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# Strategies and practices to reduce the ecological impact of product returns: An environmental sustainability framework for multichannel retail

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## Abstract

Product returns in retail are inherently wasteful and have considerable negative environmental impacts. Besides the monetary costs, they lead to increased transportation, packaging and processing, and the returned items are often discarded. We present strategies and practices retailers can adopt to manage their product returns in a way that reduces environmental impacts. With eCommerce flourishing, product returns have increased significantly. Whilst highest for online sales, they are a challenge across all channels. The importance of developing sustainability management in operations and supply chains is evident from the growing body of literature, but there is a gap regarding the management of product returns in a more environmentally sustainable manner. To address this gap, we interviewed multichannel retailers, retail experts and return service providers operating in the UK and North America. The findings reveal that although retailers have started paying attention to the financial impact of returns, there is little awareness of the scale of environmental impacts. In addition, retailers lack a comprehensive approach to addressing the environmental impact of product returns. Based on our findings, we (1) unpack the barriers inhibiting retailers from developing environmental sustainability plans in returns management, (2) present a set of strategies for retailers to reduce the environmental impact of returns and (3) develop a framework for environmental sustainability in returns management. Our findings and proposed framework have implications for research and practice on addressing the environmental impact of product returns.

**KEYWORDS**
ecological sustainability, environmental impact, multichannel retail, product returns, returns management

**Abbreviations:** CE, Circular Economy; CO2, carbon dioxide; CSR, Corporate Social Responsibility; DC, Distribution Centre; ECR, Efficient Consumer Response; EIO–LCA, Economic Input–Output Life Cycle Analysis; ISO, International Organization for Standardization; LCA, Life Cycle Assessment / Analysis; MFA, Material Flow Analysis; MFCA, Material Flow Cost Accounting; OECD, Organisation for Economic Co-operation and Development; RFID, Radio Frequency Identification; RQ, Research Questions.

## 1 | INTRODUCTION

For modern retail trade, excellent customer service and frictionless, lenient return policies are believed to be important tools that enhance customer satisfaction and increase repeat purchases (Bahn & Boyd, 2014; Griffis et al., 2012). The strategic alignment of marketing and operations to manage the stream of product returns can increase customer value (Mollenkopf et al., 2011). However, this is counterbalanced by rapidly rising return rates and return fraud (Zhang et al., 2022b). These result in significant operational challenges and associated costs. Consumer returns can significantly reduce a company's profits (Jack et al., 2019). The cost of returns can be as much as 30% of revenue (Benson, 2020). Most academic studies and retail practitioners focus on improving the efficiency of handling customer returned products from cost and reverse logistics perspectives (Anderson et al., 2009; Bower & Maxham, 2012; Cui et al., 2020) or on reducing customer return rates (Lee, 2015; Urbanke et al., 2015; Zhang et al., 2022a).

However, the financial impact of returns is only part of the picture. The increased returns are environmentally harmful due to increased transportation, wasteful packaging, unnecessary energy use, increased greenhouse gas emissions and wasted products. This study explores if and to what extent multichannel retailers have aligned their product return processes with their environmental sustainability goals. It was estimated that the US returns alone produce carbon emissions of approximately 15 million metric tonnes annually and 5 billion pounds of landfill waste (Schiffer, 2019). Likewise, in Germany alone, the CO2 emissions associated with returns were estimated at 238,000 t in 2018. This impact is approximately equivalent to 2,200 car journeys from Hamburg to Moscow daily (Universität Bamberg, 2019). Moreover, many returned products cannot be resold and will be sent directly to landfills (Wood, 2021). Returns from eCommerce create more environmental problems because of higher return rates and more packaging waste than returns to brick-and-mortar stores. Online returns can produce 14% more landfill waste compared to in-store returns (Guerinot, 2021). In the 5 years (2014–2019) before the pandemic, eCommerce return rates rose by 95% (Benson, 2020; Schiffer, 2019). During the pandemic, the US returns' online rates remained at 16.5% in 2022 (Inman, 2022). The UK e-retailer ASOS reported that 12% of its total carbon emissions were derived from customer returns (Sword, 2020). Indeed, with the increased customer expectation of free returns, manufacturers are producing more products in excess of what society needs, resulting in more waste. For instance, if it is commonly acceptable to order four pairs of jeans, two of which the customer never intends to keep, it is plausible that manufacturers produce more jeans to meet the order level but with a potential for more waste.

Furthermore, the Covid-19 pandemic not only stimulated online shopping (OECD, 2020), but also affected customer shopping and return behaviours and disrupted retailers' return systems (Zhang et al., 2022a). Since the pandemic, more waste and environmental damage have been caused by even more returns from online purchases as customers have become more comfortable with 'effortless' return processes. Whilst there has been an increase in research investigating the environmental impact of forward supply chains, production lines and food waste management during and after the pandemic (e.g., Ibn-Mohammed et al., 2021; Majumdar et al., 2021; Moosavi et al., 2022; Sharma et al., 2020), the environmental impact of product returns remains under-researched.

Many companies strive to increase their sustainability, although this does not necessarily increase the market value of the firm (Jacobs et al., 2010). The adoption of sustainability practices often depends on technological capabilities, regulatory mandates and the values and beliefs of the people involved (Wu & Jia, 2018). There has been an increasing interest in the concepts of sustainability with its environmental, social and economic dimensions, circular economy and corporate social responsibility (CSR), and these concepts have been introduced in the fields of operations, supply chains and return logistics of end-of-life products (e.g., Carbone et al., 2012; Moorhouse, 2020; Ortiz-Avram et al., 2018).

However, too little attention has been paid to the sustainability management of customer returns (Frei et al., 2020). In particular, no study has explored whether retailers have considered and implemented measures to reduce the environmental impact of customer returns to align their returns management with their sustainability agendas. What barriers prevent retailers from acting? Although many retailers have actively made sustainability commitments, it is unclear whether the environmental costs caused by product returns have been considered (Robertson et al., 2020).

Consequently, the aim of this paper is to explore to what extent environmental sustainability practices and concepts have been implemented in retail return systems in the UK and North America. The research questions (RQs) we address are as follows:

1. What barriers inhibit retailers from adopting environmentally sustainable strategies in multichannel product returns management?
2. What strategies can retailers adopt to increase environmental sustainability in multichannel product returns management?

To address these RQs, we adopt a qualitative research methodology based on an inductive approach and subsequently develop a framework to assist retailers in reducing the environmental impact of their returns management. The study makes the following key contributions: We identify the barriers inhibiting retailers from reducing the environmental impact of their product returns management, including a lack of awareness and a very serious lack of data; we suggest strategies that retailers can adopt to reduce the environmental impact of their returns management; and we propose a framework for environmental sustainability in multichannel product returns that helps academics and practitioners identify the key factors influencing this.

This article proceeds as follows: Section 2 provides context in terms of the environmental impacts associated with product returns and presents the theoretical foundation of this study. Section 3

describes the methodology employed to address the research questions. Section 4 present the findings, and Section 5 discusses possible environmentally friendly practices in returns. Section 6 presents the proposed framework, and Section A.2 concludes.

## 2 | BACKGROUND AND THEORETICAL FOUNDATIONS

### 2.1 | Environmental impacts of product returns

Product return processes comprise a complex reverse supply chain, including extra transportation, product acquisition, gatekeeping, inspection, refreshing, repackaging, refurbishing, remanufacturing, remarketing, recycling and disposal (Blackburn et al., 2004; Daaboul et al., 2014; Schwartz, 2000). Retailers face considerable challenges and uncertainties when implementing a sustainable return supply chain (Cullinane et al., 2019).

The extant environment-related studies typically focus on the environmental impact associated with delivering new products, i.e., the forward supply chain (Hischier, 2018; Mangiaracina et al., 2016; Mommens et al., 2021). For example, evidence shows that online retailing produces lower CO2 emissions compared with offline channels in many circumstances (Buldeo Rai et al., 2019). The offline channel is more environmentally friendly when travel distances are small: When customers travel less than 14 km for shopping, offline shopping will produce less carbon emissions (Wiese et al., 2012). Other studies examined the ecological influence of unsold products (Pålsson et al., 2017; Shen & Li, 2015) or shipping the end-of-life products (i.e., products that have been used) back to the retailers (Okumura, 2022; Senán-Salinas et al., 2021).

Focusing on the reverse supply chain, we categorise the environmental impacts of returns into four classes: (1) collection, reverse and onwards transportation; (2) inspection and refurbishing (whereby we also include refreshing, remanufacturing and repairing); (3) disposal (in case items cannot be resold, donated or recycled) and (4) packaging waste.

#### 2.1.1 | Collection, reverse and onwards transportation

Regardless of who executes the reverse and onwards transportation and what type of vehicle is used, each item being returned to a store or a distribution centre and then transported onwards, such as to a secondary retailer, charity, manufacturer or recycling plant, means additional fuel consumption and potential greenhouse gas emissions. Couriers often still use heavily polluting vans to collect returns, and Edwards et al. (2009) found that, when using a courier, the return of each unwanted item emits 181 g of $CO_2$ emissions on average. Recently, many delivery companies are transitioning to low and zero emission vehicles as part of their fleet. However, there is no guarantee that these vehicles are charged from renewable energy. There are also unresolved issues around the batteries of electrical vehicles, including the acquisition of scarce minerals, the recycling of batteries and their end-of-life solution (Erdelić & Carić, 2019; Feng & Figliozzi, 2013; Schneider et al., 2014). Likewise, customers' journey of returning unwanted products either to a store or to the post office/drop off point will consume energy and potentially create carbon emissions (Wiese et al., 2012). Edwards et al. (2010) found that if returners make a separate car trip to return products, the CO2 emissions are 12 times greater than if the return journey is a part of another shopping trip. The most environmentally friendly return trip would consist of a customer walking or cycling to a shop to return an item in pristine condition that can be resold locally.

Studies on the transport emissions caused by shopping behaviours often exclude product returns from the analysis (Buldeo Rai et al., 2019). So far, the CO2 impacts caused by returns are only discussed as one of several elements included when comparing the environmental impacts between offline and online shopping (Bertram & Chi, 2018; Wiese et al., 2012). Edwards et al. (2010) demonstrated that different return methods have different impacts on CO2 emissions. That is, if the unwanted product is collected on a subsequent delivery round, the integrated return collection is allocated 362 g of CO2 (twice the amount of CO2 of an outbound drop). In contrast, if online customers solely make a separate car trip (13 miles) to return the item to a high-street store without other trip purposes, the CO2 would be 4,522 g CO2. Whilst the most environmentally friendly return option is to use the returning vehicles on their normal delivery route to collect packages ('reverse logistics'), the transportation still contributes to emissions (Bertram & Chi, 2018). In addition, the environmental impacts of returns also depend on the product type. Some studies suggest that returns are negligible for fast-moving consumer goods, such as personal care and homecare products (van Loon et al., 2015). However, research concerning the environmental impacts of packaging waste, remanufacturing and disposal caused by returns remains scarce. The number of returned items and packaging waste should be considered when evaluating which return routes are more environmentally friendly.

