

# Fast Fashion, Charities and the Circular Economy: Challenges for Operations Management

## ABSTRACT

Textile waste is one of the most pollutant items globally, being strongly affected by fast fashion (FF) products. Public pressure has made many FF firms voluntarily collect a small fraction of their preowned items and export them to developing countries for reuse. However, some developing countries are launching import bans on second-hand clothes. In addition, FF firms may soon be forced by extended producer responsibility (EPR) legislation to collect more preowned items for reuse and recycling. To date, they do not have sufficient capacity to deal with this.

Charities have been the key collectors and recyclers of unwanted clothes. Therefore, charities could help FF firms increase their capacity in this reverse supply chain. However, we hardly witness such a collaboration for two main reasons: (i) charities prefer to sell high-quality preowned items in the primary market to generate the highest possible revenue and FF firms may fear cannibalization; (ii) many charities believe that FF firms generate quantities of low-quality items that require collection and sorting while being difficult to sell in the primary market. Charities also face competition from many small for-profit organizations selling FF preowned items. While charities have the support of volunteers, they tend to be less efficient.

This work urges Operations Management (OM) researchers to suggest innovative business models to help (1) FF firms and charities collaborate to solve the abovementioned issues; (2) charities to improve their traditional practices for competitiveness. This paper is primarily a position paper highlighting some challenges and introducing interesting research problems. Although the paper is not a research paper, it follows a qualitative research method to collect and analyze the required supporting documents to justify arguments and statements. We collected primary and secondary data from the textile reverse supply chain (SC) members to familiarize the OM community with this context. The current changes in the textile reverse supply chain offer many great opportunities for impactful OM research.

**Keywords:** charities; fast fashion; circular economy; business model innovation.

# 1. INTRODUCTION

## 1.1. Role of charities in societies

Charities are non-profit organizations (NPOs) with philanthropic and social objectives (Berenguer and Shen, 2020; Berenguer et al., 2017), often engaging people who are difficult to employ. They frequently recruit retired people who intend to do something useful with their time, young professionals who want to give back, mothers who want to get back into the swing of work, people with disabilities to gain work experience, students who wish to enhance their resumes, and offenders who want to atone for their crimes. In 2013, research across UK charities showed that six percent of adults have worked or volunteered in a charity during their lives (Harrison-Evans, 2016).

Charities generally make significant economic, social, and environmental contributions in any country. There are over 1.4 million non-profit organizations in the United States, employing more than ten percent of the domestic workforce, contributing to at least 2.1% of the GDP in 2017 (over \$410 billion) (Giving USA, 2018) and potentially up to 5% (McKeever and Gaddy, 2016). The annual growth rate of this contribution has been 5.2% (Giving USA, 2018).

In the UK, there are over 11,200 charity shops<sup>1</sup> (CRA, 2020c). There are around 230,000 volunteers and 23,000 paid staff working in UK charities (Osterley, 2019a). Charity shops raise essential funds for significant causes such as health, human rights, poverty, disaster management and animal rights. Charities are also environmentally salient because their main activity is collecting preowned items<sup>2</sup>, sorting them and selling them for reuse. They are a strong actor in the so-called circular economy (CE).

## 1.2. The vital importance of garments for charities

Selling preowned items in charity shops is the primary financial source of income for charities. Over 90% of charity shops make a substantial profit from donated preowned items (CRA, 2020b). Charities accept a wide range of crockery items, games, films, jewelry, music, ornaments, paintings, shoes, clothes, and toys (CRA, 2020b). The approximate proportion of donated goods sales in the UK charities (in £) from January to March 2019 were clothing and accessories (58.6%), bric-à-brac (16.3%), books (6.6%), music and video (4.4%), furniture (4.9%), electrical goods (1.5%) and other donated goods (7.6%), respectively. Interestingly, the UK CRA's financial data shows that charities are heavily dependent on clothing items. CRA's chief executive stated that the statistic does not vary much according to the size of charities (Osterley, 2019a). Our interviews revealed that 95% of the weight of donations are clothing items (Brinson, 2019b). However, only high-quality clothing items reusable in high-income countries can generate significant charity value. Low-quality clothing items are usually exported to low-income countries.

## 1.3. Rise of fast fashion

The fast fashion (FF) concept was introduced in the 1980s in the United States by the Spanish company Zara (Lowson et al., 1999) and proliferated. FF firms produce fashion items with 'short production and distribution lead

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<sup>1</sup> There are 184,532 registered charities in the UK (Charity Commission, 2020) but few of them have shops. There are 11,200 charity shops in the UK that belong to 987 charity retailers. However, in this paper, we use the word charities instead of charity retailers for ease of writing. According to CRA, the term 'charity shop' - also called thrift shop or opportunity shop - refers to an individual retail unit whereas the term 'charity retailer' refers to a retail chain such as Oxfam GB, the Royal Trinity Hospice, and the Salvation Army. A charity retailer could run a single store or several hundred stores.

<sup>2</sup> In this paper, we use preowned and unwanted items equivalently and interchangeably. These terms are used in the archival documents generated by WRAP (Waste Resources Action Programme) and CRA. Note that unwanted/preowned items are not necessarily used items; they can be new or 'as good as new'. Therefore, we avoid using the term 'used' for the donated items.

times, enabling a close matching of supply with uncertain demand' (Cachon and Swinney, 2011). Zara, Primark, H&M and Topshop are examples of FF firms. By 2030, it is estimated that clothing consumption will increase by 63% (House of Commons, 2019). Over the [past](#) two decades, there has been considerable growth in FF market share. The low average price of FF items and changes in consumer behavior are some of the reasons. British, French, and Italian consumers are the most fashionable people with the highest [clothing](#) consumption rate in Europe. In 1980, the British would buy approximately five times less than today (Dharshini, 2019). In 2018, on average, each consumer bought 68 pieces of textile items. The British and Chinese respectively wore clothes seven and three times on average in 2015 (Thomas, 2019). Between 1996-2012, the clothes consumption rate increased by 40% in the EU, growing steadily [by](#) 4% to 5% per year until 2018 (Šajin, 2019).

Many FF consumers purchase some items and then wait for the next design to replace them. Hence, the durability of the purchased items is not a critical factor. Accordingly, FF firms do not design clothes for longevity to save costs. These firms usually work with a low price/profit margin and frequently introduce [new](#) designs to attract consumers. The result is an increase in market demand, the mass production of inexpensive items with low durability and a high waste generation of low-durable items (Rauturier, 2020). Most charity managers believe that FF items are responsible for the high logistics costs of collection, transportation, sorting and storing [of preowned items](#). Some charity managers believe that their low durability does not necessarily reflect consumer perception of quality (Brinson, 2019a).

[Some derivatives of the word 'fashion' are luxury fashion \(Chiu et al., 2018\), sustainable fashion, ethical fashion, slow fashion \(SF\), FF and circular fashion. While these concepts vary in focus, they do have commonalities and may overlap to some degree.](#) SF was introduced as a natural reaction by some producers to the FF trend. Patagonia, Uniqlo and M&S are examples of SF firms. The focus of SF firms is not sustainability. [However, they contribute to sustainability by producing more durable products to be used for an extended period.](#) As another reaction to FF, sustainable fashion follows sustainability concepts defined by the United Nations on 'meeting the needs of the present without compromising the ability of future generations' (Brundtland Commission, 1987). However, FF is still growing, and we are also witnessing the emergence of ultra-fast fashions such as Boohoo, Missguided and ASOS<sup>3</sup>.

#### **1.4. General trends**

*Fast fashion market:* In the United States, the fashion market value was \$22 and \$36 billion in 2009 and 2019 respectively, and is estimated to reach \$43 billion by 2029 (Thredup, 2020a).

*Textile waste collection:* Currently, less than 20% of textile waste is collected in the United States, but it is estimated that all will be collected by 2040 (OEC, 2018), and this will present an opportunity for collectors, particularly charities.

*Second-hand clothes market:* In the United States, the second-hand market value was \$10 billion and \$28 billion in 2009 and 2019 respectively and is estimated to grow to \$80 billion by 2029 (Thredup, 2020a). Therefore, the market for second-hand clothes is growing even faster than the FF market.

*Online shopping:* In the next five years, it is projected that consumers in the United States will be prepared to

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<sup>3</sup> The response speed of a fashion firm – i.e., how quickly they respond to market needs – is measured in terms of the time a firm spends from design, sourcing, production, up to delivering to the market. For example, this time was estimated 2-4 weeks for Boohoo, ASOS and Missguided, and 5 weeks for Zara in 2017 (Howland, 2017). This speed interplays with the durability and market price of fashion products.

spend more on second-hand clothes and will prefer to buy online (Thredup, 2020a). Private for-profit retail platforms are overtaking others.

### 1.5. Future of charities and opportunities

*Charity market share:* In the United States, charities’ market share was 100% in 2013 but dropped to 75% in 2019. Table 1 shows that while traditional thrift and donation shops are growing, their pace is slower. Charities are losing market share in the resale market and face unprecedented competition by new rivals such as Thredup (marketplace for all brands), TheRealReal (marketplace for luxury and designer brands) and Poshmark (a peer-to-peer marketplace) (Thredup, 2020b).

Table 1. Share of charities (in value) in the United States’ second-hand clothes markets (Thredup, 2020b).

Year	2017	2018	2019	2020*	2021*	2022*	2023*	2024*
Charities’ market share for second-hand clothes	85%	79%	75%	69%	65%	60%	55%	44%

\* The figures for 2020 and onward are predicted.

*Urgency:* Charities are currently not prepared to make the most of the growth in the second-hand market. If charities do not quickly capture this opportunity, then private commercial platforms will.

### 1.6. Future of FF firms and issues

*Collection infrastructure:* FF firms have made some attempts to collect preowned clothes, but their current infrastructure and business models can only manage a small fraction of their waste.

*Imminent EPR:* Legislation like extended producer responsibility (EPR) is imminent in the clothing sector. For example, the UK parliament considered charging one penny per garment to the producer to be invested in waste reduction in 2019. Still, the EPR law is not passed yet, as some improvements are required for setting up an effective EPR system (House of Commons, 2019). The backbone of EPR is the existence of collection and recycling infrastructures (Alev et al., 2020), which is where FF retailers suffer.

### 1.7. Observation about CE

*Growth in waste generation:* The emergence of FF has increased consumption and waste generation. Consequently, collectors face a higher incoming flow of preowned items, which is labor-intensive to collect and sort. Therefore collectors, including charities, need to handle the influx of vast amounts of clothing items (mostly FF items), hoping to give them a second life in high-income countries.

*Dumping in low-income countries:* FF retailers have been criticized for their social and environmental impact, specifically for their waste generation (GFA, 2020). Currently, they collect only a very small fraction. Besides, only a small portion of these items is re-usable and re-sellable in high-income countries. Nowadays, most of the items gathered by collectors for reuse are exported to low-income countries. Evidence shows that low-income countries have started to launch an import ban on second-hand clothes exported from high-income countries, particularly the United States (Kuwonu, 2019). The CE principles require business models to promote reuse and avoid dumping in emerging economies.

### 1.8. Solutions and opportunities

Essentially, charities and FF firms face the following challenges: (i) Charities urgently need to modify their current business models to capture a significant share of the growing market of second-hand clothes; (ii) FF firms will be under the pressure of collecting their preowned items and giving them a second life, while lacking the infrastructure. Our research focuses on positioning the subject as complex dynamic systems while considering the interplay of factors, such as changing consumer behavior (e.g., developing interest in second-hand and fashion products) and technology (e.g., its popularity, accessibility, electronic platforms for buying and resale). Our primary focus is on charities and then FF firms based on the following possible improvements:

*Charities internal operations:* Charities need to make significant changes to their internal operations such as logistics systems, collection, resale channels, and technology.

*Collaboration between charities and FF firms:* There can be business models in which charities and FF retailers collaborate on collection and resale to respond (at least) partially to the challenges.

The paper deals with a big problem in an important sector. We paint the problem and focus on charities (and how they could collaborate with some major FF retailersculprits). The paper shows the importance of this waste management problem, its complexity (supply chain and larger system), and suggests how and where discipline can/should contribute.

## 2. LITERATURE REVIEW

Since this is a position paper, this section briefly introduces the main streams in the literature, some related theories and the paper's contributions.

### 2.1. The Fast Fashion and its Related Theories

Textile manufacturers and particularly fashion and FF firms are among the main stakeholders of this research. There are many design, marketing, and innovation theories related to fashion (DeLong, 2021).

*Fast fashion theory:* The fashion model can have alternatives like the populist model where a definite segment (e.g., a cultural segment) is interested in a specific style (Polhemus, 1994). However, following the operations management (OM) context, the term *fashion* is used for a trendy product design (Cachon & Swinney, 2011). The term 'fast fashion' comprises two words: *fashion*, which focuses on the enhanced design, and *fast*, which is an issue of time and quick response (Cachon and Swinney, 2011). While various consumers react to FF clothes differently (Cachon and Swinney, 2009), Cachon and Swinney (2011) show that this concept generates more economic value than the traditional and quick response systems. However, the concern of this research is a high level of waste generation of FF items in the post-consumer stage.

*The quality of FF:* Some criticize FF products for their quality and consider it the main reason for increased waste generation. Garvin (1987) identifies eight quality dimensions, i.e., performance, features, reliability, conformance, durability, serviceability, aesthetic, and perceived quality. Some of these dimensions, including aesthetic and perceived quality, are more subjective. Therefore, FF items' enhanced design and freshness may attract some consumers more than conventional durability in some cases. However, the overall perceived quality of FF clothes is not high. Long and Nasiry (2021) analytically show that the quality of FF items could not be higher than a limit. Besides, FF clothes have a time value, i.e., they lose their freshness relatively quickly and go out of fashion (Guide et al., 2006, 2008; Guide and Van Wassenhove, 2009).

*Selling fashion items:* New and preowned fashion items (including FF) can be sold online or offline. Based on

tradeoffs between the online and offline channels, consumers decide which one to choose (Bell et al., 2014). Boada-Collado & Martínez-de-Albéniz (2020) empirically show that displaying products as inventory at the store in fashion retailing significantly increases sales by drawing consumers' attention. This fact was also shown by Cachon et al. (2019) in other sectors. There are giant online (like ASOS) and offline FF firms (like Zara) that work based on different business models, each having advantages and disadvantages over the other (Cachon, 2020).

## 2.2. Circular Economy and its Related Theories

Another main stakeholder of this research is collectors and recyclers that contribute to the CE, particularly charities.

*OM theories in the CE:* The concept of the CE dates to 1976, when Walter Stahel suggested an idea of “economy in loops” (European Commission, 1976). Later, the Ellen MacArthur Foundation (EMF) popularized the term CE, defined it as “restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all time.” EMF publicized some successful business models related to the implementation of CE in various sectors such as carpets (EMF, 2017c), clothes (EMF, 2013; EMF, 2017d;), household appliances (EMF, 2019), and furniture (EMF, 2017). The OM academic literature also has a rich history of research on recycling, reverse logistics, and remanufacturing, commonly denoted as Closed-Loop Supply Chains (CLSC) (Ferguson and Souza, 2010; Guide Jr, VDR, LN Van Wassenhove, 2009). One could argue that CLSC theory forms a substantial academic base for the CE, but it is also fair to state that the CE has extended the field to include more design and new business model considerations.

*CE in economics and marketing theories:* Economics and marketing theories play a vital role in framing the market and individuals' motivations of NPOs (Valentinov, 2008). Moreover, some of these theories can be linked to second-hand items in CE. For example, Veblen's trickle-down theory (introduced in 1899) investigates the movement of a style from upper economic class people to the lower levels (Trigg, 2001). Similarly, we can predict that some lower-income people may buy preowned clothes previously bought by higher-income people.

