological and ontological foundation of the study. The epistemological position of research defines what is regarded as acceptable knowledge in a discipline, whereas the ontological position defines what is perceived as the "nature of social entities" (p.28) and whether these are objective entities independent of social actors or social constructions built from the perceptions and actions of social actors (Bryman, 2016). Easier said ontology is the researcher's view of the nature of reality posing the question "what is reality?", whereas epistemology is how reality is explored posing the question "how can I know reality?" (Patel, 2015). The epistemological stance in this thesis is interpretivism, implying the perception that there does not exist only one true recognition of the reality, but rather many competing recognitions that cannot be viewed as more true than others (Bryman, 2016). Further, the ontological position is constructionism where the social reality is viewed as continually accomplished by social actors, implying that social phenomena are not only produced by social interaction but in a constant state of revision (Bryman, 2016). Basing a study on interpretivist and

[1] RQ: *What is the state-of-the-art research on circular business model innovation, and what areas merit further exploration?*

constructivist positions is according to Bryman (2016) normally associated with qualitative research strategies, which also is the case in this thesis.

3.1.4 The relationship between theory and research

This study has an abductive approach to the relationship between theory and research as described by Dubois and Gadde (2002). The main characteristic of this approach is a continuous movement between an empirical world and a model world, implying that the framing of the research evolves during the study and that "the original framework is successively modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the process" (p.559). The authors further argue that the main objective of any research is to confront theory with the empirical world, and that through a 'systematic combining' based on abduction this confrontation is "more or less continuous throughout the research process" (Dubois & Gadde, 2002, p. 555).

Systematic combining can be described as a nonlinear, path-dependent process of combining efforts with the ultimate objective of matching theory and reality, as illustrated in Figure 3.3. 'Matching' is the act of going back and forth between framework, data sources, and analysis (Dubois & Gadde, 2002). Instead of following a standardized research process consisting of many planned subsequent phases, Dubois and Gadde (2002) argue that by going back and forth from one type of research activity to another and between empirical observations and theory, the researcher can expand her understanding of both theory and empirical phenomena.

The analytical framework is according to Dubois and Gadde (2002) of great importance in the systematic combining process. The preliminary analytical framework presented in 2.2.4 thus consists of articulated preconceptions. Over time, it is developed according to what is discovered through empirical fieldwork, as well as through analysis and interpretation. The result is a revised framework which is presented in section 5.2. Thus, the theoretical concepts are used to create a reference and as guidance when entering the empirical world (Dubois & Gadde, 2002).

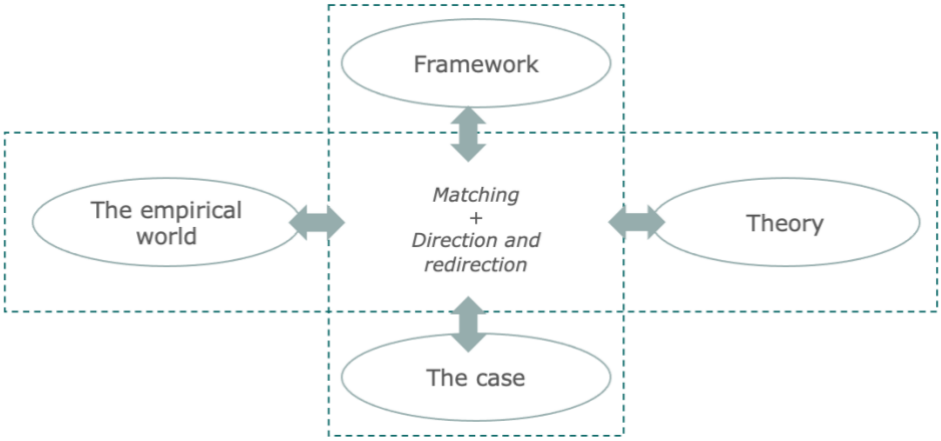

Figure 3.3: The basic elements of systematic combining. Adapted from *Systematic combining: An abductive approach to case research*, by Dubois and Gadde, 2002, Journal of Business Research (https://doi.org/10.1016/S0148-2963(00)00195-8)

According to Bryman (2016), the most regular approach in qualitative studies is an inductive one, where empirical observations and findings lead to the generation of theory. The opposite is a deductive approach, where the researcher draws upon what is known and relevant theoretical ideas in a particular domain to deduce a hypothesis that then is subjected to "empirical scrutiny" (Bryman, 2016, p. 21). However, scholars also suggest a

deductive approach can be used in qualitative research. For example, Yin (2012) reveals a preference for a deductive process in which the researcher begins with theoretical propositions. Hyde (2000) states that "a balance of induction and deduction is required in all research" (p.88).

According to Hyde (2000), extreme induction could deprive the researcher of useful theoretical perspectives and concepts which can help guide exploration of a phenomenon, while extreme deduction could preclude the researcher from the development of new theory. The systematic combining proposed by Dubois and Gadde (2002) argues for a stronger reliance on theory than is suggested by true induction. However, they stress that the abductive approach is to be seen as different from a mixture of deductive and inductive approaches. The authors explain that an abductive approach is fruitful if the researcher's objective is to discover new things — other variables and other relationships. Similar to "grounded theory", the main concern is related to the generation of new concepts and development of theoretical models, rather than confirmation of existing theory. However, in the abductive approach *theory development* is the focus, rather than generation. Systematic combining builds more on the refinement of existing theories rather than on inventing new ones. Moreover, a major difference compared with both deductive and inductive studies is the role of the framework which is central (Dubois & Gadde, 2002).

This study thus proceeds through an interplay of inductive and deductive processes, as suggested by Hyde (2000). As described in 3.4.1 the data analysis commences with an inductive phase before proceeding to a more deductive phase of theory testing and concept development. The process in this thesis might have a stronger reliance on deduction than the true abductive approach as described by Dubois and Gadde (2002). This is due to the choice of doing a multiple case study, as described in 3.2.2, and that all the data was gathered before the analysis, and not gathered along the way as advocated in the systematic combining process. However, one could argue that since all the case companies participate in networks in the same industry cluster, this constitutes a common frame around the cases which make them embedded subcases which Dubois and Gadde (2002) suggest can "strengthen the contribution to the total case" (p. 558).

3.2 Research design

According to Bryman (2016), a research design is a framework for the generation of evidence that is chosen to answer the research question(s). The choice of research design further guides the execution of a research method and the analysis of subsequent data (Bryman, 2016), as elaborated in sections 3.3 and 3.4.

3.2.1 Unit of analysis

The unit of analysis in this thesis is fashion or textile companies that collaborate with other companies in business networks focused on circular innovations. At the beginning of the research process, two alternatives for the unit of analysis were considered; the companies that participate in networks for CBMI or one specific network. Companies were chosen as the unit of analysis for two reasons; First, Yin (2012) suggests choosing the same unit of analysis as the existing literature to compare the findings with previous research. Therefore, as the majority of existing literature on CBMI uses companies as the unit of analysis, the same choice was made for this thesis. Second, by studying the entire network as one case, it would only be possible to figure out *how* they collaborate. However, by using the companies as units, it was possible to dig deeper into their strategic objectives and *why* they collaborate as well.

Yin (2012) argues that any finding or conclusion in a case study is likely to be more convincing and accurate if it is based on multiple sources of evidence following a similar convergence. Therefore, in addition to the companies, other resource persons within the field have been interviewed. These resource persons are the people working behind the scenes, facilitating the networks, and thus play an important role in the networks' existence. These interviewees will hereafter be referred to as 'facilitators', due to their position in the network. As the facilitators work with facilitating collaboration and networks for circular innovation, they were considered as providers of a more holistic perspective as to why and how collaborative circular innovation takes place. However, they are also likely to answer in a way that argues for their importance, as the networks are the basis of their professional existence. Therefore, the facilitators are not used as the main source of information, but instead supportive of the case company findings. The selection and sampling of cases are further described in 3.3.1.

3.2.2 Multiple case design

The research design in this thesis was chosen based on Yin's (2012) three conditions for when to choose each method: "(a) the type of the research question posed, (b) the extent of control the researcher has over actual behavioral events, and (c) the degree of focus on contemporary as opposed to historical events" (p. 9). The research question in this thesis has the form of a 'how and why'-question which according to Yin (2012) is more explanatory and "likely to lead to the use of a case study, history or experiment as the preferred research method" (p.10). Further, Yin (2012) argues that the choice between those three depends on the extent of control the researcher has over the events to be studied and whether the focus is on contemporary or historical events or both. In this study, none of the relevant behaviors can be manipulated, and it is both contemporary and historical events that need to be studied to answer the research question. When this is the case, Yin (2012) states that a case study design is the most appropriate.

A multiple case design was chosen over a single case design, as Yin (2012) states that evidence from a multiple case study is considered more compelling and robust than its single counterpart. Studying more cases will thus provide a deeper understanding of how and why companies collaborate for circular innovation and give a better basis for comparing them and the dynamics between them.

3.2.3 Anonymity

As treating cases anonymously is the standard thing to do in multiple case studies, it was decided to follow the same procedure in this thesis. Moreover, Yin (2012) recommends using anonymity when the study has a controversial topic, to protect the real case and its real participants. With the overall theme of coopetition, it was difficult to know in advance how controversial they would perceive the topic to be, and whether the questions would be directed towards themes they thought were sensitive. Therefore, the companies were told they would be treated anonymously when being invited to the study, as it was considered to lower the bar for joining the study. Additionally, the interviewees would perhaps feel that they could speak more freely when they knew they would be anonymous, as suggested by Bryman (2016). Besides, identifying the companies was not seen as relevant for the conclusion in this thesis.

The companies interviewed are referred to as Alpha, Beta, Gamma, Delta, and Epsilon. These pseudonyms were chosen instead of Company A, B, C, etc. to increase the readability and flow of the case company findings in Chapter 4. During some of the interviews, the case companies mentioned other brands or competitors, and since they

have not agreed or been asked to participate in the study it was considered fair to also treat them anonymously. Thus, when other brands are mentioned, they get nicknames (introduced when mentioned) as different colors, Red, Blue, Green etc. The facilitators are also treated partly anonymously, meaning they are mentioned by names in this chapter but will be referred to by pseudonyms (Facilitator 1,2,3..etc.) in the following. The order in which the facilitator's names are presented in Table 3.2 in section 3.3.2 does not coincide with the numbering of each facilitator. This approach is therefore partly anonymous, so that specific answers could not be traced back to their names. However, presenting them by name initially is found important to illustrate their background, role, and expertise, and their relevance for this thesis.

3.3 Research method

Bryman (2016) states that a research method describes the techniques used for collecting data, which in this case entails case selection and data collection through interviews.

3.3.1 Case selection

The sampling approach that is applied in this study is generic, fixed, a priori, and purposive. Bryman (2016) describes the 'generic purposive sampling' approach as a process where the researcher "establishes criteria concerning the kinds of cases needed to address the research questions, identifies appropriate cases, and then samples from those cases that have been identified" (p.413). Further, 'fixed' means that the sample of cases is more or less established at the outset of the research, while 'a priori' implies that the criteria for selecting cases are decided before the data collection begins (Bryman, 2016). Purposive sampling also means that the sampling is conducted with reference to the research questions so that the units of analysis are selected in terms of criteria that will allow the research question to be answered (Bryman, 2016).

This thesis focuses specifically on the textile and fashion industry, and therefore all the companies are naturally also within the given industry. Additionally, the cases had to meet the following criteria to answer the research question. The first criterion was that the company is engaged in a circular oriented innovation process as defined in 2.1.4, and has implemented or aim to implement one or more of the circular strategies explained in 2.1.2 (Figure 2.2). Since the circular development is still quite new and underdeveloped, it was not possible to demand that the companies had implemented a fully circular business model. The second criterion was that the company is actively seeking collaboration with others through networks to perform circular innovation activities. Since the research question is directed towards the investigation of collaboration, all the companies had to be connected to the same industry cluster – so that they were in comparable collaborations.

The criteria described above were selected as they directly addressed the research question. Since many of the networks consisted of a variation of actors, other criteria were necessary to narrow down the sample of companies and to be sure that the phenomena in focus would be observed. First, only commercial companies were selected, as these were assumed to have more competitive interests than e.g., non-profit, or interest organizations. Second, the companies had to be involved in the production of their products, not only a retailer. Third, the products offered by the companies had to be intended for consumers, so that they would have similar characteristics and commercial motivation. Lastly, the companies had to be Norwegian-based, with headquarters (HQ) in Norway.

Sampling process

The fashion industry was chosen since it seemed like a promising industry to investigate the concept of coopetition, due to its high competitive pressure and need for collaboration to proceed in the circular transition. The industry cluster in focus was chosen due to it being a part of the Norwegian Innovation Clusters program, which increased its credibility. Additionally, the cluster consisted of several networks, increasing the probability of identifying promising case companies.

Since one of the criteria was that the companies had to be connected to the same industry cluster, all the companies were found by looking at the cluster's member companies. First, the networks were chosen based on their ambition, goal, and type of activities so that they coincided with the circular strategies described in 2.1.2. This resulted in three selected networks, from which each of the member companies that met the selection criteria was contacted. Among the companies that answered, the companies were selected based on convenience meaning that they had relevant interviewees available in the time period of the study. For the interviewees to be relevant, they had to be directly engaged in the business networks or have sufficient information or involvement about them to answer based on their own opinions. The result was five different fashion or textile companies and five network facilitators willing to participate in the study. The final sample of case companies is presented in Table 3.1, while the case company and facilitator interviewees' roles, etc. are presented in section 3.3.2.

Table 3.1: Key information of the case companies, rounded to nearest appropriate whole numbers.

Company	Founded	Number of employees	Revenues [MNOK]	Product type
Alpha	1900s	200	500	Outdoor apparel and equipment
Beta	1930s	1700	1600	Interior design and textiles
Gamma	1900s	400	400	Used clothes and textiles
Delta	2000s	200*	1000*	Sport and outdoor apparel
Epsilon	1950/ 2010s**	2	4	Wool garments and blankets

*Numbers for the entire sports brands group Delta is a part of.

**The company has two brands, one that was established in the 1950s and one that was established in the 2010s.

According to Bryman (2016), one of the problems with qualitative research is that it is difficult to establish at the outset how many people that need to be interviewed before theoretical saturation is met. However, as a rule of thumb, it is suggested that "the broader the scope of a qualitative study and the more comparisons between groups in the sample that are required, the more interviews will need to be carried out" (Bryman, 2016, p. 416). Thus, five case companies supported by interviews by network facilitators were found sufficient as all the cases were from the same industry and network.

The selection of facilitator interviewees was also based on the selection of networks. Three of the facilitators are project leaders for the three networks in focus, and the two other interviewees are members of one of the networks, but also facilitators for the industry cluster as a whole.

3.3.2 Data collection

According to Yin (2012), one of the most important sources of case study evidence is the interview, which also is the case in this thesis. The main sources of evidence have been interviews with the case companies, supported by interviews with the network facilitators. Since Yin (2012) recommends relying on at least two or more pieces of evidence in a case study, documentary evidence such as publicly available information has also been used.

Semi-structured interviews

Semi-structured interviews were chosen as it coincided the best with the research design and strategy. Bryman (2016) argues that in a multiple case study it is necessary with some degree of structure to ensure cross-case comparability. On the other hand, some degree of flexibility in the data collection was desired due to the abductive approach. When conducting a semi-structured interview the researcher has a list of questions or fairly specific topics to be covered (the interview guide) and the interviewee has a great deal of leeway in how to reply. Further, the questions do not need to be asked exactly in the way outlined on the schedule, and questions that are not included in the guide may also be asked as the interviewer picks up on the interviewee's replies (Bryman, 2016).

Due to the Covid-19 situation, all interviews were performed digitally over the video conferencing software Zoom. Table 3.2 presents an overview of all the interviews that were held with the case companies. The selected interviewees were those who were personally involved in the business networks and involved in the decision-making regarding circular innovations. Except for two companies (Gamma and Epsilon), two people were interviewed at each company. Due to time constraints, these interviews were not conducted separately with each person. Originally, it was desirable to conduct these interviews separately so that they could be treated as different sources of information and thus serve as a source of data triangulation as suggested by Yin (2012). However, it was considered more valuable to interview two people in one interview compared to only interviewing one person, since the interviewees might have different insights to share. Another important consideration regarding the choice of interviewees was selecting people with personal experience from work in networks, as explained in 3.3.1. Therefore, it was not relevant to interview other people at Epsilon (not that many employees) and Gamma (only one person involved in networks).

As Bryman (2016) recommends, and with approval from the interviewees, all interviews were recorded and subsequently transcribed. Recording made it possible for the interviewers to concentrate on what was being said and able to follow up on interesting points made instead of concentrating on making notes. Transcribing the interviews also enabled a more structured form of analysis, as described in section 3.4. In total, 10 interviews – each lasting between 33 and 82 minutes were conducted (Table 3.2 and 3.3), which constitutes approximately 10 hours of interview data and 79 170 words transcribed. The transcribed interviews were stored in the case study database as explained in 3.5.4. To preserve the anonymity of the companies and ensure safe storage of data, the transcripts were not linked to the company name. Instead, the pseudonyms explained in 3.2.3 were used.

Table 3.2: Overview of case company interviews.

Company	Interviewee	Position	Date	Duration [min]	Words transcribed
Alpha	1	CFO	11.03.2021	33	3538
	2	Sustainability manager	16.03.2021	72	10866
Beta	1	Sustainability manager	23.02.2021	70	9455
	2	Quality manager			
Gamma	1	Sustainability manager	23.02.2021	82	9903
Delta	1	Brand manager	26.03.2021	53	9183
	2	Product developer			
Epsilon	1	CEO	09.04.2021	72	9120
Total				382	52 065

Table 3.3: Overview of 'facilitator' interviews.

Company	Facilitator	Position	Date	Duration [min]	Words transcribed
NF&TA	Gisle Marani Mardal	Innovation manager	08.03.2021	48	5769
NF&TA	Linda Refvik	CEO	17.03.2021	55	6153
Reform projects / NF&TA	Elin Carlsen	Consultant, project leader	11.03.2021	51	5999
Virke	Tord Dale	Sustainability manager	25.03.2021	62	9183
	Marit Hagehaugen Evensen	Chief adviser retail	25.03.2021		
Total				216	27 104

Preparing the interview guide

The interview guide for the case companies (Appendix 1) consists of 18 questions with sub-questions, revolving around the initial theoretical framework in 2.2.4. The interview guide was constructed based on Bryman's (2016) guidelines that suggest a series of steps in formulating questions in qualitative research. This entailed selecting a couple of areas that needed to be covered to be able to answer the research questions and then formulate

questions that covered these areas from the perspective of the interviewees. The guide was thus constructed through several iterations to ensure the questions would cover the necessary range. Furthermore, most of the questions were open-ended to avoid leading the interviewees. Additionally, adjustments were made before each interview according to the company in focus. This was done because people had different positions in the companies, and the companies had different product types. Moreover, as some companies had more publicly available information than others, this kind of research done in advance helped to avoid spending unnecessary time on these types of questions to gain information that was possible to gather elsewhere. Moreover, the interview guide changed along the data collection process, as it became clear that some questions were better than others, and that there was not enough time to ask all questions. The systematic combining process allowed focusing on different parts of the interview guide according to what areas were most interesting to investigate at the given case company or facilitator.

The interviews with the facilitators were based on the same interview guide as for the case companies. Therefore, the questions were the same as for the companies, only with a different wording such as: "what do you think the companies think of …", to gain a more holistic and general impression of why and how the collaborative circular innovation took place.

Documentary information

Yin (2012) argues that documentary information is a stable, unobtrusive, and exact source of evidence with broad coverage. The documentary information used in this study was mainly publicly available information about the companies' found at their respective websites, sustainability reports, www.proff.no, and news articles.

The documentary information was used to prepare for the interviews and write up the case descriptions. This information was gathered in advance of the interviews to avoid asking basic questions about the company or the collaboration that could be found through publicly available information. This allowed for more effective use of time with the interviewee. Further, it was also used to verify the collected data.

Limitations with data collection and extraordinary circumstances due to Covid-19

The Covid-19 pandemic has sent a shockwave through the world, and the retail industry has experienced particularly adverse consequences as a result of social distancing and societal restrictions. With national restrictions and lockdowns, many of the fashion and textile companies have been forced to close their shops. Additionally, a large share of the companies has been struggling with closed factories abroad leading to delays in next season's production. To survive with continuously running costs, many of the managers have been busy "putting out fires" and dealing with closed shops and layoffs. Therefore, the share of employees that were not laid off has had much more work to do and less time to complete it.

These circumstances therefore affected the data collection in the following manners. First, many of the companies that were asked to join the study had enough with themselves and did not find the time to join interviews. Second, several companies had also taken a break from the network as they did not have resources available for innovation activities at the time. A final and more drastic result of the pandemic is that some of the companies that used to participate in the networks had experienced bankruptcies. Therefore, at the time of the data collection, there were fewer people and companies active in the networks than initially assumed. A benefit, however, was that all the interviews were performed digitally

over Zoom which saved a lot of travel time, and made it easier to be flexible in the arrangement of these meetings if the interviewees were busy.