#### 2.1.2 | Inspection and refurbishing

At the inspection stage, each returned product is individually checked, and this process leads to additional operations, e.g., scanning, sorting, storing, picking and handling (Cullinane et al., 2017). If the returned products are worth refurbishing, additional processes are required, such as cleaning, remanufacturing, repackaging and restocking. The inspecting and refurbishing activities produce more carbon emissions and use more materials and energy (Mangiaracina et al., 2015). However, how much additional energy and materials are used for refreshing and refurbishing returned products remains unclear. There are frameworks to assess the environmental impact of remanufacturing automotive components (e.g., van Loon & van Wassenhove, 2018), but it remains unknown whether manufacturers or retailers have collected pertinent data for product returns.

### 2.1.3 | Disposal

Whilst there are various alternative destinations for returned products that cannot be resold in the primary market (Jack et al., 2019), many returned products, especially clothes, end up in landfills (Calma, 2019). Optoro, a company specialised in return logistics, has asserted that more than 25% of returns are discarded by retailers (Reagan, 2019). A notable example of product waste is Amazon destroying millions of unsold or returned items every year, many of them unopened or in good condition (Pallot, 2021). Assumingly, it is cheaper to dispose of unwanted items instead of continuing to pile up the stock or to process them for reselling. Additionally, retailers may not have the capacity to refresh or repair returned products locally, and transportation to a repair shop may be too complicated or expensive. In that case, it is not sustainable to retain the products. Return service provider OtailO (tech2impact, n.d.) is a pioneer in providing local circular solutions for national and international returns, but this currently remains a niche market.

Returns that end up in a landfill are not only a waste of the carbon and materials it took to produce and transport them, but many items also release greenhouse gases as they decompose. An important question raised here is how retailers decide whether a particular type of return should be disposed of or retained and reconditioned. Jack et al. (2019) showed that, often, this is a decision made by poorly trained third-party warehouse operators acting under time pressure. Environmental impact hardly comes into consideration.

### 2.1.4 | Packaging waste

Packaging waste is a significant concern with product returns at the transportation and resale stages, especially with online returns (van Loon et al., 2014). For instance, returns via post or courier involve more packaging and account for a significant portion of carbon emissions. An additional aspect of eCommerce is that retailers often provide printed return forms with attached sticky labels in advance. Although convenient for customers, these labels are complicated to recycle because of the low-grade paper of the backing sheet and the adhesive (ReBOUND, 2021). Many items are placed in an inner plastic bag plus an outer plastic bag or a cardboard box with lots of plastic sticky plastic tape, which increases the effort required to separate the materials for recycling. It is worthwhile to explore whether retailers have started to react to it and adopt a more sustainable approach to reduce packaging and simplify the return process whilst recording relevant return information.

## 2.2 | Environmental assessment methods

There are several well-established environmental assessment methods to assist practitioners in making sustainable decisions in their forward supply chain (Withanage & Habib, 2021). These methods can be applied to reverse supply chains, as demonstrated by Genovese et al. (2017) for cases in the chemical and food industries, but no study has done this for product returns. Doing this could help practitioners develop new solutions for reducing the environmental impact of product returns. The following methods are potentially suitable:

First, Material Flow Analysis (MFA) focuses on quantifying and evaluating energy use and substance flows and their effects on the environment within a well-defined framework (Islam & Huda, 2019; Meglin et al., 2022). Within a reverse supply chain, MFA may help practitioners to map, quantify, inspect and evaluate the environmental influence of the flows (e.g., materials of package and carbon emissions) that are associated with the returned items at each stage (i.e., gatekeeping, collection, transportations, sorting, remanufacturing/refurbishing and disposition). Second, Life-Cycle Assessment (LCA, also known as cradle-to-grave analysis) is a quantitative methodology to assess the environmental impacts of a product throughout its entire life cycle (Bovea & Powell, 2016; ISO 14044:, 2006). LCA provides a comprehensive picture of the required resources and material for a process and the environmental releases. However, it is challenging to conduct a full-scale LCA, and, thus, many industries use an LCA method on a selected environmental aspect, such as the carbon footprint. Third, there are two other assessment tools if retailers intend to include economic sustainability in their overall return assessment. One is Economic Input–Output Life Cycle Analysis (EIO-LCA). This method is used to estimate the effect of economic activities on materials, energy use and environmental emissions (Hawkins et al., 2007; Hendrickson et al., 1998). Another method is Material Flow Cost Accounting (MFCA). MFCA is an extended MFA method that assesses the costs associated with material flows (Christ & Burritt, 2015).

Our preliminary literature review found that very little is currently known about how retailers assess the environmental impact associated with customer returns. Further research is required to provide a theoretical foundation for this.

## 2.3 | Theoretical foundation

Increasing environmental sustainability implies reducing the environmental impact and ultimately a change in paradigm from a linear to a circular economy (Bocken et al., 2016). Reverse supply chains, which can be in an open or closed loop configuration, support the transition towards a circular economy (Genovese et al., 2017), as they bring items back for processing. Whether they will be reused, repaired, upcycled, recycled or discarded depends on the case. The aim should be to retain as much value as possible (Lüdeke-Freund et al., 2018).

A truly circular economy is circular by design and avoids waste. It can be argued that product returns are far away from this ideal situation in most cases (Frei et al., 2020). Very few manufacturers and retailers currently operate in a circular way; examples may be the Circular Clothing Cooperative in Switzerland or the Circular Electronics Partnership, an international consortium working towards this goal.

Another complementary path to explore on the way towards more sustainable consumption is the use of access-based rather than

ownership-based business models (Baden & Frei, 2021). This can take many different forms, depending on the situation, from servitisation/product service systems (Michelini et al., 2017) to Libraries of Things. Whilst these do not necessarily create circularity, they do extend the product life cycle and may encourage manufacturers to design products for longevity and easier repair, upgrade and recycling (Dissanayake & Weerasinghe, 2021).

Reverse supply chains and reverse logistics are part of 'closing the loop', which is required to create a circular economy. Product returns are a specific case of reverse logistics and reverse supply chains, whereby products are returned to retailers or manufacturers, often from the hands of the end consumer, but sometimes also from elsewhere in the supply chain (e.g., when products are not delivered or picked up by the customer). The concept of the circular economy is starting to get adopted in retail industry through reverse logistics (Kazancoglu et al., 2021; Rovanto & Bask, 2020). Customer returns in retails are a significant part of reverse logistics activities (Ambilkar et al., 2022) and represent an opportunity for the circular economy to be implemented (Frei et al., 2020). In a CE, reducing, reusing recovering and recycling of materials in production, logistics and consumption processes supersede the end-of-life concept (Kirchherr et al., 2017). With increasing environmental awareness and pressure from various stakeholders, consumers have positively perceived the initiatives to promote the circular economy (Upadhyay et al., 2021) and even feel moral obligations to engage with a more sustainable offer from retailers (Ki et al., 2021), which shows that consumers and retailers are not independent entities in this transition (Reike et al., 2022).

Bernon et al. (2018) created a framework for aligning reverse logistics with the circular economy. However, the framework remains rather general and provides little practical guidance. Also, reverse logistics is a wider term that includes but is not limited to product returns. Further work is needed on what retailers can do to make their return processes more environmentally sustainable, or the whole system more circular.

Retailers and manufacturers contribute to the circular economy through reusing, refurbishing and recycling returned products (Agrawal et al., 2022), which is reflected in Figure 1. To capture sustainability targets in product returns and understand its management, retail product return frameworks need to be developed and applied (Frei et al., 2020). There are frameworks for implementing circular supply chains (Amir et al., 2022), frameworks for customer product return behaviour (Minnema et al., 2018), the evaluation of the economic viability of product returns (Guide & van Wassenhove, 2001) and the reverse logistics of product returns management (Srivastava & Srivastava, 2006). However, comprehensive frameworks, which align retail product returns management (as a narrowly defined field) with the goal of environmental sustainability, are lacking. Therefore, we develop a framework that guides retailers in designing their processes such that return processes become more environmentally sustainable.

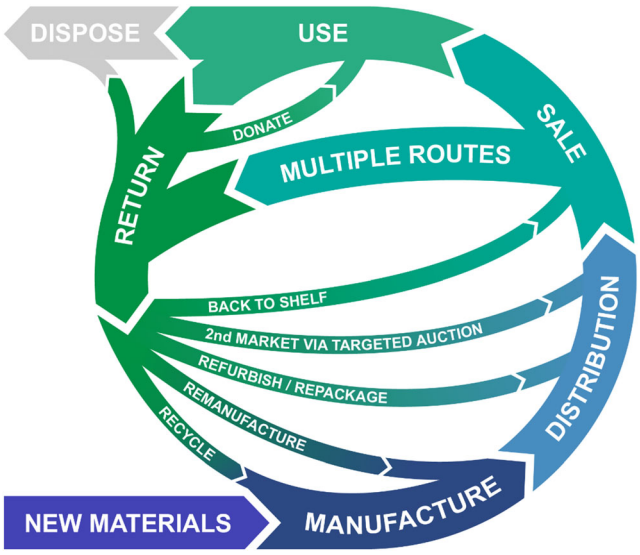


**FIGURE 1** Circular economy in product returns (Frei et al., 2020; reproduced with permission).

## 3 | RESEARCH METHODOLOGY

To address the research questions, we employed a qualitative research methodology via semi-structured interviews with practitioners for the following reasons: First, the qualitative research design enables us to go beyond descriptive accounts to obtain a deeper understanding (Patton, 2002) of barriers to adopting environmental sustainability practices in a real-world context and strategies to support our conceptual development. Existing studies (e.g., Elf et al., 2022; Köhler et al., 2022; Schnittfeld & Busch, 2015) have employed the interview technique to develop frameworks for circular economy in different research topics. Second, the phenomenon of environmental sustainability in product returns management is still underexplored compared to more matured aspects of retail research (e.g., Bernon et al., 2018). As such, conducting exploratory research to investigate this emerging phenomenon is important. Third, qualitative research methodology is more suitable for the explanatory nature of our research question concerning the 'how' (Flick, 2022). Thus, there is a fit between the research methodology and our research questions and our overarching aim to develop a framework for environmentally sustainable product returns.

### 3.1 | Data collection

To ensure the validity and reliability of our research, the semi-structured interviews were conducted with two main groups of actors, namely, retailers and industry experts. First, we considered semi-structured interviews as the appropriate technique for explorative study (Flick, 2022; King & Horrocks, 2010; Kvale & Brinkmann, 2009), enabling us to investigate an emerging topic on the environmental impact of product returns to obtain deeper insights into appropriate mitigation strategies. Furthermore, the semi-structured approach provides freedom of expression, allowing the informants to

provide more valuable insights whilst consistently covering the research questions as appropriate (Leech, 2002; Wilson, 2013).

Second, interviewing two groups of actors allowed us to obtain rich information and more comprehensive insights. Whilst the retailers provided insights on product return strategies and practices, the industry experts offered independent perspectives. Bogner et al. (2009) suggest that interviewing experts is one of the most frequent, effective and valid approaches in empirical research to support data triangulation. We adopted a purposeful sampling approach for sample selection as it has been widely used in qualitative research and is viewed as more effective for collecting rich information (Patton, 2002). Our study focuses on omnichannel retailers because they face more challenges typical of both online retailing and brick-and-mortar stores (Frei et al., 2020, 2022). As such, the targeted retailing organisations participating in this study are based on the criteria of not only offering both online and in-store returns but also having important critical implications for broader society and industry change.