There are also theories related to an individual's motives that can be linked to charities and CE. For example, the supply-side theory investigates motives to support NPOs (Valentinov, 2008). The supply-side theory applies to people (like volunteers) who wish to find charities and contribute to recycling and CE. On the other hand, Rose-Ackerman (1996) highlights the intention of people who support a specific culture rather than helping others. Similarly, James (1987) shows that many NPOs support an ideology (e.g., religion).

*Extended Producer Responsibility (EPR) and Waste collection:* EPR puts the responsibility for paying for proper collection and recycling on the manufacturer (Lindhqvist & Lidgren, 1990). EPR exists for WEEE, batteries, packaging, and vehicles in developed countries such as EU member states (European Commission, 2019). EPR has already been investigated by researchers in sectors such as durable products (Alev et al., 2020; Huang et al., 2019), electronic waste (Atasu and Subramanian, 2012), and pharmaceuticals (Alev et al., 2021). EPR on textile items, which is the focus of this research, is also under investigation in some countries (House of Commons, 2019).

Setting up an infrastructure with a higher capacity to collect unwanted clothes is an improvement area for fashion retailers that is investigated in this research. Scholars have already highlighted that the first reverse mile is a significant challenge in the waste collection (Atasu and Souza, 2013; Atasu et al., 2013). For example, Savaskan et al. (2004) study various waste collection scenarios that a manufacturer can consider: the manufacturer can directly collect them and incentivize a retailer with the collection infrastructure to collect or subcontract a third party.

*Behavioral aspects:* Some behavioral aspects related to CE have been studied in the literature. For instance, there

is a vast literature in consumer psychology on how people react to preowned items. Interesting research exists on consumers' psychological responses to preowned items (Abbey et al., 2015a, 2015b). For example, some people do not wish to touch used items due to hygiene factors or other negative perceptions (van Loon and Van Wassenhove, 2020). Besides, from a marketing perspective, the contribution of an organization on any sustainability aspects, including CE may have positive reputational effects on consumers and other SC actors (Servaes and Tamayo, 2013; Hartmann and Moeller, 2014). Note that there is a lot of literature on second-hand items (e.g. cars) and a vast literature on consumer psychology on how people react to preowned items.

### **2.3. Contribution**

The CE has not been studied extensively in the FF SC, particularly when interacting with charities. Given that the field is largely unexplored by academics, this position paper (instead of a research paper) offers OM researchers opportunities to explore innovative ideas to mitigate the pressing issues that charities and FF firms face. Specifically, this paper contributes to the literature as follows:

*Mapping fashion CE:* OM research and CE research are well-established in areas such as e-waste (Esenduran et al., 2020a), packaging (Kunz et al., 2018), and automotive industries (Esenduran et al., 2020b), but poorly explored in textile and fashion supply chains (SC). OM scholars have investigated some areas in fashion business such as layout (Degraeve and Vandebroek, 1998), forecasting (Donohue, 2000), inventory management (Caro and Gallien, 2010; Caro and Gallien, 2012; Fisher et al. 2001) and business models (Cachon and Swinney, 2011; Cachon, 2020). Academic research has already highlighted environmental issues in the fashion industry (Sandvik and Stubbs, 2019). We familiarize the OM community with the apparel return SC and identify improvement areas. In particular, the role of charities in textile reverse SC is described in detail.

*Mapping collectors' operational activities:* We describe various textile waste collection modes (e.g. home collection, bank collection, charity collection, etc.) in physical, information and financial flows. Then, we analyze each mode's advantages and disadvantages, focusing on charities and their interaction with fashion firms to introduce improvement areas.

*Analyzing fashion-charity business models:* We analyze the interplay between various types of fashion retailers and different collectors based on existing real-life practice. Primarily, we show that there is a severe need for business models to enhance collaboration between FF firms and charities to increase reuse in the primary market. Then, practical gaps are introduced as future research directions for academics.

*Highlighting future trends:* The research is based on collecting real data that reflects the past and present of fashion CE. But we believe that the future can be significantly different in many ways affected by upcoming regulations, Covid-19, technology, and consumer behavior trends. Therefore, while research potentials are highlighted, we will emphasize possible changes in trends that need to be considered.

### **3. RESEARCH METHOD AND EVIDENCE**

This is a position paper rather than a research paper. However, we followed a qualitative research method based on unstructured interviews and textual analysis to collect the required supporting documents and analyze them to justify our arguments and statements (Saunders et al., 2019). Initially, we investigated the existing theories of FF and CE to explore their interaction in the fashion CE. However, our research philosophy is fundamentally inductive to investigate how FF products affect charities and how charities can help FF firms reduce their waste impact.

We employed a chain-referral (snowball) sampling method to recognize around two dozen organizations from the textile reverse SC members, such as collectors, recyclers, and related associations (see Figure 1). We analyzed the relationship between these organizations in terms of material flow, competition, collaboration, cooperation, and partnerships. We visited the key organizations and conducted unstructured interviews to collect primary data. Before the COVID-19 pandemic, we used face-to-face and online interviews. During the pandemic, we switched to online and email interviews. All interviews were recorded and transcribed either by hand or software products. The transcripts were read, annotated, conceptualized, segmented, and analyzed. We also used the grey literature such as company sustainability reports and parliamentary documents as the secondary data sources to familiarize the OM community with the apparel return SC and identify improvement areas.

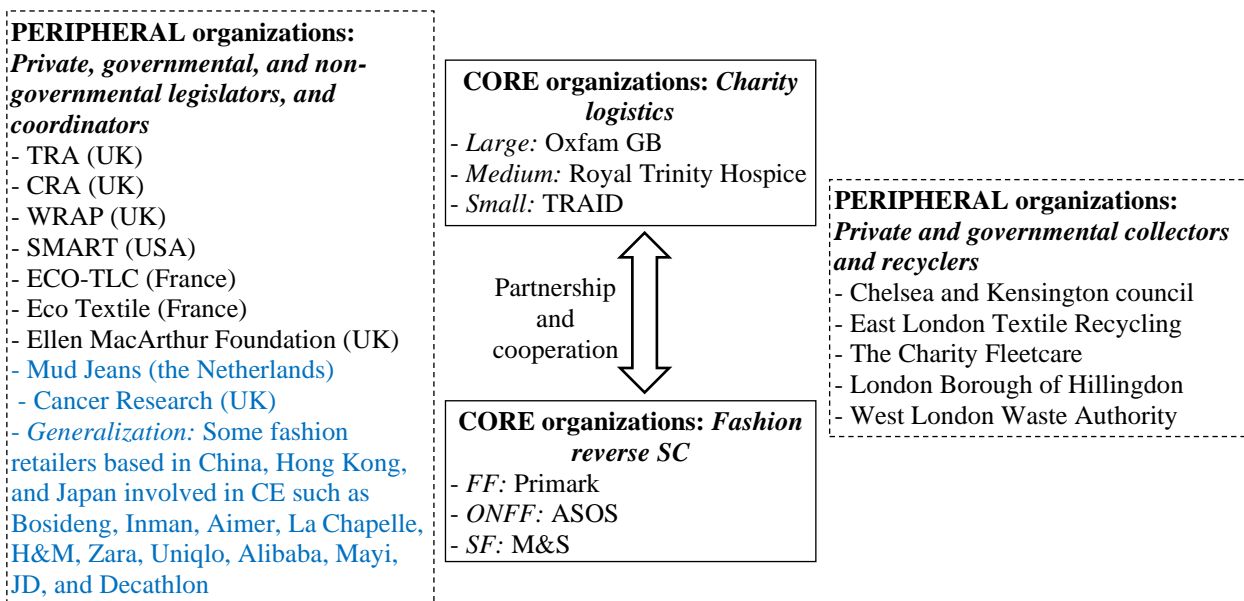


Figure 1: The organizations used in this research as the source of data and evidence.

While learning about all stakeholders in the textile return SC, we focused on the key stakeholders in our research, i.e. charities and FF firms. The UK based organizations were initially chosen for several reasons: (1) it is one of the largest textile waste generators in Europe and the world (Circular, 2020); (2) British people consume clothes (per capita) more than other European countries (ECAP, 2018); (3) it is one of the leading textile waste generators in the world, but also collects and reuses clothes more than any European country (Wheeler, 2020); (4) it has one of the world's largest and most organized charity systems. Later, we also interviewed peripheral organizations from other countries like the United States, France, China, Hong Kong, and Japan to generalize the research findings.

Initially, we successfully approached the sustainability manager at M&S via direct contact. She put us through their partner charity Oxfam GB (to interview the recycling site manager), the TRA director, and CRA's chief executive. Similarly, the chief executive of CRA connected us to the managing director of Charity Fleetcare. The latter put us in touch with the head of retail in RTH and the director of communities at Cancer Research UK. The main organizations we interviewed are summarized below.

### 3.1. Key Associations

The focus of the research is on charities and fashion retailers. However, three associations played a crucial role in introducing and connecting us to the members of the apparel reverse SC:

**CRA:** CRA (Charity Retail Association) is the primary reference for UK charity shops to improve their charitable



causes and retail experience toward sustainability (CRA, 2020a). We needed CRA to learn from their reports on the charity shops. In addition to sharing archival data reports, they facilitated our connection with charities. The research subject related to the influx of FF items was validated by CRA (Osterley, 2019b); it is also mentioned on their website (Kelcher, 2020).

*WRAP*: WRAP (Waste Resources Action Programme) is a British registered charity that works with many organizations toward the CE. WRAP focuses on the clothing industry in terms of design, reuse, and recycling to reduce waste. WRAP generates valid documents related to the CE for the government and these helped us map the reverse textile SC. Besides, their regular meetings with the major fashion retailers' representatives could facilitate our communication with retailers.

*TRA*: TRA (Textile Recycling Association) is linked to the main recyclers in 50 nations (TRA, 2020). It prepares reports based on statistics to advise the government regarding best practices and legislation in textile recycling. They introduced some key members in the textile reverse SC and mainly put us through WRAP, the East London Recycling Centre, and ECO-TLC (France). They also introduced the related reports generated by them and other bodies like parliament.

*SMART*: SMART (Secondary Materials and Recycled Textiles Association) is the equivalent of TRA in the United States. To compare the UK's observations with the United States, we interviewed SMART to see whether the findings can be generalized (King, 2020).

### **3.2. Charities**

We approached charities in the UK to learn the details of their operations such as collection, reverse logistics network, sorting, and reselling preowned items. Surprisingly, the response rate was 100%. CRA, M&S, Charity Fleetcare and Chelsea and Kensington Council nominated several charities as the most thriving in the nation. We shortlisted three: Oxfam GB as a large<sup>4</sup> charity (with 650 retail shops), RTH as a medium-size charity (with 32 retail shops), and TR Aid as a small charity (with eight retail shops dedicated to the selling of preowned garments)<sup>5</sup>.

### **3.3. Fashion Firms**

The UK fashion industry is valued at \$41.8 billion in 2017, employing 890,000 people in its design, manufacturing, and retail processes (British Fashion Council, 2018). We approached top managers in the leading UK fashion market (which are not necessarily British-based) to ask them whether they are looking at the near future waste issues and possible interactions with charities to address them. Specifically, we contacted five FF retailers (Boohoo, Missguided, Primark, H&M and Zara) directly and through WRAP. We also approached ASOS, an online FF (ONFF) retailer. We included M&S, the fashion market leader in the UK, as the most successful benchmark actively supporting charities to learn about their practices. The response rate was 50% as we could interview either face-to-face or online with M&S, Primark (the FF market leader in the UK), and ASOS (the largest ONFF retailer in Europe (Hasbun, 2019)). Other sustainability reports (e.g., UK Parliament, 2019) also confirm that M&S, Primark and ASOS

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<sup>4</sup> Oxfam is officially categorized as a 'very large' charity by CRA. But for the ease of presentation, we call it 'large'. The number of shops and employees of charity retail identifies its category. CRA categorizes charities as very small, small, medium, large and very large. However, the size of charity retail is not a proxy for its internal logistics, operations, amount of collection, turnover, etc.

<sup>5</sup> We also interviewed Cancer Research UK (a large charity) but decided not to include it to avoid duplications. The existing shortlisted charities cover all aspects we need.

are responding well to sustainability research studies.

### 3.4. Miscellaneous Organizations

During the snowballing process, we visited and interviewed some other organizations as follows:

*A logistics service provider:* The data related to logistics activities between donors/ waste generators and charities were collected through Charity Fleetcare. Charity Fleetcare is a British company providing logistics services for the charity sector by modernizing fleet connectivity and serving them in receiving online collection orders, consolidating orders, collecting unwanted clothes, leasing collection vehicles, etc. Charity Fleetcare was aware of the issues mentioned above and trends. They linked us to some other charities such as Cancer Research UK and British Heart Foundation.

*Private and governmental recyclers:* We visited two recycling organizations: (1) The East London Textile Recycling, a private recycler in charge of bank collection, sorting and exporting to low-income countries, and (2) West London Waste Authority, a governmental recycler of general waste bins.

*City councils:* We visited Chelsea and Kensington Council and the London Borough of Hillingdon and interviewed them to learn from their business model, in collaboration with TR Aid. The Chelsea and Kensington Council connected us to managers of TR Aid.

*Grey literature:* We investigated some reports generated by legislative bodies in the UK and other countries such as ECO-TLC (France) and the Ellen MacArthur Foundation (EMF). We also searched the leading FF retailers' websites following their corporate social responsibility (CSR) and sustainability reports.

### 3.5. Generalization

While the core data and evidence are based on organizations from [the UK, the United States and France](#), the following facts show that the research outcomes apply to most high-income countries:

*High-income countries are the leading producers and customers of new FF Products.* The major producers of these items are in Spain, the United States, and the UK. See a list of major FF firms and their country of origin in Appendix A1. Consequently, these nations generate most of the textile waste and second-hand clothes.

*The supply of FF items and clothes consumption has been continuously increasing in high-income countries.* In the United States, overall textile waste increased by 78% by weight from 2000 to 2017, higher than any other item, including plastics, rubber, leather, wood, metals, and foods. Surprisingly, during the same period, the waste generation per capita decreased by 5% in the country (Adler, 2020).

*High-income countries export preowned clothes to low-income countries<sup>6</sup>.* The three largest exporters of preowned clothed are the United States, the UK and Germany, with a global share of 15%, 10%, and 10%, respectively (TRA, 2018). In 2018, the main exporters of preowned clothes in the world were the United States, UK, Germany, China, South Korea, Netherlands, Belgium/ Luxembourg, Italy, Canada, Japan, France, and Switzerland, respectively<sup>7</sup>. The primary importing countries were Ghana, Pakistan, Kenya, Nigeria, India, Malaysia, Philippines, Cameroun, Tanzania, Angola, Thailand, and Cambodia (OEC, 2018).

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<sup>6</sup> The major consumers of preowned fashion products are low-income countries and particularly West African countries. These items are exported from the abovementioned countries.

<sup>7</sup> Note that we have excluded countries such as Poland, Ukraine and Russia because they are among the large exporters and large importers. The reason is that they re-export rather than reusing preowned clothes.

A small fraction of the collected clothes is reusable in high-income countries. In the UK, 15% to 30% of the collected items are reusable in the nation, depending on the collection system (Baladron, 2019a). It is also mentioned that this portion is no more than a third of the collected items (Wheeler, 2020; WRAP, 2019). Similarly, on average, 20% of the collected textile waste makes its way to resale in the United States (Adler, 2020).

In high-income countries, charities have been the leading collectors of preowned clothes. These countries have organized charities and waste collection systems to facilitate reuse and recycling. Countries like the United States, New Zealand, Australia, Ireland, Canada, and the Netherlands have the highest giving index that shows the importance of their charities (CAF, 2018). In the United States, charities, city councils, the apparel industry and consumers are the main parties involved in collecting, sorting, and selling preowned clothing items (SMART, 2020).

