

Circular Economy and Reverse Logistics: An Analysis of Sustainable Business Models

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Abstract. The present paper aims to investigate circular business models and the key role assumed by reverse logistics in promoting sustainability and the reduction of negative externalities associated with various economic processes. The objective of this paper is to investigate how reverse logistics is integrated within corporate circular business models. The objective is to highlight how the implementation of circular business models depends as much from a management of company production processes as from the optimization of reverse logistics and from an accurate analysis of company location dynamics, aimed at a more effective and efficient use of resources through optimal management of resources by transforming waste into raw materials following the principles of repair, recycling, and reuse. The methodology adopted involves qualitative and inductive analysis starting with the definition of the theoretical framework of circular business process. In this context, it will be essential to analyze and define reverse logistics, assisted by a survey about the geographical location of waste to be processed and industrial production sites.

Keywords: Circular Business Models · Reverse Logistics · Sustainability · Circularity

1 Introduction

The circular economy is a concept that has been gaining popularity in recent years, both nationally and internationally. The goal of the circular economy is to create a sustainable economic system, which not only aims to reduce negative environmental impact, but with a focus on better efficiency in the use of resources, through to an optimal management of waste, where it is transformed into new resource materials, thus going on to reduce environmental impact and ensuring long-term sustainability [1].

We will therefore need to initially introduce the concept of sustainability, where a commonly accepted definition is that provided by the Brudtland report of 1987 [2] "development that meets the needs of the present without compromising the ability of future generations to meet their own needs.". At the World Summit Development in

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2002, the concept of the triple bottom line was defined [12], meaning that sustainable growth cannot be separated from its three basic components, People, Profit and Planet. These three factors represent the pillars on which sustainable development is based. With regard to circularity in business models, on the other hand, there are some fundamental concepts [3] that need to be introduced to better define the framework of application [4–6]:

- Design for circularity: designing products, processes and systems that can be used, repaired, remanufactured or recycled efficiently.
- Performance economics: a business model that rewards positive environmental performance instead of relying on the product ownership model.
- Efficient use of resources: reducing the use of finite resources and increasing energy efficiency to reduce negative environmental impact.
- Repair, remanufacture and recycle: increase the useful life of products through repair and remanufacturing, and reduce waste through recycling and the use of recycled materials.
- Creating networks of integrated production systems to develop the circular economy.

This set of concepts will be useful in developing the framework of this paper, where the analysis will focus on the development of circular business models [7], going to examine the relationship that exists in circular business models, reverse logistics [8], and the spatial location component and development network system to maximize the efficiency of these production systems [9].

Reverse logistics, or the management of material flows out of the value chain, is a key element of the circular economy [10], as it focuses on managing the recovery, reuse and recycling activities of products and raw materials. Reverse logistics can have a positive impact on the environment, business competitiveness and the quality of life of local communities [11]. Reverse logistics is an important element of the circularity of the business process, as it focuses on managing the recovery, reuse and recycling activities of products and raw materials [12].

In this study, we will explore the basic principles of the circular economy and reverse logistics with a focus on the geographic and localization aspects, analyzing the role of localization in the implementation of the circular economy and reverse logistics, and analyzing the opportunities and challenges related to its implementation in different geographic contexts.

The information presented through desk research will then be used to develop a SWOT analysis on the sustainability of business processes applied to the case of IKEA, a company that, as we will see, places circularity and sustainability of its processes as key drivers of its strategic development.