3.4 Data analysis

This section presents an overview of how the data analysis was performed. According to Bryman (2016), there are no clear-cut rules about how qualitative data analysis should be carried out. However, Yin (2012) suggests that the ultimate goal of the analysis is "to treat the evidence fairly, to produce compelling analytic conclusions, and to rule out alternative interpretations" (p. 132). Further, Yin (2012) suggests applying both a general strategy for analysis and specific analytic techniques according to the general one. As explained in 3.1.4, the general strategy in the thesis follows an abductive approach based on systematic combining. The general analysis thus relies on a theoretically derived framework. Since Dubois and Gadde (2014) argue that in such analyses, the framework could sometimes be too "tight and prescriptive" (p.1229), the first analytic steps were inductive. Being only one person doing this analysis, the inductive first steps was also a measure taken to avoid research confirmation bias and "jumping to conclusions" (p.196) as suggested by Tjora (2017).

3.4.1 Analytic steps and process

According to Yin (2012), who favors applying deductive logic in case research, one of the most desirable techniques for case study analysis is to use a pattern matching logic. Such a logic "compares an empirically based pattern – that is, one based on the findings from your case study – with a predicted one made before you collected your data" (p.143). If the predicted and empirical patterns appear to be similar, the results can help a case study to strengthen its internal validity. In the systematic combining process, the 'matching' of empirical findings and theory is a kind of pattern matching. The difference is however that the empirical data are first coded inductively and then compared to the theoretically deduced framework, not sorted into predefined constructs based on propositions. Therefore, no constructs were made beforehand, and the data were instead coded in an "empirical close" (p.197) manner as suggested by Tjora (2017). The analytic process is illustrated in Figure 3.4.

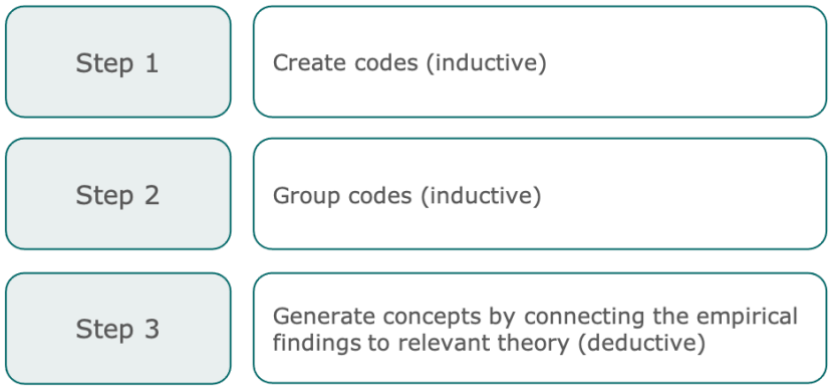

Figure 3.4: The steps conducted in the analytic process.

Therefore, the first step was to code the transcribed interviews. Since the focus in this step was to create "empirical close" codes, there was no restriction on the number of codes made. Tjora (2017) defines empirical close codes as codes that are "very close to the empirical data, and often use concepts that already exist in the data material, so-called 'native concepts'" (p.197). Thus, the point is to create codes that are close to the original statements and often include specific words or phrases said by the interviewees. Empirical

close codes make it easier for another researcher to interpret the findings (codes) without reading the actual interviews (Tjora, 2017). New codes were thus created when needed, but when multiple statements contained largely the same message, these statements were put into the same code. As suggested by Bryman (2016) two steps were performed to create the codes. First, the transcribed interviews were read on paper, and potential codes were noted on the margins while reading. Then, the coding process was finalized by registering the codes in NVivo, a computer-assisted qualitative data analysis (CAQDAS) program (Bryman, 2016). The main arguments for using NVivo were the opportunity for easy and fast management of big amounts of data, as well as the opportunity for enhancing the transparency of the analysis process, as it is recommended by Bryman (2016).

The second step in the process was grouping the initial codes. This step was also done in inductively, and consisted of grouping codes that had a common thematic consistency as suggested by Tjora (2017). Moreover, the codes that were considered irrelevant for the subject of study were separated into a residual group. The main code groups that appeared are shown in Appendix 2. This step thus enabled the exclusion of a larger number of codes that were not relevant for the direction of the study (Tjora, 2017). The parts of the data material that were coded as parts of the main categories and themes were used to write the case findings presented in section 4.1.

After the case findings were written, the third step of the process was revisiting the theoretical framework, comparing the inductively derived group of codes with the theory to develop concepts. Thus, the cases were analyzed on a cross-case level along with the theory. Tjora (2017) suggests that the development of concepts entails looking at the code groups or main themes from the previous step, and with relevant theories and perspectives in mind ask "what is this all about?" (p.211). In reality, this step entailed moving more 'back and forth' between theory and research as the systematic combining process suggests (Dubois & Gadde, 2014). The cross-case findings were used to answer the research questions and propose a revised framework, which is discussed in Chapter 5.

3.5 Quality of study

According to Yin (2012), construct validity, internal validity, external validity, and reliability are four tests that have been commonly used to assess the quality of case study research. In the following subsections, the quality of the chosen research design is assessed according to these tests.

3.5.1 Construct validity

Construct validity involves identifying the correct operational measures for the concepts being studied. The measure thus refers to the extent to which the research investigates what it claims to investigate, and if the research strategy leads to a precise and correct observation of reality (Yin, 2012). To increase the construct validity, Yin (2012) suggests defining the study in terms of specific concepts. In this study, the collaboration between companies will be studied in the light of coopetition, meaning that the why part of the research question looks for the companies' strategic objectives for collaboration, and the how part looks for how the competitive mechanisms between the companies play out in the choice of activities, resources, and actors. Thus, the theoretical framework presented in 2.2.4 is used to specify the concepts.

Another tactic that was used to increase the construct validity was using multiple sources of evidence, as Yin (2012) states that "any case study finding or conclusion is likely to be more convincing and accurate if it is based on multiple sources of evidence following a

similar convergence" (p. 120). Also Bryman (2016) advocates 'triangulation', which entails using "more than one method or source of data in the study" (p.412). In this study, a variety of sources have been used to minimize the subjectivity in the evidence, as explained in 3.3.2. However, the fact that some of the interviews were performed with two interviewees from the same company instead of individually reduces the construct validity as they are more likely to agree when they answer together.

When conducting semi-structured interviews, there is also a risk that the interviewer and the interviewee do not have the same understanding of the discussed concepts, and that the interviewer interprets the information differently than what is intended by the interviewee. In that case, the construct validity of the study is reduced. Therefore, the use of ambiguous terms and long questions that could be interpreted in different ways was avoided to reduce this risk, as suggested by Bryman (2016). Moreover, the interviews were conducted and transcribed in Norwegian to avoid misunderstandings, since that was the first language of all the participants for the interviews. However, in the process of translating the transcripts from Norwegian to English, some of the meanings might have been lost in translation as many sayings could not be directly translated. To avoid that, all the data material was coded in Norwegian, and only the direct statements used in this thesis were translated to maintain a precise analysis and rendering of what was said.

3.5.2 Internal validity

Yin (2012) defines ensuring internal validity as "seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships" (p.46). It can thus be understood as the concern of whether there is a correspondence between the researcher's observation and the theoretical ideas they develop (Bryman, 2016). According to Yin (2012), internal validity is mainly a concern in studies that are trying to explain how and why one event led to another. The concern over internal validity in case study research thus extends to the broader problem of making interferences, which can make it difficult to identify tactics for achieving internal validity when doing case study research (Yin, 2012).

The most evident causal relationship in this thesis is the one between the competitive mechanisms and the collaborative behavior that occurs in the networks. For example, is it the competitive mechanisms that actually influence how the actors behave in the network or do the concepts merely fit the observed behavior by chance? To increase the internal validity, Yin (2012) suggests using a pattern matching logic in the data analysis. Thus, if patterns coincide the internal validity is strengthened. In this thesis, an important part of the systematic combining process is the matching of empirical findings and theory. Therefore, the last step in the analytic process follows a pattern matching logic, as described in 3.4.1. As this study sought to not only figure out how but also why companies collaborate through analyzing the interplay between competitive mechanisms and collaborative behavior, this study seeks a more thorough description of how the findings and theory relate. This is also recommended by Yin (2012) to increase the internal validity. Another risk that would have affected the internal validity is leading the interviews (Bryman, 2016). To avoid that, most questions were open-ended as elaborated in 3.3.2 and evident in Appendix 1.

3.5.3 External validity

According to Yin (2012) external validity is the "problem of knowing whether a study's findings are generalizable beyond the immediate study" (p. 48). Thus, discussing the external validity of the study entails defining the domain to which a study's findings can

be generalized. In general, the findings from a case study cannot be generalized to a whole population (statistical generalization), because the cases are too small in number to serve as an adequately sized, representative sample (Yin, 2012). However, case studies allow shedding empirical light on some theoretical concepts or principles. Thus, it could present the opportunity for generalizations to theory (analytical generalization), which also increases when more cases are explored, as in this multiple case study. As discussed in 3.3.1., it is difficult to know in advance what sample size is the most appropriate for the study. According to Bryman (2016), external validity always represents a problem in case studies, due to "small samples which are difficult to generalize outside that specific setting" (p.399).

Even though a multiple case design lays the foundation for analytical generalization (Yin, 2012), the sample of the companies may limit the external validity in this study for two reasons. First, the sample of companies in this thesis is restricted to merely fashion and textile companies. Since this industry has its specific problems related to the CE and many companies operating in the same market, it might be difficult to generalize the findings outside the industry. Second, as many of the cases were chosen out of convenience and their availability, the case companies might not be similar enough to apply a replication logic, as suggested by Yin (2012). However, since the companies are different in terms of e.g., company size, production process, and products, it might increase the opportunity for analytical generalization as the study can investigate whether different companies think and behave differently in the network.

3.5.4 Reliability

According to Bryman (2016), the objective of reliability is to be sure that, if a later researcher follows the same procedures as described by an earlier researcher and conducts the same case study over again, the later researcher would arrive at the same findings and conclusions. The goal of reliability is thus to minimize the errors and biases in a study. To achieve this, the research process should be "conducted as if someone were looking over your shoulder" (Yin, 2012, p. 49), and thoroughly documented, as attempted in this thesis. Since reliability entails being able to arrive at the same result by doing the *same* case over again, it is limited by the fact that the cases in this thesis were made anonymously, which entails that an external researcher cannot replicate the same study without clarifying it with the research group. Moreover, Dubois and Gadde (2014) mention that obtaining the same results again is not truly possible, since the world is constantly changing and so are the cases. Bryman (2016) states that it is almost impossible to conduct a true replication in qualitative studies, as "the investigator is the main instrument of data collection so that what is observed and heard and also what is the focus of the data collection are very much products of his or her preferences" (p.398).

Nonetheless, the steps of the research process have been well documented, and the three strategies suggested by Yin (2012) have been followed to improve the reliability; creating a case study database, creating a case study protocol, and conducting the analysis process in a CAQDAS-software.

First, the case study database was created during the initial phase of the research process, as recommended by Yin (2012). The database is stored electronically and contains the case study protocol with notes made during the research process, all information about the cases, interview guides, plans for the data collection, and all the transcribed material. The audio files were however kept locally stored as a privacy measure for the interviewees. Other members of the science group (scientific staff at IØT) were also granted access to

the database so that they could use the material for further research, and follow up on the process.

Second, the case study protocol was also created at an early stage, as recommended by Yin (2012). This measure was taken to ensure that all decisions taken were documented, to ensure high quality in the data collection and analysis, and to make replication of the study possible given necessary consents from the interviewees. It also helped to avoid individual research and confirmation bias, as it contained the research objectives and gave an overview of the process. The protocol also includes tentative research questions, information about the case companies and facilitators, and a tentative outline for the thesis. However, some of the content, such as the research question, interview guide and outline of the thesis has changed during the process.

The last measure to ensure a reliable research process was conducting the analysis in NVivo. NVivo allowed for information storage of the codes and code groups created, and relationships between the different code groups and data segments. Furthermore, the whole project is saved within one file, which makes it easier for other researchers with valid access to assess the data.

4 Empirical findings

In this chapter, the empirical findings from the research are presented. Since the data was collected from different types of network actors, it is presented separately. In section 4.1, the case company findings are presented, while in section 4.2 the findings from the interviews with the network facilitators are presented. Finally, section 4.3 assesses the findings on a cross-case basis, structured around the initial framework presented in 2.2.4. All quotes from interviewees are marked with quotation marks and italic writing, "*like this*".

4.1 Case company findings

The case company findings are presented in turn for each company, and structured around the main categories and themes identified during analysis as described in 3.4. The amount of data related to each element varies between the cases since the interviewees in each company emphasized different topics. Moreover, interviewees are not distinguished in the same company unless directly quoted, as their answers mostly coincided.

4.1.1 Company Alpha

Alpha was founded in the late 1900s and has long traditions of providing the Norwegian people with outdoor apparel and equipment. It has approximately 200 employees in total and yearly revenue of approximately 500 MNOK. The company designs and produces its clothing and equipment in partnership with over 30 factories worldwide, while its headquarter (HQ) is in eastern Norway. The products are mainly sold through large retailers, such as XXL, Intersport, etc., but the company has also opened a flagship store in Oslo and an online store where it sells products directly to consumers.

Alpha has since its beginning focused on certain circular initiatives by offering product repairs and focusing on extending the lifetime of the product. The company thus has a sewing room with 6-7 employees working full time on repairs. Recently, Alpha has increased its focus on circular initiatives and pronounced a long-term goal of integrating sustainability into every stage of its business. To accomplish this, Alpha is currently exploring circular business models by selling used clothing and equipment in its flagship store, in addition to experimenting with rental models for children's park suits. Alpha is visible in the field of sustainability within the market and participates in most of the relevant networks found today. By the other interviewees, Alpha is mentioned as one of the most advanced players in adopting circular principles.

View on circular oriented innovation

Alpha is highly focused on the burden their industry puts on the environment and has therefore invested considerable amounts on R&D and exploration of new innovative (circular) business models. The CFO admits that they would have made much more money by just continuing as usual, but argues that these investments should be seen in a longer time perspective. For Alpha, the entire sustainability effort is embedded in the company. Since it sells apparel and equipment for outdoor use, being concerned with taking care of nature is fundamental: "*If the winter disappears due to climate change or hiking trails disappear due to littering, Alpha and many other companies lose the ability to make a living*" (Interviewee 1). The company therefore strives to always do better, and not settling for "good enough". In addition to exploring new business models such as sales of used

clothing and rental models, Alpha also looks for new solutions for how materials and fibers could be recycled again after the products end-of-life in order to close the loop.

Alpha states that their innovation projects rarely are very thoroughly analyzed and planned. Instead, the company pursues new opportunities when they appear, and "*if it does not work, try something else. If it works, we continue"* (Interviewee 1). Thus, Alpha follows a "*trial and error*" (Interviewee 1) approach when it comes to innovation.

In the long run, Alpha believes that these explorative projects will become real business models for the company and that the company will gain an advantage through being in the customer's front of mind. The CFO explains that in the price range of Alpha's products, rental will be profitable if the products are circulated enough e.g. if a jacket is rented enough times. Therefore, the company believes that rental models in particular could be profitable in the foreseeable future, which is why this model is initially tested out on smaller scales. Alpha also regards used sales as a promising area and has observed rising interest in this area from customers. Adopting circular principles can also be a source of competitive advantage for Alpha by making them more attractive to new customer segments. The sustainability manager explained that since their products are quite expensive, rental models could make the products accessible for people that normally cannot afford them, or only use outdoor equipment a couple of times per year. The company's experience with offering repairs is also that it gives them an advantage: "*It is very clear that when we offer repair and have performed a good repair on a certain product, the customer is happy to come back to us later*" (Interviewee 1).

However, the company also remarks that something must happen with laws and regulations for circular business models to be truly profitable. Today, the system of taxes and customs is not suitable for a circular economy, and as an early mover, Alpha has felt the disadvantages of the system. An example that illustrates the issue well in Alpha's case is the rental of children's park suits. Due to the customs, it is not economically feasible to expand across borders, because custom tolls are charged every time the product passes the border, even if the product has already been paid for the first time:

> *"Today we bring goods in and out of customs, back and forth. We sell a product, we pay customs. If we are going to repair it for the customer, we pay customs again. So, it is not arranged in a way that we can ever break even." (Interviewee 2)*

Additionally, Alpha states the customers must be willing to pay more. Both for rental models and products with better quality and extended lifetime. The "ease of rental" for the customer leads to extra costs for the company due to the logistics and handling it entails. Moreover, the CFO stated that "*making products with better quality is more expensive because the product must be designed so that it could be repaired, and the materials have to be stronger*" (interviewee 2).

Motivation to seek collaboration

Alpha is involved in many different networks and states that they are very eager to collaborate with other companies. The sustainability manager mentioned that the social aspect in these networks is often central because people in the same position across different organizations tend to be alone in having this responsibility in their company. Therefore, they seek networks to have a sense of unity and having cross-organizational colleagues. Moreover, since working with sustainability often involves complex and difficult questions it is nice to have a community in which to discuss these questions. The network

also offers a "*slightly safer arena to talk about common challenges (…), it is easier when you are already in there to ask questions and discuss somewhat difficult issues*" (Interviewee 1). Another issue that was pointed out is that the work environment of sustainability managers within retail is a relatively small world. Often, many of the different sustainability managers have been working in other companies in the network. Therefore, the people in the network are often the same, because they "*continue in the network when they change jobs*" (Interviewee 1).

Alpha's next argument to collaborate was that everyone in the textile industry has a common responsibility to save their future living, as "*the challenges ahead are too demanding for companies to solve them on their own*" (Interviewee 1). Therefore, collaboration is seen as a necessity to succeed with the transition. It is about finding "*common solutions to common problems*" (Interviewee 2). The sustainability manager mentioned that it does not help achieving the SDGs if they were the only company doing it, it requires participation and involvement from everyone.

Alpha mentions that they also have more strategic reasons for seeking collaboration. First, getting increased attention about doing something sustainable, which was also one of the main reasons for joining the network in the first place. Second, to influence the consumers together in order to make circular business models more feasible and thus more profitable for the company, because the market is not mature enough yet. As the CFO mentioned, the customer must be willing to pay more for better quality and be more open to rental and repair models instead of always buying new products. This entails marketing campaigns that enlighten the consumer on the topic of sustainable consumption and sustainable choices. Alpha stated that it will have a greater effect the more companies that join the campaigns. Third, collaboration can provide a more comfortable situation for each company with regards to risk-taking and resource spending. Alpha's sustainability manager said that most of the innovative work is on the side of everything else they must do on a day-to-day basis. Therefore, in the networks, they get to focus on things they would not otherwise have the time or resources to focus on alone. Not only is it less work for each person when collaborating, but things are also done faster and with fewer errors, which is beneficial for both the environment and the time and energy spent on a project for each company. It is also about avoiding work being done twice, because:

> *"We see that we are doing many of the same things, so there is much double work being done (…). Everyone benefits from building a joint system where we collaborate on these things instead". (Interviewee 1)*

Because it is beneficial if many companies change at the same time, another strategic reason for Alpha to join networks was to get others aboard. The sustainability manager said that they actively try to influence others by showing what Alpha is doing, and ask others "*can't you do that too*?" (Interviewee 1). The CFO also agreed that Alpha benefits from including those who are lagging a bit behind. Alpha believes that by finding common circular solutions, synergies and economies of scale may be achieved e.g., within the costs of handling and logistics these services require. One of the most important reasons, however, is pricing and the competitive picture:

> *"I think everyone benefits from working together. Because if you have an actor who is not concerned about sustainability and only operates on price... the consumer might be very tempted. But if the consumers in a way become forced to choose sustainable by not giving them options,*

then everyone understands that they have to pay a little more for that." (Interviewee 2)

Deciding which activities to collaborate on

Alpha admits that they base the activities they are working on in the networks on how far the other companies have come in the development. Therefore, the activities are driven by needs that the companies have at the moment. Today, there is much work being done on competence development within the network, because dealing with the CE is new to most of the companies. The competence work includes both arranging courses together on topics the members wish to learn more about, but also sharing of experiences. The next step is to map the opportunities within circular business models together. "*We do not have that much collaboration on innovation activities, because not that many companies are 'there' yet*" (Interviewee 1). Another issue that affects all the network members is the new initiatives coming from the EU. Therefore, Alpha states that they need the network so that groups can be working on what the regulations will mean for the Norwegian companies, and potentially "*be in front of the regulations to know what we want, and then influence the politicians (to our benefit)"* (Interviewee 1).

For Alpha, it is more common to collaborate in activities located higher up the value chain. The company describes it as two different types of collaboration. The first one is a collaboration between the manufacturer and wholesaler, which is "*a very central issue, (…) because they are completely dependent on each other to succeed*" (Interviewee 2). Another way of collaborating which, according to Alpha, has become more usual with the emergence of networks, is horizontal collaboration with other retailers. This entails sourcing common demands to the same specific factories or producers to get a more sustainable production and value chain. Another central activity that was important for Alpha to collaborate on was building common systems, KPIs, and standards. Standards are important so that the companies don't "*run in separate directions, but agree on which areas to focus on first*" (Interviewee 1). The standards also help Alpha and the other companies to work with improvements instead of being occupied with operational work.