*Asian developed nations:* The research concentrates on fashion CE and charities. Therefore, countries like the UK and the United States are highlighted where charities play a critical role in the fashion CE. However, to generalize the research findings and explore similarities and differences with other developed countries, we also provide related information about Asian developed countries, including China, Japan and Hong Kong (Chen, 2021) (refer to Appendix A2):

- Domestic fashion brands in China (Bosideng, Inman, Aimer, and La Chapelle)
- Global fashion brands in Hong Kong and Japan (H&M, Zara, and Uniqlo)
- Retailers and platforms in China (Alibaba, Mayi, JD, and Decathlon)
- Major charities and some private collectors in China and Hong Kong

There are many similarities and relatively small differences between fashion CE in the developed nations. These nations are pretty similar in utilizing diverse collection modes, selling channels, target markets, and business models.

#### 4. ROLE OF CHARITIES IN FASHION CIRCULAR ECONOMY

Figure 2 illustrates a simplified version of the UK charity SC. According to WRAP (2019b), over 900,000 tons of clothing items, including textile and non-textile (i.e., shoes, bags, and belts), end up in general waste bins each year. Over 300,000 tons of clothing finishes up in general waste bins and eventually in incineration plants and landfills. 80% of general waste is used to generate energy in incineration plants.

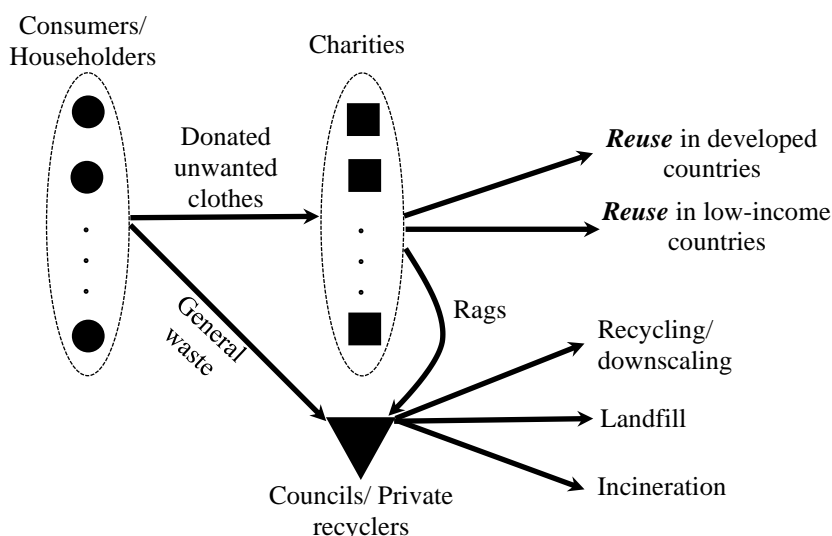


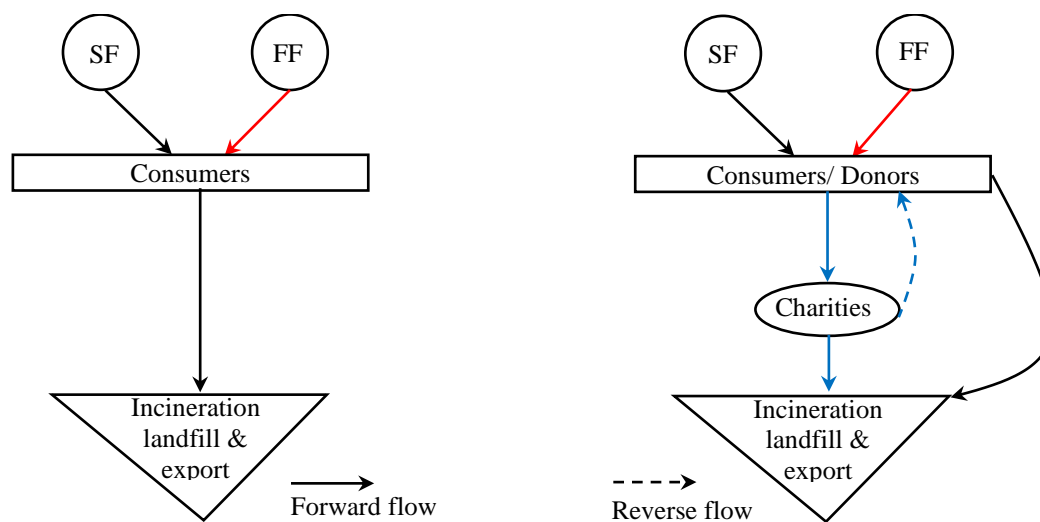
Figure 2: Garment flow in the charity SC at the macro level.

Most textiles currently go through a mechanical recycling process that typically involves pulling the fabrics and

using the resulting fibers for manufacturing products such as heat and sound insulation or impact insulation in motor vehicles, so-called 'downscaling'. Cotton fabrics might be cut to manufacture wiping cloths and wool waste could be used to manufacture shoddy yarn or possibly blended with virgin wool to make a 'recycled wool yarn'. While chemical recycling would allow businesses to recycle clothing back into clothing, i.e. thereby avoiding downscaling, these technologies have not yet moved beyond the demonstration plant stage. The UK collects around 60% of all clothing, while approximately 40% goes into the waste bin.

Donors generally deliver the collected clothes. In 2019, 31% of the collected items were sold for reuse in the UK through charity shops. Currently, around 62% of these items are exported to low-income countries for reuse. With respect to the rest of the items, a very small fraction is sold or recycled/ downscaled for commercial use. For example, [H&M uses a small fraction of recycled fibers to create new products](#)<sup>8</sup> (Leal Filho et al., 2019). For instance, the fraction is about 40% of the raw materials for Mud Jeans (Mud Jeans, 2020; EMF, 2017d; Vijgeboom, 2019). While flows in the charity SC in many high-income countries are comparable to Figure 2, statistics can significantly differ from country to country (ECAP, 2018; ECO-TLC, 2018).

New FF or SF items are sold and consumed in the primary market. Figure 3(a) shows how the apparel SC would work in a linear economy if the unwanted clothes were not collected for reuse. Figure 3(b) suggests that charities can directly/indirectly close the loop in the former linear economy and contribute to more circularity. Increasing the flow of unwanted clothes through charities can significantly divert clothes from landfills and incineration plants. Charities extend the useful life of clothes and return the reusable clothing items to the SC.



a) The linear economy model without charities. b) The CE model with charities.

Figure 3: The role of charities in the fashion return SC.

Figure 4 expands Figure 3(b) to show the physical flow changes over time, where the thickness of each arrow is a proxy for flow quantity. Figure 4 shows that the emergence of the FF concept democratized fashion products for their affordability. This trend resulted in high waste generation, whereas a lower fraction of items are reusable in high-income countries. Figure 4(a) shows that charities have been the only organizations managing textile wastes for reuse until recently. Figure 4(b) shows that the FF market is growing. Besides, second-hand items become popular and charities face competition from for-profit collectors, but charities are still capturing the highest market share (Thredup, 2020b). However, entrepreneurial and innovative firms equipped with information technology, online

<sup>8</sup> This fraction is no more than 1% globally. For H&M, it is stated to be no more than 13%. (Chaudhuri, 2019)

selling platforms, and e-commerce are seizing the opportunity with a fast-growing market share.

Figures 4(c1) and 4(c2) show potential scenarios for the future. Demand for fashion products has grown continuously, causing FF waste influx (Šajin, 2019). Figure 4(c1) shows that if charities do not reform their traditional practices, for-profit firms' technological capabilities will make them win market share (Thredup, 2020b). Figure 4(c2) shows that if charities improve their current practice, they can seize the second-hand clothes market opportunity.

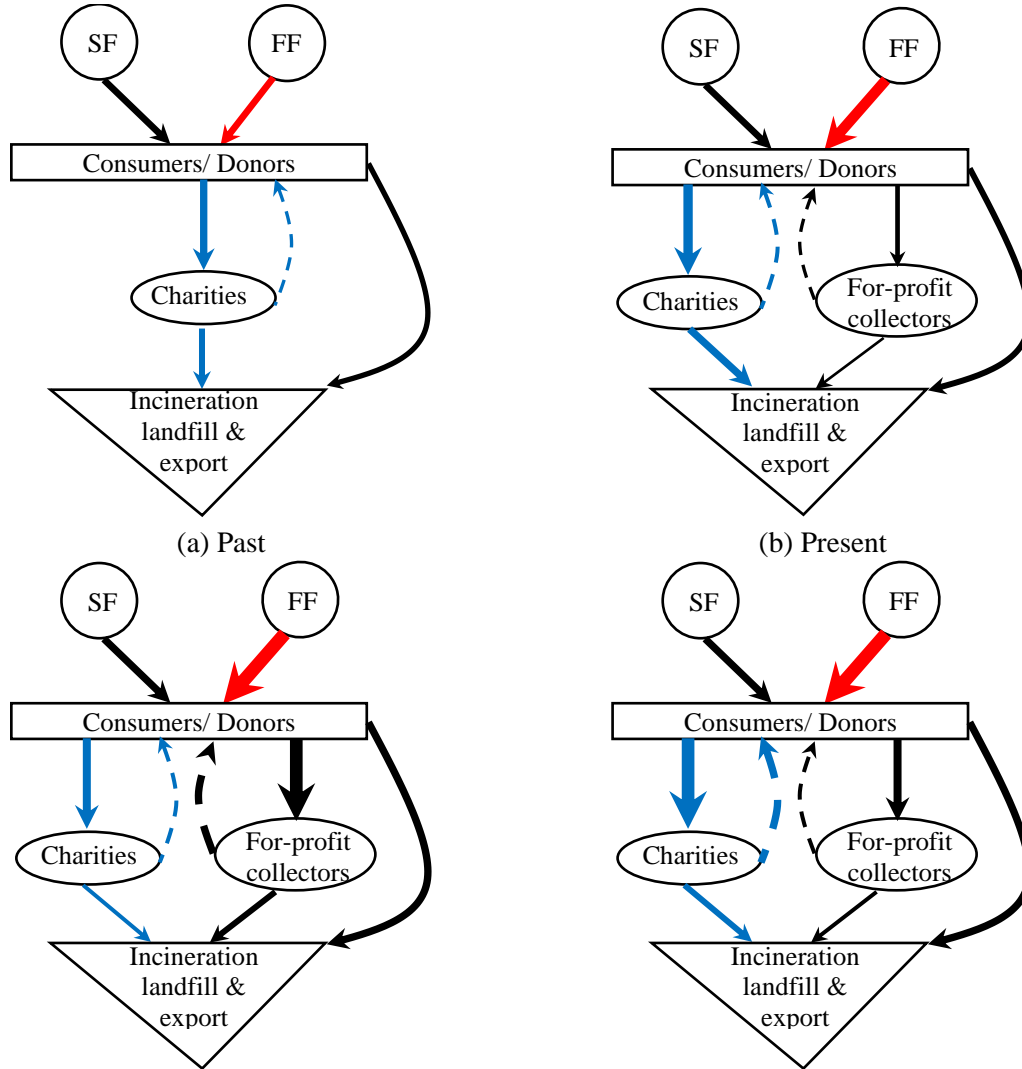


Figure 4: Flows of preowned clothes in the apparel return SC over time and emerging competition between charities and for-profit collectors.

(Thickness of each arrow is a proxy of flow quantity. Blue arrows are related to charities. Red arrows are outflow of FF retailers)

For-profit organizations appear to be more competitive than charities. They seem to have a much better ability to use technology and online selling (Thredup, 2020a), the most prevalent channel in this sector. The retail sector was projected to shrink by 15% between 2019 and 2021. During the same period, the online second-hand market is expected to grow by 69% (Thredup, 2020a). Charities need to promote their systems to be competitive. For example, currently direct delivery to charities (e.g., in the UK) (WRAP, 2019b) and street bank collection (e.g., in France) (ECO-TLC, 2018) are the most prevalent collection systems, respectively. But home collection is a fast-growing trend, and many believe this will become the dominant collection mode (Hilton, 2020). We observe that currently private collectors adapt to this trend, while charities find it challenging and costly (Baladron, 2019a).

While the above description focuses on charities, it is also relevant to FF firms. FF firms need to be actively

involved in collection (Alev et al., 2019) and resale because of any imminent legislation and potential brand damage. Collaboration with charities in collecting and recycling can be a solution for the benefit of both parties. It could be argued that FF firms can also have (almost all) these benefits when working with for-profit instead of charities. Why should FF firms collaborate with charities? Tweddle (2018) lists some possible business benefits of partnering with a charity including tax exemptions, business image from consumer's perspective and increased sale of new items. Additionally, while some for-profit organizations have established only sales infrastructures, currently only charities (particularly large ones) have a robust physical infrastructure for collection, sorting and sales. If FF firms intend to develop such partnerships, currently charities are the only feasible option for an immediate reform because such a physical network is necessary. Tweddle (2018) also highlights that 82% of UK consumers would prefer a commercial company is partnered with charities rather than for-profit firms. Therefore, a partnership with a charity can increase sales of new items and improve brand image. Similarly, such partnerships can ease collection as 79% of donors prefer charities to other organizations (TRAID, 2019).

## 5. HOW DO CHARITIES CURRENTLY FUNCTION?

All charities collect unwanted clothes, then sort, advertise and sell them. However, they differ in the preferred collection system, logistics network, advertising modes, selling channels and partnerships with fashion retailers. Since charity size affects the differences, we study three charity retailers of different sizes (i.e., small, medium, and large). Charity operations start from collecting unwanted items at donation points and for this reason, we first discuss various donation points and their characteristics.

### 5.1. Donation modes

#### 5.1.1. Collection points

The UK has three major collection systems (WRAP, 2019b): direct donations to charity shops (48%), textile banks (37%), and home (also called door-to-door) collection (9%). The 'other' system (6%) refers to in-store collection of fashion retailers, municipal waste collection and brand mail-back systems (EMF, 2017a). These figures can significantly differ in various nations. For example, in France, they were as follows (ECO-TLC, 2018) in 2016: textile banks (89.3%), direct donations to charity shops (9.3%), in-store drop-offs (1.2%) and home collection (0.2%). France has a far lower number of charity shops selling preowned clothes (Osterley, 2020): between 3000 and 4000, according to ECO-TLC (Hardy, 2020). France relies heavily on bank collection as it increased the number of collection banks from 15,621 in 2011 to 41,793 in 2016 (ECO-TLC, 2018).

*Direct donation to charity shops:* Donors may physically visit a charity shop and directly donate their unwanted clothes. In return, some charities offer discounts to donors who shop with them.

*Bank collection:* Many banks for garment collection are located either on public streets (owned by the local government) or on private land in busy areas (e.g., supermarkets, company car parks and schools). A running company regularly visits the banks to unload. In the UK, local councils decide who can run street banks. Private landowners determine who can run their banks for free or at a fee.

*Home collection:* Charities or private companies may send their vehicles to the consumers' doorstep to collect unwanted clothes. Traditionally, consumers would call a collector to arrange an appropriate time slot for collection, but most of these arrangements are accomplished via mobile apps or charity websites.

*In-store collection:* Most fashion retailers provide in-store collection services for consumers. Some, such as

H&M, Levi's, Primark and Intimissimi, offer incentives to persuade consumers to return more unwanted items. If a charity has a partnership with a fashion retailer, they may agree to incentivize donors, regardless of whether they refer to their charity shops or fashion retail shops.

*Brand mail-back system:* This system works on a small scale. For example, Patagonia (Agrawal, 2019; EMF, 2017a), Eileen Fisher (an American women's clothing brand) (EMF, 2017a), and Timbuk2 (an American bag manufacturer and marketer) (Elks, 2014) use a brand mail-back system in which users mail their unwanted clothes to the firm. Such a system can be economically feasible for valuable items.