2 Literature Review

Increasing attention to environmental aspects assisted by the quest for efficient use of resources has determined that the topic of circular economy and reverse logistics is an extremely central component of production processes [12, 13]. The literature points out that the circular economy and reverse logistics are closely linked and that their implementation can have a significant impact on local communities and the environment [14,

15]. For example, effective management of waste and unused materials can increase the availability of raw materials and reduce costs associated with disposal [16]. In addition, circular economy and reverse logistics can also help create new economic opportunities by following the basic principle of the 3Rs: recycle, reuse, recover [17]. The R-list establishes a clear hierarchy of priorities for waste management methods: the first R (Regenerate) is given priority over the second R (Reduce) and so on, with the degree of circularity decreasing progressively down the list [18, 19]. These strategies can be applied within the types of material cycles characterizing as the biological cycle, which encompasses the flows of food and biologically-based materials (for instance, cotton and wood) that are designed to return to the biosphere through processes such as composting or anaerobic digestion and the technical cycle, which relates to the flows of inorganic or synthetic materials [20].

The importance in managing limited resources and waste in production processes is one of the leading themes within the circular economy [21], however, emphasizing that the goal is to optimize process efficiency by minimizing resource use and waste generation. The literature has also highlighted the importance of reverse logistics for the development of circular business models that also take into account product end-of-life [22, 23]. Reverse logistics represents one of the central elements of circular business processes as widely pointed out in the literature [24, 25], as it aims to reduce waste by enhancing the value of discarded products, thus generating a flow of goods in the opposite direction to the main one [26–28]. Thus, reverse logistics represents the starting point for product recycling aimed at recovering the residual value of discarded products [29]. It is necessary to emphasize the circularity of production processes and optimal reverse logistics management depend on several factors [12, 30]: among them we find the corporate culture oriented toward the sustainability of processes, which can lead to an increase in the company's effort toward the practices of efficient and careful management of reverse logistics, trying to increase the quality of returns and reducing the costs associated with waste management, and a second aspect, related to technological advances [31, 32], so as to optimize different waste material flows [5].

3 The Concept of Circular Business Models

The concept of the Circular Economy is gaining increasing attention and support in academia, industry, and policymaking circles as a viable alternative to minimize resource depletion, waste, and emissions [33]. To effectively implement the Circular Economy at the organizational level, business models play a crucial role as a leverage point. However, the theoretical conceptualization of circular business models and circular business model innovation lacks clarity and consensus.

A comprehensive literature review was conducted to address this gap and provide a systematic understanding of the emerging field of circular business models and circular business model innovation [34].

The concept of the circular business model is built upon two core concepts: the circular economy and business model innovation. This section provides a brief introduction to both concepts. The idea of the circular economy, initially influenced by Boulding's work in 1966, suggests that achieving a balance between the economy and the environment

requires viewing the Earth as a closed-loop system with limited capacity for assimilation [35]. This concept encompasses a loop economy, which entails implementing strategies in industries to prevent waste, foster regional job creation, improve resource efficiency, and promote the dematerialization of the industrial sector. A relevant business model for a loop economy involves shifting from ownership to utilization, enabling industries to generate profit while reducing costs and risks associated with waste [36, 37].

The contemporary understanding of the circular economy, introduced by Pearce and Turner in 1989 [38], incorporates various features and contributions from related concepts that emphasize closed loops. These include industrial ecology, cradle-to-cradle design, the laws of ecology, looped and performance economy, regenerative design, biomimicry, the blue economy, and life cycle management and engineering [39, 40]. In 2015, Webster made a significant contribution by promoting the idea that a circular economy should be restorative by design, aiming to maximize the utility and value of products, components, and materials throughout their lifecycles [46].

Kirchherr et al. conducted a comprehensive review of 114 definitions of the circular economy and proposed a new definition based on their analysis [47]. According to their proposal, a circular economy describes an economic system based on business models that replace the concept of "end-of-life" with practices such as reducing, reusing, recycling, and recovering materials in production, distribution, and consumption processes [41, 42]. This system operates at multiple levels, including the micro level (individual products, companies, and consumers), meso level (eco-industrial parks), and macro level (cities, regions, nations, and beyond). The aim is to achieve sustainable development by creating environmental quality, economic prosperity, and social equity for both present and future generations [43].