One of the networks that Alpha currently participates in is different from the ones in which they usually collaborate. In this network, the main focus is influencing the consumers by having a joint marketing campaign. This collaboration has however been going on for many years and began with just an activity day where the different companies gathered. After which the companies thought "*this was fun, to stand together like this (…). And not as scary as we initially thought. (…) We should do it again*" (Interviewee 1). Therefore, the collaborative activities are further down the value chain than they usually do, but it has turned out as a positive thing for Alpha. Lastly, the sustainability manager mentioned that the networks often function as a springboard for other collaborations and side projects. For example, Alpha was invited to join an R&D project with another large outdoor brand (from now on Blue) to explore new sustainable materials.

Competitive mechanisms within the network

Alpha is restrictive when it comes to sharing information about product development, for example, new styles or products that are coming in a year or two. Alpha is especially cautious when similar companies are in the network: "*for example, Blue is in the network, and we have a good connection and everything… it is not about that. But this is one of the things we have to be careful with*" (Interviewee 1). However, when it comes to sustainability the company is as open as possible because they have "*everything to gain*" (Interviewee 1) on it, as the motivations to seek collaboration clarified. Alpha

acknowledges that they collaborate with many of their closest competitors, but emphasizes that the Scandinavian brands have to stand together in competition against the big international brands and companies. "*We often hear, 'yeah, Scandinavian brands, they are really good!', and in that way, we get a collective advantage and sales boost*" (Interviewee 1). It is also important for Alpha that the brands stay together to negotiate with the big warehouses to keep their prices at an acceptable level. Similarly, the market entry of Amazon is also something that the Scandinavian brands have discussed and wish to have a united front on to maintain their market position.

Alpha regards sustainability as an important area for collaboration and is therefore open on all their achievements to the network. Nonetheless, the company is proud to be one of the first:

> *"Yes, we want to be first. Not necessarily the best, but be able to lead. (…) We have come a long way on the circular economy, and are perhaps a little further ahead of many others." (Interviewee 1)*

Alpha can list several reasons why it is an advantage to be one of the first-movers on circularity. The company has built a story and its brand around sustainability, and has experienced that the customers "*like brands that have these things in place and stand for something*" (Interviewee 1). Alpha is confident that this is a growing trend, as the younger population is much more concerned with sustainability, and that the producers that are not yet concerned with sustainability "*are going to lose ground*" (Interviewee 2). Another advantage of being a first-mover is the competence that Alpha has built along with the development of new sustainable solutions. Since competence is built over time, the company has the opportunity to stay ahead:

> *"We have a fantastic lab where we test our products, and we have a sewing room that works very well. So, it will be challenging to catch up with us, then we have to stop now or the competitor has to put in an insane amount of money to get to the same level. (…) So, we are not that afraid to share what we do, simply because the expertise we have provides an enormous advantage." (Interviewee 2)*

Alpha must admit that even though they tend to say "*sustainability is not a competition*" (Interviewee 1), there still is a bit of competition in it. However, the company sees competition as something advantageous because it is a necessary driving force for improvement. The sustainability manager mentions another large outdoor brand's (from now on 'Red') new web solution as an example: "*I looked at Red's page and it was much nicer than ours, so I thought that we should do something too. (…) We keep an eye on the others to get inspired*" (Interviewee 1). Therefore, Alpha does not fear competition but hopes the companies that strive for sustainable improvements are those who survive in the end.

When asked about the future development of collaboration on sustainability, Alpha believes many companies will keep more secrets when they have managed to overcome the challenges they face today, and commercialize the new sustainable solutions:

> *"When everyone is on a certain level...When the products are sustainable, and your business models are profitable. Since the margins in this industry are very tight, volume counts. So, if everyone manages to commercialize this business then there will be more competition." (Interviewee 2)*

4.1.2 Company Beta

Founded in the 1930s, Beta has risen to become a leading textile- and interior design chain, with more than 140 wholly-owned stores across the country, as well as an online store. The company has approximately 1700 employees, and the HQ is located in eastern Norway. Beta has a healthy financial statement, and a solid market position with total revenue of approximately 1.6 billion NOK, and a positive trend in the past years. Additionally, Beta owns a sister company with approximately 140 stores in Sweden, Finland, and Estonia.

The product range offered by Beta varies from curtains and bedding to decorative items and accessories for the home. The products are sold to both the B2C and B2B-market. A few of the products are designed in-house, such as beddings, but most of the decorative items are bought from wholesalers at international interior design fairs. Therefore, having an overview of the value chain and all the different production processes is complex. Recently, Beta has noticed increased traction on sustainability issues and awareness and has developed its business thereafter. Thus far, the sustainability work has mostly been focused on attaining standards and certificates on their products to ensure the right quality from suppliers while also making the company's efforts visible to the consumers. Beta has partnered up with a clothing collector to let customers deliver used textiles in the shops, while the clothing collector ensures reuse or downcycling of the textiles. Beta has previously been selective of which networks to join but has joined more networks in the past years along with the company's increased focus on sustainability.

View on circular oriented innovation

Until just recently, most of Beta's sustainable innovations have been related to reducing greenhouse gas emissions. The company's innovation process is often a result of external inspiration. During the interviews, Beta mentioned several times that the company has a cost-versus-benefit oriented perspective on sustainable innovation and circular economy. Therefore, the company investigates potential measures along with the cost and potential sustainability outcome to understand which ones ought to be focused on. Beta's strategy is to offer high-quality products at affordable prices, and in this segment "*price is an issue*" (Interviewee 1). Therefore, the company does not wish to spend too many resources on innovation, and it does not have a goal of being the first-mover:

> *"Our goal is not to be the first, but rather very close to the first ones. Then someone else can go forth and do something about the price picture before we start pushing. We accept slightly higher costs in our product range, but we are not an organization that drives sustainability work forward. We can support and use it when it begins to become widely available." (Interviewee 1)*

Beta's motivation to become more sustainable, while also looking towards circular business models is that the company has observed market trends and increasing expectations from the consumers. Not in the way that it has become an external pressure, because "*it works perfectly fine to just push unsustainable products out on the market to earn money*" (Interviewee 1). Rather, they observe an increasing consumer awareness, which Beta believes will continue to grow. Therefore, Beta sees this as an opportunity to be more attractive in the future and the first choice for the consumer: "*We want the customer to have a 'one-stop shop' for a clear conscience, where they know we offer the best possible product within the given price category*" (Interviewee 1). Moreover, the new taxonomy and pressure from shareholders have increased the focus on sustainability within the entire organization. "*The financial market trumps the customer, in a way... but it's clear that*

without the customers you will not be able to deliver to the shareholders, so it is interrelated" (Interviewee 1). The sustainability manager also acknowledges that such changes take time, which is why Beta has to start now to be an included player in the future. All the sustainability changes performed by the company until today have taken five years to accomplish. The company does not necessarily believe that it will take five years in the future, but that it illustrates the time perspective of these issues.

Beta acknowledges certain advantages with adopting circular business models. For example, the development of extra services and rental as potentially convenient solutions to expand their market. Furthermore, the company has a lot of raw material that is not recycled today because it costs more than using virgin material. If the waste from old products could become more valuable it would certainly be beneficial for Beta, as they would save both virgin material use and material costs. In the longer term, the company imagines that if most companies adopt circular business models it could stabilize raw material prices due to more stable demand. However, for the time being, Beta sees more challenges with circular innovation than opportunities. The company wishes to find solutions for how the products it brings to the market could be reused, but points to the many technical challenges of actually doing it, and getting it to scale. "*The solutions available are not available for a mass-market*" (Interviewee 1). One of the greatest challenges is the profitability of circular business models since the company does not see them as commercial enough yet:

> "*We have not found any real options yet. Some companies are doing it, but they have a lot of money and it is not really profitable for them either. For us, there has to be a cost-benefit value*." (Interviewee 1)

Another challenge with using recycled materials is the traceability of the products. The question is therefore whether Beta can be sure that the material it buys is recycled. The quality manager said that it is easier to control the flow of chemicals when you know exactly where the raw material comes from, which is why they often end up using virgin materials. Beta emphasizes the need for technology development to get further, but does not see it as their responsibility to do something about it. The company is rather "*arranging to be ready when it happens*" (Interviewee 1). Additionally, Beta does not think the market is quite ready for all types of circular business models. The sustainability manager said that many consumers need to "*mentally change*" (Interviewee 1) before rental and reuse models are possible in the mass market: "*Since we have an affluent population, many consumers buy new products because they can, and do not choose rental because they think that 'I am not poor' or 'my child deserves better'*" (Interviewee 1). Moreover, implementing circular business models would entail a lot of extra handling and logistics costs for Beta, which again raises the profitability question. "*Perhaps the customers have to be willing to pay extra to avoid all the handling themselves*" (Interviewee 1).

Motivation to seek collaboration

Regarding sustainability and circular innovations, Beta came to a point where they asked themselves "*how on earth are we going to solve these problems?"* (Interviewee 1). The company realized that collaboration was necessary to come further, and that all the companies in the textile industry have a common responsibility and desire to make a change. It is therefore of great value to have a platform to discuss common problems and find new solutions. The company has found it easier to clarify the challenges ahead and make prioritizations for the next steps together with other companies. Beta has actively used the network for input before they implement changes, to learn from other's

experiences and get insights about potential pitfalls. The quality manager said that it is a quite small group working within the area in the industry, and therefore, it feels like having "*industry colleagues*" (Interviewee 2) in the network. Beta also argued that it is important to be together in these challenges in a wider perspective, as one cannot achieve the SDGs if only a single actor makes changes to become more sustainable. Moreover, "*the business network that makes us progress faster than if everyone was just pondering on their own*" (Interviewee 2).

Beta has a cost-versus-benefit perspective also when it comes to networks, and which networks to join. Therefore, the company has several strategic reasons for participating in networks. First, joining the network was seen as an excellent opportunity to get attention for their sustainability work. Second, the companies Beta likes to compare themselves with were in the network, so "*it was nice for us to be mentioned along with them*" (Interviewee 1). Third, Beta is one of the few interior textiles companies in Norway, and it was therefore also important to be represented and show that "*interior is also a part of the textile industry*" (Interviewee 1). Since many of the previous conversations only involved clothes, Beta needed to ensure that the proposed solutions also were suitable for interior textiles, and not forgotten.

Beta says that networking in itself is about gathering inspiration and finding new opportunities. If Beta is considering a new sustainability measure, they look towards the network to see if somebody else has done something similar and if it is possible to do it in the same manner. One of Beta's main reasons for joining the network was to get input on challenges and possible solutions, in addition to getting a view of the bigger picture perspective. Moreover, Beta argued that pointing to others as examples have been important to get approval for doing similar projects internally. Seeing other companies in the network successfully perform changes makes it easier for Beta to go after:

> *"We want to look at the solutions others have found, not having to reinvent the wheel all over again. Why? Because there is much to earn on letting someone else do most of the work..." (Interviewee 1).*

Another strategic advantage the two interviewees mention is that the network enables them to increase the focus on sustainability internally in the organization and the management group. Therefore, the network leads to results that they did not think of in advance.

Deciding which activities to collaborate on

According to Beta, the most important areas to collaborate on to begin with is the most simple and basic things to create a belief that it is possible to make changes, both internally in each organization and within the network: "*If we manage to implement small changes, and see that it's possible… and then we try a bit more, and make it work…we get the snowball rolling*" (Interviewee 1). Sense of achievement and positivity are therefore central keywords for Beta.

Beta says that many of the companies are in the same early phase regarding circularity as they are, and therefore share many common needs and questions to be answered. Additionally, the upcoming EU regulations are affecting all companies, and it is therefore more effective to understand their implications together and discuss appropriate related standards. Beta thinks that the industry needs to agree on how something is measured or discussed so that everyone has the same approach. Therefore, common standards and KPIs are crucial for development in an early phase so that efforts could be measured in the

future. "*We need to figure out what is 'better?' and what does 'use longer' mean?...and what should 'end of life' be defined as?"* (Interviewee 1). In Beta's point of view, a KPI will always have its weaknesses in how it is measured for each company, but it is more important that everyone has agreed to follow the same KPI for the sake of common improvement. "*The KPIs enable us to work more in the same manner and go together to solve similar problems*" (Interviewee 1).

For Beta, collaboration does not entail much more than working together on these issues the companies have in common and having an arena to discuss questions and share experiences. The collaborations have happened bit by bit over time, and the sustainability manager hopes that the new standards and certifications will "*become the new normal, and that collaboration with other companies happen indirectly through these*" (Interviewee 1). Since Beta has a cost-versus-benefit view on collaboration, it is important for them that the collaboration itself does not take more time than the company saves from it. Since they participate in many different networks, and the same people often participate in each network, they sometimes "*end up having the same discussions for several days in a row*" (Interviewee 2). Thus, it is challenging for Beta that there are many networks to participate in and that many of them have a very "*narrow focus*" (Interviewee 2) which makes Beta use a lot of time on all the network meetings. They, therefore, think that "*in an ideal world there would be fewer networks with a wider perspective*" (Interviewee 1).

Competitive mechanisms within the network

Beta does not feel that they need to be cautious about what information they share in the network. This is because the company is the only interior textile actor in the network, and does not view the other participating companies as competitors. However, Beta explains that the network facilitators and the competition authorities have clearly defined the kind of information that cannot be shared and that this is clearly defined in contracts that everyone has signed. Even if Beta does not have any competitors within the network, the company said that there is a definite presence of competing clothing chains in the network:

> *"They are very aware of the challenges that exist, and therefore we never talk about price, collection and specific suppliers. We're talking about how to deal with systemic problems". (Interviewee 1)*

Further, the network has agreed to follow the so-called Chatham House Rules[2] where members can quote what has been said within the network but not who said it. "*But nobody is saying anything secret in these groups anyways…*" (Interviewee 2). Besides, "*most of the people within the networks are engaged in sustainability positions*" the quality manager explains. Therefore, they are engaged about sustainability issues and do not generally care about numbers and what things cost.

For Beta, collaboration is important to change the competitive landscape in favor of sustainable solutions and make sustainable alternatives possible in terms of price. Therefore, as many as possible must change at the same time:

[2] Under the *Chatham House Rule*, anyone who comes to a meeting is free to use information from the discussion but is not allowed to reveal who made any comment. It is designed to increase the openness of discussions. Named after the Chatham House in London, UK (Chatham House, 2021).

> *"We cannot sell all our products at a 10% higher price just because it is sustainable. (…) but if all the biggest companies go in that direction, then the competitive situation will be more similar. That is why it is important that many companies participate, and do things the same way, to drive such a change." (Interviewee 1)*

This is also important in negotiation with suppliers. For example, if Beta has 2% of the total production it will cost the company much more to make the supplier do changes in their production, or they buy from totally new suppliers. But if thirty companies each have 2% of the total production at a factory, then suddenly 60% of the production is changed… and it becomes "*the new standard*" (Interviewee 1). When something has become a new standard, the rest of the companies also get more sustainable materials because of the others. Therefore, it is not necessary to include everyone, only enough to get to such a "*tipping point*" (Interviewee 1). Beta does not think that it is an advantage to be as far behind as the 40 % mentioned in the example, because of the time it takes to adjust: "*I think we're approaching a breaking point…If you're not in now, then it will cost you a lot to make a dramatic change quickly*" (Interviewee 1). The sustainability manager also states that it also depends on the size of the companies: "*if one of the big international clothing chains decides to do a change, they have completely different 'financial muscles' to make such changes. Moreover, they have the power to pressure the rest of the value chain to change as well*" (interviewee 1).

Even though Beta does not wish to be a first-mover on circular innovations, the company acknowledges certain benefits of being exactly that. "*The ones that go first also get the benefit of deciding how things should be and also decide the sourcing of a product or how a new standard should be*" (Interviewee 1). Moreover, the first-movers get an opportunity to be more attractive to the growing customer segments that care about sustainability. Beta's strategy of being just behind the first-movers is chosen to reap such benefits. The company stresses that the time frame of being right after the first, and just being one of many is quite critical.

> *"You do not want to be one in the crowd, because then you lose the advantage of being able to talk about all the good things you are doing. (…) instead of just showing that we are another company that has done something sustainable, we can instead say that we are one of those who are driving the change." (Interviewee 1)*

4.1.3 Company Gamma

Gamma is a part of a large social enterprise that was established in the 1900s and separated as a subsidiary in the late 2010s. It is a leading second-hand chain in Norway, with around 40 second-hand stores and 1 online store. Gamma has around 400 employees in total and yearly revenue of approximately 300-400 MNOK. The company has stores located in most Norwegian counties and works closely with governmental agencies, the private sector, donors, and customers. The HQ is located in eastern Norway.

Selling used clothes, Gamma has based its business on circularity since its inception and aims to improve the environment through reuse and recycling. It is also the largest collector of used clothes and textiles in Norway, with over 3000 containers specially designed for this purpose. Additionally, Gamma owns two facilities for receiving and handling all used clothes and textiles in Norway, where over 15000 tons of clothes and textiles end up every year. The clothes and textiles that are not possible to sell in second-hand stores or useful for social work (around 90%) are exported and re-used in other

countries. Moreover, the company has an international chain that oversees the export to other customers in Europe, Pakistan, and Iraq, where some of these further export clothes and textiles to Asia and Africa. Some of the clothes that cannot be reused in their original form are re-made into cloths or other products for use in e.g. mechanical industries. Gamma is an eager participant and initiator of business networks, where it wishes to collaborate with similar companies and retailers.

View on circular oriented innovation

Gamma is highly focused on innovation and being a forward-leaning organization that always thinks it is possible to do better. The company said that one has to be innovative to not experience stagnation, and "*we have it in our DNA or culture to be innovative*" (Interviewee 1). Even if Gamma has a more than hundred years old tradition of taking social and environmental responsibility, the company still emphasize the need to stay up to date and renew itself:

> *"Even though we have 'always' been circular, it is important to prepare for the future. (…) Therefore, we are concerned with renewing ourselves so that we are always able to keep up and reinforce our position to always be an included player. We often use the typical Kodak example[3] right… we don't want to be like them." (Interviewee 1)*

Gamma explains that they have a structured approach to innovation, with annual business plans and annual goals that all lead up to a handful of the company's long-term goals. On a general basis, the company does not think innovation always has to be something brand new, it could also be development and improvement of existing processes. The sustainability manager argued that this is important to "*not make things too complicated*" and "*get an easy start to just get going*" (Interviewee 1). Since Gamma is founded on environmental responsibility, its sustainability strategy often lays the foundation for the innovation strategy. Gamma has therefore made an overview and analyzed which business areas are critical, in order to "*contribute to something bigger than ourselves*" (Interviewee 1). One of the defined main areas is textiles, due to the upcoming EU directive in 2025.

According to Gamma, there are many challenges with circular business model innovation. Gamma needs to improve the collection process of clothes and textiles, to increase the quality of the materials that are handed in so more can be reused. Additionally, they need to improve the sorting process so that it is both more effective and precise. Another issue is the recycling of textiles and clothing that cannot be reused. Today, it is only possible to reuse textiles or downcycle the materials, which means achieving true cycles and closing the loop is not possible within the industry yet. According to the sustainability manager, only 1% of the textiles that are handed in are recycled into new fibers, since "*the right technology does not exist yet*" (Interviewee 1). However, the technology development is a "*chicken and the egg*" (interviewee 1) paradox, since nobody has been willing to invest in it, but there has not yet been a demand for it either. The recycled materials will most likely end up being more expensive than virgin materials. Therefore, Gamma does not

[3] The Kodak Example is about the American icon who had the talent, the money, and even the foresight to make a transition, but instead ended up as the victim of the aftershocks of a disruptive change (Anthony, 2016).

think that many companies will end up using them. The company thinks that something must happen from the government in terms of political incentives and regulations to facilitate such a change:

> *"We need a process where there are some good incentives from the government to choose recycled materials over virgin materials… for example through subsidization. We have the same problem with plastics before, but they have managed to crack the code there." (Interviewee 1)*

Motivation to seek collaboration

For Gamma, "*networking and collaboration is a natural part of the innovation process*" (Interviewee 1). Gamma is therefore involved in many networks and collaborations and has at several occasions initiated them. Further, Gamma views collaboration as essential for circular innovation, because all the companies are dependent on each other to make a "*wheel that works*". Because "*if you just stay in your own cave, then you can at best achieve something linear. And that is what the textile industry is characterized by now... it is linear*" (Interviewee 1). Thus, collaboration is a keyword that Gamma believes will become all the more important going forward. Further, the sustainability manager argued that it is important to have the right network composition: "*it's about bringing in players with different skills to ensure that you benefit from the innovation project within the various focus areas we have defined*" (Interviewee 1). The company therefore often contacts other companies they think can be interesting to be in contact with, and from which they could learn something.