We complemented the purposive approach with the snowballing technique to recruit knowledgeable informants (Lincoln & Guba, 1985; Marshall & Rossman, 2006; Miles & Huberman, 1994). We started with introductions from practitioners within the Efficient Consumer Response (ECR) Retail Loss Group, a retailer association we work with, to identify appropriate participants with experience in product returns management. To ensure the validity and rigour of our sample selection, we also performed initial informal interviews with potential retailers to select more appropriate participants, assessing their abilities to reflect experiences and knowledge in our research topic and their willingness to introduce sustainable practices in their organisations. Therefore, we interviewed 12 experienced managers from eight omnichannel retailers (based in the UK, the US and Canada) with their number of outlets ranging from 500 to 1,000 in 2021/2022 as an indicator to represent their influence on society and industry. These retailers sell a wide range of products, including clothing and general merchandise products such as home entertainment and small electrical goods, which allows us to obtain more comprehensive insights. All managers hold responsibilities in returns management, loss prevention in returns and data analysis for returns from both offline and online businesses and are involved in decision-making in product returns management. Therefore, these managers are informed and experienced informants. Before each formal interview, to motivate discussion, we also investigated whether the selected organisations publish a sustainability strategy and whether they have made a sustainability plan for returns management. We found that although these selected organisations all aim to implement good environmental sustainability strategies as stated in their sustainability reports (2020/2021 and 2021/2022), only Retailers 2 and 6 mention product returns in their reports by stating that they work with charities for this purpose. The strategies do not go beyond this, and no other retailer discusses this topic in their reports.

In terms of interviews with industry experts, we interviewed two experts from the ECR Retail Loss Group and one the IMRG (the UK online retailer community), as well as four experts from three return technology providers. These experts closely collaborate with retailers in developing and achieving innovative and sustainable returns management.

In total, we conducted 14 interviews with 19 informants. Table 1 provides background information on the informants and organisations. Despite the comparably small sample size, our data collection reached saturation. Hennink and Kaiser (2021) observed that this is realistic in qualitative research for a sample size of 9–17 interviews. Additionally, small sample sizes are often appropriate in qualitative research as they allow the researcher to gain a deeper understanding of the situation (Crouch & McKenzie, 2006), especially when interviewing experts (Bogner et al., 2009). Although there is little consensus on the ideal number of interviews in qualitative studies, small samples with the selection interviewees to maximise the richness of information are valid and reliable for qualitative research (Marshall et al., 2013).

Due to the COVID-19 pandemic, all interviews were conducted online to adhere to social distancing guidelines. All interviews were recorded and fully transcribed with the interviewees' permission. On average, each interview lasted for about 75 min. Data were collected between July 2021 and May 2022. Prior to each interview, the list of interview questions was sent to the informants, allowing them to prepare and offer more valuable information. Appendix A presents the interview instruments for both the retailers and industry experts, demonstrating how the interview questions address our defined research questions.

## 3.2 | Data analysis

Given there is little existing literature on the topic of sustainability in product returns management, we applied grounded theory principles (Corbin & Strauss, 1990; Gioia et al., 2013), which is an inductive approach, for data analysis. We followed the processes of open, axial and selective coding by deriving first-order, second-order and aggregate dimensions from our data to ensure rigour in our analysis.

During the open coding phase, we reviewed transcripts and developed first-order codes. We began by dissecting data (key quotations) into discrete increments to generate initial codes at the informant's level of meaning (Corbin & Strauss, 1990) regarding RQ1 (the barriers to adopting an environmental strategy in product returns) and RQ2 (the practices of environmental sustainability in product returns). In the second-order analysis, we performed axial coding (Corbin & Strauss, 1990; Strauss & Corbin, 1990) by analysing, refining, mapping and comparing the first-order codes in terms of similarities and differences. Thereafter, we organised the first-order codes into empirically grounded second-order themes (Gioia et al., 2013). This analysis facilitates us to inductively generate the themes of implementing sustainable management in product returns and associated strategies. Lastly, we reviewed and refined the developed second-order themes to aggregate them into overarching dimensions via selective coding (Corbin & Strauss, 1990; Williams & Moser, 2019). This data analysis step allows us to generate a data structure that can serve as the basis for developing the environmental sustainability framework in product

**TABLE 1** Background information on the interviewed companies.

| Company | Retail sector | Representatives | Country | Number of stores | Topics addressed in their sustainability report |
|---|---|---|---|---|---|
| 1 | Groceries, apparel, electricals | **LP1 A:** Loss prevention manager in charge of online and wholesale operations.<br>**LP1 B:** Loss prevention manager in charge of store operations. | UK | More than 500 | • Tackling the climate change crisis.<br>• Providing efficient transport.<br>• Reducing production waste.<br>• Reducing operational emissions. |
| 2 | Fashion and apparel, footwear and accessories | **LP2:** Profit erosion and data mining manager. | UK | More than 200 physical stores as well as five dedicated online sites. | • Using sustainable materials in production.<br>• Offering opportunity to customers to return old clothes.<br>• Donating excess or end of line items to charities. |
| 3 | Electricals, fashion and apparel | **LP3 A:** Head of digital risk.<br>**LP3 B**: Risk and loss prevention investigator | UK | More than 750 | • Complying with the Government's Carbon Reduction Commitment.<br>• Aiming to improve energy efficiency across all stores, reduce the amount of waste, and use biodegradable carrier bags. |
| 4 | Electricals | **LP4 A:** Manager of loss prevention and inventory control (online).<br>**LP4 B:** Return manager, involved with returns and return prevention. | Canada | More than 150 | • Committed to reducing carbon emissions through making operational improvements.<br>• Aiming to move to electric vehicle delivery.<br>• Complying with all applicable regulations, especially with recycling operations. |
| 5 | Groceries, apparel, electricals | **LP5**: Multi-Channel return manager. | UK | More than 1,000 | • Aiming to create renewable energy from operations.<br>• Managing transport efficiencies to reduce carbon emissions. |
| 6 | Fashion and apparel, footwear and accessories | **LP6 A**: Fraud analytics manager.<br>**LP6 B**: Head of online loss prevention. | UK | More than 500 | • Increasing the amount of waste diverted for recycling.<br>• Introducing renewable fuels.<br>• Monitoring and reducing the carbon footprint.<br>• Identifying opportunities to minimise the waste produced. |

(Continues)

**TABLE 1** (Continued)

| Company | Retail sector | Representatives | Country | Number of stores | Topics addressed in their sustainability report |
|---|---|---|---|---|---|
| 7 | Electricals | **LP7:** Fraud prevention and investigations manager. | UK | Focus online, limited stores. | • Measuring and monitoring the environmental impacts of the operations.<br>• Reducing energy use, greenhouse gas emissions and waste. |
| 8 | Fashion and apparel | **LP8:** Director of loss prevention. | US | More than 1,000 stores worldwide | • Using more sustainable materials.<br>• Using an optimal mix of shipping options to reduce energy use and waste. |
| 9 | Expert (IMRG) | **E1:** An analyst who has valuable retail experience. | UK | N/A | N/A |
| 10 | Expert (ECR) | **E2:** Works closely with retailers on identifying problems of loss and returns. | UK | N/A | N/A |
| 11 | Expert (ECR) | **E3:** 30 years of research experience in understanding retail loss problems. | UK | N/A | N/A |
| 12 | Expert (return technology service provider) | **E4:** Senior manager (public relations) who works closely with retailers.<br>**E5:** President of the retail technology company. | US | N/A | N/A |
| 13 | Expert (return technology service provider B) | **E6:** CEO & co-founder | Based in Israel but provide services globally. | N/A | N/A |
| 14 | Expert (return technology service provider) | **E7:** Chief technical solutions in product returns | US | N/A | N/A |

returns. Figures 2 and 3 summarise the data structure for RQ1 and RQ2.

All the coding and data analysis processes were conducted manually and used Nvivo software that helps the documentation of codes, themes and coded text passages to be shared and reviewed by our research team. We had three researchers from the team independently code the interview data and then constantly compare data and codes, which was to ensure that interpretations and all codes were consistent across the dataset, and detect possible analysis bias to achieve the credibility of the analysis (Vollstedt & Rezat, 2019). Having three researchers involved in the coding and analysis process can also help us ensure no important evidence was omitted. Furthermore, our research team of seven members plus three project advisors also had regular group meetings to discuss the coding outcomes and check any discrepancies until we reached a consensus. Additionally, we presented the data structure and the findings to the retailers in a meeting of the ECR Retail Loss Group for further confirmation and discussion, rather than using inter-coder reliability only. During the discussion, no new substantive information was obtained for the research purpose, which was to validate and triangulate the original results from the interviews and indicate that our research had reached data saturation. Overall, the cross-check approach allowed us to generate a solid data analysis and findings (Sandberg, 2005).

## 4 | FINDINGS

We structured our findings to first outline how various barriers inhibit the retailing industry from adopting environmentally sustainable strategies in multichannel product returns management. Then, we