However, a previous review of circular economy literature has identified several shortcomings in this definition. For instance, it simplifies the term "end-of-life" to "disposal", overlooking the broader interpretation commonly adopted in product development theory [45]. It also places a reduced emphasis on other lifecycle stages, presents a three-tier level system that essentially encompasses all levels, and places an undue focus on sustainability aspects that are not always integral to the circular economy concept [44]. For instance, the existing definition simplifies the term "end-of-life" to "disposal," disregarding the more comprehensive interpretation commonly adopted in product development theory [48]. It also lacks sufficient attention to other stages of the product lifecycle, employs a three-tier level system that essentially encompasses all levels, and places excessive emphasis on sustainability aspects that may not always align with the core principles of the circular economy concept [49]. In this study, we will define the circular economy as an economic system that aims to minimize resource input, waste, emissions, and energy leakages by implementing practices such as cycling, extending, intensifying, and dematerializing material and energy loops. Achieving this objective involves various strategies such as digitalization, servitization, sharing solutions, designing long-lasting products, prom and opting maintenance, repair, reuse, remanufacturing, refurbishing, and recycling [50, 53].

Considering that achieving a completely closed-loop system is theoretically impossible, our understanding of the circular economy adopts a dynamic perspective, focusing on the transition towards circularity rather than envisioning a static state of a fully closed

system with no material or energy leakage [51]. It acknowledges the need for continuous improvement and innovation.

The concept of the business model gained popularity and underwent significant evolution during the dot-com boom of the 1990s, characterized by the introduction of innovative revenue mechanisms. Initially, the business model concept served as a means to convey complex business ideas to potential investors within limited time frames [52].

From its fundamental function, the concept of the business model has evolved to serve as a tool for systemic analysis, planning, and communication. Additionally, it has become a strategic asset that contributes to competitive advantage and firm performance [54]. The ability to innovate and introduce new business models can provide organizations with a significant competitive edge, particularly in light of diminishing returns on technology, increasing complexity, and declining costs of capital [55]. This advantage is further amplified by the disruptive impact of digital transformation, as evidenced by the substantial market valuation of relatively new technology conglomerates with innovative digital business models [56]. Furthermore, business model innovation plays a crucial role in enabling organizations to achieve their social and environmental objectives by harnessing environmentally, socially, and economically effective technologies and solutions [49, 57].

Companies that actively pursue sustainable business model innovation have the potential to enhance their financial, social, and environmental performance, as well as strengthen their resilience and ability to navigate environmental risks [59][60].

In this research, we adopt a previously established definition, which is based on a thorough review of the field. Business model innovation is defined as the process of conceptualizing and implementing new business models. This encompasses various possibilities, including the development of entirely new business models, diversification into additional business models, acquisition of new business models, or the transformation from one business model to another. The scope of transformation can vary, ranging from the entire business model to specific elements such as the value proposition, value creation and delivery mechanisms, value capture elements, interrelationships between these elements, and the overall value network [58].

4 Reverse Logistics and Circular Business Models

Reverse logistics refers to the process of moving products in the opposite direction from the typical forward flow in order to recover their value or dispose of them properly [61]. Reverse flow can occur through a number of channels, including an organization's traditional channels, separate channels, or a combination of both. It is important to note that reverse flow is not necessarily a mirror image of forward flow. When reverse logistics is introduced to recover value from finished goods, the goods enter a closed-loop network, which is more complex than traditional open-loop networks because it must handle both forward and reverse logistics [62].

In recent years, many companies have begun to introduce reverse logistics into their supply chains as a means of increasing profitability. This trend has been driven, in part, by the fact that organizations are increasingly being held accountable for their actions along the supply chain. This accountability stems from both legal and social

applications and has generated multiple pushes for companies to adopt reverse logistics, finding economic, social and environmental sustainability to be its key pillars [63].