*Municipal waste collection:* This collection system is usually handled by governmental bodies such as city councils or municipalities. Most general waste (including clothes) is routed to incineration in high-income nations, some to landfills. In low-income countries, general waste usually ends up in landfills.

*Singled-out curbside collection:* In some high-income countries, governmental bodies have included home separation plans for textile items, like the established practices applied to plastic, glass, cardboard, food waste etc. (EMF, 2017a).

### **5.1.2. Comparing collection systems**

Items collected at donation points differ in quantity, quality, accessibility, collection cost, required personnel and FF products' impact. Direct donation to charity shops has large quantities (in the UK), the lowest collection cost and acceptable average quality. Home collection generates the highest quality items and bank collection the lowest (Baladron, 2019a). However, the home collection has the highest collection cost, while bank collection has a reasonable collection cost, in-between home collection and direct donation. Collection banks – particularly street banks that are open 24/7 – have the highest accessibility to donors because of their number and location. Not surprisingly, the highest FF impact is observed in collection banks (Baladron, 2019a). If collection banks are not carefully monitored to be discharged when they are full, clothes get wet or contaminated, limiting reusability. Consequently, most items collected in collection banks are unfortunately exported, some would say dumped, to low-income countries, which recently understandably led to import bans.

## **5.2. Charity logistics systems**

Our focus is on that part of the material flows in the reverse clothing logistics that directly or indirectly involve charities. In the following subsections, we discuss operations for three charities in the UK.

### **5.2.1. Oxfam GB**

*Donation points:* Oxfam is one of the largest charities in the UK with over 650 shops throughout the country. Since Oxfam is such a well-known brand, they are often overwhelmingly supported by volunteers to save costs of labour-intensive activities. They use all major collection systems introduced earlier. Their donation banks are mainly located in car parks, which are open 24/7. Their retail shops are on high streets to be highly visible and accessible as alternative donation points. Finally, they are also active in home collection. Oxfam's mobile application and website can help donors find the closest donation point.

*Reverse logistics network with hubs:* Oxfam's network has three levels (Figure 5): donation points, hubs, and charity shops. All donations are sent to and processed by two central hubs. Hubs are costly but facilitate the efficient processing of large volumes.

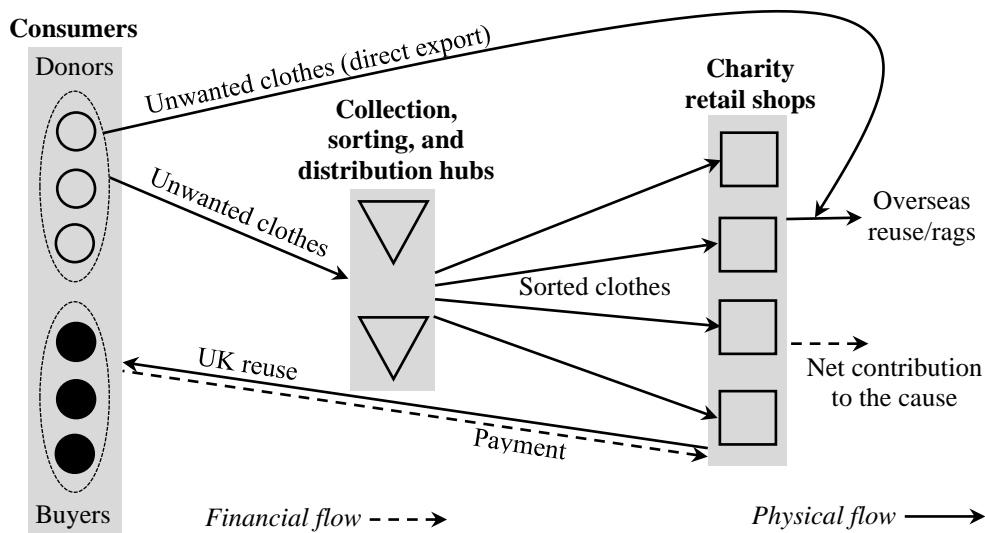


Figure 5: Oxfam charity logistics network with hubs.

*Sorting:* In the sorting, collected clothes are separated into high and low-quality items. The high-quality items are put on display for selling in the [primary](#) market. The low-quality items are divided into various categories such as men, women and children and then packaged to be exported to low-income countries. Sorting is applied in two locations, *hubs* and *shops*, that essentially run the same process. Shop inputs are unsorted items, received through direct donations. Hub inputs are unsorted items collected from banks and low-quality items disposed of in shops. Hub sorting is on a large scale for multiple sites and shop sorting is just local. [The RTH uses a blend of two networks as follows:](#)

(i) The shops collect and sell the items individually (Figure 6a). Then the unsold items are treated as explained in the hub system. This system is used by large charities such as Cancer Research UK and the Salvation Army that have large superstores. If the shops are spacious enough to sort, hold and sell many different items, this network can be feasible. However, this network is costly as retail shops are situated in congested areas where the land cost is high.

(ii) The unsold clothes are not kept for long and are circulated between shops, hoping that a fraction of them can still be sold (Figure 6b). The RTH has defined two weeks (so-called cull cycle) for selling. After two weeks, if an item remains unsold in a shop, they pass it to another branch in the same city and area. Then, they move the unsold clothes shop to shop. If an item remains unsold in three shops, they consider it completely unsold and treat it as low-quality items in the Oxfam model.

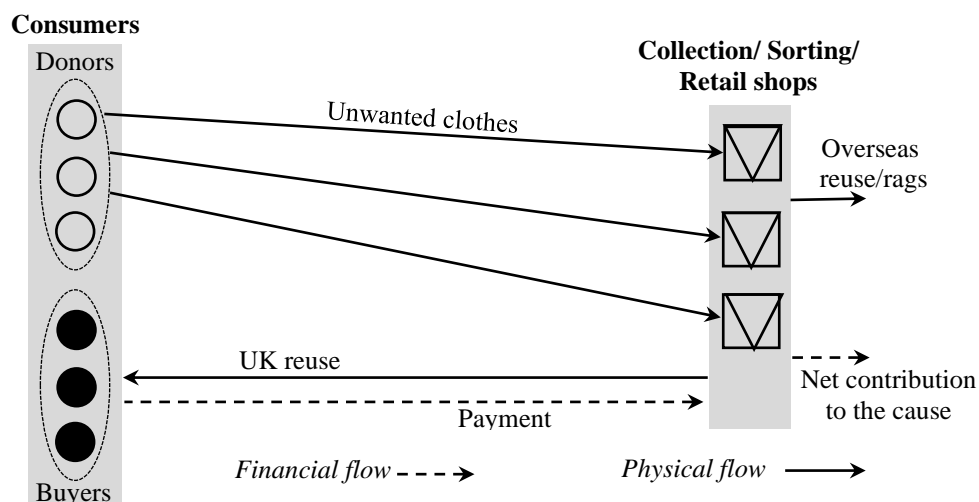


Figure 6(a). Charity shop sorting without rotation between shops (without hub).



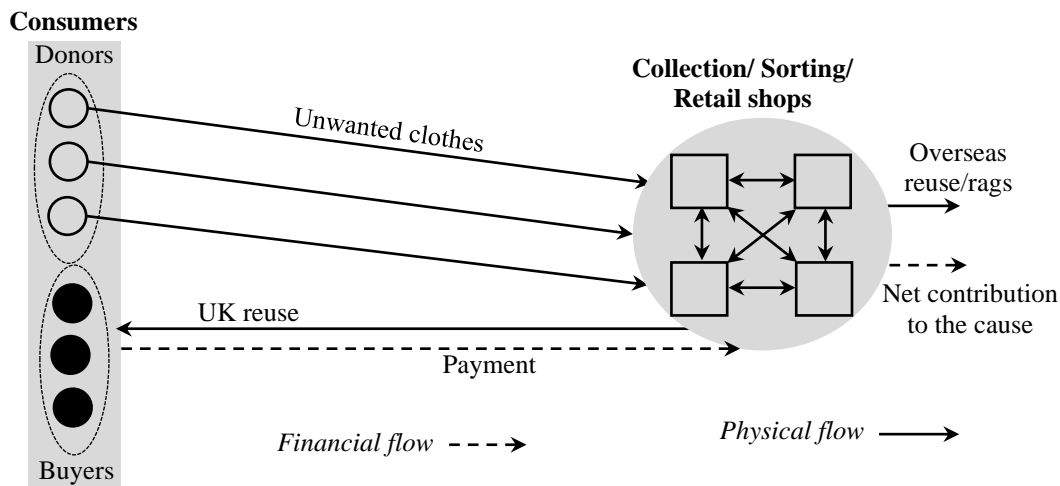


Figure 6(b). Charity shop sorting with rotation between shops (without hub).

Figure 6. Charity shop sorting and rotation.

*Advertising and sale:* Oxfam uses several channels for selling its high-quality items. Customers can visit Oxfam retail shops for on-foot shopping, but Oxfam also significantly relies on its online selling platform. Additionally, Oxfam uses omnichannel marketplaces like ASOS Marketplace. Finally, Oxfam can manage its costly advertising activities requiring considerable training for listing the item, descriptions, photography, pricing, and computer skills via volunteers.

*Partnerships:* Oxfam is unique for its partnership with M&S. Under this partnership, donors can deliver their unwanted items to M&S retail stores or Oxfam retail shops and receive discount vouchers to shop with M&S. Items collected in M&S stores are delivered to one of Oxfam's sorting and distribution hubs.

*Other schemes:* Oxfam has launched a Gift Aid scheme to generate more value from donations. Under this scheme, Oxfam uses tags to track donated items to inform donors of the final value of the sold items (Oxfam, 2020) so they can reclaim 25% income tax<sup>9</sup>.

### 5.2.2. The Royal Trinity Hospice

*Donation points:* The RTH is a medium-sized, traditional charity with 32 southwest and central London shops. The shops are mainly located in populated and wealthy areas. Home collection and direct donation to shops are their major donation modes. RTH uses its vans and some self-employed drivers collecting from certain postcodes. They also work with Charity Fleetcare – the private third-party logistics company – for arranging home collection via its mobile app.

*Reverse logistics network without hubs:* The collected clothes are directly sent to the charity retail shops for sorting. Therefore, unlike the Oxfam model, RTH does not have any hubs nor works in a two-level network of donation points and charity shops. Consequently, sorting and selling take place in shops (Appendix A2).

*Shop sorting:* The unsold items in RTH shops are put into bags of different colors to identify their quality (to save sorting time) and circulated among other shops to be given a second and third chance (to be sold).

*Advertising and sale:* RTH is a traditional charity relying on direct and local donations. They prefer physical (on-foot) resale rather than online selling to save advertising. RTH is not as highly supported by volunteers as large

<sup>9</sup> To support donation, the UK government allow a higher rate taxpayer to claim back 'the difference between higher rate and basic rate tax on the value of donation'. It will be 25% for a 40% rate taxpayer (TRAID, 2020).

charity retailers are. RTH uses some online selling via their website and omnichannel sites, such as eBay and Amazon, but only for valuable items.

### 5.2.3. TR Aid

*Donation points:* TR Aid is a relatively small charity with eight clothes shops in London.

Like Oxfam, TR Aid is not limited to a particular geographical area. It has its vans and drivers. TR Aid does operate some home collection but heavily relies on bank collection. It runs over 1500 collection banks across the UK (TR Aid, 2020), providing them with sufficient preowned clothes input. TR Aid is involved in three types of bank collection, both physically and non-physically (TR Aid, 2019) (Appendix A3). Physical involvement means TR Aid collects, sorts, and sells in-house. Non-physical involvement means TR Aid outsources these activities to private collectors and recyclers to be performed under its own name (or logo). The main reason for this is that surveys show that consumers donate more if they know collection banks are run by charities rather than private companies (Baladron, 2019a).

TR Aid (2019) states that TR Aid is physically and non-physically involved in three types of bank collection scenarios. The reason behind non-physical involvement is based on research conducted by TR Aid (TR Aid, 2019). A survey conducted with a sample size of 1126 people and 342 local councils in the UK shows that 95% of people would like to know who is running a particular collection bank, and 79% of people believe that local councils should award the collection bank contracts to charities rather than to private companies. Therefore, private collectors are happy to borrow the name of a charity to display on the banks to increase the collection rate. The scenarios are as follows:

*Scenario 1:* Charity pays the landowners to put their banks in the landowner's property. The charity sends its collected clothes to its retail shop. Unsold clothes are sent to the wholesale market (Figure 7a).

*Scenario 2:* A commercial company hires a charity retail bank and its brand to increase its collection. The commercial company needs to pay the landowner too. The commercial company sends the collected clothes to the wholesale market (Figure 7b).

*Scenario 3:* The charity pays the landowner. A charity hires a company to carry out the physical collection and send the collected clothes to its retail shop. Then the unsold garments are sold in the wholesale market (Figure 7c).

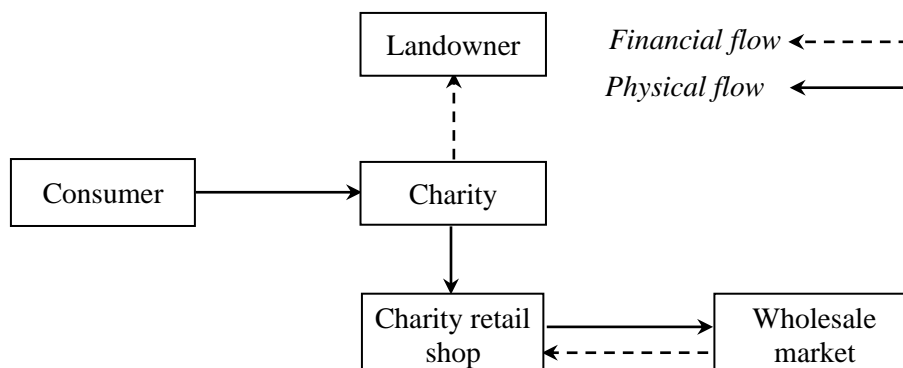


Figure 7(a): Bank collection by charities in scenario 1.

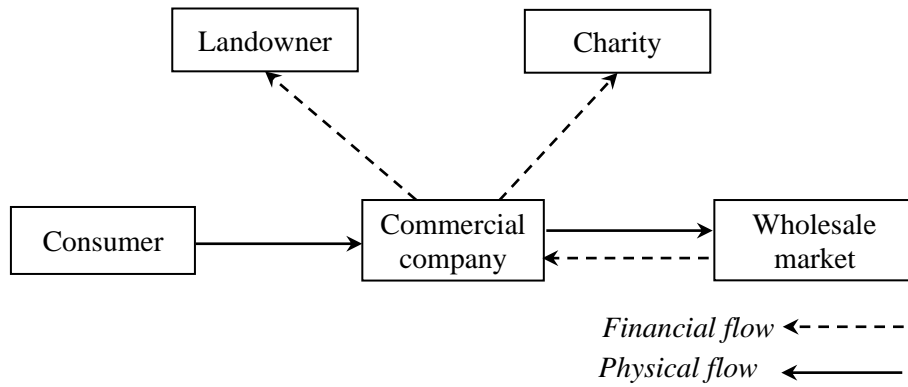


Figure 7(b): Bank collection, physically run by commercial companies and charity branded in scenario 2.

