“Close the Loop”: Evidence on the implementation of the Circular Economy from the Italian Fashion Industry

"Close the Loop": Evidence on the implementation of the Circular Economy from the Italian Fashion Industry

Journal:	*Business Strategy and the Environment*
Manuscript ID	BSE-20-0550.R1
Wiley - Manuscript type:	Research Article
Keywords:	Circular Economy, Fashion Industry, Product Lifecycle, Business Model, Fashion Circular Economy, Sustainable Development

“Close the Loop”: Evidence on the implementation of the Circular Economy from the Italian Fashion Industry

Keywords: Circular Economy; Fashion Industry; Product Lifecycle; Sustainable Development; Environmental Impact; Business Model; Fashion Circular Economy.

"Close the Loop": Evidence on the implementation of the Circular Economy from the Italian Fashion Industry

Abstract: Fashion is widely considered one of the most polluting and destructive industries to the environment and is a resource-intensive industry in which opportunities to reduce environmental impacts abound. By relying on an exploratory approach, this paper features an investigation into the Circular Economy (CE) practices of four purposefully selected Italian fashion companies. The study endorses the overlooked perspective of the product lifecycle (*vis-à-vis* the business model perspective), consistent with the key principles of the CE, to provide a comprehensive picture of CE practices implemented. This study engages with the current debate on the relationship between the concepts of sustainability and CE, supporting the idea that there is a beneficial relation between the two. The analysis shows the emergence of categories of CE-related practices as well as CE implementation challenges The study also provides granular insights into the nature of these challenges that hinder the implementation of CE and demonstrates how they can be turned into sources of competitive advantage. Drawing on this emblematic evidence, we develop a set of theoretical and managerial implications.

1. Introduction

Accenture Strategy recently surveyed more than 500 manufacturing companies with revenues over $1 billion and found that over 90% claimed to be implementing circular business models (Ghosh et al., 2017). However, while recycling waste materials across a company's operations is certainly a practice in the right direction, it is a modest one that only scratches the surface when it comes to fully capturing the value of the Circular Economy (hereafter CE). Accenture Strategy provides evidence that when it comes to the adoption of CE practices, there is significant room for improvement (Ghosh et al., 2017).

Within this context, the fashion industry is paving the way towards a new industrial paradigm where the CE can be more fully embraced. The efforts of the global fashion industry in terms of environmental sustainability and transparency have become increasingly important, as demonstrated by the ever-growing body of research. Indeed, the fashion industry is one of the largest polluters in the world, given its high carbon emissions, wastewater production, and large amounts of landfill waste, and it is also known for its poor working conditions (United Nations, 2019). Having been an engine for global development for decades and one of the world's largest consumer industries, the fashion industry now needs to address its environmental and social footprint (Karaosman et al., 2017; Kerr & Landry, 2017). This will be particularly challenging as fashion companies have traditionally focused on supply-chain management that achieves technology-driven efficiencies in order to maintain lower costs, lower prices, and higher production volumes that, in turn, facilitate the emergence of so-called throwaway fashion, or low-cost fast fashion (Kozlowski et al., 2015). The fashion industry, indeed, has a primary role in driving a culture of consumption – that, is stimulating the constant consumption of the "new" and disposal of the "old" (Joy et al., 2012; Kozlowski et al., 2015) – so that "*over 90 million items of clothing end up in landfills globally each year*" (Pedersen et al., 2018 p. 272). Only around 20% of clothing is recycled or reused (Global Footprint Network, 2017; Pal & Gander, 2018). The reuse and recycling value of materials and products could be captured and reintroduced in the market if companies adopted CE principles such as product take-back, reuse, upcycling and recycling (Hawley, 2008; Kant Hvass & Pedersen, 2019).

Because the fashion industry is so resource-intensive, a transition to a circular fashion industry is desirable, yet systematic research on the opportunities and the challenges of its

implementation is still fragmented. The literature has started exploring the commitment of fashion companies toward sustainability using the business model perspective, suggesting different approaches and limitations to the adoption of sustainable practices (Beh et al., 2016; Kant Hvass & Pedersen, 2019; Pal & Gander, 2018; Pedersen et al., 2018; Todeschini et al., 2017). However, mainstream business model thinking is centered on the creation and capture of value by a company through the satisfaction of consumer needs and the maximization of economic return, disregarding core concepts of the CE such as take-back, reuse, resell, upcycle and recycle (Bocken et al., 2015; Pedersen et al., 2018). Kant Hvass and Pedersen (2019) explore one aspect of circularity, namely, product take-back, through a single case study of a fashion brand, yet adopting the business model perspective.

This paper, differently, is focused on the CE and aims to provide a finer-grained picture of circularity through a qualitative analysis of four purposefully selected Italian fashion companies. In particular, we empirically examine emblematic case studies of practices through which circularity can be improved throughout different stages of the fashion value chain. To this end, we adopt the Close the Loop framework, (Flanders DC, 2020; Vecchi, 2020) that was developed to guide companies and other stakeholders in the fashion industry (i.e. designers, producers, retailers and consumers) to embrace a circular approach by considering the whole lifecycle of a fashion product. Accordingly, our study takes the overlooked perspective of the product lifecycle, which is highly consistent with CE principles that refer to products (Urbinati et al., 2017), to provide in-depth insights over the extent to which Italian fashion companies embrace CE practices along the stages of their products lifecycle.

2. Background: The Implementation of the Circular Economy in the Fashion Industry

Economic performance, social inclusiveness, and environmental resilience are sustainability goals that have spurred the introduction of the concept of CE - "*a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops*" (Geissdoerfer et al., 2017 p. 766). The concepts of CE and sustainability indeed share similarities, but are not interchangeable with each other (Geissdoerfer et al., 2017): while "sustainability" provides a broader framing, which can be adapted to different contexts and goals (Brundtland, 1987), "CE" emphasizes environmental benefits and gains for the economic actors that implement the system.

In particular, CE is a new industrial paradigm that aims at overcoming the dominant, open-ended linear economy model based on "take-make-dispose" and has become a vibrant area of research in Strategic Management, as well as a hot topic in practitioners' debates about new and sustainable economic production models (The Ellen MacArthur Foundation, 2013). The shift from a linear model of resource consumption to a closed production system that replaces the "end-of-life" concept with restoration, where resources are kept in loops to achieve longer use and reuse (i.e. more value for a longer period) (Ellen MacArthur Foundation, 2013; Urbinati et al., 2017), can radically transform the way companies use resources to achieve sustainable development (Murray et al., 2017). The "closing logic" is at the core of the CE (i.e., closed loops or circular processes that allow the cycling of resources to make efficient use of them) and is aimed at reducing damage to the environment (Morlet, 2017; Pal & Gander, 2018). In addition, higher and more volatile resource prices expose companies to higher risks, and increasing signs of resource depletion call for a new economic model (Ellen MacArthur Foundation, 2013). Consequently, CE implementation is an economic strategy rather than just an environmental strategy (Yuan et al., 2006).

The rescue of resources from disposal and their reintroduction into the production or consumption processes is associated with four main "loops" that represent the four key

principles of the CE. These are: 1) *product-life extension:* products are designed to be durable and to have a long lifetime; 2) *reuse:* preservation of all of the added value within the product; 3) *remanufacturing*: return a product to like-new condition or better performance at the end of its life, with a warranty to match, and 4) *recycling:* used materials are treated to make them suitable for reuse (Choi, 2017; Geissdoerfer et al., 2017; Hazen et al., 2017; The Ellen MacArthur Foundation, 2013; Urbinati et al., 2017). These principles affect the way companies make profits, so the transition to the CE often entails adaptations of companies' existing business models or the creation of new ones (Ferasso et al., 2020). Companies therefore design their business models around new activities to achieve a sustainable development aimed at preserving resources (Centobelli et al., 2020).