From an economic point of view, companies can benefit significantly from returned products. According to), the costs of recovering returned products are often lower than the expenses associated with raw materials [64], which can help reduce the high production costs of new products. Companies adopt reverse logistics not only for the direct profit derived from it [61], but also as a strategic decision to improve their competitiveness and prepare for future legislation. Reverse logistics can help companies establish their brand as sustainable, generating a positive green image and increasing sales as environmental issues are becoming increasingly important [65].

Legislation can also provide economic incentives to support the circular economy through reverse logistics. In Sweden, for example, a lower tax rate on repairs of some products was introduced in 2017 to increase economic incentives for customers to choose repairs over new products. The tax rate was reduced from 25 percent to 12 percent for the repair of products such as bicycles, shoes, and textiles [66]. This measure aims to create greater demand for repair services and make it more attractive for companies to offer such services [8].

Reverse logistics is essential for improving resource utilization by circulating products and materials and reusing, repairing, remanufacturing, or recycling them instead of generating waste and filling landfills. By adding reverse logistics to advanced logistics, we can close the cycle of production and consumption, thereby reducing waste and conserving resources (Ellen MacArthur Foundation and Material Economics, 2019). The benefits of implementing reverse logistics go beyond economic incentives, as it also supports sustainability and helps reduce our environmental impact.

Bernon et al. (2018) [67] highlight the critical role of "tone from the top" in promoting the circular economy, meaning that top management should align company values with circular economy principles and integrate them into strategic directives. This implies a greater emphasis on second-hand products and a decrease in sales of new products. To achieve this, circular economy values should be incorporated throughout the organization and reflected in performance measures [28]. By implementing reverse logistics, products and materials can be reused, repaired, remanufactured, or recycled, reducing waste and landfill and improving resource utilization. Reverse logistics can close the cycle of production and consumption, thus facilitating the transition to a circular economy [15]. The benefits of a circular economy include reducing environmental impact, improving resource efficiency, and promoting sustainable economic growth. Companies can also gain a competitive advantage by developing a positive reputation as a sustainable brand, increasing sales and customer loyalty [35]. Therefore, it is critical for companies to adopt a circular economy approach through the integration of reverse logistics and circular economy values into their operations, starting from top management to the entire organization [42].

To achieve a circular economy, the value of second-hand products and the reduction of new product sales should be integrated into strategic directives and permeate the entire organization, reflected in performance measures. Reverse logistics is a crucial aspect of achieving this goal, as it allows products and materials to be reused, repaired, remanufactured, or recycled instead of being discarded and landfilled [5]. The reverse

logistics process involves several activities, including collection, inspection, separation, reprocessing, and redistribution. Figue 1 shows the steps that a product follows as part of the management of a reverse logistics flow for product companies.

Collection is the initial activity involving the purchase, transportation and storage of returned products [14]. Inspection is the subsequent activity in which returned products are inspected and product quality is measured through disassembly, crushing, and testing. In the separation activity, products are selected according to the different characteristics determined by the previous inspection activity. Separation is used to make the most profitable and suitable decision for disposal and includes sorting and storage. Reprocessing refers to product recovery and includes reuse, repackaging, repair, refurbishment, remanufacturing and recycling, depending on the inspection and separation [3]. Finally, redistribution involves the reintegration of reusable products back into the market through sale, leasing, transportation, storage, and marketing [22].