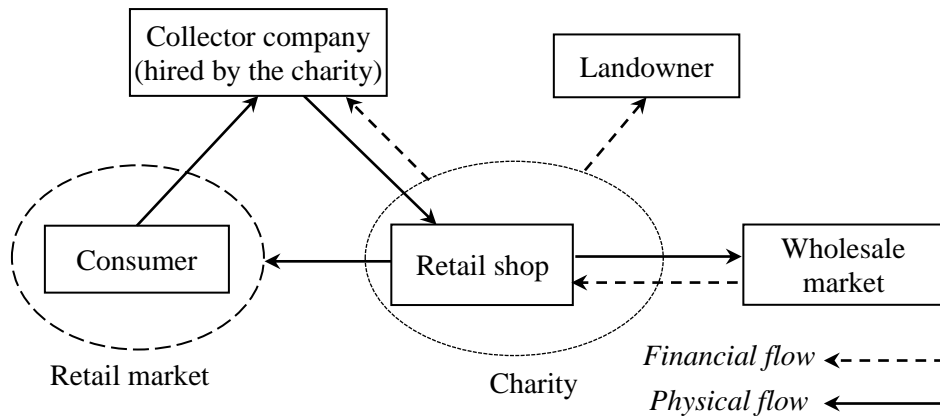


Figure 7(c): Bank collection, physically run by commercial companies but sold by charities in scenario 3.

Figure 7: Bank collection scenarios implemented by TR Aid.

*Reverse logistics network with hub:* TR Aid uses a hub system in its reverse logistics network, with a sorting hub in London and a new one being planned.

*Sorting:* TR Aid uses its current hub for sorting activities. Unlike Oxfam, TR Aid schedules its charity shop managers to frequently visit the hub and select high-quality items appropriate for resale in their regions. Since early visitors have a higher chance of picking from high-quality and on-demand items, TR Aid regularly changes the shop managers' visit sequence and schedule to preserve equitability.

*Advertising and sale:* TR Aid mainly sells through its retail shops and exports to low-income countries. It also sells via online omnichannel marketplaces, such as eBay and ASOS Marketplace.

*Partnerships:* TR Aid is unique for setting up a collaboration with Chelsea and Kensington council, the wealthiest local authority in the UK, putting them officially in charge of clothes collection. Therefore, this has given it the freedom to locate many 24/7 on-street banks and collect a substantial amount of preowned clothes.

#### 5.2.4. Lessons learned

There are some fundamental lessons learned from analyzing charity operations:

*Difficulties for MSME charities:* According to the data we received from CRA, 987 UK charities own 11,242 shops (on average, 11 shops for each charity). CRA divides charities into very small (82%), small (10%), medium (6%), large (1%) and very large (1%). Therefore, 98% of charities are micro, small, and medium enterprises (MSMEs). These charities have difficulty transforming their processes as they lack volunteer support and suffer from weak technology and logistics infrastructures. Thus, they do not heavily rely on online selling (which needs skills like advertising), home collection (which needs vehicle and driver services), nor bank collection (which needs sorting

labour).

*Future collection systems:* It is predicted that gathering preowned clothes in the future will be based on home collection, which is the most convenient mode for donors. While home collection is the costliest collection system for charities, they believe it yields the highest quality items (Baladron, 2019a), and is less affected by FF items.

*Diverse perceptions of FF quality:* Not all charities are negative towards FF items (Brinson, 2019a) and, indeed, some traditional MSME charities may prefer them. The head of retail in RTH believes that charity customers first examine the clothes' design and their condition to ensure the item is 'as good as new.' FF items have an updated design, have been used for a short time and can attract fashion-sensitive customer segments. The one main issue for charities is the large influx of FF items and their low average price, which clearly presents a logistical challenge.

*Impact of FF on collection systems:* FF items affect collection banks more than charity shops and homes. Therefore, involvement in bank collection generates more sorting cost unless charities outsource their bank collection and sorting.

*Hubs:* Hubs are only useful if the number of donation points and quantity of collection is high, which happens when a charity relies heavily on bank collection through an extended network. That is why a small charity like TRAIID (collecting from many banks) and a large charity like Oxfam (dealing with many donation points and various collection systems) both use hubs.

### 5.3. Future research direction

In this section, the current charity operations and their main issues were highlighted as future research. The traditional models used in areas like facility location, capacity planning, vehicle routing, and OR optimization models (e.g. supply chain network optimization using mixed integer programming) are still valid and can address such issues. However, concepts like collaboration, partnership, and centralization/ decentralization may need new models to be developed. Besides, emerging IT tools and equipment such as mobile apps that generate much data may help researchers develop more interactive models and better estimate their model parameters. In particular, a serious gap in this area is the lack of data for empirical research that can be bridged using internet-based IT tools.

## 6. FAST FASHION OPPORTUNITIES AND CHALLENGES FOR CHARITIES

We investigate how charities can change their current practices and capture the opportunities of overgrowing volumes of second-hand clothes. These clearly reveal interesting OM research challenges.

### 6.1. Bank Collection

*Should MSME charities involve in physical or non-physical bank collections?* Bank collection is still a major collection system in terms of volume, and FF items have the biggest impact on the amount and quality of items in banks. As the FF market grows, the bank items grow, and their unloading, sorting, advertising, and selling are resource intensive. Large charities prefer to do these activities in-house because the support of volunteers makes it cost-effective. After an MSME charity wins banks in a geographical region, it is unclear whether the charity should outsource or insource handling the banks. Furthermore, unlike MSME charities, the reputation of large charities can also help them collect more. MSME charities can investigate horizontal partnerships to benefit from a higher reputation and economies of scale in the collection (e.g., putting logos of all partner charities on banks), while hiring a third-party logistics firm to handle preowned items.

*How can charities win a competition on owned-land banks?* Banks located at sites like schools are less affected by FF items. Our interviews with charity managers (Baladron, 2019a) show they heavily weigh school/ community banks because of their attractiveness for the primary market. These banks are owned by organizations that may ask for a little money. For example, TRAIID mentioned that about half the school banks prefer to work with private collectors offering money. Charities traditionally do not pay bank landowners. Analyzing the viability of offering payments may help charities improve their competitiveness. Alternatively, instead of competing, charities and private collectors can engage in collaborative agreements to split a target region to reduce logistics costs. Analyzing such collaboration opportunities can be insightful for charities.

## **6.2. Home Collection**

*How frequently should charities visit homes?* Based on 2019 data, on average, the British female and male consumers had approximately £22,000 and £11,000 of lifetime unworn clothes in their wardrobes, respectively (Sabanoglu, 2019). 57% of clothes in American ladies' closets were never used because of being the wrong size (Winmark, 2017). Donors are increasingly becoming interested in collectors that collect the items on their doorsteps (Hilton, 2020). While home collection cost is higher than other collection systems, its quality has been less affected by FF items. This tempts many collectors to compete in home collections. Longer time intervals may lead to more efficient and shorter tours because of the larger supply. Still, the competitive nature of home collection imposes higher frequencies and flexible time slots for pickup. Uncertainties in collection location, amount and quality of items complicate decision making. Research can help charities determine how frequently to visit homes in a region considering their fleet size, vehicle capacity, geographical dispersion of dwellings and the area's income status. The area can also be empirically investigated to provide insight into how the visit frequency can increase charities' competitiveness against private collectors.

*How can information technology promote home collection for charities?* Many websites and some mobile apps are currently set up by charities and private collectors, where consumers request a collection time slot. To increase home visit frequency while keeping it cost-effective, a charity can outsource collection to a third-party logistics company like Charity Fleetcare. Donors can target a specific charity for collection through the mobile app owned by the logistics company. The logistics company consolidates the requests for pickup and collects them while minimizing travel distance. The logistics company collects unwanted items during a period and then distributes them to the targeted charities, taking a commission fee from charities. Given the uncertainties in donations, the benefits of pooling collection for multiple charities by a logistics company could be an interesting research area.

## **6.3. Charity Culture and Competition**

*How can charities incentivize/pay potential donors to enhance their competitiveness against private collectors?* There are no legal barriers for charities to pay donors, schools, councils etc. in the collection process (Baladron, 2019b). It is simply a cultural tradition of not paying for donated items. Some private collectors pay donors to get access to preowned items. A few charities have started to consider paying, but most are cautious (Baladron, 2019b). While some donors may voluntarily refuse to accept cashback, incentivizing consumers to donate high-quality clothes may increase donation quality and volume. If charities were to pay people who only return for the money, based on the condition and quality, it might positively affect consumer behavior around post-consumption and the CE. This practice may reduce the supply of FF items as their monetary value is low. This could also reduce the amount of FF

purchased in the first place and thus lead to more sustainability. Empirical research could show whether paying can significantly affect the amount and quality of collection in the short term. The negative side is that donors may switch their behavior to become sellers. It is also essential to verify whether paying would change the behavior of socially conscious donors. Paying for high quality items (e.g., by for-profit firms) can also change the flows so that low value items go to banks, waste bins and charities, creating challenges for the latter.

#### **6.4. Logistics Network Redesign**

*Should MSME charities redesign their reverse logistics network by sharing a hub?* Collecting large volumes of preowned clothes often requires hubs located on inexpensive land to consolidate, sort and distribute them. Smaller charities perform these activities in their shops. Shops are small but expensive facilities because of their locations. The increased flow of FF items causes lack of sufficient sorting space. MSME charities are not interested in using expensive retail shop space for sorting, especially when most of the collected items do not create much net value. Hubs are also costly because they tend to be large facilities. A possible solution is to share hubs and shift sorting activities to them. Research can show how such a horizontal collaboration on hub sharing can aid cost efficiencies in smaller charities to increase their capacities.

#### **6.5. Sorting**

*Who should sort in hubs and shops? Volunteers or employees?* On average, in UK charities, 10% of staff (e.g., retail shop managers) are paid (Osterley, 2019a). The paid staff give charities a level of expertise and accountability that is difficult to get with only volunteers. While using paid staff is costly, their experience and expertise to pick the best items lead to the minimum error (i.e. minimum unsold items). Sorting can be executed at different levels: primary sorting in terms of quality of materials, appearance, etc. and secondary sorting in terms of size, age, gender, etc. Each of these sorting types needs skills. A highly skilled person can consider all sorting criteria at the same time. Some charities ask their shop managers to sort in the hubs and pick their favorite items. In some others, volunteers do an initial sorting in hubs and send them to charity shops for a second sorting by shop managers. Given the growing flow of FF items and their quality – which is affected by the collection – and the need for a workforce more skilled in sorting, applied research can provide insights to recommend what combination of paid and volunteer staff should be allocated to hubs and shops to increase capacity while keeping errors at an acceptable level.

*How can the logistics costs of collection be reduced by sorting at donation points?* Charity managers believe that the main cost components of their logistics systems are transportation and inventory costs. Transportation costs depend on the logistics network while inventory costs are mostly due to additional storage space required in hubs and charity shops. Reverse logistics theory (Souza, 2012) would recommend charities to sort at the donation points to avoid waste transportation. Currently, most collecting drivers do not have sorting skills. Moreover, sorting is a time-consuming task so sorting at collection points would limit the number of sites visited per day. Exploring models to implement sorting at donation points is an interesting research topic. The research results may very well differ between home and bank collections, as the volume and quality of items significantly vary between them.

#### **6.6. Technology and Sales**

*How should MSME charities improve their online selling?* Large charities rely on online selling and MSME charities do not. For using an online channel, charities need an online selling platform that may not be affordable for

low value items – e.g., most FF items – in MSME charities. Making advertisements for preowned items is costlier than for new items because of a broader assortment involving smaller volumes. Online selling is not attractive for many MSME charities because: (i) they sell one-off clothing items, with a limited range, that cannot attract many consumers who are searching for a specific size, color etc., (ii) the return rate in online selling of second-hand items is high (also mentioned by Gao and Su (2016)) and (iii) the significant effort involved in advertising. If charities increase their capacity to collect, store and sort individually or collaboratively, they can also execute online selling processes cost-effectively. Research can reveal the effect of economies of scale related to online selling for MSMEs.

*In the case of online selling, should charities develop their own online platform or sell via omnichannel marketplaces?* If charities decide to sell online, they need to choose whether to develop their own online platform or use omnichannel marketplaces. Some charities use both their own platform and omnichannel marketplaces including e-Bay, Vinted, Vestiaire Collective, Rebelle, Depop, ASOS Marketplace, Gumtree, Preloved and Facebook Marketplace. These are all examples of omnichannel marketplaces in fashion. Indeed, using an omnichannel marketplace can save investment in setting up an independent platform and increase viewers but at the same time, it lowers flexibility and usually comes with a commission fee.

*In case of online selling via omnichannel marketplaces, should charities sell via the platform utilized by online fashion marketplaces (e.g., ASOS Marketplace)?* Simultaneously promoting through online marketplaces increases competition for second-hand items because buyers can compare prices. Some believe that charities can sell at a higher price in stores than online as this avoids price comparison with alternatives (Brinson, 2019b). Some large charities such as Oxfam, TRAIID, Barnardos, Save the Children and British Red Cross use online marketplaces such as ASOS Marketplace. This approach increases the visibility of charity items. For example, as the largest online fashion retailer in Europe, ASOS can advertise items worldwide among its 18 million active customers. Empirical research can investigate tradeoffs between these advantages and disadvantages and then hopefully recommend which charities (in size) should utilize which online selling platform.

*How can charities generate the highest value from the design of FF items?* The value of fashion items is mainly related to their design, and reduces over time. If charities shorten the time to market for preowned items (including times for collection, sorting, advertising, etc.), the items' market value will be higher. This time is more critical for FF items than other fashion products (e.g., SF). Shortening the time to market for FF items increases logistics costs. Investigating tradeoffs between logistics costs and market value can provide insights for charities. Any business model that suggests fast and smart logistics to charities (e.g., based on online systems or logistics network redesign) can generate more value and make charities competitive. Such a trend is in line with behavior changes in consumers who wear clothes only a few times and change them frequently (Guide et al., 2006).

## **6.7. Future research direction**

In this section, the current practice of FF firms at strategic, tactical and operational level was described as long as they are dealing with recyclers and particularly charities. For future research, the main gap is the lack of effective business models to help FF and charities solve the stated issues collaboratively. This issue is partially related to the lack of a clear view regarding the markets of FF and charities. For example, it is not clear whether their market is segmented or not. We stated some similar gaps that can be addressed via empirical research. Additionally, solving the mentioned issues requires innovative business models (which can also be borrowed from other industries). The paper explores many issues which can be handled by very different methodologies/techniques. These could range

from case-based research to econometric analysis, from OR optimization to game theory, and so on. For example, game-theoretic techniques are more likely to be helpful if competition and power relationships (leader and follower) are supposed to be included in modeling.

## 7. FAST FASHION REFORM AND COLLABORATION WITH CHARITIES

Collaboration between charities and FF retailers can help (1) charities to access items collected in-store by FF retailers (and excess new items left over after a fashion season) and (2) FF retailers to be prepared for future changes such as EPR legislation and response to social and environmental criticisms. In this section, business models related to collaboration with FF retailers are described and analyzed, including Primark (an FF retailer) and ASOS (an ONFF retailer). We also introduce the M&S (an SF retailer) business model that can help inspire FF retailers. [We briefly mention examples of H&M, Patagonia, and Mud Jeans](#) and these can help FF retailers independently to make some improvements in their reverse logistics networks.

### 7.1. Collaboration between FF and charities

We investigate how fashion retailers collaborate with charities in one or more of these activities: (1) collecting items, (2) delivering the collected items to a partner charity, (3) advertising charities' items on their online platform, and (4) supporting financially, via the profit made from exporting collected items.

#### 7.1.1. How does Primark collaborate with charities?

Primark is an important FF retailer exemplifying a larger class of similar companies regarding collaborating with charities.

*Current situation:* Primark, the FF market leader in the UK, has launched a 'take back' scheme to collect and reuse preowned items. Primark issues a discount voucher for a specific number of donated clothes from any brand. The voucher can only be spent on buying new items from its merchandise. The collected items are sorted in a private recycling plant rather than being forwarded to charities. The sorted items are exported to low-income nations at a wholesale price. Primark donates the cash profit made on these transactions to its two partner charities in Europe and the US.