Gamma said that many of the companies in transition have most of their challenges in common, and therefore they all win on trying to resolve these in collaboration. For example, most companies have restricted resources to use on innovation, so the collaboration enables them to save both time and resources. By collaborating and sharing resources, the tasks can be divided and thus also solved at a greater speed than could be achieved alone. Another benefit of collaborating is getting access to government funding (Innovation Norway IN) in the form of business network support. Gamma explained that IN supports innovation projects in business networks that have shown the ability to gather the industry, and coordinated and agreed on important common goals. These funds are then used on innovation projects that none of the companies would have had the resources to conduct on their own. Another common issue is the upcoming directives from the EU. For Gamma, the network is an important arena to discuss how the rules are affecting the Norwegian textile industry, to get prepared for what is coming. Moreover, Gamma argues that "*influencing the authorities is also an important part so that when they are to make decisions at the government level, decisions are made on the right basis*" (Interviewee 1). With much going on politically, Gamma needs to keep their current position to be relevant in the future:

> *"All the collectors in the network are concerned about the new schemes coming up. We hope that the authorities will not come up with guidelines that break the legs under us, instead of strengthening us and allow us to continue as we do today. (…) because it can be enticing to think of other more effective solutions, streamlining and such, which would undermine our aspect and everything that has been built up through fundraising and social work." (Interviewee 1)*

Further, Gamma mentioned that one should collaborate to influence the consumers by "*making campaigns to promote reuse and make them understand*" (Interviewee 1). Another strategic reason Gamma mentioned for seeking collaboration was that it enabled them to keep an eye on potential competitors. The company has a strong position today, and no real competitors in the Norwegian market currently, but someone might find out that they wish to enter the textile industry:

> *"Waste companies could for example be a threat for us because they have 'financial muscles', they have enough money to build up a lot of exciting things fast. But that's why we've been very smart and included them in the network. It's like… 'If you can't beat them, join them'." (Interviewee 1)*

Even though Gamma is positive about networks, the company also states that the internal resources are setting the limits for what they can make use of. The sustainability manager therefore advocates only joining networks when it is still useful for the company, and one can keep a steady progress. "*Because the more companies you are connected to, the more it requires management to get the benefit of it. So each company probably has a kind of intersection for when it is no longer useful, and one has connected too many"* (Interviewee 1).

Deciding which activities to collaborate on

Gamma views collaboration as something dynamic, because "*you collaborate on the things that are useful to do together to come out strengthened as an individual company as well*" (Interviewee 1). The sustainability manager further explained that new challenges will always arise as the previous ones are resolved and that the network must adjust thereafter; "*Suddenly, you have ticked off what you were supposed to do, and then you have to find new things*" (Interviewee 1). Today the network is doing much information gathering and mapping of work that has been done in other countries. Then, the network further tests and investigates whether similar projects can be performed in Norway, or if they need to do something else. Another important area currently, is influencing politicians, "*because the authorities are quite uninformed when it comes to textiles*" (Interviewee 1). Further, the network wants to present results in the form of concrete input, suggestions, and ideas. A topic that all the network members agree on is the need for a producer responsibility scheme for textiles.

It is therefore mostly competence work or practical things that the network collaborates on, "*things that affect everyone*" (Interviewee 1). Gamma said that when a network has just been established, it is often more theoretical work in the beginning, before becoming more practical after the required knowledge base is established. Within the network, they are aiming to become more practical within the year, and to have two pilot projects ready for initiation.

Competitive mechanisms within the network

Gamma is conscious of what they share in the network and not, and to have a "*dynamic collaboration with someone you can both give something to, but also get something from*" (Interviewee 1). Therefore, Gamma is maneuvering what information they share and what they do not share. The company does not view the other clothing collectors in the network as competitors but is instead keeping its eyes on larger waste companies with substantial financial resources. When it comes to sustainability Gamma "*shares all the things we can share, and we think is safe to share*" (Interviewee 1). For example, since Gamma is the

only player that is engaged in textile sorting in Norway, the company wishes to have its own, more closed projects within this area. The sustainability manager explains that the motto of the network is "we *collaborate where we can, compete where we have to*" (Interviewee 1). When it comes to how Gamma is going to solve certain issues in terms of formats and technical solutions, the company often says "*okay, this is a bit business-sensitive, so we wish to work on this subject for ourselves*" (Interviewee 1). Therefore, everything that is related to the development of for example sorting technology, that Gamma thinks is a "*pre*" (Interviewee 1) for them, is kept within the organization.

Currently, a lot is going on within the area of reuse and many new actors who get involved and come along with new concepts. In this area, Gamma's strength is that they "*have a large rig*" and that "*nobody else has a rig like that*" since the company is the only player that sorts used textiles for reuse in Norway. Therefore, Gamma focuses on building on their strengths and areas of importance and hopes that they are "*equipped to be an important partner for even more companies in the future*" (Interviewee 1). Gamma wants other companies to engage in the industry, but in a way where they are a "*hub*" or "*central motor*" which may be used by other companies as a collaborative partner:

> *"It's complicated, because we have it as an overall goal to help lift reuse and recycling into an industry, a sustainable new industry that several players find it exciting to get involved in. But when this gets big enough, and the economy gets interesting enough… There's a lot that can happen. (…) We also want to keep existing. If the textile industry suddenly gets very attractive, and the big players with financial muscles want to get on board, it's easy for them to start up and buy all the services they need. They might even buy out people from Gamma…" (Interviewee 1)*

The company sees it as a strength to be one of the first in these innovation projects because then they will "*own the original*" (Interviewee 1). For Gamma, this means having the power to decide how things will be, but even more importantly always being a "*horse's head in front of the others*" (Interviewee 1). Gamma believes that if they are in front, they can continue to develop while the others are adopting. Even if there is an extra cost of staying ahead and trying and failing, they view the competence that is built over years as invaluable. Therefore, they need only "*strengthen what we're good at, and renew ourselves and get an even stronger position within this field*" (Interviewee 1). Many of the other companies, on the other hand, need to change most of their processes from top to bottom, which is a much greater challenge.

As mentioned, the network participants usually collaborate on general and practical issues, which sets the principles for how other players should handle various issues and run their business forth. Gamma explains that the value creation in the networks is something that the companies must utilize on their own:

> *"It is up to every company to decide what initiatives they want to launch to ensure the value creation for themselves, but the network gives everyone an easier opportunity and access to create, facilitate and get funds" (Interviewee 1).*

4.1.4 Company Delta

Delta was founded in the early 2000s and is a sport and outdoor apparel brand for girls and women. In addition to the Norwegian market, Delta is well established in twelve other European countries and said to be one of the fastest-growing women's activewear brands in Europe with solid growth in all markets. Recently, Delta has also entered the US market, and the sales figures thus far show a promising future also there. Delta is a subsidiary of a larger sports brand group, which has around 1 billion NOK in total revenue and around 200 employees for all their brands. The HQ is in eastern Norway, and most of the production is in Asia. The products are mainly sold through larger retailers, such as XXL, Intersport, etc., but the company also has an online store where it sells products direct to consumers.

Since its inception, Delta has focused on sustainability through sourcing materials, reducing emissions and chemicals, and ensuring fair working conditions in the value chain. Just recently, Delta launched an entire collection made of a mixture of cuts from previous collections and fiber from wood pulp and cotton. The way the company chose to market this collection caught the attention of many other companies. Delta chose to be completely open about how they produced the entire collection and invited their competitors to collaborate. After this marketing stunt, Delta became at loss for an answer when many of the companies they had reached out to in their commercial, was already collaborating in networks that Delta was not yet a part of. Therefore, Delta has just opened up the door to the world of networks and is mainly focused on networks specifically aimed towards outdoor sports brands.

View on circular oriented innovation

Delta says that the company has been working on sustainability for a long time and that it is an important part of the organizational values. Therefore, the product developers always aim to choose sustainable options if possible. Delta's approach to sustainable innovation is project-based and focused on areas they define as in need of development. More importantly, the company "*always considers the cost-versus-benefit of potential measures*" (Interviewee 1). Delta is willing to pay the extra price it takes to develop more sustainable products but is also very conscious of choosing the options that "*protect the employees*" because they cannot "*only be idealistic*" (Interviewee 1). Therefore, the company prioritizes the most feasible initiatives that reduce its CO2 footprint the most, which they have found to be centered around their products. However, the company also believes that there still exist many unresolved challenges ahead and that they should always "*work towards something bigger*" (Interviewee 2).

Delta believes that it is necessary to have a longer time perspective on sustainability to survive as a company and start changing now because "*it takes quite a time to turn the ship around from linear production*" (Interviewee 2). The product developer also said that they have seen an increasing trend in the demands from their buyers, due to higher reporting requirements in these areas from the large chains. For Delta, it is these kinds of demands are the ones that forces the company to change:

> *"Because the moment the really big buyers or retailers (both physically and online) decide to make demands, then those who have not started to change must do something very fast if they are to survive. So, they have an incredible amount of power in this regard. (…) Because even if many companies also sell directly to consumers, it is only some percentage*

> *points compared to the volume that goes through the retailers" (Interviewee 1)*

Delta also describes their circular initiatives as "*financially sustainable*" (Interviewee 1), because they produce new products from material that would otherwise be wasted. The company's goal is therefore to produce sustainable products, while still seeing the economy in it.

> *"What Alpha does related to sustainability is, of course, admirable, but perhaps a bit too early, since it goes at the expense of their financial results… Because while you want to do something good you also need to ensure the daily operation in your company, right, and then you have to weigh up these things."* (Interviewee 1)

Even if Delta describes the new collection made from waste as financially sustainable in principle, they admit that they have not "*checked the numbers that closely*" (Interviewee 1). The company acknowledges the cost of innovation, and that they use more resources on producing sustainable material than using new material. Therefore, Delta thinks the consumer should be willing to pay more for sustainable solutions, which they are "*not necessarily willing to*" (Interviewee 1) at the moment since it is easy to be tempted by cheaper options offered by the big chains. "*So that's a challenge right, because we suppliers are squeezed by the big chains on price while we pay more for the goods to be more sustainable."* (Interviewee 1). Therefore, Delta thinks that there should be more incentives and regulations to facilitate sustainable change, making it easier for producers that want to change. Delta points to the solutions with electrical cars in Norway and says something similar should have been with sustainable textiles since there are many extra costs related to producing more sustainably.

When it comes to implementing circular business models like used sales, repair, rental and such, Delta is worried about the extra challenges related to logistics and transport since they have both sales and production all over the world. The company also questions "*how sustainable is it really to collect old textiles and then send them back to china?"* (Interviewee 2). Thus, Delta does not think it will be doable unless they move their factories closer in distance.

Motivation to seek collaboration

Delta has not been involved in any networks until just recently. In its newest commercial the company invited its competitors to collaborate, even if they were aware that many networks already existed with sports industry brands. Delta thus became at a loss of an answer and had to investigate the potential within the world of networks. The company explained that they thought some brands are just members of sustainability networks because "i*t looks nice on paper"* (Interviewee 1), and were afraid of the greenwashing stamp. Therefore, Delta has spent some time finding the networks that would be the most beneficial to be a part of, because they *"wanted to find the networks that we can be a contributor to and also we get something in return for*" (Interviewee 1). Apart from that, the company does not view collaboration with other companies as risky, because "*when you change jobs you usually stay in the same industry, and then it's a bit like meeting old colleagues again to find solutions together*" (Interviewee 1). Therefore, Delta says the company will listen to Alpha and Blue's recommendations when it comes to choosing networks since they have more experience.

Delta also felt that under the development of their new sustainable collection, the more they were looking for answers the more questions they got. The company then realized that they had a responsibility to share what they had accomplished, since "*the globe doesn't have time for everyone to sit on their own and come up with one solution at a time. We will not be able to move forward fast enough*" (Interviewee 1). Therefore, Delta thinks collaboration is necessary for the industry to progress faster and work in the same direction to achieve the SDGs. Since they have the same problems, Delta is sure that they will arrive at a good solution faster if the companies can then exchange experiences. Delta also hopes they will "*get some answers from others about the things about which we are still wondering*" (Interviewee 1).

Delta also had other strategic views on collaboration and being more open. First, the brand manager was very happy with the attention their new commercial had gotten, and stated that "*it's clear that we've hit a nerve*" (Interviewee 1). The company admits that one of the reasons they chose to be open was a conversation with their marketing bureau, which showed them an old commercial from Volvo in 1959. "*Volvo chose to be open about their new three-point seat belt, which shortly after became the industry standard. Since then, Volvo has managed to keep their position as the 'safest car'"* (Interviewee 1). The brand manager also said that collaboration is not something new, but Delta took advantage of the fact that "*nobody has been talking that much out loud of it*" (Interviewee 1). Second, there are many barriers to overcome that Delta thinks will be easier to achieve in collaboration. For example, influencing the consumers to change their habits and expectations, or influencing the politicians as "*we are much stronger together than if one single brand tries to do something like that*" (Interviewee 1). All the companies have the same challenges with regulatory barriers, and therefore everyone benefits from getting them removed to "*make it possible to make circular business models financially sustainable*" (Interviewee 1).

Deciding which activities to collaborate on

Delta does not have that much experience from collaborating in networks but has recently started the work along with the other Norwegian outdoor sports industry brands to form a new network. It was important for Delta to form a new network because the company saw the most value in joining a network consisting of only similar players with the same problems: "*we have a completely different complexity in our products than the rest of the fashion industry. We have much more technical products, much more use of membranes, etc."* (Interviewee 2). At the time of the interview, the companies have had a couple of meetings to discuss the collaboration's next steps and figure out what issues to fight for together. Delta thinks what activities they collaborate on will change over time, and that it was difficult to say in advance "*what exactly we are going to work on*" (Interviewee 1). Further, the company stated the need to just wait and see how it goes, and then enter into other networks since they have "*no experience with it*" (Interviewee 1). Delta thinks the most important activities initially, are centered around producer responsibility and collection of used textiles, in addition to preparing for the new EU regulations coming up.

Even if Delta has not collaborated in networks yet, the company speaks warmly of their collaborations upwards in the value chain. The company thinks that having close relationships with its suppliers is an advantage when performing sustainable and circular innovations.

> *"We have entered into cooperation with those we have collaborated with for a long time and have stable relationships with. When we look at*

> *potential circular innovations… we must look at what prerequisites we have in our production chain. What we can achieve depends on very good relations with our suppliers, because it is a certain risk for them also to develop things with us since it does not necessarily give them any short term benefits." (Interviewee 2)*

Competitive mechanisms within the network

When the idea of the new, more sustainable collection first sprung out, Delta explains that the project was marked as super-secret and that "*only a few, a handful of people knew what we were working on"* (Interviewee 1), because the company wanted to create something unique and have a big launch for it. The company, therefore, was secretive about its circular innovation up until the collection launch. As mentioned, there were three main reasons for the company wanting to share openly. First, as a marketing stunt to get increased attention for doing something sustainable. Second, since they encountered many questions they could not answer themselves and hoped that someone else could be of help. And lastly, due to the environmental values in the company and a sense of common responsibility to help the entire industry become more sustainable: "*we cannot be secretive about everything that has to do with sustainability, since we need to improve our industry at a faster pace*" (Interviewee 1).

When Delta chose to be more open, they chose to be open about their whole process, and open about who made the products for them. However, the brand manager said that "*we cannot share the secrets of our partners again, but as long as other companies know what our process is and what supplier we use, we feel that we have been as open as we can."* (Interviewee 1). Then, Delta says it is up to their competitors to go to their factory and say they want the same solution. However, the company is also very focused on the laws of competition, and is very aware of what types of information they can and cannot share. But when it comes to sustainability, they wish to have an open philosophy.

According to Delta, "*it is not that important who is the first*" (Interviewee 1). The brand manager certainly sees the advantages of being first, but also says that the downside is all the money it costs to be first. Moreover, the company thinks it is extremely expensive and difficult to get a position as a sustainable company as this statement by the brand manager illustrates:

> *"There was a survey last year where Norwegian consumers were asked if they could name any Norwegian companies that were good at sustainability. And there were no significant answers or any clear direction on the answers... and that's a little interesting because one would think that Alpha, who has been pushing pretty hard on these sustainability things for many years should be on top of mind for most people."* (Interviewee 1)

One of the reasons why Delta does not think it is possible to position the company within sustainability is that it is going to be a hygiene factor. When it becomes a hygiene factor, the brand manager explains that "*it is not a competitive advantage anymore, it is just expected by everyone*" (Interviewee1). However, due to the time it takes to change, Delta says it is important to start innovating now to survive as a company. Therefore, the product developer states that in those regards "*it will be an advantage to start early. But not necessarily in terms of marketing and towards the consumer*" (Interviewee 2).

4.1.5 Company Epsilon

Epsilon is a company that has two brands. The first brand was founded in the 1950s and is a traditional company that offers a range of wool garments and blankets. The second brand was established in the mid-2010s when a young designer bought the 60-year-old factory situated in eastern Norway. This brand is more modern and fashion-directed, but also centered around wool materials. Since then, the two brands have been carried under the same small-sized company, with yearly revenue of approximately 4 MNOK and 2 employees. The brand is selling to shops in Norway and Japan and has also recently started directly to consumer both at the factory and through an online store.

The entire philosophy of Epsilon is built around the way fashion could be made more sustainable, with local production as a keyword. The company collaborates with a selection of local crafts guilds from Norway. Epsilon follows circular principles by using old materials and recycled wool garments and reduces emissions by producing locally. Moreover, since local production is more flexible, Epsilon can produce much more of their products on demand and therefore avoids building up a stock of products that will not be sold. This reduces the waste and use of materials in Epsilons production. The CEO has several roles, leading two brands and at the same time responsible for the daily operation at one of the test facilities used by the network. Epsilon was one of the initiators of the network it is a member of, and the CEO has close connections to the industry cluster as a board member there.

View on circular oriented innovation

Epsilon has always been concerned about sustainability, and about trying to make the fashion industry more sustainable. The CEO explains that:

> *"I don't believe that any brand can be sustainable, because I don't think production will ever be sustainable. But I think there is a scale where you always try to be better and constantly stretch towards something that you in a way never can reach" (Interviewee 1).*

Epsilon has a "*try and see how it goes*" approach to innovation, because "*you will always face new challenges, and you will always have to figure out new things. You will never be finished learning*" (Interviewee 1). If there is a solution that seems more sustainable than others, Epsilon is willing to try it out instead of concluding it is not possible, even if that is the immediate thought. The CEO believes, and points to many researchers saying the same, that local production is the solution to many of the problems in the textile industry. Epsilon therefore focuses on the exploration and development of new ways of producing to make the brand more sustainable and succeed with local production. The company also focuses on how it can modernize the industry by utilizing new technology and digital tools.

For Epsilon, local production gives a better overview of how things are produced and other positive synergy effects. For example, when the company owns the production themselves, they save costs by cutting intermediaries which means they may put more money into the raw materials. Thus, further ensuring better product quality. Epsilon also knows their producers and raw material suppliers better because they work directly with them, which gives the company a better overview of all the processes they are involved in. Moreover, Epsilon experiences that the proximity often makes the products more valuable for the customers, since they know the entire story behind them. The fact that Epsilon produces locally, therefore, distinguishes the brand from many other Norwegian brands as a more innovative and sustainable brand.

Epsilon sees growth potential in their market but simultaneously wishes to approach this opportunity at an organic pace, to not push out too many products and go against their original goal of being more sustainable. Rather, the company facilitates what comes naturally in terms of sales growth, to not end up as a "*Duracell Bunny, like many others are forced to be, just to keep things running*" (Interviewee 1). The challenge for Epsilon is thus to find its perfect size because there are fixed costs that come with running a business and a lot of responsibility and risks related to these costs. Therefore, Epsilon needs to manage for full utilization of their production to find the right breaking point between profitability and costs, while also focusing on keeping a reasonable volume in the production.

Motivation to seek collaboration

Epsilon is closely intertwined with the industry cluster from which the network springs out, as the CEO also is a board member at the industry cluster. Also, one of the project leaders in the industry cluster and facilitator of the network have ownership in Epsilon. The CEO explains that the network started while they "*all got to know each other*", combined with shared needs and desires. Epsilon says that they then had been talking about it for many years, but that it "*somehow happened over time when we have seen that it has been a good match*" (Interviewee 1).

Epsilon also believes that all companies have a common responsibility to change, and will have better conditions to succeed by working together. Since the world is moving forwards and there is constant development, companies must continually adapt and develop. Therefore, Epsilon believes there will always be a need for cooperation:

> *"You have to work together to reach good solutions and you have to go into more cooperative solutions to be able to offer more sustainable solutions… precisely because it is very difficult to find out all this on your own. Many companies wish to change, but do not have the overview or knowledge needed to do so." (Interviewee 1)*

Therefore, Epsilon views collaboration as essential to get the right knowledge and solve common problems together. Further, the CEO thinks that "*if companies do not have enough knowledge or overview of what they actually are doing, the measures they thought were helpful could be the opposite"* (Interviewee 1). Instead of sitting on separate locations and trying to figure out different solutions to the same problem, the CEO argues that the brands should find solutions and initiatives together from which they would all emerge stronger. Therefore, Epsilon says that they want to collaborate to learn how other companies work and be inspired, and therefore also gladly share how they work.