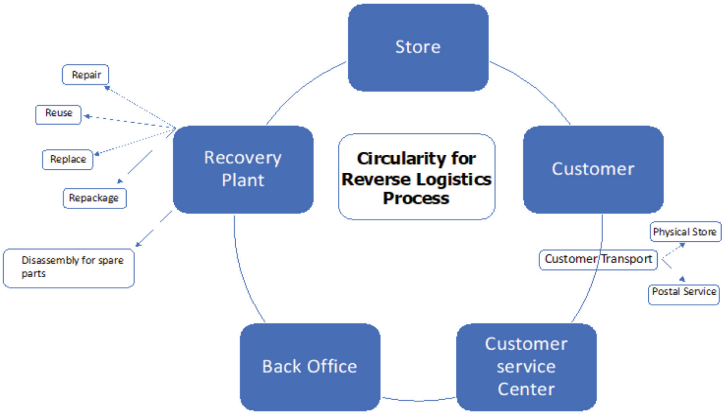


Fig. 1. Scheme of the circularity for reverse logistics process (Source: Author's elaboration on Fleischmann, M., Bloemhof-Ruwaard, J. M., Beullens, P., & Dekker, R. (2004) [79].

5 Circular Economy and Geographical Localization

A key component of circular business models is represented by the locational considerations of waste treatment plants in reference sites of supply of raw materials to be treated. In fact, the accurate management of reverse logistics, i.e., the flow of materials and products back to the production cycle, requires special attention to their origin and route [68, 79]. Locational choices of production facilities must be evaluated very carefully both in terms of reverse logistics and the final destination of flows leaving industrial sites after being processed [69]. The choice of the geographic location of production facilities and supply sites is a critical factor in the effective management of reverse logistics and the

success of a circular business model [9, 70]. The circularity of the economic system is based on reducing the consumption of prime raw materials and using those already present in the production cycle [72]: in this context, it seems clear that raw material treatment plants, therefore, represent the key elements of the circularity of the business model as they allow the recovery and reuse of waste materials and transform them into new raw materials to be introduced in new production processes [71].

Consequently, the geographical location of plants is a key aspect of environmental and energy economic efficiency: the proximity of treatment plants to raw material supply sources can reduce transportation costs and improve the quality of recovered materials. In addition, locating treatment plants near urban areas can reduce the environmental impact of transporting materials for recycling [59]. At the same time, however, it is imperative to also consider the environmental, economic, and social impacts on the territory and regions adjacent to industrial plants, highlighting the negative externalities inevitably generated during these processes [14]. Locational choices will therefore be faced with the search for an optimal trade-off, where on the one hand an attempt will be made to optimize the economic and efficiency aspects of the production cycles and on the other to try to minimize, where possible, the negative externalities generated by the production processes. Locational spatial dynamics are therefore key factors in the implementation of circular and sustainable business models. The choice of the geographic location of production facilities, supply sites, and waste collection centers are influenced by many factors, including the availability of raw materials, proximity to outlet markets, availability of transportation infrastructure, and the presence of local communities.

In particular, the adoption of circular business models requires efficient management of reverse logistics, and this, in turn, requires a supporting infrastructure network and specific services, such as waste collection and sorting centers, transfer stations, and waste treatment facilities [72]. It thus becomes apparent how spatial dynamics can affect the availability and efficiency of such infrastructure and services. For example, the presence of densely populated urban areas may increase the demand for waste collection and sorting services, but at the same time may make traffic and transportation management more complex [35]. Conversely, the presence of rural or remote areas may make reverse logistics management more expensive due to the greater distance and lack of adequate infrastructure [11].

The issues and perspectives of circular economy recall some of the main points related to the more traditional location theories as studied in geographical research. Recently, geographers and planners started from the traditional Weber's theory of industrial location proposing a modified model capable of hosting a circular model instead of a linear one, involving, as important places to be considered in location decisions, not only the raw materials places, but also those dedicate to treating and managing waste and second raw materials [76], here, as Balletto, Borruso and Mei point out, considering circularity in the construction and demolition sector can have important implications on the spatial consequences of the new activities put in place in the treatment leg. In this specific interpretation of the locational issues within the experience of the MEISAR project, in fact, led to considering the Construction and Demolition Waste (CDW) as secondary raw materials, whose locations, in terms of places of origin of waste, as well

as treatment plants, become important places influencing, potentially, producing plant location decisions [77, 78]. The extended, modified model, in particular, is focused on the dynamics of spatial localization of the different production sites called upon to regenerate waste materials in order to generate new raw materials can also be considered in light of Weberian localization theory in its linear simplification. The above cited authors in fact starts from the original Weber theory in its simplified version to embed new locations dedicated to the treatment and processing activities, with a consequent re-organization of the entire locational process.