*Analysis:* The Primark model is used by many fashion retailers such as [H&M, Levi, and Zara](#). FF firms have a low profit margin and avoid potentially costly activities. The model does not impact Primark's profits as it donates the marginal revenues (i.e. income excluding collection and logistics costs). Primark avoid cannibalization between its new and collected items in the primary market. The Primark model's positive feature is that it financially supports charities, showing that the company cares about the social and environmental impacts of its products. Still, the support remains modest because (i) the financial help is significantly lower than the current damage attributed to the low reusability of FF items in the primary market, (ii) the quantity of current in-store collection is minimal since in-store collection in the UK is below 2% of the total collection (WRAP, 2019b), (iii) the model does not create any jobs for charities – as charities are not involved in the collection, sorting and resale – thereby not supporting the social objective of many charities to provide jobs for difficult-to-employ people.

#### 7.1.2. How does ASOS collaborate with charities?

*Current situation:* Founded in 2000, ASOS plc is one of Europe's largest online fashion retailers. Interestingly, preowned items are also sold via its platform. In 2010, ASOS launched a platform named ASOS Marketplace (similar to Amazon's) to allow firms and individuals (like eBay) to sell items under their own responsibility, guidelines, commitments, delivery and pricing. Selling new and preowned goods can be challenging for any retailer (Abbey et al., 2015b). Firms selling through this



channel pay a commission fee to ASOS Marketplace.

ASOS supports charities in collection and resale. For collection, ASOS has a partnership with Duddle, a logistics company providing services such as collecting, returning, and shipping for retailers. Duddle works with several retailers, including ASOS. Donors can deliver their unwanted clothes to the closest Duddle store, referring to ASOS. Accordingly, Duddle packages the clothes and sends them to TRAIID, which sorts the clothes and advertises those that are wearable in the UK via ASOS Marketplace. Figure 10 shows the reverse logistics network of ASOS.

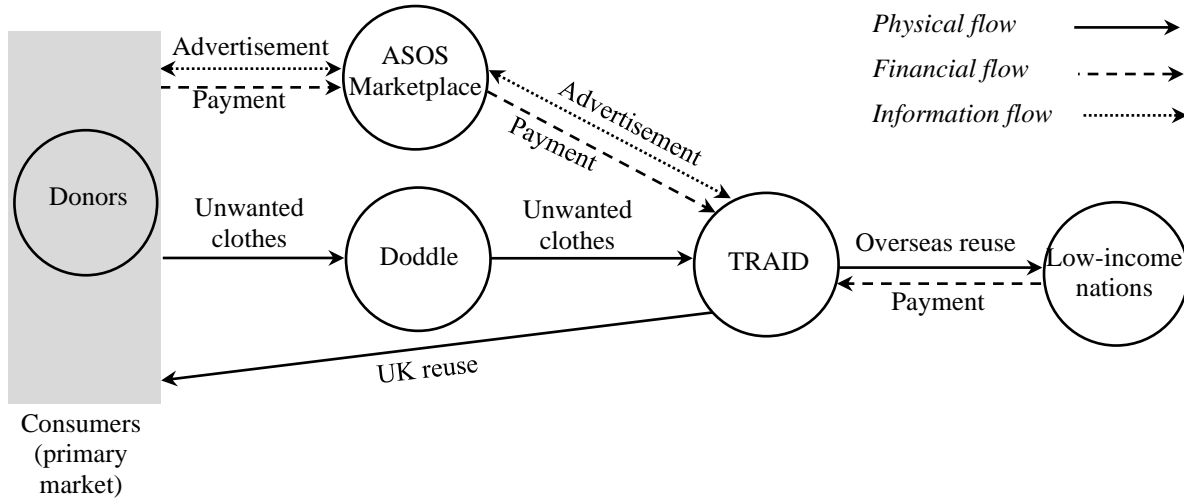


Figure 10. ONFF-charity model: ASOS supports charities with collection and selling.

*Analysis:* The ASOS business model is beneficial to its partner charities because (i) it makes products visible to millions of customers worldwide, and (ii) it does not ask for any commission fee from the partner charities. Therefore, ASOS Marketplace significantly assists charities in selling preowned clothes, which is a unique feature compared to other FF retailers. Interestingly, unlike most FF retailers, ASOS has engaged with multiple charities, namely Oxfam, TRAIID and Barnard’s and is presently extending its support to other charities such as Save the Children and British Red Cross.

However, the ASOS model has scope for improvement common to all other FF retailers. Currently, donors need to carry their unwanted clothes to one of the branches of a logistics company, which only a small fraction of people will be prepared to do. Therefore, ASOS is not particularly effective in collection.

## 7.2. Learning from other fashion retailers

Unlike the previous two fashion retailers, M&S is an SF outfit. M&S has creatively solved the common retail challenge to collect a significant volume of unwanted clothes by physically involving charities in the process. The M&S model, which is based on a long-term collaboration with Oxfam GB, could be fully or partially adopted by FF retailers. Refer to Appendix A4 for more details. It follows that research could focus on speeding up the turnaround time of FF items. Consumers should return faster and the time to get the item back on the market should be shorter to preserve the value of the item. This would be an interesting avenue for research.

FF retailers need business models to help them switch from exporting preowned clothes to low-income countries to closing the loop within high-income countries. Such models generate high value for preowned items and solve the issue with EPR and import bans. FF firms can also learn from best practice at other FF firms (like H&M) and SF firms (like Mud Jeans, Patagonia, and M&S). For example, Mud Jeans uses a leasing model to persuade consumers to return their unwanted items. Patagonia is another example of a company appropriately using its online channel and helping consumers swap and repair their clothing items (EMF, 2017b).

### 7.3. Questions for OM researchers

*How can charities convince fashion retailers to collaborate on collection-based mutual benefits?* We learned that SF retailers such as M&S might benefit from collaboration with a partner charity on all the activities mentioned above. On the other hand, FF retailers do not significantly support charities' collection to avoid cannibalization in the primary market. M&S action shows that preowned items should perhaps not always be diverted from the primary market. Analytical and empirical research can extract conditions that enable a fashion retailer to benefit from such collaboration with charities. Of course, both products and consumers may differ between SF and FF retailers. Empirical research can show the fraction of buyers common to charities and fashion retailers and this information could feed into the comparison of alternative strategies around preowned items.

*Why should a fashion retailer voluntarily increase its collection rate and support charities?* There are several reasons: (1) fashion retailers have been socially and environmentally criticized and a voluntary increase could show they are trying to address this criticism, (2) the incentivization vouchers issued by fashion retailers to collect preowned items can be used to buy new items and generate demand, (3) it helps to prepare for imminent new legislation like EPR, (4) it may have positive reputational effects on consumers and other SC actors (Servaes and Tamayo, 2013; Hartmann and Moeller, 2014). Setting up a high-capacity infrastructure to handle unwanted clothes is one improvement area for fashion retailers. Of course, private firms are also developing their infrastructures and they can collaborate with FF retailers, but charities are very experienced in this.

*How may the psychological reaction of consumers to preowned clothes affect charities?* Less is known about how consumers react to preowned clothes. OM researchers can conduct empirical research to help practitioners explore consumer perception of quality and its effect on preowned attractiveness.

*How can horizontal collaboration between FF retailers improve their collection and recycling capabilities?* Setting up an infrastructure with a higher capacity to manage unwanted clothes is one improvement area for fashion retailers. The vertical partnership between charities and FF retailers can also be extended as a horizontal collaboration between FF retailers to benefit from economies of scale (Gui et al. 2016). Emma Safety Footwear has set up a coalition with its competitors HaVeP (van Veldhoven, 2020) and Allshoes Safety Footwear (Emma Safety Footwear, 2020) to create enough economies of scale on the collection, reuse and recycling of used items. The heterogeneity in cost, quality, and production quantity among FF retailers (Gui et al. 2016, 2018) needs careful design so that OM researchers can study it.

### 7.4. COVID-19 and the fashion circular economy

Our research started before the COVID-19 pandemic. During COVID-19, there were some significant changes in the fashion CE. Around a year into COVID-19, many processes started to get back to normal, but the pandemic has taught some lessons that may affect future trends. Therefore, we were encouraged to explain how the pandemic affected activities in the fashion CE.

*Textile waste generation:* The COVID-19 lockdowns initially affected the FF SC. Such measures forced closure of many physical shops of FF brands such as Zara, Primark, and H&M. Consequently, many production plants in the upstream part of their forward SC experienced lost demand. According to Bloomberg, only in Bangladesh 1089 garment factories faced cancelled orders (Fashion and Revolution, 2020). While the pandemic damaged the garment industry in 2020, in 2021, it started to recover and it is estimated that it will keep it up for at least a decade (Wood,

2021). While online FF brands like ASOS experienced significant growth in online demand (Sillars, 2021), the overall demand reduction for fashion items significantly reduced the generation of unwanted clothes.

*Waste collection modes:* During the pandemic, lockdowns made charity shops stop store collection, but the home collection rate grew. Although home collection is convenient for donors, it is the most expensive collection mode. Collectors would come to doorsteps only if the amount of donation is sufficiently high.

*Volunteers and vehicles:* The number of volunteers decreased by 40% due to lockdown and economic impacts (Collinson, 2020). Collectors also faced a lack of vehicles and increased transportation costs for home collection since many vehicles were required to satisfy sharply increased demand for home delivery of essential items like food, hence transportation costs increased.

*Online platform:* The utilization of mobile apps that consolidate donation requests experienced a massive rise (Hilton, 2020). Online platforms were not highly vulnerable to the pandemic but they were not prepared for a surged demand in their apps.

*Online FF:* On the other hand, surprisingly, online FF brands like ASOS experienced significant growth in online demand (Sillars, 2021). While the economic impact of the pandemic decreased the consumers' purchase power, we observe that business models based on physical shops are vulnerable to disruptions in such situations. Before the pandemic, for several years, online shopping in fashion had an increasing trend compared to in-store shopping. But the pandemic sharply increased this trend. For example, according to Mintel (2021), in the last year before the pandemic (2019), online shopping portion was 32% of all fashion retail in the UK, but it reached to 56% in 2021.

*Consumer reaction:* The economic impact of the pandemic decreased the consumers' purchase power from fashion retailers and charities. Consumers of preowned items are also concerned about sterilization and price (Chen, 2021). In the United States, while after the introduction of vaccines and easing limiting rules, the portion of in-store shopping improved, it did not get back to the situation before Covid-19 (Orendorff, 2021). It seems some long-lasting changes happened to the consumers' habits.

The pandemic showed that future business models could be designed for more resiliency, but it is a matter of time to see what changes will have a lasting impact.

## 8. CONCLUSION

This paper highlights significant changes in the future of textile CE, focusing on charities and FF retailers. Charities were the only organizations closing the loop in textile SC for many years. More recently, charities have seen growing competition in the second-hand market created by for-profit commercial platforms equipped with efficient business models and technology. Large charities can adapt to such changes but many MSME charities need critical changes to become more competitive. The second-hand market is enormous and highly growing due to changing consumer behaviors and omnipresent online platforms, and societies can benefit more if charities capture a significant share.

The rise of FF has significantly increased flows of low-value returns, thereby increasing charities' logistics cost while currently only a small fraction of their revenue-generating items is reusable in high-income countries. FF products necessarily require charities to search for economies of scale (logistics, sorting at hubs, etc.) through a horizontal partnership between charities and vertical partnerships between charities and FF retailers. Presently, vertical collaboration may not intuitively interest FF firms due to the fear of cannibalization. FF firms have also learned to expect unprecedented changes. EPR legislation is inevitable and will create pressure for more collection

and reuse, through efficient circular systems. Traditionally, FF retailers have directly or indirectly exported their waste to low-income countries, some of which are about to launch import bans. Therefore, FF firms also need new enhanced business models to close the CE loop through a 'fast' return cycle.

We have suggested ideas to urge OM researchers to help charities and FF retailers by introducing innovative business models. **In addition**, several other interacting trends are changing the world of charities and FF retailers. **First**, consumer attitudes change as they buy more FF items and generate more waste, which could be donated or resold. **Second**, consumers are more open to preowned clothes through renting, swapping etc. **Third**, online channels are becoming increasingly common for selling new items and resale by for-profit organizations and individuals. **Fourth**, consumers prefer collectors who can collect on their doorstep. These trends show that charities, FF firms, and CE interplay in a complex and dynamic system with different, sometimes poorly understood and in flux, forces.

While charities are socially important, this paper highlights charities' competitiveness focusing on economic aspects. Some may think when for-profit platforms might operate more efficiently, why we should support charities. Charities (with shops) have a dual social role: (i) employing people who are difficult to employ and enhancing moralities in societies (e.g., cooperation) and (ii) supporting a social cause (e.g., hunger). Therefore, economically efficient charities eventually create social impacts through their cause.

While charities and FF firms should improve their systems based on predictable trends, the advent of the COVID-19 pandemic showed that they also need to increase their resilience against uncertainties. The recent pandemic caused overall demand for charities and FF retailers to fall and many of them had to close their shops, leading to a shift to online selling. Accordingly, **the share of the home collection** has increased significantly, and individuals have raised direct resale from home rather than donating to charities or selling to private firms. The world of fashion is strongly in flux, **offering** multiple research opportunities and challenges for OM researchers.

**Note that different business models discussed in this paper have an environmental and social footprint that is poorly understood. More circularity in textiles does not automatically have a beneficial environmental and social impact.** Levänen et al. (2021) investigate how various CE strategies in forward and reverse SC affect global warming potential (GWP). Considering jean products in EU countries, the researchers study five strategies: two end-of-life scenarios (reduce and recycle), two ownership scenarios (reuse and share) and current practice (base). These strategies are compared in production, delivery, utilization, end-of-life/ second life, and products at the system level. The research shows that the lowest GWP impact is through 'reduce' and 'reuse,' respectively. Surprisingly, 'share' is the worst scenario due to its users' mobility. Even 'recycle' is not recommended due to the energy spent on converting jeans to cotton. Therefore, business models that incur additional transports and operations may have a bigger impact than savings due to reuse. More research is urgently needed to better understand the social and environmental impacts of circular business models to evaluate the impacts of various textile CE strategies correctly. This opens great opportunities for OM researchers and begs for deeper connections with disciplines like industrial ecology (e.g. for lifecycle environmental impact analysis).