Epsilon mentioned several reasons why collaboration is strategically beneficial for the company. First, the CEO experienced that everything related to new technology and digital tools was difficult to accomplish on their own both due to the high investment costs and the knowledge required to adopt it. Therefore, collaboration was "*necessary to make the factory the vision I have dreamt it should be*" (Interviewee 1), since many processes in the textile industry are still manual. Second, the other companies in the network feed assignments into Epsilon's production, which is a way for Epsilon to finance their operation. The CEO also says that they feed their own two brands into the production so that their brands also function as customers of the factory. Third, collaboration is necessary to release a lot of pressure from the CEO in Epsilon, and free up time that can be used for innovation:

> *"Collaboration is about achieving the things I dream of achieving. To create and to be innovative, and show what we can achieve here in Norway with nice, innovative, forward-looking products in good qualities. The collaboration enables me to work with this to a much greater extent because it takes off a lot of pressure from me and on things that I before had to do to make money." (Interviewee 1)*

Epsilon explains that the business is barely able to make ends meet and that the pressure is higher to keep things going and keep things efficient when you are a small-sized company. Which was also a reason for seeking larger collaboration partners. Fourth, collaboration enabled easier financing of the innovative projects Epsilon dreamt of through access to public financing (IN) and investing in technology along with other companies. Epsilon also states that it is easier to get access to public financing when you are a member of a business network since the network facilitators are experts on how to obtain funding and "*actually achieve things within research and development work*". Moreover, the CEO said that *"it is easier to invest in things if there are many companies that wish to figure things out*" (Interviewee 1).

Lastly, Epsilon mentions a couple of market factors where collaboration would be beneficial. For example, when more companies are involved in testing and developing, everyone gets access to more suitable raw materials. The CEO explains that it is important to "*push demand and make the raw material producers more rigged and open to produce more sustainable in our industry*" (Interviewee 1). Moreover, by putting these things on the agenda the consumers will also become more aware. However, Epsilon does not view sustainability as a source of competitive advantage, because *"it will become a hygiene factor where it is expected that everyone does their utmost to try to contribute in the best possible way"* (Interviewee 1). The company also states that customer communication is important to achieve this, to *"make it easier for the customers to expect this from all companies"* (Interviewee 1).

Deciding which activities to collaborate on

Epsilon says that the activities they collaborate on in the network are based on what needs the brands have in common. The network participants are also often chosen due to similar wants and needs: *"if there are some kind of services you wish to be able to perform or offer, then you look at other brands that share those needs to have a discussion*" (Interviewee 1). Since Epsilon was one of the initiators of the network, they got to choose the other participating brands they thought would be the most appropriate. The CEO explains that "*working with other brands was also a way to test the limits for what we could do with our facilities*" (Interviewee 1). The chosen brands were thus picked due to the feasibility of their wishes and their understanding of what was possible and not within local production. According to the CEO, it was also "*a way for us to get a nice exchange where they also pushed the boundaries of what we did here*" (Interviewee 1).

Epsilon explains that the network facilitates projects according to the brands' needs: "*for example, if we wish to offer some kind of service, the network facilitates a workshop on the subject to make us more prepared to do that"* (Interviewee 1). In the network Epsilon is a part of, many of the activities have been directed towards production and prototyping by taking advantage of new technologies and digital tools. For example, they have been working on using a 3D program where you can virtually design and view the fit before sewing to test the pattern. In the network, they test these kinds of patterns by sewing many different digital designs. That way they save a lot of time on the production of

prototypes since they can be made close to the designers instead of sending descriptions to Asia and then receive the prototype months later. In addition to looking at new methods for the design process, the companies also look at what infrastructure is needed for this kind of production and how it is best to organize the work. According to the CEO, the collaboration is mostly about those practical issues. The network also had an initial phase with competence work on digital technology to get everyone up to the same level before starting to explore the opportunities.

When working with actual experimentation and prototyping, the network participants needed a physical workplace where they could test and develop things together. This meeting place is also the factory where Epsilon produces its products. Working on design processes thus entails a risk for the companies involved of becoming too inspired by each other. Therefore, Epsilon states the importance of choosing the right collaborative partners, because you cannot include everyone on such a project. Since this type of collaboration is a bit closer than the other collaborative setups in the industry cluster, it was important for Epsilon to settle early on the boundaries and Non-Disclosure Agreements (NDAs) to protect all the companies: *"I think if you want to enter into such concrete collaborations with people, then you have to have a good framework. You have written agreements that what is shared within the project here should be within the project and so on."* (Interviewee 1).

Epsilon explains that if the design process is very "close" between two brands, it is more usual to co-brand the products so that both parties benefit. If there is a co-branding between two similar brands, Epsilon says it is more common to separate the roles and collaborate further up in the value chain. For example, Epsilon had a collaboration with a larger Norwegian fashion company (from now on Green). In this case, Green bought the production from Epsilon after they had been working together on a design process project. Then, Epsilon acted as the producer for Green and they got their name on the product, while Green paid them for the job and took both the sales risk and profits themselves. According to the CEO, that was a very good solution for Epsilon because "*then we are guaranteed to cover our expenses. We are not a big player such as Green, so it is in a way a safer solution for us than if we were to enter and also take a risk in terms of actually selling the products*" (Interviewee 1). Therefore, this is also something that must be agreed upon in advance, to "*find something that works for everyone involved*" (Interviewee 1).

Competitive mechanisms within the network

As long as the formal arrangements such as NDAs are in place at the beginning of the collaboration, Epsilon feels quite safe about what the company shares within the network. This safety is a result of both the formal agreements, but also the fact that a very restricted number of companies are in the collaborative network. Moreover, the CEO says that they mostly focus on the design process and practicalities that affect everyone, never the actual designs each company are going for: "*we never ask each other 'what coats are you going to make next season?' because it is implied that everyone knows and can their design… that's not why we are collaborating*". In addition to the formal agreements, Epsilon says trust and equal respect for each other is very important for the collaboration to work. Since Epsilon has a very narrow focus area, it is essential for them with respect from the other network partners:

> *"All this requires people to be very good at respecting each other's special field. I have had some issues where others suddenly have come into the field and done the same as we do, and that there has been a little lack of understanding that we are not such a type of lifestyle brand that can just*

> *say 'yes but then we just do something else'. We do one thing and that is our special field." (Interviewee 1)*

Since most of the collaborative activities take place at Epsilon's production facilities, the company is quite aware of the risks they face by letting other companies in. For example, they have most of their fabrics laying around there, which makes it easy for the other companies to get inspired and say that they wish to work with the same fabric. Since the fabrics are very special for Epsilons products, then they demand to get their name on the collaborator's product if they want to use the fabrics. It is not however something that Epsilon sees as a negative thing, as long as they get their name on the products in terms of a "co-branding":

> *"Because it is a typical thing that can happen here, that other brands come in and 'ooh this was nice'. Therefore, we have established some ground rules for solving these issues. For example, if there are fabrics that are very special to our brands, then it will be a collaborative project." (Interviewee 1)*

Epsilon also thinks co-branding can be beneficial for both parties if they have different needs. For example, in the case with Green, Epsilon did not have enough resources to put into a big collection that Green wanted, so it was beneficial for them to sell production capacity. Green, however, did not have the knowledge or capacity to develop and produce this collection alone – but they had the money.

Epsilon also thinks it is beneficial if more companies want to work with local production, as it might give an increased focus on it and make more people aware of the benefits. However, the company does not think it will be a competitive advantage to be one of the first, due to the belief of sustainability becoming a hygiene factor. Thus, it would be beneficial if it becomes a hygiene factor sooner than later because then the companies who are not sustainable would have to "*change or be outcompeted*" (Interviewee 1), and the competitive mechanisms would be more fair for companies like Epsilon. However, the CEO admits having to "*keep your tongue straight"* if other companies begin with local production. Although improbable, Epsilon mentions that another risk is if other brands try to outmaneuver Epsilon by taking their production capacity at one of their main suppliers. But again, due to the local production, Epsilon has very good connections with all of their suppliers, and "*they would never ditch us for another brand just like that. Everything is very trust-based because we know each other so well* (Interviewee 1).

Even if there are similar companies within the network that could be said to be direct competitors to Epsilon, Epsilon does not think about competition within the network. For them, it is more important that many companies are going in the same direction to find out things. The CEO explains that "*if you have been a member of the industry cluster for a while, then you realize that there are such great benefits to coming out of working together. Therefore, in most cases you are very supportive and helpful to the others"* (Interviewee 1). The CEO also says the network and cluster have a saying that goes like "*collaborate where you can, compete where you must*". Furthermore, since the Norwegian fashion industry is quite small compared to the rest of the world, Epsilon thinks they stand stronger together in competition against the global brands if they cooperate: *"Norwegian brands must stand together and get better together"* (Interviewee 1).

4.2 Network facilitator findings

This section presents the findings from the interviews with the network facilitators, structured around the same elements as in 4.1. The amount of data related to each element varies as the facilitators put more emphasis on some topics than others. As explained in 3.2.2, each network facilitator is given a randomly chosen number that is used throughout the presentation of the findings.

4.2.1 View on circular oriented innovation

Most of the facilitators say that the main challenge for companies seeking to perform circular oriented innovation is the uncertainty related to profitability and the customers' willingness to pay. They all agree that potential customers must be willing to pay more for more environmentally friendly solutions since it costs more for the companies to provide these kinds of products or services due to the additional logistics circular business models entail. Therefore, Facilitators 2 and 3 states that the market is not mature enough for these types of solutions yet and that companies performing circular oriented innovation thus should have a longer time perspective. Because at the same time as pursuing innovation the companies shall "*live and work*" (Facilitator 3). As a consequence, the facilitators have experienced that the willingness to invest in circular innovations among fashion companies is low since the companies "*are not able to earn back the costs of pursuing innovation*" (Facilitator 3). The fact that many fashion companies already are on a tight budget and live from "*hand to mouth*" (Facilitator 5) is also mentioned as a possible explanation for this unwillingness to invest. Further, Facilitator 5 says that it is therefore often easier for the companies to choose the short-term, easily implemented measures over those with a more uncertain and longer and time perspective.

Another challenge that concerns the facilitators is the regulatory barriers and a lack of regulatory incentives related to circular innovation. According to Facilitators 1 and 3, regulatory barriers are one of the reasons why it costs more to provide circular business models and a reason for its difficulty to compete within the market. For instance, they mention that the taxation schemes mostly favor linear businesses, and therefore the circular businesses have both higher costs related to handling but also its fixed costs. Such unbalance in the competitive landscape is also evident further up the value chain, in the material purchasing stage. Facilitators 1,2 and 5 mention that the companies would very much like to use fabrics made of recycled materials, but end up choosing fabrics made from virgin materials since they are considerably less costly. Thus, Facilitator 5 explains that many companies desire standards and requirements for the entire industry related to minimum use of recycled materials in fabrics, to ensure competition on a fair level.

Moreover, all the facilitators agree that many companies lack the knowledge and capability to do the actual innovation work themselves. Therefore, they say the facilitating role is very important to contribute with "*academic replenishment, funding, framing conditions and networks*" (Facilitator 2). The facilitators also help the companies solve one problem at a time, reducing the complexity of the whole issue and not try to do it all at once.

Even though there are many challenges related to circular innovation, all the facilitators agree that the industry is slowly changing and that sustainable innovation is the future. They therefore believe that it would be "*much riskier to not innovate towards circularity*" (Facilitators 1 and 3), since it takes a lot of time to change.

4.2.2 Motivation to seek collaboration from the company perspective

According to the facilitators, the most evident reasons for joining collaborative networks is that many companies are not able to solve these challenges on their own and thus networks enable them to; share risks and get access to resources, go together to influence either the consumers or politicians to make the circular market more viable, and help other companies get on board in the transition because it is beneficial if they are more companies in the change.

Not able to solve the challenge alone

According to Facilitator 1, none of the players that exist today, apart from the biggest ones like HM and IKEA, are large enough to be able to make these changes alone. Therefore, they have the perception that most companies have agreed that they cannot compete on sustainability to "*get the change you need, in the short time we have to adjust*" (Facilitator 1). Facilitator 5 also states that "*the problem is quite complex, so they need to collaborate to actually make it happen*". Therefore, the facilitators think that many companies have realized that they must collaborate for their measures to be effective.

Share risks and get access to resources

Additionally, a majority of the facilitators mention the costs related to sustainability innovations, and that the tight budgets that the companies have made it impossible to invest in circular innovation without collaborating: "*if everyone develops their technology separately, the development is extremely capital-intensive*" (Facilitator 5). Moreover, Facilitators 4 and 5 mention that the companies get mitigation of risk when they invest together and that they can also share important information related to the innovations. Facilitator 5 experience that the companies often get enthusiastic when asked to join an innovation project and that "*they would very much like to join, but preferably as a group so that they can share the risk or contribute in slightly different ways instead of doing all the activities alone*" (Facilitator 5). Moreover, Facilitator 4 mentions that another advantage of collaborating is that the companies get access to public funding. The funding also gives the facilitators incentives for establishing networks, since *"IN and others often prefer when we have gathered to collaborate on innovation since the support will then benefit many companies at once*" (Facilitator 4).

Another reason mentioned by the facilitators, and especially emphasized by Facilitators 1,2, and 4 is that the companies need access to knowledge, which they can get by being attached to the network. Therefore, the networks function as a unique source of knowledge, as "*you get access to an expertise you would not necessarily have otherwise."* (Facilitator 4). Moreover, the networks also give the member companies the advantage of "*staying up to date on what is happening in the market*" (Facilitator 1). Facilitator 3 says that this access to information can be a source of competitive advantage for the companies that are involved, because "*it allows them to make much smarter choices*". This is also an advantage since "*sustainable changes take many many many years. And the networks thus enable them to not lag behind*" (Facilitator 3). Since the network's ambition is to aspire and facilitate fashion companies to perform circular innovation, the companies also get access to this knowledge and expertise at very low costs.

Influence consumers, politicians, and other companies

Facilitators 1 and 3 also suggest that some companies want to collaborate to influence the consumers and politicians more easily. Because in the fashion industry, the companies also "*depend on consumers changing to make money on new business models, such as renting, repairing and reusing*" (Facilitator 1). Facilitator 3 states that the customers need to be

more used with the thought of circular business models, and need to be trained on them. With reuse for example, because "*80-90 % of the population still thinks that it smells like moth of everything that you buy second hand*" (Facilitator 3). Collaboration is also mentioned as important to influence politicians and be prepared for new regulations: "*With the new EU-directive coming up we stand stronger together if we are to have a voice in that work*" (Facilitator 3).

Additionally, Facilitator 1 suggests there is a trend of collaborating in the industry, and that the companies that have been the best so far at sustainability innovations run open-source, share, and invite others to collaborate. Moreover, when the big companies lead by example and collaborate, smaller companies realize that it is possible. Therefore, some of the companies that are collaborating also do it because they have a desire for more openness in the industry, and join collaborative projects to influence other companies to think in the same direction. Facilitator 1 also thinks "*it has something to do with the culture and way of life we are in, in 2021. And that this was first and foremost set through the UN's sustainability goals*". (Facilitator 1)

First-mover disadvantage

Facilitators 1, 3, and 5 mentions that it is not necessarily an advantage for a company to sit on a sustainable/ circular innovation on their own, because then they compete on different grounds than the rest of the market. Facilitators 1 and 5 states that if a company for example has invested in the development of a new material, then the end product also gets more expensive. The customer might not be interested in paying extra since they have other (cheaper) opportunities offered by the other companies. "*For example, if you have developed a new material, then it becomes extremely expensive to be the only player with access to this material, and you never get any economies of scale. Thus, one may not be able to compete on price*" (Facilitator 5). On the other hand, if many companies go together on producing this material, then "*you also get better access, and there will be better prices*" (Facilitator 1). Therefore, Facilitator states that even if some larger companies want to be first out with new solutions, they often do it in collaboration with a few other, large companies.

4.2.3 Deciding which activities to collaborate on

According to the facilitators, the innovation activities in the network are a result of both what kind of needs the companies have, but also what kind of needs the facilitators or the industry cluster have identified in the industry. Therefore, the cluster works both with connecting companies to innovation projects that already exist, in addition to helping the companies to establish new networks if there is a need for it. According to Facilitators 1 and 4, the industry cluster thus works constantly with innovation "*on behalf of those who give us the money*" (Facilitator 4). Therefore, the industry cluster has partners such as IN, Siva, and the research council for financing and all of these have a starting point that is about value creation: "*so we make sure that Norway strengthens in terms of market development, but also ensures future jobs*" (Facilitator 4). For the companies, the facilitators' main role is thus facilitating the network, ensuring communication between the parties, and assisting in obtaining public funding for project development.

Much of the activities in the networks are thus also affected by the facilitators and the funding partners, but Facilitator 4 stresses that the activities are not possible to conduct if the companies are not motivated. Therefore, if the network is established due to a need identified by the industry cluster, the network needs to be attractive for the companies the facilitators wish to join. The facilitators therefore work with mapping the industry landscape

and to understand what actors are relevant and what resources they can provide, and whether they are motivated to collaborate. According to Facilitators 4 and 3, it is important to offer the companies to be a part of a network that is relevant for something they are already working on and want to get done, but something they can save time and money by doing together with others. If you are going to do something that is not central to what they need at that exact moment, they will not be incentivized and the network will not work. Therefore, the activities "*have to be demand-driven*" (Facilitator 4). The support from the public sector also works as a rationale for companies to join the networks, since it enables them to test and develop new products with a "*cost reduction*" (Facilitator 4). Since the companies' demands are central in deciding which activities are conducted in the network, all the facilitators agree that much of the work so far has been concerned with increasing the companies' knowledge and facilitating experience sharing.

Additionally, Facilitators 1 and 3 believe that the most similar companies also have the most similar challenges, and are also those who like the best to collaborate with each other. When it comes to deciding what types of activities to collaborate on, Facilitator 1 does not think the activities have to be divided into upstream and downstream activities. Instead, it depends on where the companies have competence and needs, which varies from company to company. In contrast, Facilitator 3 thinks it will be easier to collaborate, especially invest in innovations together, if the project is further up in the value chain "*and not that much front end*" (Facilitator 3).

4.2.4 Competitive mechanisms within the network

All facilitators emphasize the importance of trust in the business networks. In order to establish trust, the network facilitators have established formal contracts and non-disclosure agreements. Moreover, when entering the network, the companies agree on what is okay to share and not. Even though the formal agreements are important, all facilitators say that it takes time to establish trust because the people in the network must get to know each other. According to Facilitator 4, some of the companies were uncomfortable in the beginning, and the information sharing has increased as the companies have gotten to know each other better. Facilitator 4 therefore emphasizes spending time on establishing a good work environment for trust.

Moreover, Facilitator 1 said that even though the companies might compete on branding, marketing, and product development it is "*kind of agreed upon by everyone that nobody competes on sustainability*". Therefore, Facilitator 1 explains that they rarely speak of anything confidential in the network and that this is formally manifested in contracts when entering. If something is confidential, the companies must clarify it. Also, Facilitator 3 states that as long as trust is established in the network, it does not make a difference what you collaborate in the network even if it is one of the closest competitors because "*then you have a belief that what you bring in will be taken care of in a good way."* The facilitators do not agree on this matter, as Facilitator 4 said that the companies often have preferences in who they want to work with and not. For example, Facilitator 4 states that the companies do not want to work with direct competitors and that it is "*easier to work with those who are not direct competitors. We only need to work with those who are equal enough. Everyone works in the clothing market, but some are fighting for the same customers - and then it quickly becomes a little more difficult..."* (Facilitator 4). Moreover, the facilitators facilitate different types of network activities. For example, Facilitator 4 facilitates physical workshops and the exploration of production processes. Therefore the network is described as "*a small duck pond"*, where plagiarism is "*quickly done*" since it is

easy to get inspired by each other at the production facilities. Therefore, it is also seen as *"incredibly important to have the formal frameworks in place"* (Facilitator 4).

All facilitators agree that information about the products is something that the companies wish to keep to themselves, as they want to keep as much uniqueness as possible about the product. The facilitators also reveal that there exist some competitive mechanisms when it comes to what information is shared and not: and that the companies behave differently according to their position. Facilitator 1 thinks that the degree of information sharing is different from company to company. For example, if someone with high competence internally, Facilitator 1 believes they will work to get this first into the market on their own to "*get the PR value*" and that "*in those areas where you can be first in the market because you are a leader or have a high level of competence, then probably someone will choose to do it themselves."* (Facilitator 1). If they on the other hand have a low level of competence, Facilitator 1 thinks they will be naturally drawn to the network to learn more. However, Facilitator 3 thinks that "*there probably are some who hold the cards a little closer to their chest than others*". Further, Facilitator 3 thinks that it is easier to follow if the largest and most powerful companies lead the way, since "*they have more to gain than what they have to lose*". Also, Facilitator 4 states that the biggest fast fashion companies have strong incentives to crack the circular code since "*it is the only way they can keep their fast fashion business model*".

Even though the networks facilitate innovation through experimentation and knowledge work, all facilitators state that the companies must ensure the results for their own: "*The values are created on their own based on the competence they have acquired in the network*" (Facilitator 1). Also, Facilitator 3 agrees that the networks are not focused on producing or creating values together, and that "*the individual company must take the initiative and make sure to create a business idea out of it*". Therefore, none of the facilitators are concerned about value creation and distribution, since the value created is a consequence of the networks rather than their main focus (Facilitator 3).

If other values are to be created together, Facilitators 3 and 5 think that the structure needs to be in the form of a more formal partnership, where everyone participating gets an ownership stake in a company. Further, Facilitator 3 thinks that there are some areas on which the companies just have to agree not to compete or collaborate, or they have to become co-owners. If the collaboration entails innovation, the question of "*who owns the rights, and everything with IPR becomes an issue*" (Facilitator 3).