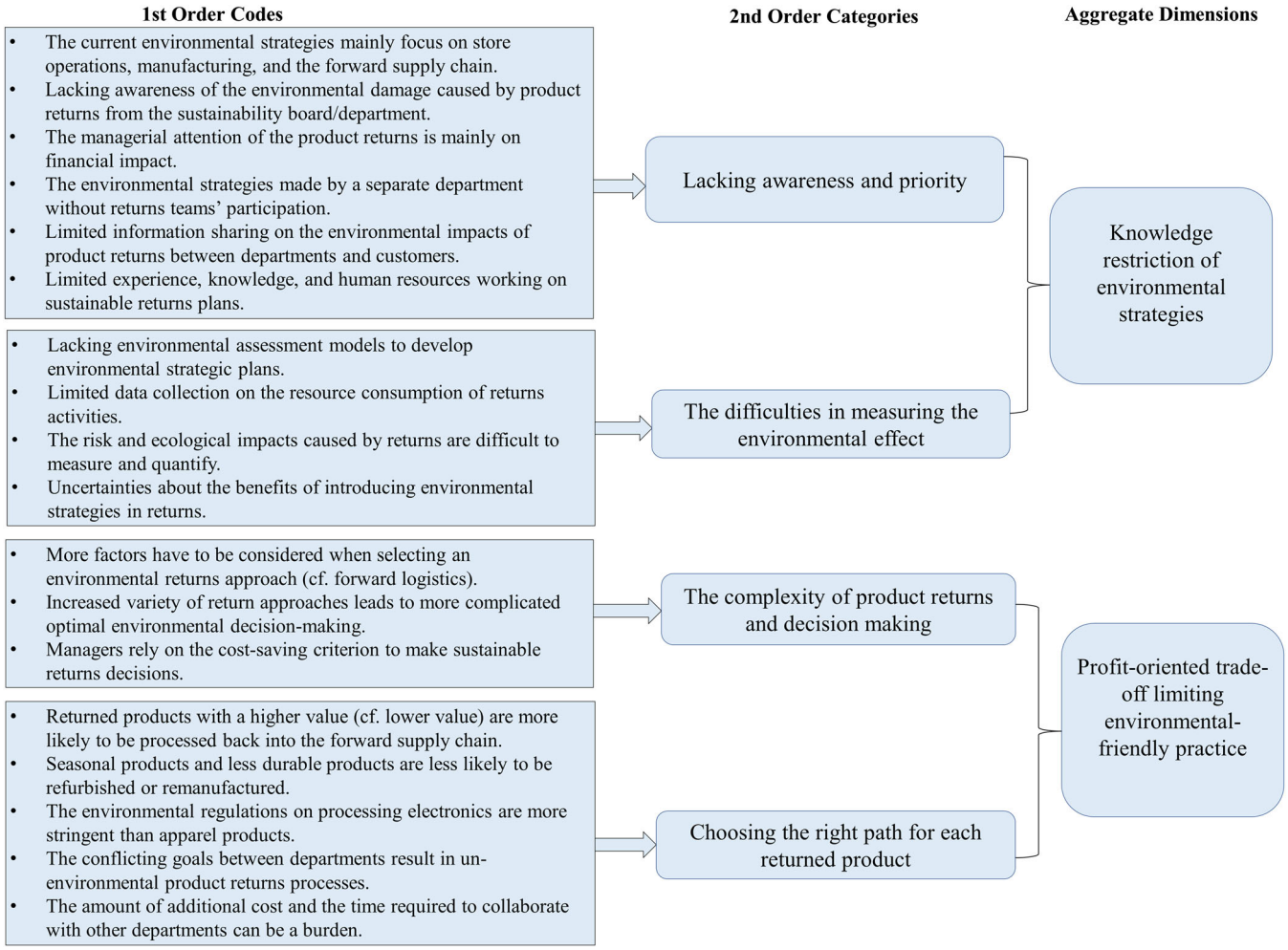


**FIGURE 2** Illustration of the data structure of the barriers to adopting environmental sustainability in product returns.

discuss how retailers can increase environmental sustainability by working towards a more circular economy in multichannel product returns management.

## 4.1 | Barriers to adopting environmental sustainability in product returns management

### 4.1.1 | Lacking awareness and priority

The retailers we interviewed all published sustainability strategy reports or CSR statements on their websites. They all demonstrate strong intentions of engaging in environmentally friendly practices, exploring new ways to reduce their environmental impact and aligning with the United Nations' Sustainable Development Goals. However, except for retailers 2 and 6, we could not identify specific programmes or strategies focused on reducing the environmental effects and waste caused by product returns. The environmental sustainability strategies focus on store operations, manufacturing and the forward supply chain (see the summary in Table 1, last column). All managers claim that their organisations have committed to conducting their business responsibly, building a better brand image and keeping focused on the environmental sustainability journey, including reducing production wastes, less energy usage, using sustainable materials in production, reducing carbon emissions and recycling the end-of-used products. However, making consumer returns more sustainable is not being considered yet. Over the last few years, many have just started paying attention to the financial impact of returns and reducing return rates rather than the environmental damages and waste. For example, we were told that

> ... Sustainability, and ensuring returns go back to production or getting resold, is obviously a big concern for the company. So, I'm speaking very single focused here: we haven't connected environmental issues in returns yet (...). But, honestly, no, we haven't looked at [it] and reducing the [returns] rates, saving costs is our focus. (LP8)

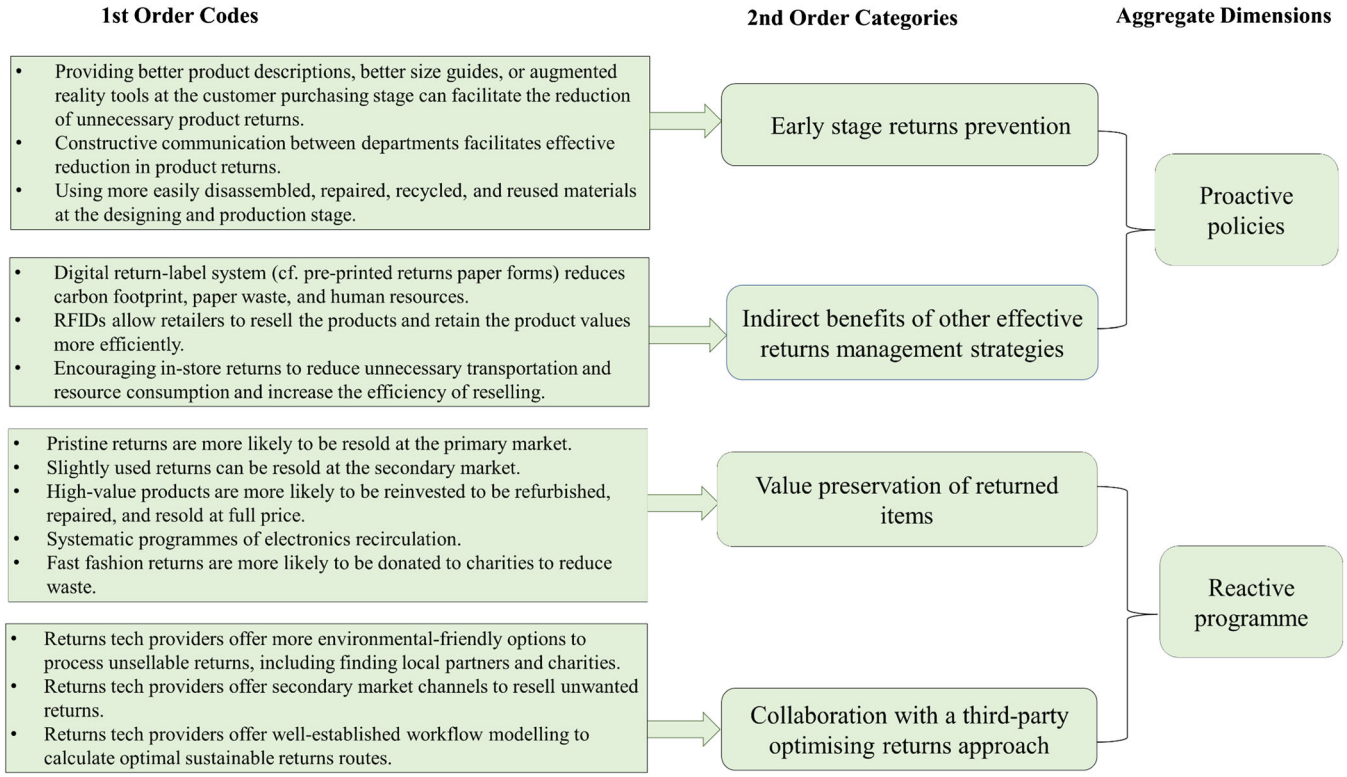


**FIGURE 3** Illustration of the data structure of the current practices to increase environmental sustainability in product returns.

> So, we want to reduce waste anyway and retain more value, of course, then it helps environmental sustainability. But sustainability in terms of returns is not the main driver. We focus on costs and losses. I mean, financially. But, I believe it's time at the minute to see what the opportunities are, how we can best do it and sort of manage it. (LP5)

All return managers pointed out that their top management teams only started to pay attention to the financial losses of product returns due to the increased online returns in recent years. As a result, their teams have not gained enough experience and knowledge on managing returns more effectively and environmentally. This finding accords with our literature review, which showed that returns-related research focusing on the topic of reducing return rates (Sahoo et al., 2018), costs of product returns (e.g., Bower & Maxham, 2012; Shulman et al., 2011), the influence of return policies on sales and return volume (Rokonuzzaman et al., 2021; Shehu et al., 2020); however, very limited research (Frei et al., 2020) focuses on the environmental sustainability management in returns. This finding shows that the current priority of the retailers concerns mostly financial aspects and the practical and academic discussion on environmental aspects is largely neglected. For instance, although Ratchford et al. (2022) have highlighted the importance of product return issues in the retailing industry and proposed ways to reduce the volume of returns, no discussion of the environmental impacts of product returns is provided.

Notably, our interviews show that the company-wide decisions on sustainability strategy are made by a separate department; thus, the return managers we interviewed have no opportunities to participate in planning their organisation's environmental sustainability strategy, for example,

> We're doing a lot on sustainability. We even have a sustainability team within our business. So, the business is really trying to get some traction on sustainability. We don't know all the initiatives because that's one by the sustainability board. We actually cannot participate, but we do all the returns and make decisions, right. So … that could be the reason no particular strategy is in place for returns. (LP2)

The return department being unable to contribute to internal environmental policy-making is one of the primary reasons why the organisation lacks awareness of product returns. As Soo Wee and Quazi (2005) pointed out, top management commitment to environmental management and employee participation are important elements of adopting sustainable development in environmental management.

Moreover, although several studies have suggested that it is essential to reduce the negative environmental impacts of returns from product design and production stages (Bernon et al., 2018; Frei et al., 2016; French & Milliman, 2008), retailers commented that this would depend on the time and cost required to collaborate with other departments may not be available.

> Well …, clearly, you know my company does focus on sustainability. We have to be at the forefront, we have to be [a] leader. Our other departments do take care of the materials we used, making sure we are a good citizen of the earth …. But, honestly, we haven't joined with them to design and think about saving waste on product returns yet … honestly, we need time (…). We'd like to (…) but we're not in a good position to give suggestions on the whole design process …. Whether they would really consider us, not sure, it's on the one side. (LP8)

Lacking information sharing on the environmental impacts and waste (economically and economically) of product returns between departments (e.g., supply chain, finance and design team) and manufacturers could be another barrier, leading to negligence in developing environmental strategies in product returns. We also asked retailers if they have communicated the environmental impacts of returns to their customers and encouraged them to shop more responsibly. They stated that they had not introduced this practice even though they believe it is a good idea, as it requires planning and time. We further found that this is because comparing to other departments or teams, returns management teams have very limited staff (typically five to eight members) and hence little resources to define and structure sustainable returns management, and other operational issues take priority. This finding of limited investment in human resources for dealing with product returns supports the findings of Frei et al. (2022).

### 4.1.2 | The difficulties in measuring the environmental effect

Different from forward logistics, the measurements of risk and ecological impacts caused by product returns are under-researched. All informants highlighted that to adopt a sustainable return strategy, they require a well-established environmental assessment method to assist in measuring the impacts of returns when making environmental strategies and cost-benefits evaluations. For example, fashion Retailer LP6 A addressed that if they would like to adopt any sustainable plans and new eco-effectiveness technologies in return processes, their team needs detailed information on the potential economic and environmental benefits allowing them to convince the top management teams. Unfortunately, retailers claim that they did not observe any significant technologies or solutions being recommended by practitioners or academics. This finding also aligns with our literature review where we did not identify specific environmental assessment methods designed to measure the environmental impact of product returns.

As retailers pay very little attention to the environmental impacts of returns, no data have been collected to be used for analysis. The retail technology company we interviewed commented that even for their more sustainable clients (i.e., retailers), they only have limited data on the proportion of returned items via each return path and the associated resource consumption. They do not know how many products returned in-store are resold immediately or transferred to the warehouse or sent back to manufacturers. This finding indicates that, in the future, actively collecting data can help retailers develop plans to make returns more sustainable. A robust environmental assessment model would be grounded in data availability and reliability (Haupt & Hellweg, 2019; Jacobi et al., 2018).