In the hereby proposed research we can recall the basic principles of Weber's theory, where it is hypothesized that there are two fixed locations, identified as the raw material extraction site (RM) and the final market (FM) [74].

According to Weber's theory of optimal localization, optimal localization occurs at the point where total costs are minimized. Based on these considerations, it will therefore be necessary to find the point of cost minimization for transportation by deciding on the spatial localization of the materials treatment plant according to three different options: adjacent to final markets, near sources of raw materials, or at an intermediate point [75].

We can consider the total cost of transportation to be minimized according to the following formula:

$$TTC = t \cdot q_{RM} \cdot d_{RM} + t \cdot q_{FM} \cdot d_{FM} \tag{1}$$

The total cost of transportation (TCC) will be equal to the unit transportation cost (t) multiplied by the quantity demanded (q) and the distance (d) both for the component from the extraction site of raw materials to the productive plant (dRM) and for the distance between productive plant and final markets (dFM) [76].

Therefore, we can graphically outline the different choices of spatial localization for production sites following the linear simplification of the Weberian model, presented in the following figure (Fig. 2).

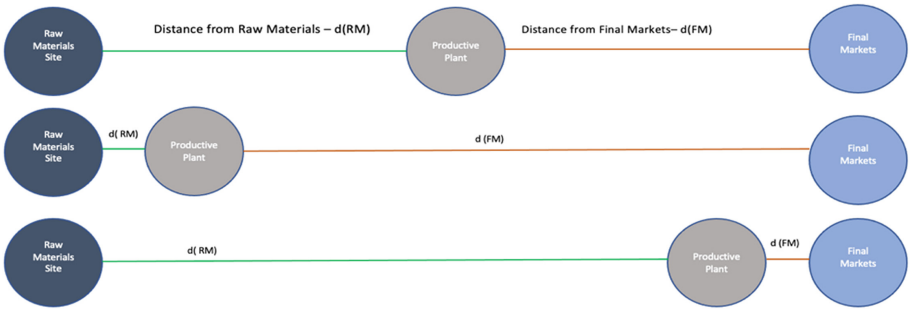


Fig. 2. Schematization of Weber's model of a location on a line. Source: Personal elaboration based on [76].

Therefore, the different companies will adopt a localization choice between the site where raw materials (RM) are located and the final market (FM). This location will depend on the weight of the raw materials compared to the final product, using an

indicator introduced by Weber called MI (Materials Index), which is the ratio of the weight of raw materials to the weight of the final product.

In the case where MI > 1, the optimal site location will be close to the raw material site to minimize waste transportation costs (third case in Fig. 2). In the case where final products are mainly produced through perishable resources, we will be in the second case highlighted in Fig. 2 (Fig. 2).

In the case where MI is equal to 1, then the industrial localization of the production site should be exactly halfway between the raw material markets and the final markets (first case in Fig. 2) [76].

The above mentioned theory represents the starting one in the simplified Weber's model. As anticipated, a possible extended model [76] foresees the possible, best locations of treatment plants as important elements in location decisions.

In a further extension of the Weber model adapted to the circularity concepts of production processes, it would be useful to also conceptualize the dynamics of reverse logistics to consider the flows of returned goods. In such terms, there would be the needs to insert different variables within the model, including, as a matter of example, considerations about the locations in space that will be involved in the reverse location process itself, as well as the costs and distances related to the transport means involved. This will be the object of future research in such sense.

The localization choices for structuring circular business models can be multiple and must balance the specific needs of enterprises with the characteristics of available territories, infrastructure, and services [70].