4.3 Cross-case analysis

The initial framework in 2.2.4 (Figure 2.7) proposed some drivers that companies have for seeking collaboration, along with competitive mechanisms that might affect the collaboration. Further, it suggested that the way companies collaborate in networks can be described in terms of their activity patterns, what resources they share, and how the actors perceive each other. To assess whether this gives a realistic perspective of why companies are collaborating in networks, as well as how they decide which activities to collaborate on and which resources to share, the findings from sections 4.1 and 4.2 are analyzed on a cross-case level in the following subsections.

4.3.1 View on circular oriented innovation and collaboration

When interviewing the companies, it became evident that the majority of them have sustainability as a core value. Thus, the companies think that it is a common responsibility to contribute towards a circular transition. Moreover, the companies' view on COI also seems to affect their view on collaboration. Table 4.1 summarizes the findings related to the companies' view on COI on a cross-case level, where the most important findings are further elaborated below.

Table 4.1: Summary of empirical findings related to companies' views on COI.

	Views on circular oriented innovation	Case	Facilitator
Motivation to innovate	Sustainability as one of the core values in the organization	Alpha, Gamma, Delta Epsilon	
	Market trends and increasing expectations from customers	Beta, Delta	
	EU taxonomy, finance markets start demanding it	Beta, Delta	
	Have it in our DNA to be innovative	Alpha, Gamma	
	Common responsibility	All	
Barriers	Customers need to change	Alpha, Beta, Delta	All
	Need regulatory changes	Alpha, Gamma, Delta	All
	Need new technology (not able to recycle that much today) "chicken and the egg paradox"	Alpha, Beta, Gamma	
	Logistics and transport of material handling might be difficult	Delta	
	Uncertain profitability	Alpha	All
	Lack of knowledge and capabilities		All

Time perspective	Takes a long time to turn the ship around (stay relevant in the future)	Alpha, Beta, Gamma, Delta	Facilitator 1 and 3
	Need to protect the nature which is the foundation of our living	Alpha	
Approach to innovation	Try and see how it goes	Alpha, Beta Epsilon	
	Structured approach: According to a plan and strategy	Gamma, Delta	
	Cost-versus-benefit is important	Beta, Delta	
	See what others are doing, external inspiration	Beta, Gamma	
View on collaboration	Go together to find common solutions to common problems	Alpha, Delta, Epsilon	All
	Dependent on collaboration to succeed in the transition	Alpha, Gamma, Delta, Epsilon	Facilitator 1,5
	Everyone has to do it to make a real impact and reach the SDGs (time perspective, do not have time..)	Alpha, Beta, Delta	
	Find the networks we get something in return for being in	Beta, Delta	

Overcoming circular innovation barriers

When talking about circular innovation, the companies mentioned several related barriers without being asked and it therefore seems to be at their front of mind. Moreover, the companies mentioned they have issues overcoming these barriers alone, and both Alpha, Gamma, Delta, and Epsilon said they depend on collaboration to succeed in the transition. The facilitators also agreed to this by implying that the problems were too complex and that companies "*need to collaborate to actually make it happen*" (Facilitator 5). For example, Gamma argued that if everyone continued innovating on their own, they could "*at best achieve something linear*" (Interviewee 1). Moreover, the companies' environmental beliefs also make them look towards collaboration as "*the globe doesn't have time for everyone to sit on their own and come up with one solution at a time." (Interviewee 1, Delta).* The companies therefore view collaboration as crucial for the industry to progress at the needed pace to achieve the SDGs. The facilitators also mentioned that an additional reason for why these challenges were too demanding for companies to solve alone was that they lacked the required knowledge.

The most prominent barriers, as they were mentioned by a majority of the companies, concerned the maturity of the market, regulatory barriers, and lack of regulatory incentives. Further, these reasons are to blame for the difficulties in making the circular business models profitable, as many companies are uncertain about, and Alpha has

experienced first-hand. The companies experience that the linear models are favored, through for example taxation schemes and the "used sales law" as mentioned by Alpha and Facilitator 5. Since the innovation of new products and services cost them a lot, and since there are many extra costs related to providing circular services such as repair and rental, Alpha, Beta, and the facilitators state that the customer must be willing to pay more for environmental solutions. Therefore, all the companies stated a need for the customers to change. The facilitators also mentioned that since the companies are already struggling with profitability due to the high competition and tight margins in the industry they are living from "*hand to mouth*" (Facilitator 1). Therefore, it is difficult for companies to invest in COI alone, and often "*the short-term measures are preferred over the more long-term ones*" (Facilitator 5).

Longer time perspective to protect the future livelihood

Due to the external pressure of environmental change, accelerating the circular transition was also mentioned as an important argument for collaborating. Moreover, as both Alpha, Beta, and Delta mentioned that such a change takes a long time, they argue that it is all the more important to begin the process "yesterday". Alpha also mentioned that having a longer time perspective on the investments made on sustainable innovation is necessary as it also entails protecting their future "*livelihood*" (Interviewee 1). The companies also argued that since it "*takes a long time to turn the ship around*" (Interviewee 1, Beta; Interviewee 2, Delta) it might turn out very disadvantageous to have started too late when sustainability becomes a "*hygiene factor*" either through regulations or market demand. The facilitators, too, supported this view and views it as "*riskier to not innovate*" (Facilitators 1 and 3) than actually spending the resources now.

Approach to innovation and view on collaboration

The companies' general approach to innovation also seems to affect their view on collaboration. For example, among the companies, two different innovation approaches were identified; the "try and see approach" and the "cost-versus-benefit approach". In the first approach, Alpha and Epsilon stated that they do not have very detailed plans for their innovation and like to throw themselves into the unknown. These are also the companies that seemed the most enthusiastic about collaboration in the interviews, and the most eager to participate in many different networks. The second approach that was identified in Beta, Gamma, and Delta followed a more methodological and systematic approach which had to be in line with a plan and a strategy. Therefore, they carefully plan what measures to implement according to the investment cost and the expected environmental outcome. They also stated that when it comes to collaboration, they want to be sure that they "*get something out of being in the networks*" (Interviewee 1, Gamma; Interviewee 1, Delta) before joining them.

4.3.2 Strategic objectives and other reasons for joining networks

In addition to overcoming barriers as elaborated in the previous subsection, several strategic reasons were found as reasons for joining networks. Moreover, additional reasons were found e.g., increased market attention and increased focus within the organization. Table 4.2 summarizes the findings related to these drivers for collaboration, and the most important findings are further elaborated upon below.

Table 4.2: Summary of empirical findings related to drivers for collaboration.

	Driver to collaborate	Case	Facilitators
Share risks and (get access to) resources	Share risk and resources, and getting things done faster	All	Facilitator 4,5
	Get access to knowledge and expertise	Beta, Gamma, Delta, Epsilon	Facilitator 1,2,3, 4
	Get inspiration, "avoid reinventing the wheel"	Beta, Epsilon	
	Collaborate to get public financing (Innovation Norway)	Gamma, Epsilon	Facilitator 4
Seek synergies	Influence the consumers, need more mature market	All	Facilitator 1, 3
	Influence politicians	Alpha, Gamma, Delta	All
	Negotiation with suppliers	Beta, Epsilon	
	Avoid double work, gather information together	Alpha, Beta, Epsilon	All
	Achieve economies of scale	Alpha, Epsilon	Facilitator 2, 5
First-mover disadvantage	Beneficial if many companies change at the same time	Alpha, Beta, Gamma, Epsilon	Facilitator 1, 3, 5
	Establish ground market rules through common standards	All	All
	Collaborate to get others on board	Alpha, Beta, Delta,	Facilitator 1, 3, 5
Social	The social aspect, sense of having colleagues	Alpha, Beta, Delta	
	The collaboration has developed gradually over time, it just "clicked"	Epsilon	
	Continue in the network when you change job	Alpha, Delta	

	Get a place to discuss common problems and solutions	Beta, Gamma, Epsilon
Other	Increased attention internally in the organization	Beta
	Get increased attention that we are doing something sustainable	Alpha, Beta, Delta,

Share risks and (get access to) resources

Since all the companies mention economic barriers related to circular innovation, collaboration can provide a "*more comfortable situation for each company with regards to risk-taking and resource spending*" (Interviewee 2, Alpha). Facilitators 4 and 5 thus call collaboration a "*risk relief*" for the companies. Another resource that is shared is the companies' time when tasks are distributed, and double work is avoided across companies in the network. Alpha stated that most of the innovative work is on the side of everything else they must do daily. Therefore, in the networks, they get to focus on things they would not otherwise have the time or resources to focus on alone. Also, Epsilon agrees that collaboration is important to free up time and release a lot of pressure from the CEO. Not only is it less work for each person when collaborating, but things are also done faster, which Gamma states is "*beneficial for both the environment and the time and energy spent on a project for each company*" (Interviewee 1).

In addition to sharing risk and resources, another frequently mentioned reason to seek collaboration is to get access to information and knowledge. Also, the facilitators said that the companies needed increased knowledge and competence and that the network thus functions as a "*unique source of expertise*" (Facilitator 4). Beta said that due to the network they had managed to clarify the challenges ahead and make prioritizations for the next steps together with other companies. Moreover, with a cost-versus-benefit perspective, the network provided Beta with the necessary information, so they could "*avoid reinventing the wheel*" (Interviewee 1) and "*avoid potential pitfalls*" (Interviewee 2). Alpha and Gamma also said that the collaboration enabled them to stay updated on market trends more efficiently, as more information was available from the network.

The last resource functioning as a motivation to collaborate was the access to public funding through for example IN's business network support. According to Gamma, these funds are important as they enable innovation projects that none of the companies would have had the resources to conduct on their own. Also, Epsilon mentioned that public funding was important to deal with the high investment costs and that it was easier to access these resources as the facilitators are "*experts in how to obtain funding*" (Interviewee 1). Thus, it seems as though funding is a strong incentive for collaborating in networks. Moreover, the funding also gives the facilitators incentives for establishing networks, since "*IN and others often prefer to support collaborative innovation, since then the support benefits many companies at once*" (Facilitator 4).

Seek synergies

As explained in 2.1.6, companies generally seek collaboration when they expect some value added. Wit (2017) mentions three different ways in which synergies can be achieved; leveraging resources, integrating activities, or aligning positions. As seen in the previous paragraphs, companies leverage their resources by dividing risk and resource spending along with sharing information and knowledge. Moreover, most of the companies and all

the facilitators agree that in addition to sharing current knowledge and experiences, they seek to enhance their knowledge by gathering new information together. This coincides with Wit's (2017) description of a learning-oriented relationship, where the objective is to exchange knowledge and skills or to engage in the joint pursuit of new know-how.

The only company that stated lending as a motivation to seek synergies was Epsilon, which thus stands out from the other companies in how it leverages its resources. Epsilon is one of few companies that have pursued local production, and thus have its production facilities in Eastern Norway. The CEO in Epsilon explained that letting other companies in the network feed assignments into their production was a way of financing their operation. None of the companies mentioned synergies from integrating activities as a motivation to collaborate, except Alpha who spoke about it only vaguely. Alpha mentioned that finding common circular solutions could result in "*synergies and economies of scale, for example within the costs of handling and logistics these services require"* (Interviewee 1). The handling and logistics were also mentioned by Facilitators 2 and 5 as a potential area, and pointed towards other markets where this trend was increasing: "*Foodora and similar delivery services have started to pick up groceries, books, and electronics. So, using the same transport across companies and industries is already a trend, which I think will also grow in the fashion industry*" (Facilitator 5).

The most emphasized strategic objective to collaborate by the companies was related to elements that could help circular innovations become "*financially sustainable*" (Interviewee 1, Delta). According to the companies, this entails overcoming many of the regulatory and market barriers discussed in 4.3.1, by aligning positions. First, to overcome the regulatory barriers the companies said they have realized the need to stand together to have a stronger voice against politicians and other regulatory actors. Gamma argued that "*influencing the authorities is important so that when decisions are made at the government level, they are made on the right basis*" (Interviewee 1). Also, Facilitators 1 and 3 suggest that many companies seek collaboration to influence the consumers and politicians more easily. Second, to affect the market situation they stated a need to lean on each other to stand stronger and improve their bargaining position towards other industry actors.

The companies explained that they will lean on each other in different ways, with the main objective of changing the competitive landscape in favor of sustainable solutions and making sustainable alternatives possible pricewise. First, the companies wish to lean on each other in negotiation towards suppliers to get them to produce more sustainable products on a larger scale to increase access to sustainable materials and improve the prices. Beta explained that, if a majority of the companies demand the suppliers to do changes in their production, suddenly it gets "*the new standard*" (Interviewee 1) as it is expensive for the suppliers to make changes back and forth. Epsilon also agreed to this by stating that it is important to "*push demand and make the raw material producers more rigged and open to produce more sustainable in our industry*" (Interviewee 1). Second, the companies mentioned a desire to lean on each other to form a consortium to launch a new industry standard, which will bolster the position of all companies involved and all companies that are doing sustainable innovation. Perhaps even more importantly, it will weaken the position of companies that today will not contribute to the change such as certain fast fashion companies. With new industry standards, they will be forced to innovate towards sustainability, or as Epsilon said it: "*change or be outcompeted*" (Interviewee 1). A majority of the companies and facilitators believe industry standards and requirements

are one of the most important measures to make companies proceed in the circular transition.

The last area the companies want to align positions on is in their marketing and information campaigns toward the consumer *"to promote reuse and make them understand"* (Interviewee 1, Gamma). If they collaborate on influencing the consumers, the information will reach out to many more and have a greater effect for all the companies. Moreover, it will weaken the perception of companies that are not working to be more sustainable and thus help sustainability to become a hygiene factor as is the companies' desire. All companies thus agreed that it would be beneficial to collaborate to influence the consumers to change their habits and also "*make it easier for them to expect a minimum from all companies"* (Interviewee 1, Epsilon).

First-mover disadvantage and desire for simultaneous adoption

Alpha and Gamma mentioned that they want to be one of the first-movers to have "*the power to decide how things are going to be"* (Interviewee 1, Alpha), or "*own the original*" (Interviewee 1, Gamma). Moreover, they hope that it will give them an advantage regarding customer perception and brand image. Despite those beliefs, they struggle with profitability and admit that it would be beneficial to get others on board. Alpha said they actively try to influence others to be more sustainable both due to environmental reasons and the need for a systemic change, but also to get a more fair pricing and competitive picture so that "*the consumer is not tempted to choose a cheaper, less sustainable option*" (Interviewee 2, Alpha). Therefore, it is not necessarily only positive to be first if the others are not following close behind. For example, the other companies Beta, Delta, and Epsilon do not think it is possible to position within sustainability, and that it rather will become a hygiene factor. For example, Beta said that they could not sell all their products at higher prices "*just because it is sustainable… but if all of the biggest companies go in that direction, then the competitive situation will be more fair for all*" (Interviewee 1, Beta). It therefore seems like they are working to establish some ground market rules so that everyone has to change and when it gets to that stage, they are prepared to implement these measures.

Also, Facilitators 1, 3 and 5 mentions that it is not necessarily an advantage for a company to own a circular innovation on their own, because then they compete on different grounds than the rest of the market. Facilitators 1 and 5 states that if a company for example has invested in developing a new material, then the end product also gets more expensive, which the customer might not be interested in paying extra for since they have other (cheaper) opportunities offered by the other companies. Further, Facilitator 3 thinks that it is easier to follow if the largest and most powerful companies lead the way, since "*they do not have much to lose, they have more to gain than what they have to lose*". Also, Facilitator 4 states that the biggest fast fashion companies have strong incentives to crack the circular code since "*it is the only way they can keep their fast fashion business model*".

Social aspect

A majority of the companies mentioned that since the group of people working within the industry is quite small, they feel like "*industry colleagues*" (Interviewee 1, Alpha; Interviewee 2, Beta). According to Alpha, this is an important reason for joining the networks, as they often are just one or two persons responsible for sustainability work within each organization. Therefore, the network gives them a sense of unity and a place to discuss difficult questions. Due to this small environment, some of the sustainability managers have also worked for one of the other companies that participate in the network

at an earlier stage, which reduces the suspiciousness towards each other. Moreover, both Alpha and Delta stated that they "*take the network with you when you change jobs*" (Interviewee 1, Alpha; Interviewee 1, Delta). Also Epsilon revealed that the choice of collaborative partners was rather incidental, as it developed while they "*all got to know each other*" (Interviewee 1).

Increased market attention
For both Beta and Delta, collaboration is also seen as an opportunity to get attention for their sustainability work. For example, Beta also explained that one of the reasons they joined the given network was that the companies they like to compare themselves with were in the network, so "*it was nice for us to be mentioned along with them*" (Interviewee 1). Delta on the other side had the same motivation, but a different approach. Their decision to be open and collaborate was a result of a conversation with their marketing bureau where they figured out that collaboration is not something new, but "*nobody has been talking that much out loud of it*" (Interviewee 1, Delta).

Increased internal focus
Beta said during the interviews that being a part of the network also was an excellent opportunity to justify a greater focus on sustainability internally in the organization. Both because they were committed to certain initiatives from the network, but also since the achievements from other companies in the networks functioned as an example that it was possible and did lead somewhere.

4.3.3 Activity patterns
The empirical findings on activity patterns are summarized in Table 4.3 before it is further elaborated below along with how companies decide which activities to collaborate on.

Table 4.3: Summary of empirical findings on activity patterns.

	Activity patterns	Case	Facilitators
Main activities	Activities based on the needs at the moment	All	Facilitator 1,3,4
	Knowledge and competence work	Alpha, Gamma	All
	Discuss and share experiences	Alpha, Beta	All
	R&D projects and workshops on production process	Epsilon	
Systemic issues	Common demands against suppliers / factories	Alpha, Beta	
	Common standards and KPIs	Alpha	
	Producer responsibility	Alpha, Delta	
	Things that affect everyone	Gamma	
	Collaborate indirectly through standards	Beta	

Development	First theoretical, then practical	Gamma, Epsilon	
	Change role according to the type of activity and who the other actor is	Epsilon	Facilitator 5
	Dynamic collaboration	Gamma	

Deciding which activities to collaborate on

The companies agree that the decision on which activities to collaborate on is taken based on their current situation and needs. Gamma said that when they discuss activities within the network, they choose the ones that "*is useful for everyone and each company comes strengthened out of*" (Interviewee 1). Alpha further stated that choosing the next step also depends on "*how far the other companies have gotten*" (Interviewee 1) and Beta continues by stating they want to collaborate on "*solving the things that are crucial for progress*" (Interviewee 1). It thus seems as many of the activities are decided along the way, as "*new things will always come up as you move forward"* (Interviewee 1, Gamma). According to the facilitators, it is important to identify companies that have the same or similar needs to get them to join the networks. Thus, the decision of which activities to pursue in the network is very "*demand-driven*" (Facilitator 4) and "*depend on the companies needs and competence*" (Facilitator 3). Therefore, it seems like the needs are driving the decisions on what activities to collaborate on, but also that the companies with similar needs are gathered.

Another factor that seems to be decisive is the funding opportunities. As discussed in 4.3.2 public funding is important to attract network members to the projects. It is also crucial for which projects and activities that the industry cluster puts into life. According to Facilitators 3 and 4, many of the networks had been shut down because the public funding stopped.

Activity patterns

According to the companies, the most important activities to collaborate on are related to solving systemic or practical issues. As elaborated in 4.3.2, companies seek synergies by e.g., informing consumers together, influencing politicians, and posing common demands against suppliers. In addition to this, the practical issues involve building common systems, KPIs and standards, and competence work to increase all companies' knowledge within the CE field. Alpha stated that standards are important so that the companies don't "*run in different directions, and agree on which areas to focus on first*" (Interviewee 1), and Beta said that they hope these will "*become the new normal"* (Interviewee 1), and that future collaboration would happen indirectly through these. The interviewees in Alpha, Beta, and Delta all thought the activities that will be the most important to work on first are producer responsibility and collection of used textiles, in addition to preparing for the new EU regulations coming up.

To develop these standards and systems, the companies first work on increasing their knowledge within the field. According to Gamma, a network is often more theoretical in the beginning, before becoming more practical after the required knowledge base is established. The companies thus collaborate to gather knowledge and map existing research, in addition to sharing their own experiences. Epsilon also emphasized having an initial phase with knowledge work to get everyone up to the same level before starting to explore the opportunities. All of the facilitators also agree that much of the work so far has

been concerned with increasing the companies' knowledge and facilitating experience sharing.

In contrast to the other case companies, Epsilon was one of the companies that collaborate on more specific issues. In addition to looking at new methods for the design process, the company also looks at what infrastructure is needed for this kind of production and how it is best to organize the work. They have collaborated on actual experimentation and prototyping at a physical workplace in Epsilon's factory. The CEO, however, stressed that it has mostly been about solving practical issues, and is a kind of R&D work that they all benefit from. Gamma also said that they will start reasonably, with a couple of pilot projects.