Our study further revealed that the ecological impacts caused by product returns are difficult to measure and quantify; therefore, retailers do not know which type of data to collect. All managers argued that for returns, it is less feasible to quantify the environmental impacts of product returns, in contrast to financial costs. For example, we were told that

> We would need to really think about is there a quantifiable way [how] I could show the cost associated with sustainability or the environmental impact of those returns. I would think it would be open to a lot of interpretation. A lot of subjectivity depending on the item, how it was returned etc. Uh, not everything that can be counted matters and not everything that matters can be counted. You want the business to understand what's happening and why this is bad. And more than just a financial way for sure. But how did you come to that number? (LP8)

> Returns, you can add in a lot of additional costs aspects. The cost to get the garment back into your warehouse or the cost to refurbish it etc. It's important that the business understand this [returns] is creating additional costs, just put that as all operational friction. You know, yes, you could quantify the cost of returning the product and maybe the carbon footprint of getting that product. But what if it is air versus ground or what if I took it to the store? Did I drive there? Did I take public transportation? You know, it's a, it's a bit of a black hole that you could go down. (LP6 B)

Furthermore, the benefits and risks of introducing environmental strategies in returns are uncertain, and retailers question if they can be measured reliably.

> I think trying to calculate the sustainability issue isn't always straightforward (…). And we need to think about how to calculate the true cost around

> sustainability and making sure that you don't have those unforeseen consequences. (ECR E3)

Furthermore, LP3 commented that with reduced packaging, the product could be more easily damaged during transportation, resulting in more financial loss, customer dissatisfaction and material waste. It is also unclear whether operations and customer services can be enhanced through improved sustainability and whether customers recognise retailers' efforts (Liu & Bai, 2014). As a return technology provider commented,

> We had at least two or three customers [retailers] who have come up to us and say, you know, we really like what you're doing, but we don't want to go paper free for returns because we're scared that our customers will push back. So, it's not a question of [environmental] sustainability. It's a question of customer satisfaction or other business things. (E6)

Hence, retailers would be discouraged from taking risks in moving toward environmental sustainability practices. Although Khan et al. (2020) suggest that top management's risk-taking capability is pivotal in pursuing sustainable and circular economy-related programmes, our findings indicate that the return manager plays an important role in assessing the potential risks, requiring in-depth cost-benefits assessments in any environmental strategies implementation. Haupt and Hellweg (2019) also argued that environmental value is usually not explicitly assessed and could result in ineffective decisions. Our findings extend these studies, showing the importance of evidence-based information required in making decisions.

### 4.1.3 | The complexity of product returns and decision making

The informants reported that return processes have become more complicated in recent years, and they found it more challenging to evaluate which return approach is more environmentally friendly. To judge which return approach is optimal, managers must consider various factors, including the stock levels at stores and warehouses, the speed of transporting and processing returns, and the shipping costs. For instance, calculating valid average carbon emissions for various return routes, including returning to stores, by post, courier or via a drop-box, is very difficult because so many variables need to be considered, including the customer's home address, travel destination, means of travel and possible combination with other errands.

> Returns involve a lot of decisions about what we do with that stock. If it returns to the store, and we can sell it in the store. Do we pay for the transportation back to the DC [distribution centre] or not? With stuff going back to the DC, do we ensure it goes back to where it should be rather than somewhere else, such as landfills? So, a lot of it is about the provider, where it [the item] is, and how we can get it back into stock quicker. (LP5)

Various studies have found that returns have significantly increased and the variety of return approaches (e.g., return to drop-off points, returns via post or return to partner stores) has increased since the pandemic, especially for omnichannel retailers (Bernon et al., 2016; Buldeo Rai et al., 2019; Zhang et al., 2022b). The return process flow chart in Frei et al. (2022) shows numerous ways to return products, each consuming different levels of resources (e.g., human resources, transportation and packaging). Likewise, our findings show that such complexities in the product returns management make the establishment of a sound sustainability strategy nearly impossible at the current stage of knowledge.

From a business standpoint, customer convenience and profits are the priorities affecting their decisions. All managers commented that they rely on cost-saving criteria to make judgements, minimising the shipping costs and reducing the unnecessary transportation of stocks. However, from an ecological standpoint, the decision-making criteria for which path the returned item should take are reducing the environmental footprint and maximising the probability that the item will be resold. These conflicting priorities make it difficult to make the most appropriate decisions. Another important finding is that, intuitively, all managers believe returning an item to store—hoping it can be resold there—is the most ecological and economical choice. They assume this path saves fuel consumption from reverse transportation to warehouses and reduces shipping costs and packaging waste, and the returned item can be inspected immediately. They admit that the primary motivation for this decision is to save shipping and warehouse processing costs. As LP2 commented,

> (…) now, we've only looked at the costs of carriers that do the reverse logistics. So, we encourage people to return to the store more because it costs us 10% less if they return to the store. We deal with different [logistics] companies. We compare the cost per return. (LP2)

There is no evidence whether overall and in average it is more environmentally friendly for the customer to travel to store for returning the item—where it may be resold or stored and then shipped on to a warehouse for processing—or to use a shipping service, knowing the item will definitely return to a warehouse directly. Based on such an analysis, it would be useful to establish criteria for the best return path.

### 4.1.4 | Choosing the right path for each returned product

In addition to the complexity of the return paths, deciding how to process the returns in a more cost-effective and environmentally sustainable depends on 'too many' factors. Managers reported that the

returned item's characteristics, value, seasonality, materials and level of damage all determine whether the returns will be resold at a full or reduced price, donated, recycled or just simply discarded. Cost criteria weigh significantly more than the environmental impact when retailers evaluate whether the returns should be processed for resale or not. All return managers are instructed that low-valued or faulty items would not be returned for refurbishment or recycling because it would not be cost-effective to transport, clean, repair, repackage and resell these items (see the example quotation LP1 A). Even refurbishing or recycling the retailers' own products to capture their value remains complicated: It requires a larger scale of operations and consumes additional resources, thus resulting in high costs (Harris et al., 2015; Hawley, 2006). Additionally, if the returns are seasonal products and/or the materials are not durable, retailers are more likely to donate, directly sell at a discount, or discard the items. This is particularly prevalent for fast fashion retailers as apparel products have short life cycles. This finding further highlights the crucial issue from a return perspective: The cost and efficiency-based value chain in the clothing industry remains a danger to the continuously irreversible ecological damages (Saha et al., 2021).

> (…) we have to waste it [low valued apparel item] because the cost of that product or of assessing that product in a fulfilment centre is not worth putting it back into the system. So even if perfectly good and perfectly usable, and trust me, I struggle to get my head around this from a corporate social responsibility point of view, but it's not worth it. But we do [resell] for electrical returns. (…) for the high-value electrical returns, we do have a process whereby we will uplift that and essentially flow that back through our system. Also, you know, there are regulations on how we should deal with electrical products to be more sustainable. (LP1 A)

In contrast, we found that electronics are more likely to be refurbished and put back into the forward supply chain. This is because electronics are typically of higher value and consist of durable components (e.g., metal), which can be salvaged. Another possible reason for refurbishing electronics is that there are more stringent and well-developed environmental regulations for electronics recycling and waste than for apparel products. If retailers do not comply with these regulations, they can face significant fines or sanctions. However, fashion retailers rely on their managers' experience to manage returns without a specific guidebook or regulation. This finding extends current research (Chowdury & Hossain, 2015), showing that the reasons for absent regulation or enforceable laws for sustainable practices on apparel returns need further investigation, which should also include providing return process guidance (Jia et al., 2020; Saha et al., 2021).

> Our returns process is down to the local manager, how they manage it. And whether or not they believe that they can resell that item. So, you can't write procedures about that because [it depends on] that manager's understanding of how damaged that product is. If I was faced with that, would I want to re-buy it? It's those questions they have to ask themselves to make sure that (a) they're not putting complete rubbish out on the sales floor that will never resell (…) and (b) they're putting it out at a price that that customer would be happy to pay. (LP2)

Another important new finding is the conflicting goals between departments, which can result in environmentally more harmful product return processes. Return processes comprise a complex reverse process that requires collaboration with other departments such as supply chain, distribution (or returns) centres, manufacturers and designers. Each return and the initial product design and manufacturing stages are interrelated, and there might be a trade-off among different stakeholders' goals (Jack et al., 2019). Both managers and experts expressed the concern that, at the returns' inspection stage, it is typically third-party distribution centre staff who sort and inspect returns, and they often have badly chosen performance targets. They optimise processing speed instead of maximising the retained value for the retailer or reducing environmental impact, which would require the definition of useable performance metrics for measuring sustainable behaviour (de Jesus & Mendonça, 2018).

## 4.2 | Current practices to increase environmental sustainability in product returns

Whilst retailers lack strategies to reduce the environmental impact of product returns, we found some evidence of practices and motivations that can contribute to this goal.

### 4.2.1 | Early stage return prevention

Reducing the potential for returns at the purchase stage is essential to reduce the environmental impacts, especially reducing the multiple size/colour online orders. All return managers agreed that providing better product descriptions, better size guides or augmented reality tools would help consumers make more educated decisions and lessen the likelihood of returns. Retailers LP3 A and LP4 B mentioned that, recently, their returns management team had worked with the marketing and distribution centre team to explore how to improve product description to reduce unnecessary orders. Reduced return rates mean less unnecessary waste through product returns. In other words, although the aim was not specific to environmental sustainability, the effective information sharing between departments can improve the management of product returns both economically and environmentally.

> The information on the website, especially in the description of the product, is very, very important in driving returns. Each return costs money and [creates]

> waste. If that particular return is a fridge, and our website didn't mention the actual dimensions or it was not measured properly, it doesn't fit the customer, so, it might damage the fridge, damage the customer's house. Then you have transportation back to our DC again. Its' all waste and unnecessary. Now, we actually have a team [verifying website information and highlighting issues to correct]. So, essentially we work together towards reducing unnecessary returns and saving cost, of course, saving energy. (LP4 B)

Although there are no explicit environmental strategies in product returns, managers highlighted that their manufacturers have already started making products easier to disassemble and repair and using materials that can be recycled. These changes can indirectly contribute to more sustainable practices in product returns.

### 4.2.2 | Indirect benefits of other effective returns management strategies

Retailers 2, 4 and 6 discussed that they had introduced (or planned to introduce) a digital return-label system, such as QR return codes, instead of providing pre-printed paper forms. Interestingly, when we asked these retailers about environmental benefits after implementing the digital return-label approach, they all expressed they had no knowledge of this yet. Although they implemented a digital return system is enhance the visibility of return transactions and control, they are all confident that this new system allows their organisation to reduce the amount of wasted paper and sticky labels associated with their outbound parcels, ultimately reducing carbon footprint and saving costs (Globenewswire, 2014). After the interview, LP6 A manager even shared a white report with us, showing that ReBOUND's clients who use QR codes have collectively saved around 68 million paper inserts and 8,750 trees (ReBOUND, 2021). This result confirms the findings discussed in Section 4.1.2 that for retailers to introduce an environmental-friendly approach in return processes, they need evidence-based information to support their decisions. In addition, these managers commented that avoiding pre-paid return labels not only saves paper but also energy and human resources. Also, the paperless system affects the timeline of interactions between retailers and customers. Rather than waiting obliviously for returns to arrive, using a digital return system, the returns management team can be more effectively prepared to receive the registered returns and allocate the resources and use this information in their inventory management. Customers, in turn, can be offered tracking information regarding the receipt and processing of their return and refund.