With the highly significant environmental impact and the very substantial scale of the existing fashion industry, the opportunities for creating more sustainable and circular fashion abound (Şener et al., 2019). The idea of replacing the planned obsolescence strategy with the concept of "longevity by intention" has begun to gain popularity among companies (The Ellen MacArthur Foundation, 2013). Extending the use of clothes can be the cornerstone of sustainable clothing consumption, where consumers are key stakeholders in determining this longevity through their habits and actions (Cocquyt et al., 2020). From the company perspective, product longevity refers to the possibility of keeping in the loop garments and textile, since biodegradability, or biological cycles, often are not a realistic option (Niinimäki, 2017). The literature has increasingly started investigating how fashion companies adapt or innovate their business models in order to adopt the circular approach (Kant Hvass & Pedersen, 2019). Since business models have both positive and negative consequences on the environment in which they are implemented, the development of sustainable business models has begun to address a plurality of values by adopting the so-called "triple bottom line" perspective – economic, environmental and social (Evans et al., 2017).

To help move towards a more sustainable fashion industry, scaling up alternative business models is deemed a desirable scenario: The whole fashion industry "*needs to embrace a deeper, more systemic change and scale low-carbon solutions*" (UNFCCC, 2018, p. 2). In this context, some companies have started implementing systemic interventions throughout the lifecycle of garments, which are essential for the transition to a sustainable and circular fashion industry (Fletcher & Tham, 2014; Stewart & Niero, 2018). New business models based on rental, resale, and refurbishment can stretch the product lifecycle and still keep offering newness to consumers (McKinsey & Company, 2019). Furthermore, exploring the journeys of circular innovations, the literature suggests a set of factors along all the textile value chain, from product design to take-back and reprocessing, that are crucial in expediting or delaying a firm's aspirations to develop a circular product (Franco, 2017). Todeschini and colleagues identify the main trends and drivers of sustainable business model innovation in the fashion industry, one of which is the implementation of the CE, and suggest that the implications for entrepreneurship are different for incumbent and start-up companies (Todeschini et al., 2017). Mishra and colleagues found that key drivers for the closed-loop fashion value chain are collaboration with partners, innovation, waste management system, customer connect and changing utilization patterns. They suggest that to incorporate CE principles, namely, reduce, repair, reuse and recycle into current business models, redefining existing value propositions and transforming various business model elements is essential (Mishra et al., 2020). Research also stresses that the implementation of sustainable business models based on the CE in the fashion industry may be hindered by factors such as the lack of scalability, incompatibility with fashion customers' value propositions, changing consumer needs, lack of relevant technological expertise and difficulties related to changing the supply chain (Crainer, 2013; Ethirajan et al., 2020; Linder, M., & Williander, 2017; Pal & Gander, 2018; Urbinati et al., 2017).

Table 1 below provides an overview of the relevant literature on sustainability and CE in the fashion industry by highlighting their relevant focus (i.e. business model vs. product lifecycle), showing that extant research has mainly framed the CE within the business model perspective. Our paper, differently, endorses the view that firms adopting the CE should embrace a more systematic approach to identify where superior value is created in their value chain, as well as whether there are viable opportunities to close loops along the lifecycle of their products[1]. Within this context, the implementation of the CE would indeed imply a higher number of relationships along the value chain compared with a more traditional linear model (Centobelli et al., 2020). In a similar ethos, our paper relies on a framework developed by practitioners - "Close the Loop" (Flanders DC, 2020), only recently proposed in the literature (Vecchi, 2020) but never tested empirically in a study to date.

{Table 1 here}

This framework considers the entire lifecycle of the fashion product according to six stages – from resources, design, production, retail and consumption to end-of-life – to provide a more comprehensive picture of practices that need to be implemented to achieve a circular fashion business. The six stages are all aimed at rescuing of resources from disposal and their reintroduction into the production or consumption according to the four key principles/loops of the CE (i.e., *product-life extension, reuse, recycle* and *remanufacturing*). The description of the stages and the CE key principles involved for each stage are summarized in Table 2 below.

{Table 2 here}

The paper draws on this framework to investigate the extent to which CE practices are implemented by four purposefully selected companies. This paper endorses the view that this approach is particularly suitable since it focuses on the lifecycle stages of a fashion product, which is consistent (*vis-à-vis* the business model perspective) with the CE and its principles that refer to products rather than businesses.

3. Methodology

The methodology of this paper is informed by the above-mentioned Close the Loop framework and its six stages (Flanders DC, 2020; Vecchi, 2020) to take the whole lifecycle of a fashion product into account from a CE standpoint. We settled on an explorative approach because the CE implementation is still in its infancy and calls for a more granular understanding involving qualitative research (Eisenhardt, 1989). In particular, we explore the company practices implemented in each of the six stages, using multiple case studies. These cases were selected with a purposive sampling technique (Yin, 2013), namely a deliberate choice of cases that are information-rich, given the purpose of the study, as well as being available and willing to participate (Etikan, 2016). This technique has been employed previously in similar research (Pal & Gander, 2018; Teh & Corbitt, 2015).

Case study results can be very persuasive when multiple cases are used to confirm theorized differences across two or more cases (Johnston et al., 1999). To obtain a comprehensive and exhaustive overview of the CE implementation issues that attains the

[1] Urbinati and colleagues (2017), as an instance, suggest that Life Cycle Assessment (LCA) and Product Lifecycle Management (PLM) practices play a pivotal role for those firms adopting the CE.

Italian fashion industry, four case studies were selected: Candiani Denim, WRÅD, Dress You Can and Gucci. The companies, described in the sub-section below, are highly diverse and are representative of the breath of the innovative wave of unconventional stakeholders that increasingly is shaking up the more conventional Italian fashion industry (De Chiara & Iannone, 2020).

3.1 Description of the Selected Cases

Candiani Denim is a rather large manufacturer. The company was established in 1938 near Milan and has grown to become the world's oldest and most sustainable denim mill, creating the fabrics that gave birth to the premium denim industry. The manufacturer seeks to stand out from the mass of denim suppliers by producing sustainable denim and become "*the greenest textile company in the Blue World*". It is a large company, with 600 employees, and in 2018 its turnover was approximately €90 million (Candiani's Production Book). Candiani's main assets are the high quality of its product, the high rate of innovation on product quality and its environmentally responsive sourcing.

WRÅD is a small but very dynamic design company. The company was born in 2015 as an educational movement to raise public awareness about the environmental and social impact of the fashion industry. The Rana Plaza event in Pakistan in 2013, when hundreds of workers were killed in a garment factory collapse, represented the starting point for the co-founders. Matteo Ward, WRÅD co-founder, at the time was working as CSR Manager at Abercrombie, decided to resign and to embark on a trip around Europe to document the environmental and societal impact of the fashion industry. Originally, WRÅD started off as an Instagram page with the aim of deeply sensitize its followers. The first design partnership was launched shortly afterwards with the company Alisea Recycled and Reused Objects Design. By 2017 WRÅD has become a real design company with a clear brand identity, whose product development and style are handled by Silvia Giovanardi (WRÅD co-founder and formerly working at Etro). The company launches its signature product, the Graphi-tee t-shirt, dyed with recycled graphite powder from industrial waste by Tecno EDM, a Turin-based company that produces electrodes. Since then WRÅD has established itself as an innovative and unconventional player in the Italian fashion industry and has won many international awards, amongst which the very prestigious Red Dot Design Award.