In implementing circular business models, therefore, several spatial planning decisions will have to be made, which could represent key performance indicators such as the choice of locating production facilities close to outlet markets or sources of supply, where these two places are unlikely to coincide: choices regarding transportation management, a critical factor for the efficiency of circular business models [72]. In this context, companies may choose to use environmentally friendly means of transportation, such as rail or ship, or to reduce the distance between production and material collection points [73, 75]. Involvement of local communities can foster the creation of synergies between enterprises and local organizations, promoting the spread of circular business models at the territorial level, and finally, the design of products, where this can affect the quantity and quality of materials used, as well as their ability to be recycled [72]. In this context, companies may choose to design products that use materials that have a low environmental impact and can be easily disassembled and recycled [71]. In general, localization choices regarding circular business models must take into account the specificities of the area and the needs of the businesses involved [71], fostering the creation of synergies among the different components of the local economic system and promoting environmental and social sustainability [44].

6 Assessing a SWOT Analysis for the Circularity of Business Models: The Cases of IKEA

Building on the information previously discussed on circular business processes and the notions of reverse logistics. This section proposes to analyze the circularity of business models for IKEA company, through an initial screening of the analytical characteristics,

using in particular the information presented in the company's sustainability reports, and then by elaborating a SWOT analysis on the sustainability of business models for the two companies.

Ikea is a multinational company specializing in the production and sale of furniture and furnishings present in over 62 countries worldwide and with over 460 stores. We will first focus on the reverse logistics operations followed by IKEA, and then analyze in more detail the strategies adopted by the Swedish company to try to mitigate the negative externalities generated along its supply chain [84].

Returns are managed by local IKEA stores, which have an area where returned items are sold at a reduced price [82]. The Customer Service Center (CSC) at each store handles all returns, and saleable products are either returned to the warehouse or sold directly in the store. Unsaleable items are sent to the recovery department, where some products are sold directly in an As-Is area, while others undergo a recovery process, where them could be disassembly or repair. While IKEA lacks data on the percentage of unsaleable products recovered [84], they claim that approximately 70% of products can be sold as-is after recovery [80].

Each IKEA store has a salvage department, which considers factors such as complexity, time, resources, and space when deciding whether to salvage a product. In the recovery department, products can be disassembled for use as spare parts, and the main activities include repackaging and integrating products with spare parts. Repackaged, repaired, and reconditioned products are then sold as-is or as new, depending on the extent of the recovery process and the product's condition [81]. Most recovered products are sold as-is due to regulations and the difficulty of ensuring quality and safety [83]. However, if a product only needs repairs and can be sold as new, it offers significant financial advantages because it takes less time and has a higher price margin [82].

Regarding the circularity of its business processes, IKEA takes action across various components of its production chain to minimize waste production from its operations. This includes using recycled materials for packaging, generating more electricity from sustainable sources than it consumes, and incorporating environmentally friendly materials into its production lines [84].

Around 70% of the materials used to create IKEA products are derived from natural fibers such as wood and paper, with a smaller percentage of plastic and metal materials used (only 5% for plastic).

By transitioning to recycled and renewable materials like recycled wood and plastic, promoting lightweight construction, and encouraging renewable energy in raw material production processes, IKEA can significantly reduce its ecological footprint and other environmental impacts. This approach also supports the group's economic sustainability [84].

Therefore, is possible to outline the SWOT analysis for the circularity of IKEA business processes, aimed at highlighting the strengths, weaknesses, opportunities, and threats in this particular area of application. In particular appear clear that corporate development activities have been aimed for years at improving the company's environmental sustainability processes, however we can highlight some strengths how IKEA has implem,ented various initiatives to reduce its carbon footprint, such as using renewable energy self-produced, and cutting off the total usage of fossil fuel energy consumption,

designing products that are easy to recycle and improving its waste management policy [80, 83].