> We're launched in this returns portal, so we don't have to provide prepaid paper [labels] anymore and reduce cost and paper waste. I think that's something that all retailers will be moving towards. It's time at the minute to see what the opportunities are, how we can best do it and sort of manage it with the returns portal. (LP4)

Likewise, Retailer 2 commented on the additional environmental benefits of using Radio Frequency Identifications (RFIDs). That is, selling clothing with RFIDs allows them to trace the location of the products and then allows them to resell the products and retain the product value more efficiently.

> So, our RFID provides live stock information, it says: this stock has come back and you've got that size missing on your shop floor. So rather than return it back to the DC, put it out on the shop floor. We've got a trial in six stores at the minute with RFID where we're saying, the stock that's in the stockroom should be on the sales floor to refill it (…) rather than returning in stores and shipping to the DC, then again from DC sending it to that store. If they can sell it on their shop floor, we get it put there straight away, saving energy. (LP2)

As mentioned in Section 4.1.3, retailers encourage customers to return to stores based on the assumption that this return approach is the most efficient for the retailer. The essential idea is that if items were returned in-store, stores would process the returns much faster than having a return centre, opening the packs, inspecting the paperwork and items and then somehow informing the business that this item has been returned. If the returned item is in a pristine condition, the store can directly resell it more efficiently instead of shipping and repackaging it. Additionally, Retailer 2 claimed in their sustainability report that in-store returns could maximise the efficiency of lorry journeys from stores by collectively taking returns to their distribution centre and wasting materials to their recycling centre.

> We like customer returning stuff to our stores. We even offer discounts. It would be sort of 10% off on your next order if you return to store. It saves us money, gas because we get them to return to our store where we've got vehicles going already and save energy. (…) we are looking at how we can better allocate stock that's returned to store from online orders. Because at the minute, we can now match stock that's come back to a store from an online order that will get sent back to the DC but it's also been picked by the DC to go to store. (LP2)

It is worth noting that a store visit also offers the opportunity to convert the return into an additional purchase, which numerous retailers stated as their goal and is in line with Minnema et al. (2018).

### 4.2.3 | Value preservation of returned items

The condition of returned products varies, including pristine, in open packaging, showing signs of use, damaged or defective. Retailers adopt different approaches depending on the condition of returned products and product categories (Frei et al., 2022). Pristine items can

be sold directly to the primary market, although they may need to be repackaged to retain full value. Slightly used items in open packaging may go to a secondary market at a discount price, allowing retailers to recover costs whilst reducing extra resource inputs and waste (Abraham, 2011; Hvass, 2015; Vitasek et al., 2006). Retailers, manufacturers or third parties are more willing to invest in refurbishing or repair of items with higher value, hence recovering more value. The data show that electronic retailers have implemented a systematic programme regarding refurbishing/remanufacturing activities, as the leading electronics retailers suggested:

> So, we have a testing facility and refurb facility. When products are returned to us, we grade them, depending on the condition of the product. And there could be like a slightly open box, for example, but not used. Then we have a couple where it could be slightly used. So, we have several kinds of grading, which, if the thing that we can't really resell anymore, it goes to our technical liquidator channel, and we sell it in bulk etc. And then they do their kind of recycling as well. (LP4 B)

> When returns come back to their return location for quality assessment. There's a quality control stage for certain categories of products. Due to the nature of haircare products, we don't refurb them because it's the whole hygiene point. So, we can't refurb hairdryers. For floorcare products [e.g. vacuum cleaners], from an environmental care perspective, yes, we do. We'll check their condition. We basically have what is called a graded stock. It's something that we are very passionate about, sustainability and recycling. So, anything that can't be refurbed is recycled in a sustainable way. We have that process everywhere across the globe where there's a return. Wherever returns come from, they'll have that ability to recycle, disposing of this in a sustainable way. (LP7)

Retailers reported that they established both online and offline channels by themselves to resell returns and otherwise damaged items (Ertekin, 2016; Jack et al., 2019). For example, if products with minor damage are returned to stores, they can go directly back to the shelf, either to a discount corner or to the original shelf with a discount label attached. Retailers believe this approach allows returned products to be more quickly recirculated as secondary sales and avoid additional resources for refurbishment and transportation, especially fashion items. Likewise, some retailers provide a separate outlet channel category on their main website that directly sells returns. Such items are gaining in popularity as evidence shows that more consumers have been looking for discount products since the Covid-19 pandemic (Optoro, 2020). For example,

> You will notice on our website, that there is some 'last chance to buy' or sort of 'damaged in the store' ware sold at a reduced price. And it just depends on what level of damage it is and whether or not the manager technically thinks that they can do it. (LP 8)

> Yeah, we sell them through the clearance outlets. It really discounted prices, and that's how we clear that returns out asap. (LP3 A)

Fashion retailers typically donate unsold items, including returns, to charities because of the nature of apparel products (Hawley, 2006). The fashion retailer manager LP2 mentioned that

> All the write-off and bad return stock will go to the Newlife Charity. And they do all the logistics for that. So, they collect from a lot of retailers. So, we give them all our write-off stock. They collect it from stores and from the DC, so if it is soiled or marked in any way by something that we wouldn't want to resell, they could resell it as a charity in other countries or through any of their stores.

Electronics retailers rarely use the donation approach. This result accords with our earlier observation that refurbishing electronics is economically and environmentally friendly, as their materials are more durable.

### 4.2.4 | Optimising return destinations

The interviews with experts from return technology providers led to new findings regarding future patterns of adopting environmental programmes in returns. They pointed out that in recent years, more retailers have become willing to collaborate with them to manage returns more economically and sustainably. This includes arranging secondary sales, as return service providers have better systems and networking than the retailers themselves. This finding supports the suggestion that it is more sustainable for retailers to work with return specialists than to arrange everything independently (Cullinane et al., 2019; Grabara et al., 2014). For instance, we were told by retailers that their return partner has a specialised network that can assist them in finding local environmental-friendly partners to process unsellable returns whilst reducing unnecessary environmental damage, similar to what company 13 offers. E5 also stated that they even established a separate online secondary market to resell their clients' returned products. Furthermore, E7 reported that their company goes further by intercepting each return and calculating the best route for that return. They enable specialised workflows depending on various scoring parameters (return reason, geography, pricing, local affiliated stores in the area, etc.). Then they calculate the route, enabling returns to be processed, inspected and resold in local brand-affiliated stores (franchises, multi-brand retailers, etc.). In other words, they ensure that returns are processed and resold locally, reducing the costs of reverse logistics as well as reducing retailer carbon footprint and wastage.

> We look at each individual return. So if this is the item below £30 you don't want to return it to the warehouse ever. So now we enable local partners to accept the return. OK, the local partner might be a recycler, they might be a refurbisher, they might be a donation, but there are local. Also, if I'm in Germany and buying from UK. Instead of returning to UK, I'm now plugging into a local ecosystem, and when you decide to make a return, we say wait a second. There are five stores that sell the same brand, so bring your item into there and they will inspect it, validate it, and resell it. So we develop an ecosystem to make the returns more sustainable. (E6)

These return system providers have developed their services to support a circular economy and benefit from an economy of scale to manage returns better, avoid the waste of storage capacity and reduce energy consumption and carbon emissions. These findings extend current research (e.g., Elf et al., 2022; Khan et al., 2020) in relation to product returns, showing that establishing strategic collaboration return providers can seize new economic and environmental opportunities to contribute to circular practices.

## 5 | DISCUSSION AND FRAMEWORK

### 5.1 | Barriers and practices

Prior to this research, there was very limited knowledge about the barriers and practices of implementing environmental sustainability in product returns management (Frei et al., 2020). This study addressed the research gap and contributed to the rapidly expanding field of environmental management practices and the implication of the circular economy in product returns.

The findings demonstrate two main reasons inhibiting retailers from adopting environmental practices in product returns management (see Figure 3). First, existing studies focus on the environmental awareness of employees, suppliers, customers and policy (e.g., Ageron et al., 2012; Laari et al., 2016; Saha et al., 2021). We argue that it is the retailers' inability to measure the environmental impacts caused by product returns that leads to the absence of environmental strategies for product returns from the organisations. Our analysis indicates that this is caused by the lack of participation of return managers in the sustainability board, limited experience and knowledge of sustainable return practices, and no environmental information sharing between departments on returns.

Previous studies have suggested various environmental impact assessment models facilitate eco-benefits decision-making for environmental and CE implementations (Merli et al., 2018). However, we argue that there is limited evidence to show that retailers can implement this. One barrier is the difficulty quantifying the environmental impacts caused by returns and data collection. In turn, these difficulties lead to limited knowledge of the returns' environmental impacts. These findings show multiple possible interaction effects between the barriers; that is, the barriers are not isolated. We also found that return managers are reluctant to introduce new environmental strategies because of concerns about any unforeseen negative impacts, such as damages on returned items and negative customer experience.

Moreover, we found that the limited collaboration between departments constrains knowledge creation and information sharing to develop environmental practices in returns, which reduces the sensing and seizing opportunities (e.g., Easterby-Smith et al., 2009; Köhler et al., 2022; Lozano et al., 2021). An explanation for limited collaboration could be the limited investment in human resources in the product returns management team. Additionally, the costs and time required to develop environmental strategies (cf. economic efficiency) are a hindrance, given that sustainability in product returns is not a priority.

Our analysis did not show barriers to obtaining financial support in implementing new sustainable technologies (e.g., Ahn, 2016) when investigating environmental strategies. However, we found that profit-oriented trade-off limits environmental-friendly practices. Our findings show that, different from the forward supply chain, return processes are more complicated depending on product types, materials, product values, complex return approach and returned conditions. Retailers face more challenges in making the cost-benefits evaluation. Therefore, they have to rely on cost-saving criteria to make return decisions, even though corporate commitments show that the fundamental willingness to operate in more sustainable ways is there. However, in terms of product returns, there are multiple severe hindrances: not knowing about the full nature and scale of the problem, being unable to measure its severity, both the problem and the solutions being complex, and the difficulty in formulating a solid business case. This all points towards an opportunity for academics and informed practitioners to make an impact.

Although a group of scholars has already established the importance of regulations and law enforcement for encouraging businesses to pursue environmental strategies and CE implementation (e.g., Kirchherr et al., 2017; Saha et al., 2021; Sajjad et al., 2015, 2019), our investigation suggests the environmental regulations should be more focused on the apparel industry. As discussed in Section 4.1.4, electronics retailers often have better environmental practices to ensure the circulation of the returned items and have established a guidebook for their staff. Whilst previous studies suggest that fashion retailers should be incentivised by law to design and manufacture more environmentally sustainably (Lazarevic & Valve, 2017; Saha et al., 2021), they, however, omit the importance of environmental practices in product returns that should be considered by the regulations and not limited to eco-design and end-of-life products.