Dress You Can is a pioneer of the Italian fashion rental market. It is the first Italian fashion rental retailer based in Milan and it was established at the end of 2014 by Caterina Maestro, current CEO and founder of the company. The company was created to address the need, in particular of women, to rent (both online and offline) an outfit – dresses, shoes and accessories - especially for special occasions, promoting reuse and recycling. Dress You Can gives customers the chance to access an extensive wardrobe at an affordable price, with sustainability and the CE at the heart of the company strategy. The initial idea was to create a physical place and a website to share one's wardrobe, expanding the classic "sharing" between friends to a much wider audience, where individuals could make their own wardrobe available. At the same time everyone could rent designer clothes from emerging or established designers, obviously at low prices. All other players, such as the American Rent the Runway, offer either a peer-to-peer exchange platform service without logistic support or rent their own dresses from famous fashion designers and take care of logistic end-to-end. Differently, Dress You Can introduces a unique business model supported by a best of breed logistic service and powered by three different groups of suppliers: 1) the clients themselves, supplying unused personal items and clothes; 2) well-known fashion brands that supply vintage or seasonal clothes; 3) young and emerging designers who can distribute their collections with lower fixed costs. In Italy the concept of "renting" is still not very widespread as everything concerning e-commerce. Whereas in the United States the online rental of

women's fashion clothes and accessories has become a consolidated reality, in Italy the market is still at its infancy and the presence of competitors is still very limited. To overcome this challenge Dress You Can has worked to increase the client's awareness of the advantages of fashion renting and retain an ever-growing base of customers through communication, direct involvement of the diversified supplier base, word of mouth and, above all, the presence of the physical store. In addition, the integration with other providers of sharing services such as tourism and transport to couple the already active partnership with car2go in Milan, the expansion of the range of products offered (maternity clothing, extra-size clothing, clothing accessories, linen) and the "physical" diffusion in the rest of Italy with the expansion of the flagship stores have been used to further enhance brand awareness.

Gucci is a large and well-established luxury fashion house that has now branched into many different products within the fashion sector, producing leather bags, shoes, jewelry, eyewear and fragrances as well as clothing. Gucci is one the most renowned and influential luxury brands in the world today, a genuine global reference for fashion and accessories, and a benchmark for a modern, innovative business. Founded in Florence in 1921, the House is renowned for eclectic and contemporary creations that represent the pinnacle of Italian craftsmanship and are unsurpassed in quality, attention to detail and imaginative design. Today, Gucci is striving to redefine luxury for the 21st century, an ambition that has been further empowered in 2017, with Kering's (the conglomerate that owns the brand) commitment to responsible business practices. To this purpose, Gucci unveiled 'Culture of Purpose', a 10-year sustainability plan that focuses on creating a positive environmental and social impact, which is outlined in the Gucci Equilibrium platform. Gucci Equilibrium embodies the fashion house commitment to generate positive change for people and the planet. Powered by creativity and collaboration, the aim is to reduce its environmental impact and protecting nature, while also prioritizing inclusivity and respect, so that everyone in the global #GucciCommunity is free to express their authentic, diverse selves. As the fashion house approaches its 100th anniversary, it is moving forward into the coming decades with an ongoing commitment to reinforce its culture of purpose, demonstrating its values through innovative pathways towards social and environmental sustainability. Gucci Equilibrium unifies the principles upheld by the fashion house, its vision and the actions it pursues.

3.2 Interview Protocol and Method of Analysis

To increase the comparability and the confidence of the findings, the four case studies followed a structured interview protocol as illustrated in Table 3 below.

{Table 3 here}

This protocol is informed by the Close the Loop framework (Flanders DC, 2020) and was also tested in preliminary explorative stage of the research. Data collection mainly comes from in-depth, semi-structured interviews that were conducted with five top executives who were deemed very knowledgeable about the companies' relevant CE activities. These were the Sustainability Manager for B2C (at Candiani Denim), two Business Developers (at WRÅD), the CEO and Founder (at Dress You Can), and LG Time & Method Analyst (at Gucci). The interviews were conducted in December 2019, and on average they lasted for 45 minutes and all took place at the companies' premises. They were all combined with company visits, where the researchers visited the factories and observed the CE practices discussed during the interviews.

The topics discussed during the interviews, listed in Table 3 in the form of our protocol, reflect the taxonomy of practices that have been identified by the Close the Loop framework. The interviews were conducted independently by the researchers in Italian, digitally

recorded, and fully transcribed. The interview transcripts were then translated from Italian into English, devoting particular attention to issues of linguistic equivalence (Douglas & Craig, 2007). This primary data was then triangulated and complemented with secondary data, in the form of media reports and company documentation. The interviewees were also prompted to provide additional material, such as financial reports, production books, marketing brochures and other documents. Other secondary data, such as newspaper clippings, official press releases, company bulletins, company websites, and other online articles, were useful to both contextualize and corroborate the findings. These additional materials were necessary to overcome the limitations that conducting four purposefully chosen case studies entail (Yin, 2013), and also to increase the robustness of the findings by means of triangulation (Jick, 1979).

We independently coded the interview transcripts and the secondary data collected using *in vivo* codes to generate first-order codes. We then scoured the relationships between first-order codes and grouped them into categories with a higher level of abstraction (i.e. second-order themes). We followed a qualitative approach and adopted a coding process whereby we developed first-order codes and second-order themes in a process of iteration between data and theory on CE (Gioia et al., 2013). Figure 1 depicts the data structure stemming from this coding process. We found six second-order themes that are the "patterns" according to which the companies approach the implementation of CE. These are *product-life extension, reuse, recycle, resource preservation, sustainability practices* and *CE implementation challenges*.

{Figure 1 here}

4. Empirical Evidence

Figure 1 depicts the CE practices (corresponding to six second-order themes) that emerged from our study. Table 4 is based on the analysis for each company respectively, showing the relationship between the CE practices and every stage of the Close the Loop framework. In particular, our analysis shows the emergence of a set of practices that fit with three key principles of CE, namely *reuse*, *recycle*, *product-life extension*. We have also found a fourth category of practices that we labelled *resource preservation* that stems from the implementation of the previous CE practices and entails a more efficient use of resources. *Resource preservation* is the direct consequence of the implementation of the CE practices (i.e. *product-life extension*, *reuse,* and *recycle*) and can be aligned with the company's broader sustainability strategy in reducing its environmental impact (i.e. practices that are good for the environment). In addition to these four categories, our coding results suggest the emergence of further practices that we have categorized as *sustainability practices*, because they imply goals that are related to the broader concept of sustainability such as practices that are good for society at large. We have also identified a sixth category that falls under the label of *CE implementation challenges*, which comprises a series of factors highlighted by the interviewees that seem to hinder the implementation of CE.

The following sub-sections present the findings by second-order themes, namely *product-life extension*, *reuse*, *recycle*, *resource preservation*, *sustainability practices* and *CE implementation challenges*.

4.1 Product-Life Extension

Product-life extension practices are tackled differently by the selected firms. While Candiani Denim and WRÅD tend to approach the issue in terms of resources, production and design, Dress You Can and Gucci highlight consumer-facing practices where the companies mostly attempt to engage their consumers to make them more inclined in retaining their fashion products for longer.

Candiani Denim for example tackle product-life extension from the textile design angle by producing a premium denim that is made to last, that could be recycled, by thus minimizing waste and reducing the need for rapid consumption. The company is a passionate advocate of the slow fashion movement, which sees "*jeans as iconic pieces that people can easily love until they fall apart*" (interview with D.A.). Similarly, WRÅD products are designed to last, by making use of one single fiber, that can be reused and recycled. Even their packaging is designed to be reused and recycled.

At Dress You Can an important source is represented by private members who supply dresses and accessories: this practice considerably extends the lifecycle of fashion products that otherwise might have been discarded. The sharing wardrobe gives the clients the opportunity to contribute themselves with personal items that are unused, or second-hand, so that they can be suppliers and clients at the same time. Selected clients who also share iconic pieces from their wardrobe, turning "impulsive" purchases from the past into investments that can be monetized in the present, contribute to extend the clothes lifecycle and, therefore, reducing energy and materials waste.