**This paper has explored many issues that can be handled by multiple different methodologies/techniques, e.g. case research, econometric analysis, OR optimization models, game-theoretic approaches, etc. Our intention was not to be prescriptive in this since our research colleagues are very innovative in picking out a problem and applying a suitable method. This paper has tried to open a significant and potentially impactful research area**

## REFERENCES

- Abbey, J. D., J. D. Blackburn, and V. D. R. Guide, Jr. (2015a) Optimal pricing for new and remanufactured products, *Journal of Operations Management* 36 130–146.
- Abbey J, Meloy J, Guide D, Atalay S (2015b) Remanufactured products in closed-loop supply chains for consumer goods. *Production Operations Management* 24(3) 488–503.
- Adler, M (2020) Textile Recovery in the U.S., A roadmap to circularity, <https://recycle.com/white-paper-textile-recovery-in-the-us/#:~:text=%E2%80%9CTEXTILE%20RECOVERY%20IN%20THE%20U.S.,that%20ends%20up%20in%20landfills>, visited on 6 October 2020.
- Agrawal V.V., A. Atasu, L.N. Van Wassenhove (2019) OM Forum—New Opportunities for Operations Management Research in Sustainability. *Manufacturing and Service Operations Management* 21(1) 1–250.
- Alev, I., Agrawal, V.V., Atasu, A. (2020). Extended producer responsibility for durable products, *Manufacturing and Service Operations Management*, 22(2): 223–428.
- Alev, I., Atasu, A., Ergun, O., Toktay, L.b. (2021) Extended Producer Responsibility for Pharmaceuticals, *Manufacturing & Service Operations Management*, in press
- Atasu A, Souza G (2013) How does product recovery affect quality choice? *Production Operations Management* 24(4) 991–1010.
- Atasu, A., Subramanian, R. (2012). Extended Producer Responsibility for E-Waste: Individual or Collective Producer Responsibility? *Production & Operations Management*, 21(6): 1042–1059.
- Atasu A, Toktay B, Van Wassenhove L N (2013) How collection cost structure drives a manufacturer’s reverse channel choice. *Production Operations Management* 22(5) 1089–1102.
- Aviv Y., Wei M.M., Zhang F. (2019) Responsive pricing of fashion products: The effects of demand learning and strategic consumer behavior. *Management Science* 65(7) 2982–3000.
- Baladron, J. (2019a) Face-to-face Interview with Recycling Development Manager, TRAIID, 12 November 2019.
- Baladron, J. (2019b) Email Interview with Recycling Development Manager, TRAIID, 13 December 2019.
- Bell D, Gallino S, Moreno A (2014) How to win in an omnichannel world? *MIT Sloan Management Review* 56(1) 45–53.
- Ben-Ner, A. (1986) *Nonprofit organizations: Why do they exist in market economies? In The Economics of Nonprofit Institutions: Studies in Structure and Policy*, Susan Rose-Ackerman (Ed.). Oxford: Oxford Universities Press.
- Berenguer, G., P. Keskinocak, J.G. Shantikumar, J. Swaminathan, L.N. Van Wassenhove (2017) A prologue to the special issue on not-for-profit Operations Management, *Production and Operations Management* 26(6) 973-975.
- Berenguer, G., Z.J.M. Shen (2020) Challenges and strategies in managing non-profit operations: An Operations Management Perspective, *Manufacturing and Service Operations Management* 22(5) 869-1106.
- Boada-Collado, P., V. Martínez-de-Albéniz (2020) Estimating and Optimizing the Impact of Inventory on Consumer Choices in a Fashion Retail Setting, *Manufacturing & Service Operations Management* 22(3) 429-643.
- Brinson, D. (2019a) Online Interview with the Head of Retail, Royal Trinity Hospice, 17 July 2019.
- Brinson, D. (2019b) Email Interview with the Head of Retail, Royal Trinity Hospice, 21 July 2019.
- Brinson, D. (2020) Email Interview with the former Head of Retail, Royal Trinity Hospice, 28 August 2020.
- British Fashion Council (2018) London Fashion Week September 2018 Facts and Figures, <https://www.britishfashioncouncil.co.uk/pressreleases/London-Fashion-Week-September-2018-Facts-and-Figures>, visited on 30 June 2020.
- Brundtland Commission (1987). Report of the World Commission on Environment and Development, United Nations. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>, visited on 10 July 2020.
- Cachon G.P. (2020) A research framework for business models: What is common among fast fashion, E-tailing, and ride sharing? *Management Science* 66(3) 1005–1507.
- Cachon GP, Gallino S, Olivares M (2019) Does adding inventory increase sales? Evidence of a scarcity effect in us automobile dealerships. *Management Science* 65(4) 1469–1485.
- Cachon G.P., Swinney R. (2011) The value of fast fashion: Quick response, enhanced design, and strategic consumer behavior. *Management Science* 57(4) 778–795.
- CAF (Charity Aid Foundation) (2018) World Giving Index, A global view of giving trends, [https://www.cafonline.org/docs/default-source/about-us-publications/caf\\_wgi2018\\_report\\_webnopw\\_2379a\\_261018.pdf?sfvrsn=c28e9140\\_4](https://www.cafonline.org/docs/default-source/about-us-publications/caf_wgi2018_report_webnopw_2379a_261018.pdf?sfvrsn=c28e9140_4), visited on 7 July 2020.
- Caro F., Gallien J. (2010) Inventory management of a fast-fashion retail network. *Operations Research* 58(2) iii–

- Caro F., Gallien J. (2012) Clearance pricing optimization for a fast-fashion retailer. *Operations Research* 60(6) iii–1565.
- Charity Commission (2020) Charities in England and Wales – 31 December 2019, <http://apps.charitycommission.gov.uk/showcharity/registerofcharities/SectorData/SectorOverview.aspx>, visited on 21 September 2021.
- Chaudhuri, S. (2019) Why Your Used Shirts Are Destined for the Dump and Not the Recycling Center, *The wall street journal*, <https://www.wsj.com/articles/why-your-used-shirts-are-destined-for-the-dump-and-not-the-recycling-center-11570008602>, visited on 21 September 2021.
- Chen, Y. (Allen) (2021) Email Interview regarding fashion circular economy in Asia, June 2021.
- Chiu, C.-H., C. Tsan-Ming, X. Dai, B. Shen, J.-H. Zheng (2018) Optimal Advertising Budget Allocation in Luxury Fashion Markets with Social Influences: A Mean-Variance Analysis, *Production and Operations Management* 27(8) 1611-1629.
- Circular (2020) UK named fourth largest textile waste producer in Europe, For Resource and Waste Professionals, <https://www.circularonline.co.uk/news/uk-named-fourth-largest-textile-waste-producer-in-europe/>, visited on 7 July 2020.
- Collinson, P. (2020) UK charity shops sales suffer despite lockdown 'decluttering', Available online on <https://www.theguardian.com/society/2020/aug/15/uk-charity-shops-sales-suffer-despite-lockdown-decluttering>, Last visited on 9 July 2021.
- CRA (2020 a) About us, The Charity Retail Association, <https://www.charityretail.org.uk/about-us/>, visited on 15 October 2020.
- CRA (2020 b) Charity shops FAQs, The Charity Retail Association, <https://www.charityretail.org.uk/charity-shops-faq/>, visited on 15 October 2020.
- CRA (2020c) Charity shop numbers, The Charity Retail Association, <https://www.charityretail.org.uk/charity-shop-numbers/>, visited on 1 June 2020.
- DeLong, M.R. (2021) Theories of Fashion, <https://fashion-history.lovetoknow.com/fashion-history-eras/theories-fashion>, Last accessed on 17 July 2021.
- Dharshini, D. (2019) The real price of buying cheap clothes, Economics correspondent, <https://www.bbc.co.uk/news/business-49248921>, Visited 15 October 2020.
- de Brito, M.P., R. Dekker (2004) A framework for reverse logistics, Springer, Berlin
- Degraeve Z., Vandebroek M. (1998) A mixed integer programming model for solving a layout problem in the fashion industry. *Management Science* 44(3) 285–432.
- Donohue, K. L. (2000) Efficient supply contracts for fashion goods with forecast updating and two production modes. *Management Science* 46(11) 1385–1512.
- ECAP (2018) European Clothing Action Plan, Used textile collection in European cities (March 2018), [http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities\\_full-report\\_with-summary.pdf](http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities_full-report_with-summary.pdf), visited on 30 June 2020.
- Eco-TLC (2018) Annual Report, [https://www.ecotlc.fr/ressources/Documents\\_site/EcoTLC\\_2018-Annual-Report\\_web.pdf](https://www.ecotlc.fr/ressources/Documents_site/EcoTLC_2018-Annual-Report_web.pdf), Visited on 13 March 2020.
- Elks J (2014) With Timbuk2's "life cycle," customers can reuse, repair, recycle and reimagine its products. *Sustainable Brands* (23 April), <https://sustainablebrands.com/read/collaboration-cocreation/with-timbuk2-s-life-cycle-customers-can-reuse-repair-recycle-and-reimagine-its-products>, Accessed 6 March, 2020.
- Emma Safety Footwear (2020) Circular footwear alliance, <https://www.emmasafetyfootwear.com/news/circular-footwear-alliance-en>, Accessed 6 November, 2020
- EMF (2013) Towards the circular economy: Opportunities for the consumer goods sector. Accessed June 30 2021, [https://www.ellenmacarthurfoundation.org/assets/downloads/publications/TCE\\_Report-2013.pdf](https://www.ellenmacarthurfoundation.org/assets/downloads/publications/TCE_Report-2013.pdf), visited on 30 June 2021.
- EMF (2017a) A new textiles economy: Redesigning fashion's future, <https://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashions-future>, visited on 30 June 2021.
- EMF (2017b) Circular Design, <https://www.ellenmacarthurfoundation.org/explore/circular-design>, visited on 30 June 2021.
- EMF (2017c) Cradle to cradle design of carpets, <https://www.ellenmacarthurfoundation.org/case-studies/cradle-to-cradle-design-of-carpets>, visited on 30 June 2021.

- EMF (2017d) MUD Jeans: Pioneering a lease model for organic cotton jeans, <https://www.ellenmacarthurfoundation.org/case-studies/pioneering-a-lease-model-for-organic-cotton-jeans>, visited on 30 June 2021.
- EMF (2017e) The final stop for quality furniture, <https://www.ellenmacarthurfoundation.org/case-studies/the-final-stop-for-quality-furniture>, visited on 30 June 2021.
- EMF (2019) Bundles, <https://www.ellenmacarthurfoundation.org/case-studies/internet-enabled-pay-per-wash-a-model-offering-multiple-benefits>, visited on 30 June 2021.
- Esenduran G., Lauren X.L., Jayashankar M.S. (2020b) Buyback pricing of durable goods in dual distribution channels. *Manufacturing and Service Operations Management* 223–428.
- Esenduran G., Lin Y., Xiao W., Jin M. (2020a) Choice of e-waste recycling standard under recovery channel competition. *Manufacturing and Service Operations Management* 429–643.
- European Commission (1976), *The Potential for Substituting Manpower for Energy*, European Commission, Brussels.
- Fashion and Revolution (2020) Available online on <https://www.fashionrevolution.org/the-impact-of-covid-19-on-the-people-who-make-our-clothes/>, last visited on 8 July 2021.
- Ferguson ME, GC Souza (2010) *Closed-loop supply chains: new developments to improve the sustainability of business practices*, Taylor and Francis Group, New York.
- Fisher M., Rajaram K., Raman A. (2001) Optimizing inventory replenishment of retail fashion products. *Manufacturing and Service Operations Management* 3(3) 175–271.
- Fisher M., Rajaram K. (2000) Accurate retail testing of fashion merchandise: Methodology and application, *Marketing Science* 19(3) 203–296.
- Fleischmann M., Beullens P., Bloemhof-Ruwaard J., Van Wassenhove L.N. (2001) The impact of product recovery on logistics network design. *Production Operations Management* 10(2)156–173.
- Gao F, Su X (2016) Online and offline information for omnichannel retailing. *Manufacturing and Service Operations Management* 19(1) 84–98.
- Garvin, D.A. (1987) Competing on the eight dimensions of quality, *Harvard Business Review*, <https://hbr.org/1987/11/competing-on-the-eight-dimensions-of-quality>, visited on 11 August 2020.
- GFA (Global Fashion Agenda) (2020) 2020 Commitment, Copenhagen Fashion Summit 2017, <https://globalfashionagenda.com/commitment>, visited on 11 July 2020.
- Giving USA (2018), Giving Statistics, The Annual Report on Philanthropy, <https://www.charitynavigator.org/index.cfm?bay=content.view&cpid=42#:~:text=Total%20giving%20to%20charitable%20organizations,%3A%201987%2C%202008%20and%202009>, 7 October 2020.
- Gui, L., Atasu, A., Ergun, Ö., Toktay, L.B. (2016). Efficient implementation of collective extended producer responsibility legislation. *Management Science* 62(4) 1098–1123.
- Gui, L., Atasu, A., Ergun, Ö., Toktay, L.B. (2018) Design incentives under collective extended producer responsibility: A Network Perspective. *Management Science* 64(11) 5083–5104.
- Guide Jr., V.D.R., Gunes, E.D., Souza, G.C., van Wassenhove, L.N. (2008) The optimal disposition decision for product returns, *Operations Management Research* 1(1) 6–14.
- Guide Jr., V.D.R., Souza, G.C., Van Wassenhove, L.N., Blackburn, J.D. (2006) Time value of commercial product returns, *Management Science* 52(8) 1200–1214.
- Guide Jr., V.D.R., Van Wassenhove, L.N. (2009) OR FORUM—The Evolution of closed-loop supply chain research, *Operations Research* 57(1) ii–260.
- Hardy, M. (2020) Email Interview with Circular Economy Director, ECO-TLC (France), 04 September 2020.
- Hartmann, J., Sabine Moeller (2014) Chain liability in multitier supply chains? Responsibility attributions for unsustainable supplier behavior. *Journal of Operations Management* 32(5) 281–294.
- Hasbun, R. (2019) Top 10 European Fashion Retailers of 2019, <https://www.bllush.com/top-10-european-fashion-retailers-of-2019/>, visited on 11 July 2020.
- Hilton, T. (2020) Online Interview with Founder and Managing Director, Charity Fleetcare, 26 June 2020.
- House of Commons (Environmental Audit Committee) (2019) Fashion: It shouldn't cost the earth, Fixing fashion: clothing consumption and sustainability, Sixteenth Report of Session 2017–19 (HC 1952), <https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/report-summary.html>, Accessed 10 March 2020.
- Howland, D. (2017) 'Ultra-fast' fashion players gain on Zara, H&M, <https://www.retaildive.com/news/report-ultra->

- [fast-fashion-players-gain-on-zara-hm/443250/](#), visited on 10 July 2020.
- Huang, X., Atasu, A., Toktay, L.B. (2019) Design implications of extended producer responsibility for Durable Products. *Management Science* 65(6) 2573–2590.
- James, E. (1983) *How Nonprofits Grow: A model*, *Journal of Policy Analysis and Management*, 2: 350-65.
- Kelcher, M. (2020) Charity shops: the ethical and sustainable alternative to fast fashion, The Charity Retail Association, <https://www.charityretail.org.uk/charity-shops-the-ethical-and-sustainable-alternative-to-fast-fashion/>, visited on 24 August 2020.
- King, J. (2020) Online interview with the Executive Director of Secondary Materials and Recycled Textiles Association (SMART), 2 October 2020.
- Kunz N., Mayers K., Van Wassenhove L.N. (2018) Stakeholder views on extended, producer responsibility and the circular economy, *California Management Review* (Special Issue on the Circular Economy) 60(3) 45–70.
- Kuwonu, F. (2019) Protectionist ban on imported used clothing, US threatens East Africa with AGOA expulsion, <https://www.un.org/africarenewal/magazine/december-2017-march-2018/protectionist-ban-imported-used-clothing>, 11 October 2020.
- Levänen J., V. Uusitalo, A. Härrä, E. Kareinen, L. Linnanen (2021) Innovative recycling or extended use? Comparing the global warming potential of different ownership and end-of-life scenarios for textiles, *Environmental Research Letters* 16(5) 054069.
- Lindhqvist, T., K. Lidgren (1990) *Models for Extended Producer Responsibility*, 26 October 1990, published by the Ministry of the Environment in “From the Cradle to the Grave - six studies of the environmental impact of products,” in Swedish, DC 1991:0.
- Lowson, B., R. King, and A. Hunter (1999) *Quick Response - Managing the supply chain to meet consumer demand*. Chichester: Wiley.
- McKeever B., Gaddy M. (2016) The non-profit workforce: By the numbers, <https://nonprofitquarterly.org/nonprofit-workforce-numbers/>, visited on 1 June 2020.
- Mintel (2021) *Fashion & Sustainability, Increase in the number of people shopping for fashion online*, <https://reports-mintel-com.roe.idm.oclc.org/display/1097473/?fromSearch=%3Ffreetext%3DUK%2520Fashion%2520Online%2520Market%2520Report%25202020>, visited on 22 September 2021.
- Mud Jeans (2020) It’s time to rethink what we consume and how we produce. <https://mudjeans.eu/lease-a-jeans/>, visited on 18 July 2020.
- Šajin, N. (2019) Environmental impact of the textile and clothing industry, European Parliamentary Research Service (EPRS) PE 633.143 – January 2019. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS\\_BRI\(2019\)633143\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf), visited on 7 July 2020.
- Saunders, M., P. Lewis, A. Thornhill (2019), *Research Methods for Business Students*, Pearson (8th edition).
- Sillars, J. (2021) COVID-19: ASOS profits leap 275% as pandemic restrictions drive fashion sales online, Available online on <https://news.sky.com/story/covid-19-asos-profits-leap-275-as-pandemic-restrictions-drive-fashion-sales-online-12268971>, last visited on 8 July 2021.
- OECD (The Observatory of Economic Complexity) (2018) Product Trade, Exporters and Importers, <https://oec.world/en/profile/hs92/6309/>, 6 October 2020.
- Orendorff, A. (2021) *The State of the Ecommerce Fashion Industry: Statistics, Trends & Strategy*, <https://www.shopify.com/enterprise/ecommerce-fashion-industry>, visited on 22 September 2021.
- Osterley, R. (2019a) Email Interview with Chief Executive, Charity Retail Association, 21 July 2019.
- Osterley, R. (2019b) Face-to-face Interview with Chief Executive, Charity Retail Association, 30 April 2019.
- Osterley, R. (2020) Email Interview with Chief Executive, Charity Retail Association, 28 August 2020.
- Oxfam (2020) Gift Aid your goods, <https://www.oxfam.org.uk/donate/donate-goods/gift-aid-your-goods>, visited on 15 July 2020.
- Polhemus, T. (1994) *Streetstyle: From Sidewalk to Catwalk*. London: Thames and Hudson, Inc., 1994.
- Rauturier S. (2020) The 22 ethical and sustainable fashion terms you need to know, <https://goodonyou.eco/sustainable-fashion-glossary/>, visited on 27 June 2020.
- Sabanoglu, T. (2019) Average value of unworn clothing in UK wardrobes 2019, Statista, <https://www.statista.com/statistics/970513/unworn-clothing-british-men-and-women/>, visited on 14 October 2020.