Some return service providers focus on increasing environmental sustainability, and some retailers collaborate with these providers and introduce more sustainable practices. For instance, retailers can introduce digital returns to reduce paper waste and utilise RFIDs to be

more eco-efficient in managing stocks and reducing transportation. We suggest that the new technologies for managing product returns can go beyond operational efficiencies and bring environmental benefits.

Furthermore, retailers encouraging customers to return items in-store can be viewed as a reconfiguring capability (Khan et al., 2020; Teece, 2007). As discussed in Section 4.2.2, given that multichannel retailers already have transportation routes between stores and DC, returning items in-store allows retailers to recombine the forward and reverse logistics using existing transportation resources. Additionally, items returned to store can use the same service, such as inspection, refund and resale, without requiring additional resources.

## 5.2 | An environmental sustainability framework for product returns

We developed a framework for implementing environmental sustainability in product returns at an organisational level, as depicted in Figure 4. The framework encapsulates four core elements: (1) top management commitments in developing an environmental strategy in product returns, (2) cross-department coordination to achieve joint goals, (3) collaboration with third parties in managing product returns and (4) developing assessment methods for quantifying the environmental impacts of product returns. All elements are interconnected and indicate that adopting environmental sustainability in product returns cannot be adequately depicted in terms of linear or causal relationships, the same as in a forward supply chain (Senge et al., 2008). Our framework can assist retailers in implementing efficient and environmentally sustainable practices in product returns.

### 5.2.1 | Top management commitment and awareness

The findings of the research have shown that whilst many retailers have well-established CSR or sustainability agendas and some have committed to contributing to sustainable practices (e.g., recycling and remanufacturing), they did not design specific environmental programmes and plans for reducing the environmental impact of product

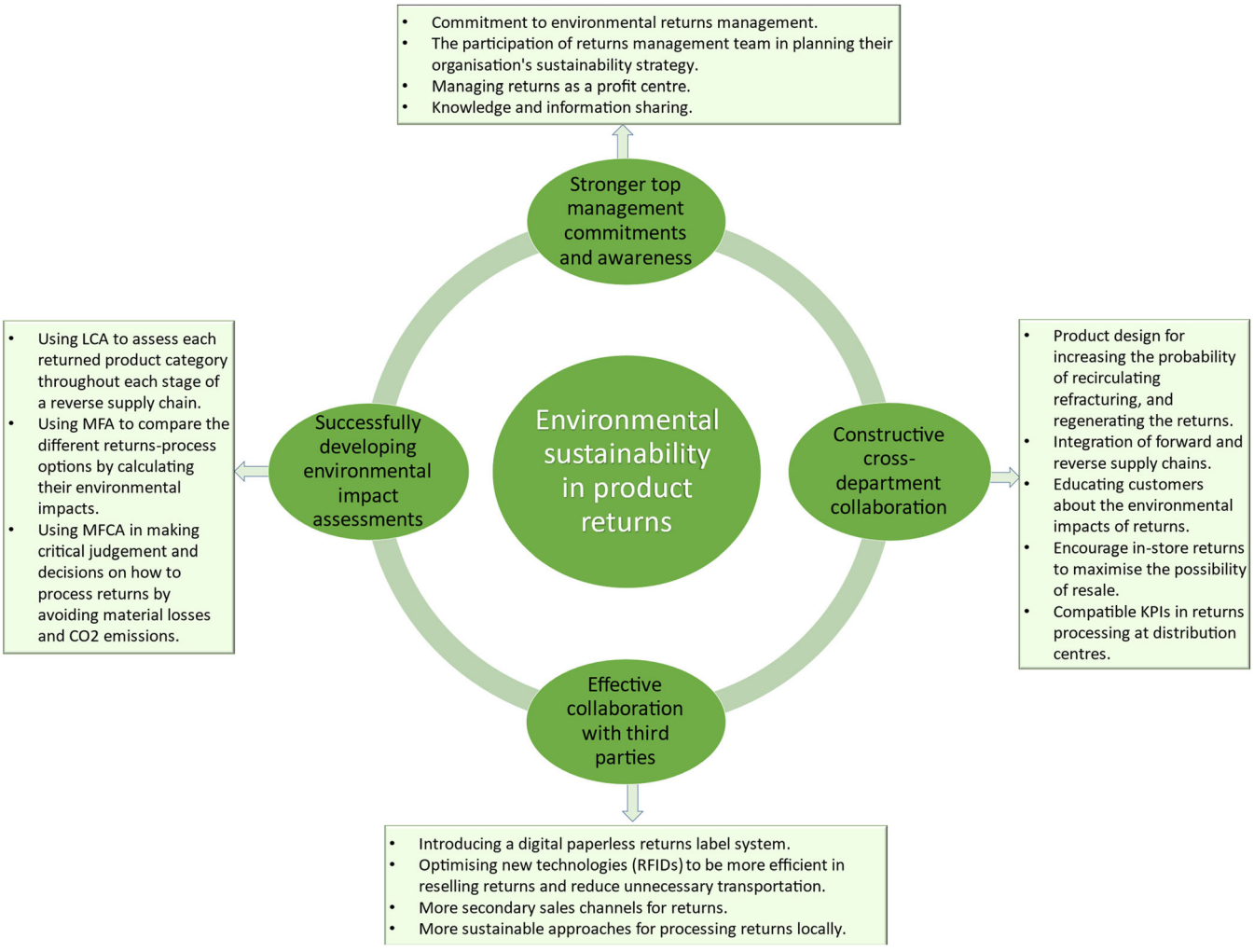


**FIGURE 4** The environmental sustainability framework for product returns management.

returns because of the lack of awareness and knowledge. Once this has been addressed, organisations' board of directors should commit to implementing sustainable returns management and setting specific targets for reducing waste and emissions caused by returns. The top management's commitment and awareness are a driving force to ensure there are strategic plans for environmental sustainability (Moktadir et al., 2020; Santa-Maria et al., 2022; Sajjad et al., 2015; Wittstruck & Teuteberg, 2012).

Given the increasing environmental problems caused by product returns (Schiffer, 2019) and the fact that product returns are not entirely avoidable in the retail industry, retailers should rethink the role of returns management and run the returns as a profit centre (Jack et al., 2019). We suggest that with a concrete strategic commitment and vision for managing returns with economic and environmental sustainability, returns management teams would be more likely to maximise the value of returned products, reduce waste and protect the environment, which supports the implementation of a CE. It is necessary for return managers to join the sustainability board or department to increase their attention to returns, ensuring the organisations' environmental strategies take into account product returns. As a result, the first proposition is derived.

> **Proposition 1.** *Stronger awareness and commitment from top management have a positive influence on the implementation of environmental sustainability strategies and practices in product returns.*

### 5.2.2 | Cross-departmental coordination to achieve joint goals

Achieving sustainable returns cannot be stand-alone; any new initiative regarding customer returns should be integrated with existing sustainability programmes and performance measurements (Bernon et al., 2018). We have shown that the return process comprises a complex reverse process, which requires coordination and collaboration with other departments, such as the supply chain, distribution and return centres, manufacturers and designers. Each department can be viewed as a partner working with the return team, and they can share the resources, information, knowledge and capabilities to develop consistent and innovative sustainability goals. For instance, interlinked performance evaluations can enforce inter-departmental collaboration. As Lozano et al. (2021) pointed out, information sharing can create knowledge and motivate collaboration for achieving a CE. Unfortunately, our findings show a lack of information sharing and communication between departments on the environmental impacts of product returns, leading to very limited coordination to address returns-related environmental issues. Therefore, we suggest that there needs to be an alignment between sustainable returns management and other managerial facets.

Retailers and manufacturers currently focus on the production stage to enable remanufacturing and recycling; however, these apply to product end-of-life, rather than product returns in our case. Whilst Tsoulfas and Pappis (2006) emphasise the importance of design for the environment to ensure products are ecological throughout their life cycle, they omit the situation of product returns. Drawing on our findings, a possible explanation for this would be limited attention and information sharing at the product return stage. Thus, we suggest that return managers connect with suppliers/manufacturers and designers to discuss the environmental impact of returns and relate this to product design. This further supports the suggestion of Saha et al. (2021) that knowledge sharing and collaboration in sustainability management across the value chain are important for implementing CE successfully.

Moreover, the transportation and collection of returned products need to be well planned. Forward and reverse supply chains could be integrated to reduce transportation and increase the quick resale of returned products, the same principle as encouraging in-store returns. Drivers can collect more returned products and deliver parcels simultaneously in one trip (Bertram & Chi, 2018; Edwards et al., 2009). Additionally, Cullinane et al. (2017) suggested that the produced emissions depend on the selected vehicle type and routes. Although there is increased discussion and practical implication investigation of transportation in the forward supply chain, our interviews did not find related information regarding vehicles transporting product returns. To achieve these eco-efficient plans in forward and reverse supply chains, it is necessary to increase communication and coordination between the returns management team and other related teams/departments (e.g., supply chain), exploring economic and environmental opportunities.

There is no doubt that consumers play a major role in influencing the environmental impacts of returns (Rausch et al., 2021). However, the retailers we interviewed have not communicated the environmental impact of returns to customers. Some studies (e.g., Corner & Randall, 2011; Liang et al., 2019) have investigated how to optimise information presentation to promote pro-environmental behaviour. For example, Spreer et al. (2021) have demonstrated how effective the display of environmental information is in changing consumer behaviours and how certain psychological nudges can have a tremendous impact on return rates. We suggest that marketing and sustainability teams should promote communication about environmental aspects on retailers' websites or the back of receipts that would assist consumers in realising that they should play a part in protecting our environment and explain how they can do it. Additionally, we suggest that the marketing team can work with the return team to utilise their online platforms to resell their returns more quickly to reduce unnecessary remanufacturing and additional resource consumption, such as repacking. Meanwhile, inspired by the study of Elf et al. (2022), retailers can also expand their own secondary sales channels via their existing social media platforms, which typically have less stringent quality requirements but remain under their own control; additionally, communication via these platforms can be targeted to reduce unnecessary returns and hence improve environmental sustainability.