Conversely, any initiative that may offer consumer engagement, such as personalization, which could strengthen the emotional attachment between the consumer and the product by therefore granting product-life extension, finds limited implementation at Gucci. As stated by the interviewee, "*On this, we have only small initiatives, on some articles you can insert the initial for example. You can't let the customer do things the way they want, especially in high-fashion houses; for example, you can't allow a customer to insert pink GGs on a wallet because she likes it that way, because this doesn't respond to Gucci's stylistic vision, which always comes first*" (Interview with D.S.).

4.2 Reuse

The selected firms engage in a wide variety of reuse practices. Reuse mostly occurs in relation to resources, production and end-of-life stages.

At Candiani Denim, for example, the production process relies on circular systems that include the following measures: recovery of water to be used later for cleaning, heat exchange systems using waste heat, using emitted CO2 to pre-treat water for production and thereby reduce the use of acids, and recovery and recycling of 100% of cotton waste.

WRÅD, in 2019, launched the collection "What is real?", a collection of garments made from recycled and certified organic cotton and reused military fabrics. Beside trying to reuse fabrics, the company through its social media as well as other channels educates people about responsible consumption and is a strong advocate of the "Fashion Revolution" movement. This worldwide movement calls for a global fashion industry that conserves and restores the environment and values people over growth and profit.

At Dress You Can, reuse of the final products plays a pivotal role in the business model of the company. "*The idea, as often happens, was born by chance, during a trip with friends. We were undecided on the purchase of a garment, which we would have worn just once. So I started thinking about a sort of 'infinite' shared wardrobe, where you can take what you want, when you want. In short, 365 outfits for 365 days. The goal was to allow unlimited access to a new wardrobe every day, thanks to the application of the sharing economy logic to the world of fashion."* (Interview with C.M.). Today the founder defines her company as "*the wardrobe Airbnb*", and strongly believes that fashion renting is the new frontier of shopping, given that in 2023 the market will be worth $2.5 billion. The numbers, at the moment, support the vision of the founder: "*Almost half of the consumers have repeated the service purchase, and 38% of Dress You Can members have already reported buying less clothes.*" (Interview with C.M.). In a similar ethos, at the end-of-life, Dress You Can only uses wooden hangers, and clothing covers – for both in-store and online purchases – are reused every time.

Gucci implements reusing practices in a very extensive manner. In 2018, as a result of partnering and cooperating with several non-profit organizations, Gucci was able to reuse around 11 tons of leather scraps. The initiative also partners with social cooperatives in Italy working with marginalized groups, to train and re-integrate people back into their communities. The company worked with Green Line, located in Recanati, Italy, which specializes in the recycling of textile scraps. In 2018, around 92 tons of scraps were collected from Gucci's suppliers and regenerated for further use. Additionally, the "Re-verso" project is an emblematic example of how the company reuses scraps of fine wool to avoid the use of cashmere, which has an economic footprint that has turned "*parts of Mongolia that once sustained cashmere goats into a dustbowl*" (Gucci Equilibrium (a), 2019). Gucci has also set up a project called "I was a Sari", founded in 2013 by Stefano Funari in Mumbai, India, where he discovered that thousands of saris, a traditional Indian garment, were discarded every year. He came up with the idea of (re)using them as an inexpensive and versatile raw material with which he could create new and original fashion items and accessories. He hired disadvantaged women from the Mumbai area as workers, seeing a powerful potential in the creativity and skills these women have. In 2013 the first group of women artisans began their training in reconditioning and upcycling saris. After considerable early success, Funari started asking himself if the project could scale and if his products could ever compete with high-end fashion ones in the global market. For this reason, in 2017 he entered a partnership with Gucci – "*the Gucci team realized that by applying high-level embroidery techniques and working with Gucci's major embroidery houses, the sari could be given new value in the global fashion market*" (Gucci Equilibrium (f), 2019).

4.3 Recycle

The selected companies tend to engage in recycling practices across the different stages of resources, design and end-of-life.

In terms of resources, Candiani Denim has undertaken a pioneering initiative that can be traced back to 1976, when the company installed a closed-loop system of dye baths for

continuous regeneration and began recycling cotton waste from its own production. WRÅD also uses upcycled resources – graphite powder and chitosan – and low-impact ones such as hemp and beeswax. The Graphi-Tee, the signature company's product for example is made of 100% organic cotton that has been dyed with upcycled graphite. "*I had tons and tons of graphite powder that I was trying to dispose from a Turin landfill. I wondered if we could find an application for this waste in the textile industry. And from there, the first WRÅD product was born, the Graphi-Tee*" (interview with A.F.).

As for design, Candiani Denim designs textiles that will last well, to reduce the need for rapid consumption and minimize waste, and that include regenerated and recycled materials - "*ReGen is the first example of our Project Denim 2.0 initiative. It is made of 100% regenerated fibers – 50% recycled cotton recovered from our own production and 50% recycled lyocell, made using Lenzing's patented Refibra technology, in both the warp and the weft*" (interview with D.A.). Similarly, when designing the products, WRÅD avoids short-lived materials such as elastane, to create clothes that will be durable and thus reusable and 100% recyclable at the end of their lifecycle. At Gucci, differently design does not seem to be driven by circularity as the interviewee noted that prototypes cannot be recycled as they need to be destroyed. As they pointed out – "*I don't know exactly, all prototypes are only stored and destroyed after a certain time because they do not match the stylistic vision or the standards of the brand … and they are already finished products, so it's difficult to recycle them*" (Interview with D.S.). However, Gucci is also working on projects involving every type of raw material used in production. The company is increasing the amount of recycled and plant-based synthetic fiber used in production. It has started using the new "Newlife polyester", which is 100% made from post-consumer bottles, as well as ECONYL regenerated nylon. Similarly, with plastic, Gucci is no longer using PVC in its products and instead is switching from virgin to recycled plastic.

Concerning end-of-life, at Candiani Denim, all production waste is separated and given to certified waste managers, significantly reducing the waste going to landfill. Waste from jute bags, fibers and semi-finished products is recycled by external companies, giving it another use. WRÅD is also working on the implementation of take-back programs, so that consumers can return the items at the end of their useful life and fabrics can be recycled into new clothes. Dress you Can is also planning to introduce packaging made of materials recycled from old clothes.

4.4 Resource Preservation

Practices aimed at preserving resources emerged from our analysis as they are widely implemented by all the selected firms. Within this context, technology tends to play a very pivotal role as not only it enables resource preservation at the production stage (i.e. Candiani, WRÅD and Gucci) but it is also instrumental to establish a new consumption paradigm as in the case of Dress You Can that ultimately also leads to resource preservation.

Candiani Denim is a strong advocate of the implementation of the CE – "*The focus was largely on social responsibility in the beginning, and has now largely moved to the innovation of alternative more sustainable materials, and textile recycling technologies*" (interview with

D.A.). The company relies heavily on a fabric produced using 100% recycled fibers and thereby saving approximately 2.600 liters of water per pair of jeans. In terms of resources, the production of denim is traditionally associated with a very high and detrimental environmental impact. Growing cotton in particular requires a vast amount of resources. The raw material also tends to come mostly from overseas, often from developing countries that provide very precarious working conditions for the workers. In the production process of denim Candiani has started using Kitotex, a sizing agent needed for weaving the yarns without breaking them, which is chitin-based and therefore more environmentally friendly than the conventional sizing agents made from plastic. Using indigo juice and Kitotex in combination has the potential to reduce water use by 75% and chemical use by 65% compared with the normal denim production process. The company is also monitoring the hazardous waste generated on a weekly basis. When considering the end-of-life of their products, denim producers aim at producing a fiber that is durable, but can be also disposed of sustainably. Candiani Denim launched the "ReLast" program in 2018, producing innovative fabrics made of Global Organic Textile Standard (GOTS) certified cotton and certified recycled elastic fiber. "ReLast" also involves clean-tech dyes and new sustainable fibers and finishing technologies. Some of Candiani's fabrics are also biodegradable - they are currently working on producing fabrics that will be fully absorbed by the soil.

