Chapter 4
Circular Supply Chain and Business Model in Apparel Industry:
An Exploratory Approach

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ABSTRACT

Today, companies are trying to move from an existing linear business model of production to a circular one. This transition is not easy and demands contextual changes beyond the control of the company. Circular economy (CE) pursues closing material flows in productive systems to maximize the utilization of available resources. Thus, different circles to reduce, reuse, recycle, re-manufacture, recover, and recycle are produced along supply chain during the cycle of life of a product. Despite an innovative apparel, little is known about the companies with disruptive business models and supply chain structures that have emerged in the recent years.

INTRODUCTION

Companies are currently trying to move from the existing linear business production model to a circular one. Van Loom et al. (2018) has advised that this transition will not be easy and will demand contextual changes beyond companies' control, such as changes in legislation, new modes of financing or changes in consumer behaviour, in addition to the needed changes inside the companies. The circular economy (CE) pursues the creation of closed material flow in productive systems to maximise the use of available resources. Along the supply chain different circles are therefore created to reduce, reuse, recycle, remanufacture, recover and redesign material during the life cycle of a product.

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The life cycle of a product (including the circular production cycle) has three basic phases: pre-production, production and post-production (Turon & Czeech, 2017, quoted in Zielecki, 2006). During the pre-production phase, product design, market definition, materials and production processes are developed. In a CE, product design waste should be reduced in the pre-production phase by choosing appropriate materials that can decrease harmful substance emissions; so, for example, fossil energy resources could be replaced by renewable ones (Szita, 2017). Manufacturers will therefore look for ways to reduce consumption of raw materials by reusing products, components and materials (Van Loon et al., 2018). In a circular supply chain, a relevant driver could be to reuse an already used product or to use recycled ones; in other words, in a circular supply chain, 'a product gets a new life in a new form' (Turon & Czeech, 2017, quoted in Abec, 2014). This avoids the production of unnecessary waste and the use of most resources by pursuing a strategy of reduction and zero waste. Indeed, waste is considered a new input in the supply chain.

All the processes, activities and tasks to manufacture and distribute a product are included in the production phase. Thus, redesigning the production line, using clean sources of energy or new materials, producing more from less material and the consumption and reduction of losses and waste material can be added in the circular production phase (Szita, 2017).

Product sales, customer care, reverse logistics and recycling take place during the post-production phase. At this point, recycling becomes relevant so that most of the product can once again become raw material that enters the production process again to create a closed-loop supply chain.

Caniato et al. (2012) and De Brito et al. (2008) have explained that the fashion industry has had a very high environmental impact in a number of ways, including: 1) use of natural raw materials (e.g. cotton, wool or leather) that require large quantities of water or pesticides, and the use of synthetic products with a toxic production process; 2) some phases of production use toxic chemical products; and 3) the manufacture and distribution of clothing make intensive use of modes of transportation. Competitive pressures due to the increase in the number of competitors and the reduction of the life cycle of the product also lead to an increaser in pollution and waste (Chung & Wee, 2008).

Srivastava (2007, p. 55) defines Green Supply Chain Management as 'integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumer as well as end-of-life management of the product after its useful life'. The adoption of a circular supply chain will thus include 'practices [that] have ranged from green purchasing to integrated supply chains flowing from suppliers, to manufacturers, to customers and reverse logistics, in order to "clos[e] the loop"', according the definition of green supply chain management given by Zhu and Sarkis (2006, p. 474).

A number of green practices have been adopted in supply chain management in the apparel industry in the last few years (Caniato et al., 2012; De Brito et al., 2008; Lakhal et al., 2008), but to the best of our knowledge, the circular supply chain aspects of this industry has not yet been analysed, although innovative apparel companies with disruptive business models and supply chain structures have recently emerged (Caniato et al., 2012).

This chapter explains how a circular supply chain could be developed in the apparel industry using case-based research. It is organised as follows: (1) the introduction provides a brief introduction to the topic and goals of the chapter; (2) the next section reviews the literature and defines key terms; (3) the section on the circular supply chain and circular business models in the fashion industry provides and case study; and (4) the final section offers conclusions and gives recommendations for the industry.