Strategic coordination between different departments is a process of establishing seizing capability, which has been recommended (e.g., Elf et al., 2022; Khan et al., 2020; Köhler et al., 2022) to contribute to CE

implementation. This can mean collaborating with others to brainstorm and explore new opportunities for developing innovative environmental practices. Therefore, we formulate the following proposition:

> **Proposition 2a.** *Effective cross-department collaboration facilitates information sharing and knowledge creation in developing more economical and environmental practices across the product return processes.*

Our research supports that not only each return and the initial product design and manufacturing stages are interrelated but also there might be a trade-off among different stakeholders' performance goals. An important finding that emerged from our research is that the speed in processing returns served as KPIs at the distribution centres can be incompatible with the environmentally sustainable performance in processing returns. Hence, the distribution centre's KPIs in processing returns should be chosen to benefit both departments and achieve the same goal from the top management. These alignments are critical to which returned products can be recirculated, as well as the resources used during the return process being minimised. It is plausible that it would be easier for manufacturers to implement a sustainable remanufacturing approach than for third parties to disassemble and refurbish products (Hatcher et al., 2011; Ijomah et al., 2007). Thus, this leads to the following proposition:

> **Proposition 2b.** *Constructive cross-department collaboration facilitates consistent economic and environmental sustainability goals between departments and supports circular process implementation.*

### 5.2.3 | Collaboration with third parties

It can be beneficial to collaborate with third parties to implement sustainable return approaches, especially with returns providers offering reverse logistics, digital return systems and services. Retailers are profit-oriented and rely on cost-saving criteria to make judgements when processing returns. They are also more concerned about the time, resources and economic costs involved in the processing and reselling of returns through their primary sales channels. Therefore, we suggest retailers work with third-party discount stores or online marketplaces to exclusively sell surplus and returned products. Likewise, return providers (e.g., company 13) have the capability to identify resell channels locally or facilitate the regifting of unwanted returns and as discussed in our interviews. Apart from regifting to charities, fashion retailers can partner with fashion colleges, local art communities, universities and workshops to reuse the materials from unsellable returns. However, only Retailer 2 we interviewed has been donating the fabric from design rooms to local arts programmes/projects. ReTuna Återbruksgalleria, a Swedish mall selling only upcycled items, shows that this can also be commercially viable. Likewise, the Renewal Workshop cooperates with apparel retailers to convert unsellable returns and excess inventory into renewed products. Between 2015 and 2018, they saved more than 78,000 lbs of textile waste from landfills (The Renewal Workshop, 2018). We suggest exploring more opportunities for retailers to adopt more environmentally sustainable practices. These practical actions in returns management can support retailers' transition from their existing status to a more circular economy approach. Hence, we propose the following:

> **Proposition 3.** *Collaboration with third parties can increase the effectiveness of environmentally sustainable return approaches to achieve better returns management.*

### 5.2.4 | Developing environmental impact assessment

From the analysis, it emerges that there is an urgent need to quantify the environmental impacts of product returns and collect data for better economic and environmental decision-making. Although several sustainability assessment methods have been recommended in the supply chain and operations (see discussion in Section 2.2), we have indicated several challenges when measuring environmental performance in a return system. This assessment requires (1) a large quantity of detailed empirical data to be accurately collected and measured, (2) a robust simulation model to demonstrate the return pathways of each product category, and (3) more financial and human resources. Therefore, we suggest more work is required to create a specialised, easier-to-use performance measurement system that captures economic sustainability values in returns management. This may be based on an existing environmental assessment method like LCA or MFA (Merli et al., 2018).

Retailers can use MFA to compare the different returns-process options (e.g., disposal vs. refurbishing) by calculating their environmental impacts. This analysis could identify any waste flows and then allow retailers to take actions to optimise the processes. Likewise, retailers can use LCA to assess each returned product category throughout each stage of a reverse supply chain. LCA can also support retailers in building a graphic model of their product return framework and return life cycle and then generate an environmental impact assessment. We also suggest MFCA, given that retailers always primarily consider costs. MFCA is expected to calculate the actual costs incurred in the reverse process chain rather than the environmental waste only. Hence, MFCA can assist retailers in making decisions on how to process returns by avoiding material losses and CO2 emissions. In conclusion, we suggest that a good environmental assessment model can help design consistent departmental performance goals. Thus, we formulate our final proposition:

> **Proposition 4.** *Successfully developing environmental impact assessments to quantify the environmental impacts of product returns can provide evidence-based information to assist retailers in making better economic and environmental decisions when managing returns.*

## 6 | CONCLUSION

Frei et al. (2020) applied the concept of the circular economy to product returns and explored the impact of returns on the environment. However, we found that the scientific understanding of returns and their degrees of (un)sustainability is still at an early stage and industrial practice is even less developed. It will require considerable effort for mainstream retailers to adopt circular approaches. A first step is creating more awareness: Our research has shown that retailers still significantly underestimate the environmental impact of product returns, which is one of the main barriers to adopting more environmentally sustainable practices (RQ1). Other barriers include difficulties in measuring the environmental effect, a lack of commitment and oversight from senior management, and the complexity of product returns and decision making, such as for selecting the right path for each returned product.

RQ2 aimed to identify strategies retailers can use to reduce the environmental impact of product returns. Whilst overarching strategies do not currently exist yet, some retailers have developed practices that reduce environmental impact. These include early stage return prevention, digital return systems and/or the adoption of RFID for improving the visibility and routing of returned items, improved value preservation of returned items and optimising the destination of returns, as they may be intercepted early and directed towards the best destination, which—depending on the product's condition, timing and location—may range from returning to store, sending to a warehouse, manufacturer, recycler, reseller, charity, community project or other alternative solution, with or without inspection, testing, repackaging, refreshing, refurbishing, remanufacturing or price reduction.

The framework provided in Section 5 can help identify what is required work towards more sustainable product returns: stronger top management commitments and awareness, constructive cross-department collaboration, effective collaboration with third parties and successfully developing environmental impact assessment methods.

There are several reasons for the still nascent modelling of the environmental impact of returns, such as the complexity of return processes, the difficulties in measuring and quantifying the environmental effects caused by returns and the lack of stricter enforcement of existing laws on returns. The process of recording the resources and related environmental impact is complex and difficult. This could be one of the reasons that retailers only acknowledge the financial loss of their return products instead of the environmental costs. Fully accounting for the environmental impacts of returns by extant assessment methods will require a robust simulation model. The model would need to demonstrate the return pathways of each product category, along with the empirical data of associated waste and energy consumption at each stage of the reverse supply chain. The costs involved in assessing the environmental impact of returns could become a burden for retailers. Different types of products have different return rates and various levels of environmental impacts and flows, making the assessment more complicated. It is also challenging to distinguish and quantify the used resources associated with reverse logistics because return-only transportation is often inseparable from the overall supply chain's transportation, or transportation for forward and reverse logistics is combined to increase efficiency. These challenges can help explain why the energy and resources associated with product returns are underestimated. Indeed, these new findings not only contribute to the current literature and provide a deeper insight into the challenges of implementing sustainable returns but also indicate a number of important implications for future practice.

Our research makes four contributions: (1) the identification of barriers to the adoption of environmentally friendly returns management, (2) practical recommendations to enhance the environmental sustainability of product returns, (3) a framework for reducing the environmental impact of product returns and (4) a set of propositions. Overall, this article demonstrates an urgent need to make customer return systems more sustainable and academic work required to support this transformation. All discussion points to a need for further research to assess the environmental effects of returns and to formulate new, evidence-based approaches to mitigate the negative effects of product returns. To embed sustainable returns into existing operations, it is vital to consider competitive positioning to maintain a good reputation regarding sustainable practices (Barros et al., 2021) and sustainability resilience (Kennedy & Linnenluecke, 2022), the compliance with legal requirements (European Commission, 2015), the alignment between circular economy and customer-centricity (Bernon et al., 2018) and empirical data collection regarding environmental impacts.

### 6.1 | Limitations and future research directions

As with all studies, there are limitations that could open avenues for future research. First, the informants we interviewed are senior product returns or loss prevention managers and return experts about their awareness of sustainability strategies or practices in relation to their field of activity. This study, however, identified that company-wide decisions on environmental strategy are made by a sustainability department. It is important to investigate how far sustainability managers are aware of the issues around product returns. Furthermore, it is worthwhile to explore the perceptions of front staff, who process returned products daily, about implementing environmentally sustainable plans in processing product returns. What are the priorities for them, and what are the associated challenges?

Second, we investigated multichannel retailers across various retailing industry sectors. Future studies could focus on one specific retail sector, for instance apparel, to explore and develop environmental plans for product returns. This would be particularly useful as fashion retailers currently have less stringent guidance for processing product returns in an environmentally considerate way than electronics retailers, for instance.

Third, there is a need to develop methods to scientifically assess the environmental impact of product returns, which is required to make solid business cases for investments into more sustainable practices.

Fourth, an in-depth environmental and financial analysis of the various return paths would allow us to determine the factors that influence which path is best in which case. An intelligent returns management system could then advise a customer that for returning a defective electronics product, a courier service should be used to send the item to the manufacturer directly; a customer living within 10 miles from a store should return an immaculate item there as long as it is still within the product range being sold; this not being the case, an alternative path could be recommended.

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## APPENDIX A

### A.1 | Interview protocol for companies

a. About the company's environmental sustainability programme/plans

There is a general trend in society towards increased awareness of the environment (pollution and climate emergency) and the need for sustainability.

- Does your company have an environmentally sustainable strategy for product returns?
- (*If so*) How does your company accomplish this strategy? Are there any specific programmes introduced?
- If a company has reported any programme or target of environmental sustainability in their CSR report (in general), we have promoted the follow-up discussion about the programme. For example, company 2's sustainability report stated that they have a 'zero waste to landfill' target, so we asked about the details of the target and whether the plan has included the returned products.
- (*If not*) Any environmentally friendly strategies or plans that your company will introduce to reduce the waste of product returns in the future?

- About the company practices in processing returned products regarding environmental sustainability

- Any sustainable strategies or solutions that your company have been implemented to reduce environmental damages of product returns?
- Environmental product returns approach
- Environmentally sustainable operations
- Reverse logistics
- Collaboration with logistics/returns providers
- How do you deal with the returned products from an environmental sustainability perspective?
- How does your company decide whether the returns should be returned for remanufacturing, directly resold or should be sent to landfills?
- Any particular sustainability assessment method or infrastructure that can help you or your staff make decisions? Could you please explain?
- Do you use any environmental assessment method to measure the environmental impact caused by product returns?
- If retailers have introduced any sustainable practices, we asked:
- Have your company deployed any measurements to assess the environmental benefits of these practices?
- If so, what are the environmental benefits of these practices?

- About the barriers to introducing environmental sustainability strategy in product returns

- What barriers inhibit your company from implementing environmental sustainability strategy in product returns?
- What are the barriers when deploying any sustainable practices product returns?

- Opinions about environmental sustainability

- Have you thought about anything to educate customers, especially people who are more concerned about sustainability now?
- As a returns manager, do you see any value in doing environmental sustainability things in product returns?
- Could you imagine how returns could become more sustainable?

### A.2 | Interview instrument protocol for industry experts

- Have you worked with any retailers in developing/implementing any environmentally sustainable strategy for product returns?
- If so, could you please explain? How successful is it?
- If not, do you know any sustainable strategies or solutions that retailers have introduced or are considering implementing to reduce waste and environmental damages of product returns?
- From your experiences with retailers, do you know how do retailers deal with returned products from an environmental sustainability perspective?
- Do you know or have been aware of any environmental assessment method that retailers have deployed to measure the environmental impact of product returns?
- From your viewpoint, what barriers inhibit retailers from implementing environmental sustainability strategies in product returns?
- Have you thought about anything to educate customers, especially people who are more concerned about sustainability now?
- As a retail industry expert, do you see any value in doing environmental sustainability things in product returns?
- Could you imagine how returns could become more sustainable?