WRÅD also seeks to reduce its environmental impact by optimizing and rationalizing the use of resources by making extensive use of low-impact resources (i.e. hemp, beeswax, organic cotton). Thanks to this, the production of the Graphi-Tee uses 90% less water and emits 60% less CO2 into the atmosphere than any ordinary t-shirts. The production of t-shirts usually involves an enormous amount of water. The dyeing process for the Graphi-Tee uses 90% less water and emits 60% less CO2 into the atmosphere than with ordinary t-shirts. They decided to introduce an original material in the fashion industry – the industrial waste graphite powder - revamping an old dyeing technique that dates back to Ancient Rome. Thanks to the use of organic materials and innovative technologies, such as the *G_pwdr* technology and *Kitotex*, water consumption and carbon emissions are drastically reduced. New technologies, such as the smart-indigo dyeing process typically used in denim production, will use 80% less water than for comparable fabrics.

Dress You Can, indirectly is also contributing to resource preservation by significantly extending the life-cycle of fashion products through the rental service. This does not imply only resource preservation stemming from curbing over-production and over-consumption but the rental service also provides monetary gains to its clients as they can monetize over their unused fashion items.

Alongside the CE practices implemented, Gucci also seeks to reduce its environmental impact by optimizing and rationalizing the use of resources. According to the interviewee, substantial effort has been made to reduce the use of leather by establishing the "Scrap-Less" project whereby only the useful part of leather goes through the tanning process. In turn, Gucci can reduce the use of chemicals in the tanning phase without compromising quality. The company is now experimenting with a new kind of metal-free leather treatment, less polluting than the traditional one. 3D printers are used for prototypes of metal accessories to make the process more efficient. The benefits from the "Re-verso" program are also

significant as they have brought an 82% reduction in the consumption of energy, a 92% reduction in the consumption of water and a 97% reduction in CO2 production.

4.5 Sustainability Practices

The coding process also highlighted further practices that were categorized as *sustainability practices* that mostly entail the selection of local suppliers, the implantation of a retail model that tends to preserve the environment by minimizing its negative environmental footprint, and the pursue of broader socially and economically sustainable goals.

In particular, the sustainability approach of Candiani Denim has a long history – *"We started innovating for sustainability back in the late 1970s; however, it was seen as efficiency, not sustainability at that time. Since we are vertically integrated our approach must be a 360° approach"* (interview with D.A.). The selection of suppliers is a key sustainable initiative for them: the company sources raw material locally from environmentally friendly sources – *"Cotton is often recognized as a crop with a significant environmental impact, and for this reason we make it a priority to obtain it from sustainable sources"* (interview with D.A.). All suppliers are screened with regard to sustainability. The vast majority of suppliers are in Italy, just a few from elsewhere in Europe and currently only one from outside Europe – *"One aspect of this effort is maintaining full transparency over our chemicals supply chain and promoting Italian suppliers as often as possible"* (interview with D.A.). The company chooses suppliers that are part of the Better Cotton Initiative (BCI), which tries to incentivize farmers to produce in a sustainable manner.

At WRÅD, sales are made mostly online, both on the company's own website and on retailers' platforms such as Yoox. In order to be more visible WRÅD also features some offline touchpoints such as boutiques in Milan and Starbucks Reserves Roasteries, where they showcase and sell custom collections. This distribution strategy is aligned with the company's sustainability ethos since its environmental impact tends to be rather limited.

By involving users both as client and supplier, Dress You Can works to "convert" every woman to use and not to possess fashion, in line with the ethos of the CE. From this point of view Dress You Can acts as a trend collector that optimizes consumption by making it sustainable (rental), transports the concept of sharing economy to the fashion world, thus contributing to the elimination of waste (sharing), analyzes and tries to prevent client requests in order to support the sustainable production of fashion products, with particular attention to emerging designers increasingly attentive to the ecological aspect of their work (i.e. sustainable and customized production).

As for the engagement of Gucci with sustainability practices, "*nowadays the company is insisting a lot on sustainability. They are testing methods to reduce the chemicals used for tanning. In addition, a contest was launched among employees to come up with ideas to reduce the environmental impact of the company. The company is also doing a lot of internal communication on the initiatives in progress*" (Interview with D.S.). In the last four years, Gucci has been sourcing gold responsibly using a financial mechanism that supports artisans and small-scale mining. Since November 2015, all the gold and the precious stones purchased by Gucci have been certified under the Responsible Jewelry Council Chain of Custody

certification scheme. The company also partners with social cooperatives in Italy, working with marginalized groups, to train and re-integrate people back into their communities.

4.6 CE Implementation Challenges

Several CE implementation challenges also emerged from the analysis.

At Candiani Denim, for instance, the interviewee claims that - "*effective textile recycling is seen as necessary to achieve a circular economy in the fashion industry. However, our personal opinion is that post-consumer recycling technologies still are not able to deliver the level of quality we are after" (interview with D.A.),* and innovation tends to be a lengthy process so that R&D takes a long time. Additionally, when considering the end-of-life of their products, one of the main challenges faced by denim producers is to provide durability to the fabric while aiming for a low environmental impact. Certifications can also be problematic, as stated by the interviewee – *"The* [main] *benefit of certifications is for the final consumer who can have a better idea about how or by who a product was made, or what materials it's made of. We now believe in going beyond certifications. This means it will become a matter of communicating, essentially proving that what we are doing is better than the requirements or the positive impact we are having is greater than what happens under certain certificates"* (interview with D.A.).

At WRÅD, the interviewee claims that CE emerges only if there is collaboration – *"If there is no collaboration between the different business realities, it is quite difficult. The dynamics are very complex."* Price is also an issue so that they are trying to make their products as affordable as possible, even though producing in Italy using high-quality materials makes it difficult to keep the price of the Graphi-Tee less than €60. However, *"Now we are trying to get more and more at a lower price because we do not want to make a sustainable fashion brand that is not accessible to most people."* Another issue is consumers' widespread attitude to fashion, as outlined by the interviewee - *"because of the fast-fashion system, we are almost used to wearing clothes as if they were disposable. So, we are trying to carry out awareness-raising through technology to encourage people to take care of their clothes and use them for as long as possible. The technology is there, but if we were to insert an NFC tag* [to pass on information to the consumer]*, they could read it only from the iPhone 8 upwards. There is still that technological limit to overcome"* (interview with A.F.). Mixed material fabrics make recycling more complex – *"A problem we have encountered is that there are many suppliers who sell you cotton as if it were GOTS when, in reality, it is not. You buy the GOTS licenses and make it pass for GOTS when it is actually grown like any other cotton. So, you always have to go to the bottom"* (interview with A.F.).

According to Dress You Can's CEO, the biggest challenge is to make consumers understand that their offering is more advantageous and convenient than any other comparable peer-to-peer initiative. As for end-of-life, take-back model initiatives are still not in place.

At Gucci, the interviewee identifies two distinctive aspects that hinder the implementation of the CE by a luxury company. In particular, one relates to prototypes and

the other one to personalization. As described above, prototypes are still destroyed, and customers have limited opportunity to personalize products.

Overall, the empirical evidence allows us to classify these challenges into three sub-categories. The first is *technical issues*, which include post-consumer recycling technologies not able to deliver the level of quality desired; difficulty recycling mixed fabrics; R&D long to develop; unreliable certifications; and durable denim fabric difficult to produce with a low environmental impact. The second, *operational issues,* includes the need to efficiently integrate take-back systems; the difficulty in establishing collaborations due to the complex dynamics among different businesses; and the need for innovations to be scalable at the industrial level, so that they are not too costly to implement. Finally, *consumer-related issues* comprise the widespread fast-fashion attitude; the difficulty of understanding the rental model; and high pricing of sustainable products. Further operational challenges, that tend to be specific to the luxury industry and might prevent firms from implementing relevant CE practices, as the Gucci case suggests, are the limited opportunities to reuse prototypes and the fact that full personalization cannot be allowed.