- Sandvik, I.M., Stubbs, W. (2019) Circular fashion supply chain through textile-to-textile recycling, *Journal of Fashion Marketing and Management* 23(3) 366–381.
- Savaskan C, Bhattacharya S, Van Wassenhove L N (2004) Closed-loop supply chain models with product remanufacturing, *Management Science* 50(2) 239–252.
- Servaes, H., Ane Tamayo (2013) The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science* 59(5) 1045–1061.
- SMART (2017) Tap into the world's SMARTEST marketplace, <https://www.smartasn.org/SMARTASN/assets/File/resources/SMART-BY-THE-NUMBERS-banner.pdf>, visited on 6 October 2020.
- Souza, G.C. (2012) *Sustainable Operations and Closed-Loop Supply Chains*, Business Expert Press, New York.
- Trigg, A.B. (2001) Veblen, Bourdieu, and Conspicuous Consumption, *Journal of Economic Issues* 35(1) 99-115.
- Thomas, D. (2019) The high price of fast fashion, *The Wall Street Journal*, <https://www.wsj.com/articles/the-high-price-of-fast-fashion-11567096637>, visited 15 October 2020.
- Thredup (2020a) 2020 Resale Report, <https://www.thredup.com/resale/#resale-growth>, visited on 4 November 2020.
- Thredup (2020b) 2020 Resale Report, [https://www.thredup.com/resale/2019?tswc\\_redir=true](https://www.thredup.com/resale/2019?tswc_redir=true), visited on 13 October 2020.
- TRA (Textile Recycling Association) (2018) Written evidence submitted by the Textile Recycling Association, <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/sustainability-of-the-fashion-industry/written/87877.html>, visited on 30 June 2020.
- TRA (Textile Recycling Association) (2020) Welcome to the Textile Recycling Association, <https://www.textile-recycling.org.uk/>, visited on 18 August 2020.
- TRAID (2020) Find a bank, <https://www.traid.org.uk/clothes-donations/find-a-bank/>, visited on 15 July 2020.
- Tweddle, A. (2018) 10 business benefits of partnering with a charity, <https://www.cbtrust.org.uk/2018/06/25/10-business-benefits-of-partnering-with-a-charity/>, 23 November 2020.
- UK Parliament (2019) Interim report on the sustainability of the fashion industry contents, [https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1148/114804.htm#\\_idTextAnchor005](https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1148/114804.htm#_idTextAnchor005), visited on 11 July 2020.
- Valentinov, V. (2008). *The Economics of Nonprofit Organization: In Search of an Integrative Theory*. *Journal of Economic Issues* 42(3) 745-761.
- van Loon, P. and L.N. Van Wassenhove (2020) Transition to the circular economy: the story of four case companies, *International Journal of Production Research*, 58(11) 3415–3422.
- van Veldhoven, S. (2020) Circular is going global, [https://hollandcircularhotspot.nl/wp-content/uploads/2018/06/LR\\_2033\\_HCH\\_Magazine\\_210x297mm\\_COMPLEET.pdf](https://hollandcircularhotspot.nl/wp-content/uploads/2018/06/LR_2033_HCH_Magazine_210x297mm_COMPLEET.pdf), Accessed 6 November, 2020.
- Vijgeboom, D. (2019) Interview with the Co-Owner of Mud Jeans international BV, 9 August 2019.
- Leal Filho, W., D. Ellams, S. Han, D. Tyler, V.J. Boiten, A. Paço, H. Moora, A. Balogun (2019) A review of the socio-economic advantages of textile recycling, *Journal of Cleaner Production* 218(1) 10–20.
- Wheeler, A. (2020) Email Interview with the director of the Textile Recycling Association, 13 March 2020.
- Winmark (2017) What's Your Closet Worth? <https://www.winmarkfranchises.com/blog/2017/march/whats-your-closet-worth-/#:~:text=According%20to%20Alliance%20Data%2C%2025,being%20worth%20up%20to%20%245%2C000>, visited on 14 October 2020.
- Wood, L. (2021) *Global Fast Fashion Market Report (2021 to 2030) - COVID-19 Growth and Change - ResearchAndMarkets.com*, <https://www.businesswire.com/news/home/20210524005342/en/Global-Fast-Fashion-Market-Report-2021-to-2030---COVID-19-Growth-and-Change---ResearchAndMarkets.com>, last visited on 8 July 2021.
- WRAP (2019a) As the UK buys more clothes, the SCAP 2020 continues to lead the trend for sustainable clothes, <http://www.wrap.org.uk/content/uk-buys-more-clothes-scap-2020-continues-lead-trend-sustainable-clothes>, visited on 1 June 2020.
- WRAP (2019b) WRAP textiles: Market situation report 2019, <https://www.wrap.org.uk/sites/files/wrap/Textiles%20market%20situation%20report%202019.pdf>, visited on 15 October 2020.

## ONLINE APPENDIX

### APPENDIX A1: Major fast fashion firms and their country of origin.

Countries (alphabetical)	Brand
Australia	Cotton On
Belgium-Germany-Netherlands	C&A
Brazil	Renner
	Riachuelo
China	Metersbonwe
Denmark	Bestseller
Germany	New Yorker
	s. Oliver
	Shasa
Hong Kong	Giordano
Hong Kong- Germany	Esprit
Ireland	Primark
Italy	United Colors of Benetton
Japan	FIVE FOXes
	Uniqlo
Spain	Inditex
	Mango (clothing)
	Massimo Dutti
	Oysho
	Pull & Bear
	Uterqüe
	Zara
	Bershka (Inditex)
Stradivarius (Inditex)	
Sweden	H&M
UK	Next
	ASOS.com
	Boohoo
	Miss Selfridge
	Missguided
	New Look
	Peacocks
	PrettyLittleThing
	River Island
Topshop	
US	Charlotte Russe
	Fashion Nova
	Forever 21
	Gap Inc.
	Nasty Gal
	Rainbow Shops
Urban Outfitters	

**APPENDIX A2: Fashion clothes collectors and recyclers in China, Hong Kong and Japan.**

<b>Type</b>	<b>Organization</b>	<b>Description</b>
<b>Domestic fashion brands</b>	SeptWolves (China)	SeptWolves is a famous men’s wear brand based in Xiamen, China. In 2018, the company launched a campaign to collect unwanted clothes from the brand. The company offered a voucher of RMB 100 for each consumer to encourage them to take the unwanted clothes to SeptWolves shops for being collected. As announced by the company, all the collected clothes would be donated to charity organizations for reusing and recycling.
	Bosideng (China)	Bosideng is the largest down apparel brand in China, based in Shanghai. The company is the initiator of the campaign named ‘Zero Discard for Worn Clothes’, which was co-launched by The Ministry of Civil Affairs of China, China National Textile and Apparel Council, and China Ecological Civilization Research and Promotion Association in 2014. Bosideng established the collecting points in their flagship shops in Beijing to collect the unwanted clothes of any brand with the incentives of discount coupons and vouchers. The campaign’s purpose was to integrate the industrial resources and social charity and public welfare undertakings by encouraging the domestic fashion brands to collect the used clothes, which was an exploration of the cooperation among fashion brands, consumers, charity organizations, and R&D institutions within a closed-loop system. As for the collected clothes, if the conditions of the clothes are acceptable, the clothes would be donated for the charity project for western China; if the conditions of the clothes are below the standards, the clothes would be recycled for producing the fabric materials.
	Inman (China)	Inman, based in Guangzhou, is a rapidly developing local women’s fashion brand in China with huge sales volumes. Since 2016, Inman has launched the public welfare activity name ‘Reborn with Clothes’ with some local association and environment-protecting organizations, which was further developed into a platform integrating unwanted clothes collection and redesigning and reusing the collected clothes. Aligning with Alipay and Xianyu, Inman promoted the campaign in omnichannel and social platforms with coupons and virtual benefits offered by Alipay to collect unwanted clothes with convenience. Furthermore, since 2016, Inman held the exhibition of environment protection to demonstrate the redesigned work with the collected clothes every year. Besides, some of the collected clothes would be sent to Hengfeng Textile, the industrial co-operator, to transfer the clothes into renewable cotton to produce relevant products.
	Aimer (China)	Aimer is a popular lady’s underwear brand in China, based in Beijing. In 2019, Aimer launched an ‘old trade-in for new’ campaign to collect unwanted underwear with a 12%-off discount coupon. However, as addressed by the company, most of the collected underwear would be recycled for transferring into new energy for heating and generating electricity instead of putting for reuse.
	La Chapelle (China)	La Chapelle is a listed fashion company in China based in Shanghai. In 2018, La Chapelle launched a promotion to offer a coupon of RMB 100 for each consumer to collect unwanted clothes from all the company’s brands. The collected clothes would be donated for charity.
<b>Global fashion brands</b>	H&M (in HK)	As for overseas fashion brands, H&M and Uniqlo play active roles in this area. Their operations are similar to what they are doing in other regional markets. The difference is that they may seek some cooperation with local organization institutions and e-platforms to smooth the process of collecting unwanted clothes.
	H&M, Zara, and Uniqlo (HK)	In Hong Kong, H&M, Zara, and Uniqlo all collect unwanted clothes. H&M offers coupons to encourage consumers to return their unwanted clothes of any brand or quality. The collected clothes will be divided into three clusters as ‘re-wear’, ‘reuse’ and ‘recycle’ for further treatments. Zara collects unwanted clothes similar to H&M, while the collected clothes will be donated to non-profit organizations. Uniqlo only accepts the unwanted clothes of Uniqlo, which will be donated to those who need them.
<b>Retailers and platforms</b>	Alibaba (China)	Alibaba penetrates collecting unwanted clothes by launching White Whale in Alipay as a portal for collecting unwanted clothes and collecting unwanted clothes in Xianyu, the biggest platform for second-hand item trading in China. According to the data demonstrated by Xianyu, many university students tend to use Xianyu to donate their unwanted clothes, and the collected clothes will be transformed into materials to produce sound-proof cotton and renewable fabric.

	Mayi (China)	Mayi is a specialized e-platform to collect unwanted clothes for charity purposes. The company is based in Shanghai, China, the first professional platform to collect unwanted clothes with an Internet presence. Mayi has established a wide-covering network cooperating with a list of fashion brands, charity organizations, and universities. The collected clothes will be divided into several categories. Those with fairly good conditions and quality will be donated to charity or delivered to the business entities to export to Africa. Those with poor conditions and quality will be recycled and degraded to raw industrial materials for reproduction.
	JD (China)	JD is the leading e-commerce platform in China. In 2017, JD launched an event to collect unwanted clothes as part of their sustainability promotion – Sustainable Blue Earth Week. The event was held together with The United Nations Development Programme (UNDP), China National Textile And Apparel Council (CNTAC), and China Social Welfare Foundation (CSWF). The event covered eight major cities in China, including Beijing, Shanghai, Guangzhou, Shenzhen, Chengdu, Xi’an, Wuhan, and Shenyang. Consumers could call the service center of JD Logistic to ask for a free pick-up service to deliver their unwanted clothes. The collected clothes were donated for charity or degraded and transformed into renewable materials.
	Decathlon (China)	Decathlon, the French sports products retailer, also joined the ‘Zero Discard for Worn Clothes’ campaign. Consumers could return their unwanted clothes to the specific blue cartoons in Decathlon shops. Cooperating with several industrial companies and governmental R&D centers, Decathlon put most of the collected clothes sorted, recycled, degraded, and reused in environmentally friendly approaches.
<b>Charities</b>	Major Chinese	In mainland China, as for sharing the collected preowned clothes, the fashion firms, retailers, and platforms collect the unwanted clothes then deliver them to the official charity organization at the official level. The charity organizations will further arrange the donation of the wearable preowned clothes. Another approach is spontaneous sharing within the community. Organized by the community administration staff, spontaneous sharing is held monthly in different regional communities. The residents bring their unwanted clothes to the location, which other residents may freely take.
	Major HK charities	Some organizations also collect unwanted clothes for charity purposes in Hong Kong, such as Friends of the Earth (HK), The Conservancy Association, The Salvation Army Hong Kong and Macau, and Christian Action.
<b>Private collectors</b>	China	On the other hand, many private collectors actively involve in this area with different business models. Some private companies source the preowned clothes and resell the collected clothes in domestic retail markets after sorting and sterilizing the clothes. Another group of private companies, including some agents, collects preowned clothes and exports them to the overseas market, especially in Africa.

### **APPENDIX A3: Summary of Major Findings.**

- The CE stakeholders and processes in the textile SC are almost the same for all fashion firms, nations and globally.
- For different reasons, FF firms would like to contribute in collecting their preowned clothes;
- Most FF firms are financially supporting charities for their socially conscious image (but not through their CE);
- While FF firms would like to collect their unwanted clothes,
  - their collection and sorting capacity is far below their supply;
  - they are not willing the preowned clothes to be sold in their primary markets.
- Unlike some slow fashion firms, FF firms have not reached a proven business model to collaborate with charities;
- The major costly activities in textile CE is related to its collection, sorting and selling;
- Charities have strong support from volunteers and governments' tax exemption. However, lack of sufficient skills and efficiency affect their competitiveness against private collectors and recyclers;
- While different countries use all collection modes, they mostly rely on charity collection and bank collection;
- It is predicted that in the future, the home collection will be the preferred collection mode;
- Unlike many perceive, some charities prefer FF products to others because of their updated design and less staleness.
- Online fashion retailers are more resilient than physical retailers against pandemics like COVID-19. With the same selling modes, the fashion business is less vulnerable than FF business.
- Charity shops are highly vulnerable to pandemics. However, charities that can switch to home collection and home delivery can survive.