When it comes to deciding what types of activities to collaborate on, Facilitator 1 does not think the activities have to be divided into upstream and downstream activities. Instead, it depends on where the companies have competence and needs, which varies from company to company. As mentioned in 4.3.2, Facilitators 2 and 5 thought it could be valuable for companies to collaborate on issues further down the value chain to reap synergies e.g., they mentioned logistics and transport as a potential area that could be valuable. In contrast, Facilitator 3 thought it would be easier to collaborate, especially invest in innovations together if the project is further up in the value chain "*and not that much front end*".

4.3.4 Resource constellation

The resources shared are thus mainly information and knowledge, in addition to the work performed by each company saving them all time. As discussed, Epsilon stands out from the others as they also share their production facilities. Moreover, Facilitator 3 explained that they do not demand other actors in the network to contribute with more than the smallest company can. In addition, all the companies get access to public funding, as discussed in 4.3.2. Since information and knowledge was the main resource the interviewees were concerned about, this will now be discussed more in detail.

Information sharing and withholding

As the companies in the networks have different resource bases, tensions regarding what to share, with whom and, under which conditions may occur (Levy et al., 2003). These tensions were evident in the network as the companies had a clear idea of what information to share and not, and that they wanted something in return for sharing their knowledge. Epsilon and Gamma said that they gladly shared information when they knew they would get something in return. Alpha stated that they are restrictive when it comes to sharing information about product development, for example, new styles or products that are coming in a year or two. Beta stated that they never talk about price, collections, and specific suppliers. Also, Epsilon said that they never share what designs they are going for in the next season because that is not "*why they need to collaborate*" (Interviewee 1). The facilitators also agree that information of the products is something that the companies generally wish to keep to themselves, as they want to keep as much uniqueness as possible about the product. Also Gamma is conscious of what they share in the network and not, and to have a "*dynamic collaboration with someone you can both give something to, but also get something from*" (Interviewee 1). Therefore, Gamma is maneuvering what information they share and what they do not share, and choose the actors they want to learn from so that they know they will get a return on the "investments" in creating knowledge and making sure that the relevant knowledge can be found and used, as described by Tidd and Bessant (2018), and discussed in 2.2.2.

Alpha and Delta stated that they want to be as open as they can when it comes to sustainability, and Gamma said that they "*share all the things we can share, and we think is safe to share*" (Interviewee 1, Gamma) regarding sustainability. It is clear that e.g., Gamma follows this logic, as the company is the only player engaged in textile sorting in Norway, and thus wishes to have its own projects within this area to protect that position. Therefore, everything that is related to the development of for example sorting technology, that Gamma thinks is a "*pre*" (Interviewee 1) for them, is kept within the organization. Delta was also secretive about their process during the product development stage, but after launching they chose to share everything about the process, and who made the products for them so that others could follow. However, they still had to keep their supplier's secrets safe, so that the supplier would get the potential benefits if other companies wanted to make similar solutions.

However, Beta and Delta explain that the network facilitators and the competition authorities have clearly defined what kind of information that cannot be shared and that this is clearly defined in contracts that everyone has signed. These formal protection mechanisms help to reduce the uncertainty between actors and make everyone feel safer. Therefore, everyone is well informed of what rules apply before joining the networks. Another mechanism used to keep information safe is the use of the Chatham House Rule. "*But nobody is saying anything secret in these groups anyways*…" (Interviewee 2, Beta). Epsilon agrees that as long as the formal arrangements such as an NDA are in place at the beginning of the collaboration, they feel quite safe about what the company shares within the network.

4.3.5 Web of actors

As elaborated in 2.2.1, business relationships create bonds between actors which affect how they perceive, evaluate, and treat each other. The degree of knowledge sharing, as discussed in 4.3.4., seem to be affected by whom the other actors in the network are, and how the focal company is related to them. For example, Alpha stated that since they have a direct competitor in their network, they are especially cautious about what type of information they share and not. Beta and Gamma, who on the other hand do not have direct competitors in the network, are less reluctant about what they share. Even if they do not have competitors themselves, Beta states that "*there definitely are competing chains present*" (Interviewee 1), and Gamma stated that some companies might become competitors and that they, therefore, use the network to "*keep an eye on them*" (Interviewee 1). Another example of how the value net describes the dynamics of the collaboration is found by studying Epsilon's activity patterns. As elaborated in 4.3.3, Epsilon has changed their position in the value net according to what actors they collaborate with, and type of actor. Thus, they have managed to collaborate with their competitors by taking on the producer role, so that the competing company functions as their customer.

Håkansson and Snehota (1995) stated that actors can create their own world by influencing the bonds they have to other actors. Both Alpha and Gamma constitute clear examples of this. Gamma in their choice of network collaborators, and Alpha in their ambition to influence others. Gamma emphasized having the right network composition to succeed with innovation and acquire the necessary knowledge. Therefore, they often contact other companies to "*bring in players with different skills to ensure that you benefit from the innovation project within the various focus areas*" (Interviewee 1, Gamma). This is in line with Tidd and Bessant (2018), who advocate considering mechanisms to ensure that relevant knowledge can be found and used. Since Alpha views it as beneficial if many companies change at the same time, they admitted that one of the reasons they had for

joining networks was to get others on board. The sustainability manager said that they actively try to influence others by leading by example and showing what they are doing, and ask others "*can't you do that too*?" (Interviewee 1).

Regardless of the extent the companies are committed to one another, Håkansson and Snehota (1995) argue that there will always be uncertainty related to perception, trust, and beliefs. One of the companies that stood out from the rest in terms of type of collaborative activities was Epsilon. Since they had opened their factory for others, they said that working on design processes always entails the risk of being "*too inspired by each other*" (Interviewee 1). Facilitator 4 also mentioned this risk, calling the network a "*small duck pond*". Due to this risk, it was important for Epsilon to choose the right collaborative partners instead of including everyone. Moreover, boundary setting in terms of formal agreements and NDAs was important to settle/agree on what to share, with whom, and under which conditions. Also Alpha, Beta, Gamma, and Facilitators 1, 3, and 4 agreed that formal agreements make the foundation for developing trusting relationships.

Positioning

Another issue that became evident during the interviews is how the companies use the networks to position themselves. Both in terms of marketing and attention, as discussed in 4.3.1, but also in terms of positioning compared to other competitors or industry actors. Alpha and Epsilon both stated that even though they collaborate with their competitors, the real competitors are the global brands. The Norwegian fashion industry is quite small compared to the rest of the world, and therefore they think they "*stand stronger together*" (Interviewee 1, Alpha; Interviewee 1, Epsilon). Beta and Gamma on the other hand said that the network was an important arena for them to stay relevant. Since Beta is one of the few interior textiles companies in Norway, it was important for them to be represented and show that "*interior is also a part of the textile industry*" (Interviewee 1). Thus, it was important for Beta to make sure all future decisions about regulations etc. were suitable for interior textiles as well as clothing, and not forgotten. Gamma also mentioned keeping their position as an important focus, so that new political incentives would not undermine clothing collectors in favor of for example waste companies, since it could be "*enticing to think of other more effective solutions, streamlining and such*" (Interviewee 1).

View on competition

Alpha mentioned that they think some degree of competition is necessary as it gives them a drive to progress. Moreover, despite the companies' statement of "not competing on sustainability", there are still some findings that uncover some competitive mechanisms. For example, both Alpha and Gamma said that they would like to be the first to strengthen their positions, as discussed in 4.3.2. For example, Gamma wanted to work alone on everything they considered a "pre" for the company, in terms of formats and technical solutions. Also, Delta was very secretive under the development phase of their new collection and decided to be open just after it was launched, ensuring they had an advantage in terms of time to market. When asked about the future development of collaboration on sustainability, Alpha said they believe many companies will keep more secrets when they have managed to overcome the challenges they face today, and commercialize the new sustainable solutions.

When interviewing the companies, it became evident that the companies have agreed to the motto "we *collaborate where we can, compete where we have to*", as this was repeated by most of the companies and facilitators. The facilitators also revealed that there exist some competitive mechanisms when it comes to what information is shared and not: and

that the companies behave differently according to their position. Facilitator 1 thinks that the degree of information sharing is different from company to company. For example, if someone with high competence internally, Facilitator 1 believes they will work to get this first into the market on their own to "*get the PR value*" and that "*in those areas where you can be first in the market because you are a leader or have a high level of competence, then probably someone will choose to do it themselves."* (Facilitator 1). If they on the other hand have a low level of competence, Facilitator 1 thinks they will be naturally drawn to the network to learn more. Facilitator 3 also thinks that "*there probably are some who hold the cards a little more to their chest than others*".

However, as discussed in 4.3.2, the disadvantages of being alone in the market outweigh the advantages mentioned here. Therefore, the companies state that they have realized they need to collaborate now and that they are prepared that the dynamics might change when the goal is reached. Therefore, both Alpha, Delta, and Epsilon view it as primarily positive that others innovate, because it is necessary to give sustainability and circularity the attention it deserves to manage to change. It thus seems like simultaneous adoption is prioritized over obtaining competitive first-mover advantages.

Table 4.4 summarizes the competitive mechanisms that play out, which have been elaborated on in both how resources are shared in 4.3.4 and how the actors view each other in this subsection (4.3.5).

Table 4.4: Summary of companies' view on competition

	View on competition	Case	Facilitator
Information withholding	Do not talk about products or new styles	Alpha, Beta, Epsilon	All
	Do not talk about price or specific suppliers	Beta	
	Do not talk about specific formats or technical solutions	Gamma	
	Keep everything we think is a "pre" for us secret	Gamma	
	Do not share our partners/ suppliers' secrets	Delta	
	Pick the actors we want to learn from	Gamma, Epsilon	
	Information trading, make sure to get a return on what is shared	Beta, Gamma	
First-mover benefits	Share more information after product launch	Delta	
	Wish to be a first-mover, have pride in it	Alpha, Gamma	
	Might strengthen the brand and story building	Alpha, Beta	
	Build competence when innovating and get a large rig	Alpha, Gamma	
	The first-mover gets the power to decide how things will be, "own the original"	Beta, Gamma	

	Good relations with suppliers	Alpha, Delta, Epsilon	
First-mover disadvantages	No ambition to be a first-mover	Beta, Delta	
	Be a close follower, prepared to adopt when the time is right	Delta	
	Cost a lot of money to innovate	Beta, Delta	
	Difficult to position on sustainability	Delta	
	Will become a hygiene factor	Delta, Epsilon	
View on other actors	Competition is a driving force for improvement	Alpha	
	Agreed to not compete on sustainability	Alpha, Delta,	Facilitator 1,3,4
	Need to change the competitive landscape more in favor of sustainable options	All	All
	Positive if others innovate	Alpha, Delta, Epsilon	
	Up to each company to create value on their own	Gamma	Facilitator 1,3,4
	Compete together against global fashion companies	Alpha, Epsilon	Facilitator 2,5
	More restrictive when competing companies are in the network, not that captious when not	Alpha, Beta, Gamma	Facilitator 4
	Use the network to keep an eye on potential competitors	Beta, Gamma	
Network dynamics	Companies behave differently according to their position		Facilitator 1,3
	Ownership structure might change if values are created together	Epsilon	Facilitator 3,5
	Trust is important, get to know each other		All
	Formal protection mechanisms are important	Epsilon	All

5 Discussion

This chapter seeks to answer the research question on why competing companies seek collaborative COI, and how competitive mechanisms affect the collaboration, based on the empirical findings in Chapter 4. Section 5.1 answers the research questions and presents the key findings of this thesis. Then, based on these answers, a revised framework is presented in section 5.2. Thereafter, implications for managers, policymakers, and theory are discussed in section 5.3. Finally, the limitations of this thesis are discussed in section 5.4, and suggestions for further research made in section 5.5.

5.1 Key findings

This section seeks to answer the research question by answering the each of the sub-questions posed in section 1.1, based on the key findings from Chapter 4 and how it relates to theory.

5.1.1 Companies' view on circular oriented innovation and collaboration

The analysis in 4.3.1 demonstrates that the main reason companies have for performing COI is their fundamental environmental beliefs and values. Moreover, innovating towards circularity is perceived as a common responsibility. As companies have realized that they neither have the ability nor the time to accomplish the necessary changes and overcome the associated barriers alone, they seek collaboration. These findings are consistent with previous literature, saying that lowering the barriers for circular adoption call for collaborative actions (Tura et al., 2019), as elaborated in 2.1.5 and 2.1.6. The majority of the companies studied were also found to have a longer time perspective on COI, which means that they believe it is important to start now to see the required change in the future. This perspective is grounded in both their sustainability beliefs and competitive reasons, as innovative processes and change take time and they do not want to lag behind. The cases have thus highlighted that having the same mindset and motivations to pursue CE may act as a key motive to collaborate, in line with Brown et al. (2019; 2021) who emphasize aligning upon a shared circular purpose.

Finally, companies' general approach to innovation also seems to affect how they view collaborative relationships. The case companies that had a "see how it goes" approach, had a similar approach to collaboration, and threw themselves into it, positive that it would be beneficial. On the other hand, the cost-versus-benefit-oriented companies would not spend time on collaboration unless they knew there would be a return. This finding provides new insight into why companies collaborate and indicates that companies' collaborative behavior in the network may be different even though they are aligned upon a shared circular purpose.

5.1.2 Companies' motivations for joining networks

The analysis in 4.3.2 indicates that the main strategic reason companies have for joining collaborative networks is to share risks and get access to resources, as a majority of the case companies could not take on these types of projects on their own. These reasons are consistent with previous research which states that collective risk-taking is one of the major benefits of networks (Brown et al., 2019; Tidd & Bessant, 2018). Moreover, companies seek collaboration due to a lack of knowledge and capabilities required to perform COI activities, which also is in line with Brown et al.'s (2019) finding that the primary motive for exploring collaborative innovation is to increase the knowledge flows.

Moreover, the collaborative synergies elaborated in 2.1.6 by Wit (2017), also seem to be relevant for COI networks, as the case companies stated a desire to align positions to stand stronger when e.g., dealing with immature customers, influencing politicians, or in negotiation with suppliers. According to Bouncken et al. (2015), these synergies take the form of not only shared costs but also mitigated risks and economies of scale realized by mutual activities, which thus coincides with the case company findings.

Further, the case company findings indicate that there are significant disadvantages related to being a first-mover in the adoption of circular principles in the fashion industry. First, the case companies mentioned that it would be beneficial if many companies change at the same time, while the first-movers use the collaboration to influence others to get on board, by making them become "aware, convinced and committed", as suggested by Håkansson and Snehota (1995, p.201). Second, neither the case companies nor the facilitators had seen a "financially sustainable" example, where the company was not losing money on adopting circular strategies. Third, as many of the studied companies desire to become more circular, they seek to change the industry by establishing ground market rules and common standards. Thus, companies collaborate to change the market dynamics in favor of those who are innovating towards circularity. This finding thus indicates a need for a 'simultaneous adoption', as suggested by Aspelund et al. (2021), meaning that it will be difficult to compete against fast fashion today, without forcing the change.

Lastly, the case companies revealed some motivations to collaborate that were not expected to be found in advance. These were the social aspects of networking, the ability to increase the internal focus on sustainability, and the attention or marketing effect of being part of a network. Increasing the internal focus and the marketing effect is in line with the findings of Brown et al. (2019), who found that the majority of companies join CE networks in a search for, and/or creation of, credibility and acceptance. Further, the social aspect and the desire to increase the internal focus indicate that sustainability still is a separate unit in many organizations, not embedded in every business unit. Thus, the companies' absorptive capacities, meaning their ability to exploit the acquired knowledge and incorporate it (Cohen & Levinthal, 1990), might not be in place.

5.1.3 Which activities to collaborate on, and which resources to share

A recurring statement by the case companies, as seen in 4.3.3, was that the decision on which activities to collaborate on is based on current needs and demand-driven. Moreover, as seen in 4.3.2, the access to public funding seems to be decisive in which projects are executed and not. These findings indicate that the composition of a network is decisive of which activities are relevant, and based on what resources the companies have available. Therefore, the web of actors, resource constellations, and activity patterns are closely interrelated (Håkansson & Snehota, 1995), also in collaborative COI networks.

Further, the activities in a COI network are mainly competence and knowledge related in the beginning, as the industry lacks the required knowledge to change. Therefore, both the case companies and facilitators emphasized getting all the actors up to the same knowledge level before working on practical issues, to make all actors able to contribute. This might also be a measure taken to prevent "free riders", which Tidd and Bessant (2018) mention as a risk in networks. When the required knowledge base is established, the network may move towards working with more practical issues. As evident in 4.3.3, all practical activities are mainly based around general, systemic issues, such as developing common standards and KPIs, or new processes. Moreover, the main resource shared is knowledge and information, but also the time each company commits to the projects, as

evident in 4.3.4. These findings indicate that companies share as openly as they can when it comes to sustainability, as long as it is perceived more beneficial to get others on board than pursuing a first-mover position.

As the case companies wish to collaborate merely on sustainability, they try to separate this type of information from other competition-sensitive information. Thus, even though marketing is defined as a competitive area, the companies collaborate to inform consumers through common campaigns, as elaborated in 4.3.2, as it is beneficial for them all to increase the maturity of the market. Both the development of common standards and informing customers are related to the market dynamics, as all the actors that wish to innovate toward sustainability also need to make sure they stay competitive. If all actors are forced to follow the same rules, the competitive conditions will be more fair for everyone. Thus, the case companies constitute an example of increasing the size of the pie (Nalebuff & Brandenburger, 1997). This finding is central as it illustrates how companies manage to balance their competitive interests and common objectives, and validates Bouncken et al.'s (2015) suggestion that coopeting companies should separate pre-competitive and competitive stages of the innovation process to manage the flow of information, knowledge, competencies, etc. However, it also implies that they can only collaborate on larger systemic issues as they are currently doing, or keeping the circular measures separate from their core business.

Moreover, as elaborated in 2.2.3, Bengtsson and Kock (2000) state that the degree of proximity to the customer is a determinant for the distribution of cooperation and competition. This also seems to be the case in COI networks, as the case companies keep information about their products and campaigns a secret while collaborating on demands towards suppliers, or work on R&D projects related to new production processes. Thus, they follow the patterns described in the activity arrow (Figure 2.5) by Walley (2007), when the activities are related to the value chain. However, the more systemic activities do not follow this pattern. Therefore, it seems to be another dimension of how activities are distributed in a coopetitive relationship. For example, the actors collaborate to inform consumers, which can be said to be close to the customers. Moreover, influencing the politicians and working on common standards does not fit the activity arrow categories (Walley, 2007) either. Neither can competence work, even though it might answer to the R&D category. Even though the companies follow the patterns of the activity arrow today, they state that there might be potential benefits to be reaped by collaborating on e.g. logistics and transport, which is in the very end of the activity arrow. Thus, the potential for collaborating on activities further down the activity arrow (value chain) is an interesting area for future research and is discussed in 5.5.

5.1.4 View on competition and competitive mechanisms

The case company findings indicate that fashion and textile companies do not view circularity as a source of competitive advantage, neither in the short, nor long term. In the short term, circular innovation entails high investment costs with uncertain returns, thus, a risk of reducing current profits. As elaborated in 2.1.5, risking a larger share of resources before market validation causes a major source of reluctance for companies (Linder & Willander, 2017). Despite the possibility to improve company's perception among sustainable-oriented customer segments, the case companies that positioning on sustainability is considered both expensive and difficult, and therefore, not worth the effort. Moreover, as the more unsustainable brands can offer their products at lower prices, it would be difficult to compete on price for those who, e.g., pay more for more durable or recycled materials. Thus, it is considered a first-mover disadvantage, as discussed in 5.1.2,

rather than a source of competitive advantage due to the additional costs and uncertain profits, as well as risking the loss of market share to other unsustainable actors. In the long term, the case companies thought sustainability would become a hygiene factor, and that the only competitive advantage of innovating is to not lag behind when that happens. Therefore, the main competition is against fast fashion companies with no ambition to adopt circular principles, not among the network participants. Thus, the Norwegian fashion industry stands together to create a collaborative advantage, as described by Kanter (1994). By developing a common knowledge base using all the companies' experience and expertise, they increase their innovation capacity as suggested by Bouncken et al. (2015).

The finding that the case companies did not perceive circular adoption as something that would lead to a competitive advantage contrasts much of the previous CE literature (from other industries). For example, Gusmerotti et al. (2019) view the CE as a way to reduce the conflicts between the competitive and environmental priorities within a company, making it more competitive, while at the same time reducing its environmental footprint. Other scholars also agree that by closing the material loop, the companies maximize the value of their resources while reducing their resource use, which is good for both the company and the environment (e.g. Jensen et al., 2019; Konietzko et al., 2020b; Nußholz, 2018b. The contrasting finding might however be explained by the fact that the industry has not found a way to recycle textile fibers on a larger scale yet, which means that it is not possible to close the loop with today's solutions. Thus, the fashion industry is not able to create value from the inner circle as described by Yang et al. (2018). Furthermore, as elaborated in 4.3.1, the other sources of value creation are not viable either, due to regulatory barriers or lack of consumer demand.