5. Discussion

A thorough understanding of the empirical evidence presented above requires a discussion along several dimensions. First, as Table 4 below shows, it is interesting to see that not all companies implement the CE to the same extent across the same stages of the product lifecycle. We believe this outcome is mainly due to the type of business run by the companies (e.g. design vs. manufacturing vs. retail) but it also reflects the approach to CE adopted by the companies (e.g. circular-born company vs. traditional company).

{Table 4 here}

Secondly, it should be noted that out of the four CE key principles described in the literature, we did not find evidence that suggests the presence of any practice associated with *remanufacturing*. For the CE to be attainable, consumers not only need to return products after use but also to purchase products that are remanufactured. While remanufacturing is a widespread practice in manufacturing industry (Abbey et al., 2015), it does not seem to be commonly adopted in the fashion industry. This is quite understandable as research confirms that consumers, in general, tend to have a poor opinion of remanufactured products and are typically not prepared to adopt them (Hazen et al., 2017). This applies particularly to fashion, as consumers are unlikely to be willing to wear second-hand clothes that have been altered. Furthermore, the boundaries between remanufacturing and recycling/upcycling tend to be blurred as producing fashion garments with recycled fabrics can be seen as a very radical form of remanufacturing (Abbey et al., 2015; Choi, 2017; Dissanayake & Sinha, 2015). Therefore, if we endorse the view of recycling/upcycling as a radical form of remanufacturing, the recycle columns of Table 4 (coupled by the practices listed in section 4.3) could provide some evidence of remanufacturing practices in this respect.

A third finding is the discovery of an unanticipated category, classified as *resource preservation*. This category is related to all those saving practices that stem as direct consequences of implementing the former three CE practices. *Resource preservation* practices can indeed overlap with those sustainability practices that are "good for the environment" whose primary goal is of economic nature.

Fourth, given that the attainment of specific economic benefits drives the implementation of CE, the four case studies also highlight how the companies were able to be proactive by turning some of the existing *CE implementation challenges* into valuable opportunities, which often yield competitive advantages. In particular, Table 5 summarizes the main challenges and opportunities that emerged from the findings.

{Table 5 here}

The advantages stem from the opportunities ensuing from the challenges - classified as *technical*, *operational* and *consumer-related* - that companies had to face in their businesses. These can be traced, respectively, to the adoption of a new process technology as in the case of Candiani Denim, the implementation of a holistic approach as for WRÅD, the embrace of a new business model as in the case of Dress You Can, the implementation of a set of dedicated projects that can yield to highly bespoke and personalised luxury products as in the case of Gucci. Our analysis also reveals that these approaches are organically embedded in the business models of the companies (i.e. Candiani Denim, WRÅD, Dress You Can), or in a set of initiatives that are aligned with the current company vision, market positioning, value proposition, and existing consumer base (i.e. Gucci). All of these companies have found some original solutions that are instrumental in translating their CE approach into value generation for their consumers while allowing them to capture the economic value from their competitive positioning.

Overall our analysis has allowed a further distinction between *sustainability practices* that are mainly associated with sourcing (e.g. selecting BCI suppliers; sourcing locally from environmentally friendly suppliers; sourcing gold in a responsible manner; local sourcing and partnering with social cooperatives), practices that are aimed at reducing pollution without seeking any efficiency from doing so (e.g. less polluting metal-free leather treatment) and sustainability practices that are ultimately driven by social goals (sometimes coming from environmental improvements): these practices, in line with the triple bottom line view of sustainability, can be classified as "good for society".

Finally, we can advance a comparison between the traditional implementation of the CE and the implementation of the fashion CE (Vecchi, 2020). While the former is mostly driven by a reactive approach, whereby companies seek to comply with the CE implementation as they would for any other market requirements (Brennan & Vecchi, 2020), the Italian fashion companies analysed seem in fact to endorse a much more proactive approach, which ultimately yields many benefits that are beyond mere cost savings stemming from recycling and reuse. Although none of the companies can close the loop entirely on their "final product", there is evidence that they try to do so for many stages of the framework. They do this according to two main patterns. On the one hand, we have companies such as

Candiani Denim, WRÅD and Dress You Can that can be defined as "circular-born companies", where the implementation of CE practices is very much part of their DNA. Candiani, for example, began implementing the CE in 1976, when they installed a closed-loop system of dye baths for continuous regeneration, and they began recycling cotton waste from their production. Similarly, WRÅD's first signature product was the Graphi-Tee, which relied on the reuse of the industrial waste graphite. By borrowing the main idea from other industries, Dress You Can has applied concepts such as sharing and renting to fashion products, to reduce waste and foster reuse. In doing so, they are not attempting to implement CE into an already existing business model, as their business models are "born circular" from their very outset of the business. On the other hand, the case study of Gucci, as an incumbent firm, suggests that CE practices can be implemented as a series of organic, well-integrated initiatives that are driven by a clear vision and aligned with the company values, yet without changing their "traditional" approach to the business. Gucci's CE approach is aimed at significantly reducing its environmental impact (e.g. the "Scrap-Less" project) and providing social value (e.g. the "I was a Sari" project), to ultimately find an "equilibrium"[2] – a balance of the aesthetic of what they do, with the ethics which the company believes in.

6. Conclusion

This study provides granular insights into the emerging CE practices implemented by four Italian fashion companies. In doing so, our research makes several theoretical contributions.

Firstly, the existing research has typically framed the topic of CE from the business model perspective, whereas this study contributes to the literature at the product-level of analysis by adopting a different analytical lens – the lifecycle of the fashion product (starting from the resources, design, production, retail, consumption, to the end-of-life) – to provide an encompassing overview of the challenges and opportunities faced by companies. This angle is more suited to the principles of the CE, which assumes the final product as the key unit of analysis. The findings can be further generalised at the business-level as companies were the units of observation of the study, suggesting implications for their business models. Within this context, the evidence supports Todeschini and colleagues' arguments by confirming differences in the innovation of business model toward sustainability between incumbents and start-up fashion companies (Todeschini et al., 2017). Younger companies tend to emerge as sustainable from the outset, where their engagement in environmental and social sustainability is typically the leading value of their founders. Companies such as Candiani, WRÅD, and Dress You Can are all flexible and willing to design innovative approaches or business models that deliberately embed many of the values and principles of the CE. Gucci, the only incumbent company in our sample, shows a significantly different approach, which is more closely aligned with the existing "traditional" paradigm even though it is experimenting with small-scale sustainable initiatives that address specific issues. This evidence also addresses the question raised by Pal and Gander (2018) on the realistic

[2] "Equilibrium" is the actual name of the website that features all the environmental and social initiatives implemented by the company (see: http://equilibrium.gucci.com/).

possibility that emerging sustainable business models in fashion will replace the dominant unsustainable ones. Our study shows, albeit through the evidence provided by a single case, that the CE can be tackled, yet partially with dedicated approaches. In a similar vein, further research can investigate the possibility of creating hybrid business models or projects that can complement the existing ones, without undermining their effectiveness in achieving the CE goals.

The study further contributes to the debate over the differences and similarities between CE and sustainability by providing additional insights on how the two concepts are related. In particular, our evidence supports the idea that there is a beneficial relation between the two (Geissdoerfer et al., 2017). More precisely, we show that companies' practices mostly fit with the CE key principles and we identify an additional category that involves all those resource preservation practices that stem from the implementation of the CE practices entailing a more efficient use of resources. We also outline those practices that emerged from the analysis that are aligned with the companies' broader sustainability strategies, involving the attainment of society benefits. Companies, indeed, while seeking to close the relevant loops, tend to concomitantly pursue more open-ended and varied goals, such as fostering economic, environmental and social sustainability. This ultimately highlights that circularity fosters sustainability providing synergies and potentially add-up gains.