For what concern the weaknesses: appears clear that the complexity of the supply chain could makes difficult to monitor and control environmental and social impacts, and also considering the geographical localization of the production plant and the global dimension of the final distribution markets, seems clear that the management of the materials flows are difficult to manage and to implement under an environmental point of view [81, 84].

IKEA proposes to achieve complete sustainability of its production processes by 2030, it seems clear that this is an extremely difficult challenge to face as it requires a total and complete rethinking of the production line, of the logistics inherent in the distribution of goods in the different sales on a global scale. The greater development opportunities in this case are highlighted by a focus on the use of recyclable materials, through an optimization of logistics and the physical movement of people through greater use of virtual reality to make the physical store superfluous, through an increase expenditure on research and development and finally through a consumer education policy [83, 84].

As far as threats are concerned, although IKEA currently holds a position of market leader, the presence of intense competition on the furniture production market represents a problem for the company which must be able to implement its environmental efficiency policies without however giving up operating margins in terms of economy [80, 84].

7 Conclusions

The aim of this paper is to highlights the importance of circular business models in promoting sustainability and reducing negative externalities associated with various economic processes. In this context, reverse logistics plays a crucial role in facilitating circularity by managing the recovery, reuse, and recycling activities of products and raw materials. The implementation of circular business models depends on the optimal management of resources [38]. It is possible to emphasizes the need to create networks of integrated production systems to develop the circular economy, where efficient use of resources and performance economics are rewarded [5].

The present study underscores the importance of analyzing the role of geographic and localization aspects in the implementation of circular business models and reverse logistics, and the opportunities and challenges related to their implementation in different geographic contexts, in fact the transportation dynamic related to the row materials, final product and reverse logistics represent one of the first challenge when we consider the mitigation of the negative externalities for the different business models. This paper provides a valuable contribution to the field of sustainability and circular economy, highlighting the importance of reverse logistics in facilitating circularity and promoting sustainable economic growth [46]. It is important to note that the implementation of circular business models and reverse logistics requires a fundamental shift in the way companies approach resource management. This shift involves moving away from the linear “take-make-dispose” model towards a circular model that prioritizes resource efficiency and waste reduction [10].

To successfully implement circular business models, companies must adopt a holistic approach that considers the entire product life cycle, from design to end-of-life management. This approach involves designing products and processes that can be used, repaired, remanufactured, or recycled efficiently, and creating closed-loop systems where waste is transformed into new resource materials. Moreover, the implementation of circular business models and reverse logistics can bring numerous benefits, such as reducing negative environmental impacts but also for improving business competitiveness, and enhancing the quality of life of local communities: for this reason we decided to elaborate a focus on IKEA company, that represent the ideal case study in term of circularity for the attention and the effort that the company puts in all the consideration related to the sustainability, starting from the production, where they used only energy derived from renewable sources, related to the waste management where the refuse are minimum reduced and considering all the other initiatives to bring IKEA as a model in the field of sustainability and the circularity [83].

The theoretical considerations presented on the circularity of business processes and the need for careful planning of reverse logistics to achieve sustainability goals in terms of carbon neutrality and net zero impact represent a first step towards analyzing the sustainability of the business processes involved. The theoretical framework presented serves as a starting point for reflections that take into account, on one hand, how reverse logistics represents a key element in achieving the objectives of sustainability for business processes, and on the other hand, aims to highlight how spatial localization dynamics of companies. Recalling recent revivals of the traditional location theories from geographers and planners (see model discussed in literature by Balletto, Borruso, and Mei [76]), location and location theories represent a strategic factors to be studied and implemented for waste flow management in terms of the localization of waste treatment and regeneration plants, also considering the geographical localization dynamics of such facilities as place of origin of secondary raw materials obtained from waste regeneration.

As a consequence, the implementation of circular business models and reverse logistics is a critical step towards achieving a more sustainable economic system that, now more than ever, depends on the implementation of extremely careful and accurate reverse logistics to be embedded within companies' business models.

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