Even though the case companies did not view circularity as a source of competitive advantage, and stated that they do not compete on sustainability, there were still some competitive mechanisms visible within the network. For example, as evident in 4.3.4, the companies still trade information to make sure they get something in return for sharing. While section 4.3.5 illustrated that the companies behave differently according to their position and the composition of the network. These findings indicate that the network composition affects the degree of collaboration in the network, as suggested by Bengtsson and Kock (2000), and that the value net (Figure 2.6) creates the dynamics of the collaboration as suggested by Walley (2007). First-mover advantage or not, the case companies' ambitions related to being first or not seem to affect their behavior in the network. For example, the companies that wanted to be first would wait to share the information on, e.g., their new innovative material until after it was launched. The facilitators also thought that companies would withhold information when it could give them a potential advantage. If they, on the other hand require information, they will be drawn to the network to learn more. These views are in line with Hamel et al. (1989), who argues that companies join collaborations to learn as much as possible from others when needed while attempting to limit the partners' access to their knowledge and skills when they view it as a potential advantage.

However, as discussed in 5.1.2, if the majority of fashion companies continue as usual, the disadvantages of being alone in the market outweigh the potential advantages. Therefore, it seems like the case companies have realized they need to collaborate now to achieve system-level effects, and that the coopetitive dynamics might change if the goal ever is reached. This finding is central, as it indicates that simultaneous adoption of circular principles is prioritized over obtaining eventual competitive first-mover advantages. As the activity patterns in 4.3.3 illustrate, the focus on general and practical issues might also be

rooted in what types of resources the companies are willing to share and not. Thus, as discussed in 5.1.3, the case companies make coopetition work because they keep sustainability issues separate, or only focus on general, systemic issues to balance their competitive interests and common objectives.

5.2 Revised framework

Based on the cross-case analysis in section 4.3, and the discussion of key findings in section 5.1, the initial framework has been revised to include the empirical findings. As illustrated in Figure 5.1, the revised framework explains that the reasons for why companies seek collaboration can be explained by their view on circular oriented innovation, their strategic objectives and other factors such as the social aspect of being part of a network. Additionally, the way competitive mechanisms affect the collaboration is explained in terms of activities, what type of resources is shared, and how the composition of actors affect the network dynamics.

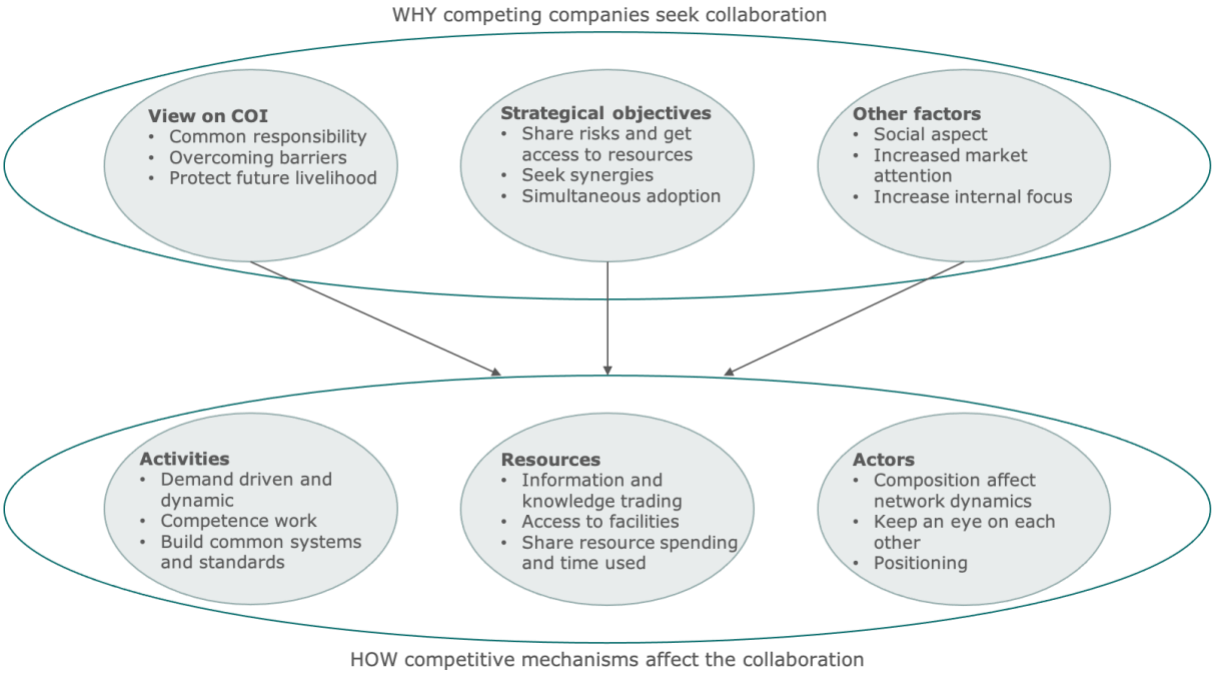

Figure 5.1: Revised framework describing why companies seek collaboration, and how the competitive mechanisms affect the collaboration.

5.3 Implications

5.3.1 Implications for managers

Having a better picture of why companies seek collaboration, as well as how the competitive mechanisms affect the way they collaborate, is important to create better collaborative structures and progress in the circular transition. The framework in section 5.2 increases this understanding, and can thus aid both network facilitators and companies in their collaborative innovation processes.

The findings imply that the companies are mostly concerned with reducing the opportunity space for the actors that choose not to innovate towards circularity, to make it possible to stay competitive for those who do. To some degree, it could be difficult to overcome the barriers without either changing the ground rules of the market through regulations or significant changes in consumer behavior. However, as authorities influence the "rules of

the game" (Nalebuff & Brandenburger, 1997, p.30) it may be valuable for companies to improve their political insight and seek to impact how future regulations are designed to strengthen their future positions. Even though regulatory change is important, there are also other issues companies can work on meanwhile to improve their situation. For example, if enough companies go together to negotiate with a factory, they can get the factory to make changes to become more sustainable. This will also indirectly force the unsustainable companies to change towards sustainability if they continue with the same supplier. Moreover, working with common standards and KPIs is also important for the new EU taxonomy, which in turn puts pressure on the unsustainable from the financial markets. This implies that companies have a much better chance of beating fast fashion by coopeting.

With the "us against them" attitude towards the companies that are not contributing to the circular transition, it may be valuable to investigate whether additional collaborative advantages could be exploited to make it less attractive to continue with fast fashion. For instance, as the case companies mainly work on systemic issues or activities far up on the activity arrow (Figure 2.5), there might be potential synergies worth investigating in the other end e.g., logistics or transport. Furthermore, most of the companies today are testing out circular strategies on a lower scale through for example pilot projects or limited collections. However, to achieve a circular transition the companies need to change the entire way of operating, including products, value chains, and how their products are offered (EMF, 2013). This implies that when circular principles gradually get implemented as a part of companies' core business, it will be harder to divide between sustainability and competition-sensitive information. Thus, the degree of information sharing within networks will be affected when more businesses become circular.

Lastly, the case companies seemed to be mostly concerned about the external barriers to circular innovation, such as regulatory barriers and market immaturity. However, one of the mentioned arguments for collaborating also is lack of knowledge and capabilities, which is an internal barrier. Thus, for the companies aiming to adopt circular principles, it may be valuable to increase the focus on internal barriers since these affect what value they get out from the network. As the social aspect illustrated, many companies also seek collaboration in networks because the sustainability managers feel isolated from the rest of the organization, or to have an opportunity to increase the internal focus on sustainability. This illuminates that sustainability could be more integrated in the organization, and perhaps deserves a greater focus. For the companies, this implies ensuring that the knowledge possessed by the sustainability manager, and obtained in the networks, is transferred and utilized in the organization.

5.3.2 Implications for politicians

As many of the companies' concerns regard regulatory barriers, it is natural that this thesis also has some implications for politicians. According to Nalebuff and Brandenburger (1997), the government pull the strings behind the scenes and set some of the rules of the game. Thus, to manage a full transition towards a CE, action is required from the public sector. The findings in this thesis illustrate how today's regulations favor the linear system, which makes it extra challenging to succeed for the companies aiming to adopt circular principles.

The companies' approach to circular innovation and their view on first-mover disadvantages point to a situation where these kinds of changes will not emerge without being orchestrated. Moreover, as the companies seem reluctant to innovate without public

funding and risk reduction, policymakers should design effective policy instruments that couple environmental performance improvements (from a CE perspective) and economic benefits. As Lieder and Rashid (2016) state, due to competitive pressure environmental impacts will most likely remain unconsidered as the primary focus is put on economic benefits and growth. Moreover, since the fashion companies do not see the economic advantages of CE, it results in reluctance in the pursuit of CE initiatives. Gusmerotti et al. (2019) found that in the manufacturing industry, the laws of today relating to the CE are unable to attract the attention of managers and practitioners, and do not generate pressures that induce and incentivize companies to adopt circular principles. Thus, as the fashion industry has even tougher competition and tighter margins, stronger political incentives might be required. To accelerate the circular transition, it might thus be more effective to ban, prohibit or economically sanction unsustainable solutions than trying to promote the circular ones. By combining demand and control, market-based instruments, and voluntary programs, policymakers should design an appropriate strategy to create the right stimuli and opportunities for companies (Gusmerotti et al., 2019). Additionally, policymaking bodies need to cooperate across continents and national borders, as the fashion and textile companies have large, international, and complex value chains.

Another issue that may be questioned by the policymaking authorities, is the balance between public funding and regulations. It seems curious that the public is both funding circular initiatives, and dooming them to fail through their lack of suitable regulations. The funding would be much more effective for innovation if the regulatory barriers were not in place. Moreover, the framework describing how and why companies come together for collaborative COI might also aid decision-makers in the establishment of circular economy action plans, which then hopefully will be more forceful.

5.3.3 Implications for theory

Even though CE research has received increased focus (Ghisellini et al., 2016; Merli et al., 2018), and collaboration is pointed out as an enabler for circular adoption (Brown et al., 2019; Geissdoerfer et al., 2018; Gusmerotti et al., 2019; Lehman et al., 2019; Tura et al., 2019) the field of collaborative circular oriented innovation is nascent (Brown et al., 2021). This knowledge gap is addressed by studying the COI efforts of Norwegian fashion and textile companies within collaborative networks.

The main contribution to theory is the framework in 5.2, which suggests why competing companies seek collaboration, as well as how the competitive mechanisms affect the collaboration. The framework suggests that companies' motivation to seek collaboration can be explained by their view on COI, their strategic objectives, and other factors such as social aspects and increased attention. Moreover, assessing the networks' activity patterns, resource constellation, and web of actors provides a better picture of how companies are collaborating as well as how the competitive mechanisms play out in the dynamics of collaboration. Another important contribution related to the framework is the application of strategic management literature (coopetition and industrial network theory) in a circular context.

As mentioned in 2.1.7, this study also contributes to CE literature by investigating collaborative COI within networks. A final contribution to theory is exploring the collaboration within a specific context, namely fashion industry networks. The initial literature review found that other studies on collaborative COI have investigated a variation of companies in terms of industry, company size, etc. By looking deeper into one industry, it might be easier to compare findings across industries in the future, as multiple-case

multiple-industry studies give little ground to assess whether differences in findings stem from company- or industry differences. As the fashion industry is one of the worst when it comes to CE (EMF, 2017), this study contributes to building the necessary research field for progressing the industry going forward.

5.4 Limitations

As the study relies on a qualitative research strategy it also has limitations as such. In addition to the research quality considerations made in section 3.5, the following limitations are believed to have affected the research.

The first limitation regards the sampling of cases. To provide a complete picture of the dynamics within a network, it would have been preferable to talk with all the companies within a single network. Another alternative would have been to study different networks as in this study, but using case selection criteria that restricted the sample to companies that are more similar to increase the replication and thus the external validity of the study (Yin, 2012). As it was difficult to get in touch with some of the companies and some did not wish to participate, one could argue that the companies that accepted are among the most eager companies also within the networks. Therefore, they might have different viewpoints than other companies when it comes to collaboration and, for example, be more enthusiastic or biased. However, the fact that the final sample of companies represented many different companies also gave the study a broader overview and thus a better understanding of different types of actors within the industry. Bryman (2016) states that in the case of a heterogeneous population, a larger sample might be required to reflect its inherent variability. However, as the cases are sampled from the same industry cluster, they can be argued to be quite homogeneous even though they provide slightly different products and have different business models. On the other hand, picking cases from the same industry cluster might also result in bias. Another data source that might have limitations is the facilitators. As the networks are the basis of the facilitators' existence, they are likely to emphasize their own role and importance in the networks. Therefore, as discussed in 3.2.1, they are not used as a primary source of information, but rather supportive to confirm the case company findings and strengthen the construct validity.

Second, when doing case study research and qualitative analysis, there is always a challenge to find the right balance between broadness and depth (Bryman, 2016). By increasing the number of cases, the theoretical saturation could be higher, implying that the proposed framework has a higher probability to describe reality. However, when one loses depth, one also loses what is considered as many of the strengths of qualitative studies, namely understanding the situation from the perspectives of those being studied (Bryman, 2016). It is thus believed that the sample size is appropriate for providing enough insights about each company's orientation, but also to strengthen the findings and external validity by being multiple cases. A third limitation that stems from the case study approach is that the data collection is based on interviews that collect retrospective data, meaning that they are based on the interviewee's experiences. It is thus a backward approach that can potentially create subjective biases (Bryman, 2016).

Lastly, being one person doing the research is also considered a limitation as the decisions taken along the way are not validated by another person, and individual research bias might occur. For example, one misses the chance of coding interviews separately and then comparing the codes. This would have reduced inconsistencies due to individual bias by creating investigator triangulation as recommended by Yin (2012). However, as stated in

section 3.5, measures were taken to avoid individual bias such as writing the case study journal and doing some of the coding steps inductive.

5.5 Future research needs

As the field of CE research and especially collaborative COI is nascent, there are several potential paths to follow that would increase the understanding of these fields.

First, as discussed in 5.1.3, companies find it easier to collaborate when sustainability is a separate part of the work, or the work revolves around systemic issues. Thus, it might be unclear where the division between pre-competitive and competitive activities is. To better understand this division, and whether companies need to push their current boundaries and collaborate more closely to succeed with the circular innovations, a longitudinal action research following the collaboration between two companies over time to evaluate how the information sharing and degree of collaboration develop as the circular innovation projects proceed could provide interesting insights. Moreover, as companies mainly collaborate on upstream activity-types, which are considered to be at the "pre-competitive" stage (Walley, 2007), future research may explore the potential for collaboration further down the activity arrow and whether these collaborations provide other potential, unexploited benefits.

Second, as discussed in 5.1.4, the empirical findings regarding circular adoption and competitiveness contrast previous research from other industries. Thus, additional research on circular value creation and profitability within the fashion industry is necessary to aid the transitioning companies in the achievement of corporate sustainability (Dyllick & Hockerts, 2002). Moreover, research directed towards solving the technical issues in the industry, such as recycling of fibers, might also be necessary to enable value creation from the inner circle (Yang et al., 2018).

Third, as many of the companies join collaborative networks due to a lack of knowledge or capabilities, future research should go more in-depth of the company's absorptive capabilities (Cohen & Levinthal, 1990) to investigate how the organization creates value from the knowledge acquired in the network. This can be done through for example an explorative single case study, to be able to go more in-depth of the organizational learning processes (Bryman, 2016). Finally, additional research on collaborative networks in other contexts is necessary to confirm and develop the findings in this thesis and the proposed framework in section 5.2 further. Other contexts could be both fashion industries in other countries, which would clarify whether some of the findings are specific for the Norwegian fashion industry, or other networks within other consumer-oriented industries to compare the findings across industries.

6 Conclusion

To overcome current barriers related to circular adoption, and achieve system-level effects, collaborative circular oriented innovation has been mentioned by scholars as both an enabler and a prerequisite. Still, there is limited evidence on how this is performed in practice. Additionally, fashion companies face tension when entering collaborative setups, as they also compete for market share and profits. To fill current research gaps on the matter, this study has aimed to enlighten how the balance between cooperation and competition plays out in business networks collaborating for circular oriented innovations. Empirical evidence is based on qualitatively analyzed interview data from five Norwegian fashion companies with circular ambitions and five network facilitators.

The main contribution of this thesis is a theoretically constructed and empirically developed framework, which suggests why competing companies seek collaboration, as well as how the competitive mechanisms affect the collaboration. The framework suggests that companies' motivation to seek collaboration can be explained by their view on COI, their strategic objectives, and other factors such as social aspects and increased market attention. Moreover, assessing the networks' activity patterns, resource constellation, and web of actors in the light of coopetition has provided a better picture of how companies are collaborating and how the competitive mechanisms play out in the dynamics of collaboration. The framework also thereby introduces insights from an established line of research – coopetition and industrial network theory from strategic management – in a circular context.

In addition to the framework, there are three particular elements uncovered that provide new insight. First, the companies do not seem to believe their circular innovations to be a source of competitive advantage. Therefore, the companies are mostly concerned with reducing the opportunity space for the actors that choose to not innovate towards circularity, to make it possible to stay competitive for those who do. Second, this approach to innovation and competition points to a situation where circular adoption will not happen without coordination in the form of demand and control. Third, when it comes to sustainability, bitter competitors become friends, because the overriding goal of achieving a circular transition is more important for their common future. The companies thus keep sustainability activities separate, or mainly focus on systemic issues in the collaboration in order to balance their competitive interests and common objectives.

These findings call for more political involvement to accelerate the circular transition. Moreover, additional research on circular value creation or profitability is crucial to aid transitioning companies achieve corporate sustainability. Lastly, companies should look for unexploited collaborative advantages to increase their competitiveness against fast fashion. In order to decouple resource use and economic growth, and help companies save their future business, coopetition is central in the transition towards a circular fashion industry.

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8 Appendices

Appendix 1: Interview guide

Appendix 2: Code groups

Appendix 1: Interview guide

1. Can you please introduce yourself, and tell us about your responsibilities in Company X?
2. How do you work with innovation in Company X today?
    a. What is your approach to circular innovation?
3. What are Company X's biggest challenges related to circular innovation?
4. Can you please describe the specific collaborative circular oriented innovation project/ network?
    a. What is the background for the network's establishment?
    b. What were the reasons for seeking collaboration?
    c. What specific issues do you hope to collaborate on?
    d. How is the communication and collaboration functioning within the network?
5. How would you describe the composition of the network?
    a. Would you say you have any competitors within Network X?
    b. How would you compare your company with the other companies in the network in terms of size, knowledge, resources etc.?
    c. Do you think this composition affects who gets the most out of the collaboration?
6. How do you decide which activities to collaborate on in the network?
    a. Are you conscious about what type of activities you want to collaborate on and not?
7. How would you describe the degree of information flow and learning between the companies in the network?
    a. Is there anything you think would be beneficial to be more open about in regard to circular innovations?
8. How would you describe the degree of trust in the network?
    a. How has this evolved over time?
9. Are there actors in the network you work more closely with?
    a. Why/ why not?
10. Has the collaboration affected how you innovate towards circularity?
11. Have you experienced any strategic benefits from collaborating?
    a. Or challenges?
12. Has the collaboration resulted in any (economic) values for your company?
    a. How do you distribute values and rewards?
    b. How do you distribute risks?
13. Have you had any disagreements in the collaboration?
    a. Why/ why not?
14. What do you think are the most important areas to collaborate on in the beginning to bring about a change?
    a. How do you think this will change over time?
    b. How about the degree of openness and cooperation?
15. How do you think collaboration will affect your competitiveness in the long run?
16. Would you have done anything differently in the next collaboration? Any lessons?
17. Finally, is there anything you would like to add?
18. Is it OK if we contact you for further questions?

Appendix 2: Code groups

The table below shows the code groups that were made during the inductive coding process. As explained in section 3.4, the creation of "empirical close" codes leads to many hundreds of codes. Thus, organizing the codes in code groups was essential to deal with the large amount of codes. The empirical close codes were thus inductively sorted in code groups, where level 1 is the first grouping of codes, and level 2 is the grouping of the groups. Each group thus aggregated the relevant market data material in NVivo, which was important in the analytical process. The last column, "number of references", shows how many times the nodes within each group occurred after all the empirical data was analyzed. As the interviews and the coding process was conducted in Norwegian, the table presents a translation of the code groups.

Level 2 code groups	Level 1 code groups	Number of references
Thoughts about circular oriented innovation	Politics and framing conditions have a major impact	21
	Benefits related to adoption of CBMs	9
	Challenges related to adoption of CBMs	65
	Effects on the value chain	45
	Longer time horizon	28
Drivers for collaboration	The social aspect	11
	Keep an eye on potential competitors	4
	Stay relevant, positioning	12
	Not enough knowledge	16
	Cannot progress without collaborating	30
	Opportunity to save own resources	35
	Want to get others aboard, simultaneous change beneficial	35
	Access to public funding	11
	Be prepared and ahead of political (EU) regulations	12
	Create common KPIs and standards	15
Management of the collaboration	Some companies contribute more than others	7
	Shared values, vision and common challenges is important when collaborating	14
	Need both formal protection and social trust which evolves with time	39
	Challenges with collaborating	21
	Learning and information sharing	20

	The companies need to create the values themselves	10
Views on competitive mechanisms	The things we don't need help with, or is business sensitive is kept secret	21
	No point of competing on sustainability	16
	Advantages of being first-mover	27
	Not everyone wishes to be first	9
	Collaborate with a few to compete with others in the bigger picture	10
	Collaboration and competition is dynamic	36

Randeberg

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