Finally, the view that the primary beneficiaries of CE practices are the economic actors that implement the system is further corroborated by the identification of specific challenges that the companies were strategically able to turn into competitive advantages (Crainer, 2013; Franco, 2017; Linder & Williander, 2017; Pal & Gander, 2018; Urbinati et al., 2017; Vermeulen, 2015). We provide finer insights into the nature of the challenges that hinder the implementation of CE, classified into technical issues, operational issues, and consumer-related issues. These are the lengthy nature of R&D activities, the questionable reliability of certifications, the difficulties in establishing supply-chain collaborations and integrating take-back systems, and the tension between fabric durability and low environmental impact, between sustainability and affordability; and we also identify some new ones that are distinctive of the luxury sector (i.e. prototypes cannot be reused or recycled and full personalization cannot be allowed).

These considerations inform the managerial contribution of the paper which shows that, regardless of the approach pursued (i.e. CE principles embedded in the business models or via dedicated initiatives), the implementation of the CE should be a strategic priority for companies and, as such, should not be ignored. Our analysis reveals that all the companies have developed organizational capabilities that have produced significant cost savings as well as unleashing creativity and innovation. The insights provided by this context suggest valuable lessons that can have broader applicability to companies in other industries; in particular, to those that, like the fashion industry, have reached a degree of maturity (e.g. the furniture or the toy industries), rely heavily on innovation (as in the case of the other creative industries) and that are exposed to fierce competition (as in most of the knowledge-intensive industries).

In line with the exploratory ethos of our study, which relied on purely qualitative research and is based on purposefully chosen case studies, our results should be put into

perspective. While this research does not provide generalizable results, we believe it offers in-depth and fresh insights into a relatively unexplored topic that has considerable potential. In this line, the findings allow us to inform a research agenda for academics interested in delving into issues related to the implementation of the CE approach. First, the role of consumers has been overlooked in our results, even though they are crucial actors in the shift toward a CE for companies especially for what concerns the reuse and recycle (Planing, 2014). Future research should further investigate the attitude of consumers towards sustainable clothing, since the lack of consumer interest and awareness is one of the main CE barriers for business (Kant Hvass & Pedersen, 2019; Kirchherr et al., 2018; Sarigöllü et al., 2020). Second, besides the role of consumers, it is crucial to consider the supply-chain perspective by studying all the actors that need to be involved in the implementation of CE, taking a more systemic perspective on fashion that includes designers, manufacturers, suppliers, managers, and consumers (Niinimäki, 2017). Third, for each stage of the Close the Loop framework future studies can formulate and test research hypotheses based on our results. Fourth, it would also be interesting to test the broader applicability of our framework by narrowing the investigation over a specific market segment such as rental clothing or the luxury market. Fifth, given the classification of the challenges suggested by this study, future research should delve more into them, shedding further light on the obstacles to CE implementation, and testing whether the same classification may apply to different industries. Finally, the topic would benefit from international comparison to critically assess whether our results are contingent on the specific case of the Italian fashion industry, in terms of factors related to the supply chain, or may be similar to those of companies in other countries.

References

Abbey, J. D., Meloy, M. G., Blackburn, J., & Guide, V. D. R. (2015). Consumer markets for remanufactured and refurbished products. *California Management Review*, *57*(4), 26–42. https://doi.org/10.1525/cmr.2015.57.4.26

Beh, L. S., Ghobadian, A., He, Q., Gallear, D., & O'Regan, N. (2016). Second-life retailing: a reverse supply chain perspective. *Supply Chain Management*, *21*(2), 259–272. https://doi.org/10.1108/SCM-07-2015-0296

Bocken, N. M. P., Rana, P., & Short, S. W. (2015). Value mapping for sustainable business thinking. *Journal of Industrial and Production Engineering*, *32*(1), 67–81. https://doi.org/10.1080/21681015.2014.1000399

Brennan, L., & Vecchi, A. (2020). *The Orbital Circular Economy Framework : Emblematic Evidence from the Space Industry*. *8*(2013).

Brundtland, H. (1987). *Our Common Future*. Oxford University Press.

Centobelli, P., Cerchione, R., Chiaroni, D., Del Vecchio, P., & Urbinati, A. (2020). Designing business models in circular economy: A systematic literature review and research agenda. *Business Strategy and the Environment*, *29*(4), 1734–1749. https://doi.org/10.1002/bse.2466

Choi, T. M. (2017). Pricing and branding for remanufactured fashion products. *Journal of Cleaner Production*, *165*, 1385–1394. https://doi.org/10.1016/j.jclepro.2017.07.163

Cocquyt, A., Crucke, S., & Slabbinck, H. (2020). Organizational characteristics explaining

participation in sustainable business models in the sharing economy: Evidence from the fashion industry using conjoint analysis. *Business Strategy and the Environment*, *October 2019*, 1–11. https://doi.org/10.1002/bse.2523

Crainer, S. (2013). Squaring the circle. *Business Strategy Review*, *24*(4), 13–19.

De Chiara, A., & Iannone, F. (2020). Sustainable Innovation in Fashion Products: An Opportunity for Italian SMEs. In C. Silvestri, M. Piccarozzi, & B. Aquilani (Eds.), *Customer Satisfaction and Sustainability Initiatives in the Fourth Industrial Revolution* (pp. 125–151). IGI Global. https://doi.org/10.4018/978-1-7998-1419-1

Dissanayake, G., & Sinha, P. (2015). An examination of the product development process for fashion remanufacturing. *Resources, Conservation and Recycling*, *104*, 94–102. https://doi.org/10.1016/j.resconrec.2015.09.008

Douglas, S. P., & Craig, C. S. (2007). Collaborative and iterative translation: An alternative approach to back translation. *Journal of International Marketing*, *15*(1), 30–43. https://doi.org/10.1509/jimk.15.1.030

Elkington, J. (1997). *Cannibals with Forks: The Triple Bottom Line of21st Century Business*. Capstone.

Ethirajan, M., Arasu M, T., Kandasamy, J., K.E.K, V., Nadeem, S. P., & Kumar, A. (2020). Analysing the risks of adopting circular economy initiatives in manufacturing supply chains. *Business Strategy and the Environment*, *August*, 1–33. https://doi.org/10.1002/bse.2617

Evans, S., Vladimirova, D., Holgado, M., Van Fossen, K., Yang, M., Silva, E. A., & Barlow, C. Y. (2017). Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models. *Business Strategy and the Environment*, *26*(5), 597–608. https://doi.org/10.1002/bse.1939

Ferasso, M., Beliaeva, T., Kraus, S., Clauss, T., & Ribeiro-Soriano, D. (2020). Circular economy business models: The state of research and avenues ahead. *Business Strategy and the Environment*, *May*, 1–19. https://doi.org/10.1002/bse.2554

Flanders DC. (2020). *Close the Loop. A guide towards a circular fashion industry*. https://www.close-the-loop.be/en

Fletcher, K., & Tham, M. (2014). *Routledge handbook of sustainability and fashion* (K. Fletcher & M. Tham (eds.)). Routledge.

Franco, M. A. (2017). Circular economy at the micro level: A dynamic view of incumbents' struggles and challenges in the textile industry. *Journal of Cleaner Production*, *168*, 833–845. https://doi.org/10.1016/j.jclepro.2017.09.056

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The Circular Economy – A new sustainability paradigm? *Journal of Cleaner Production*, *143*, 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048

Ghosh, S., Eckerle, K., & Morrison, H. (2017). *Full circle: Turning waste into value with your supply chain*. 13.

Hawley, J. (2008). Economic impact of textile and clothing recycling. In C. Hethorn, J. and Ulasewicz (Ed.), *Sustainable Fashion: Why Now? A Conversation Exploring Issues, Practices, and Possibilities* (pp. 207–232). Fairchild Publishing.

Hazen, B. T., Mollenkopf, D. A., & Wang, Y. (2017). Remanufacturing for the Circular

Economy: An Examination of Consumer Switching Behavior. *Business Strategy and the Environment*, *26*(4), 451–464. https://doi.org/10.1002/bse.1929

Jick, T. D. . (1979). Mixing Qualitative and Quantitative Methods : Triangulation in Action Author (s): Todd D . Jick Source : , Vol . 24 , No . 4 , Qualitative Methodology (Dec ., 1979), Stable URL : *Administrative Science Quarterly*, *24*(4), 602–611. http://www.jstor.org/stable/2392366

Johnston, W. J., Leach, M. P., & Liu, A. H. (1999). Theory Testing Using Case Studies in. *Industrial Marketing Management*, *28*(3), 201–213.

Joy, A., Sherry, J. F., Venkatesh, A., Wang, J., & Chan, R. (2012). Fast fashion, sustainability, and the ethical appeal of luxury brands. *Fashion Theory - Journal of Dress Body and Culture*, *16*(3), 273–295. https://doi.org/10.2752/175174112X13340749707123

Kant Hvass, K., & Pedersen, E. R. G. (2019). Toward circular economy of fashion: Experiences from a brand's product take-back initiative. *Journal of Fashion Marketing and Management*, *23*(3), 345–365. https://doi.org/10.1108/JFMM-04-2018-0059

Karaosman, H., Morales-Alonso, G., & Brun, A. (2017). From a systematic literature review to a classification framework: Sustainability integration in fashion operations. *Sustainability (Switzerland)*, *9*(1). https://doi.org/10.3390/su9010030

Kerr, J., & Landry, J. (2017). Pulse of the. *Global Fashion Agenda & The Boston Consulting Group*. http://globalfashionagenda.com/wp-content/uploads/2017/05/Pulse-of-the-Fashion-Industry_2017.pdf

Kirchherr, J., Piscicelli, L., Bour, R., Kostense-Smit, E., Muller, J., Huibrechtse-Truijens, A., & Hekkert, M. (2018). Barriers to the Circular Economy: Evidence From the European Union (EU). *Ecological Economics*, *150*(January 2019), 264–272. https://doi.org/10.1016/j.ecolecon.2018.04.028

Kozlowski, A., Searcy, C., & Bardecki, M. (2015). Corporate sustainability reporting in the apparel industry an analysis of indicators disclosed. *International Journal of Productivity and Performance Management*, *64*(3), 377–397. https://doi.org/10.1108/IJPPM-10-2014-0152

Linder, M., & Williander, M. (2017). Circular business model innovation: inherent uncertainties. *Business Strategy and the Environment*, *26*(182–196).

Linder, M., & Williander, M. (2017). Circular Business Model Innovation: Inherent Uncertainties. *Business Strategy and the Environment*, *26*(2), 182–196. https://doi.org/10.1002/bse.1906

McKinsey & Company. (2019). The State of Fashion 2019: A year of awakening. Europe, US & Asia: McKinsey & Company. *McKinsey&Company*, 108. https://doi.org/10.1163/156853010X510807

Mishra, S., Jain, S., & Malhotra, G. (2020). The anatomy of circular economy transition in the fashion industry. *Social Responsibility Journal*. https://doi.org/https://doi-org.arts.idm.oclc.org/10.1108/SRJ-06-2019-0216

Morlet, A. (2017). A new textiles economy: Redesigning fashion's future. *Ellen MacArthur Foundation*, 1–150. https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-

Textiles-Economy_Full-Report_Updated_1-12-17.pdf%0Ahttps://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashions-future

Murray, A., Skene, K., & Haynes, K. (2017). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, *140*(3), 369–380. https://doi.org/10.1007/s10551-015-2693-2

Niinimäki, K. (2017). Fashion in a circular economy. In D. Henninger, C. E., Alevizou, P. J., Goworek, H., & Ryding (Ed.), *Sustainability in Fashion: A Cradle to Upcycle Approach* (pp. 151–169). Palgrave Macmillan.

Pal, R., & Gander, J. (2018). Modelling environmental value: An examination of sustainable business models within the fashion industry. *Journal of Cleaner Production*, *184*, 251–263. https://doi.org/10.1016/j.jclepro.2018.02.001

Pearce, D. W., & Turner, R. K. (1990). *Economics of natural resources and the environment*. JHU Press.

Pedersen, E. R. G., Gwozdz, W., & Hvass, K. K. (2018). Exploring the Relationship Between Business Model Innovation, Corporate Sustainability, and Organisational Values within the Fashion Industry. *Journal of Business Ethics*, *149*(2), 267–284. https://doi.org/10.1007/s10551-016-3044-7

Planing, P. (2014). Business Model Innovation in a Circular Economy Reasons for Non-Acceptance of Circular Business Models. *Open Journal of Business Model Innovation*, 1–11.

Sarigöllü, E., Hou, C., & Ertz, M. (2020). Sustainable product disposal: Consumer redistributing behaviors versus hoarding and throwing away. *Business Strategy and the Environment*, *July*, 1–17. https://doi.org/10.1002/bse.2624

Savitz, A. (2013). *The triple bottom line: how today's best-run companies are achieving economic, social and environmental success-and how you can too*. John Wiley & Sons.

Şener, T., Bişkin, F., & Kılınç, N. (2019). Sustainable dressing: Consumers' value perceptions towards slow fashion. *Business Strategy and the Environment*, *28*(8), 1548–1557. https://doi.org/10.1002/bse.2330

Stahel, W. (1994). The utilization-focused service economy: Resource efficiency and product-life extension. *The Greening of Industrial Ecosystems*, 178–190.

Stewart, R., & Niero, M. (2018). Circular economy in corporate sustainability strategies: A review of corporate sustainability reports in the fast-moving consumer goods sector. *Business Strategy and the Environment*, *27*(7), 1005–1022. https://doi.org/10.1002/bse.2048

Su, B., Heshmati, A., Geng, Y., & Yu, X. (2013). A review of the circular economy in China: Moving from rhetoric to implementation. *Journal of Cleaner Production*, *42*, 215–227. https://doi.org/10.1016/j.jclepro.2012.11.020

The Ellen MacArthur Foundation. (2013). *Towards the circular economy: Economic and business rationale for an accelerated transition*. https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf

Todeschini, B. V., Cortimiglia, M. N., Callegaro-de-Menezes, D., & Ghezzi, A. (2017).

Innovative and sustainable business models in the fashion industry: Entrepreneurial drivers, opportunities, and challenges. *Business Horizons*, *60*(6), 759–770. https://doi.org/10.1016/j.bushor.2017.07.003

UNFCCC. (2018). *"Fashion industry charter for climate action."* 7. https://unfccc.int/climate-action/sectoral-engagement/global-climate-action-in-fashion/fashion-industry-charter-for-climate-action

United Nations. (2019). *UN launches drive to highlight environmental cost of staying fashionable*. https://news.un.org/en/story/2019/03/1035161

Urbinati, A., Chiaroni, D., & Chiesa, V. (2017). Towards a new taxonomy of circular economy business models. *Journal of Cleaner Production*, *168*, 487–498. https://doi.org/10.1016/j.jclepro.2017.09.047

Vecchi, A. (2020). *Fashion Technology & Textile Engineering The Circular Fashion Framework-The Implementation of the Circular Economy by the Fashion Industry*. *6*(2), 31–35. https://doi.org/10.19080/CTFTTE.2020.06.555681

Vermeulen, W. J. (2015). Self-governance for sustainable global supply chains: can it deliver the impacts needed? *Business Strategy and the Environment*, *24*(2), 73–85.

Yin, R. K. (1984). *Case study research : design and methods*. Sage Publications.

Yuan, Z., Bi, J., & Moriguichi, Y. (2006). The circular economy: A new development strategy in China. *Journal of Industrial Ecology*, *10*(1–2), 4–8.

Figure 1. Data structure