Master's Thesis – Master in Sustainable Business and Innovation
Faculty of Geosciences, Utrecht University

DRIVERS AND BARRIERS FOR THE ADOPTION OF THE REUSE BUSINESS MODEL STRATEGY

By

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Supervised by Dr. T. J. F. Bauwens

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Abstract

The reuse business model strategy (RBMS) is the highest-ranking circular business model strategy (CBMS) focussed on slowing down the flow of resources and is thus crucial for transitioning towards a circular economy. Therefore, it is important to uncover strategy-specific drivers and barriers that influence the adoption of the RBMS. Once this information is clear, it will be easier to accelerate the transition towards the circular economy. Consequently, this research examines the drivers and barriers for the RBMS. More specifically, this research looks into the difference between the drivers and barriers for start-ups and established companies adopting a RBMS. Seeing that start-ups and established companies play a different role in the transition towards the circular economy, it is expected that they face different barriers with regards to the adoption of the RBMS. Therefore, the following research question is answered: *what are the drivers and barriers for the adoption of the reuse business model strategy by start-ups and by already established companies?* By means of twenty semi-structured interviews with start-ups, established companies, experts, researchers, and consumers, data was collected. This data was then analysed by means of a qualitative, directed content analysis. The results are presented in a frequency table and thoroughly discussed. Start-ups seem to be mostly internally driven to adopt a RBMS, whereas established companies seem to adopt the RBMS as a way to cope with external changes. However, although they do face differing barriers, the specific barriers seem to stem from corresponding, overarching meta-barriers: 1) a complete and set ecosystem (e.g., reverse logistics and washing facilities) is missing for companies to make use of, 2) disposables are cheap compared to reusables, 3) proper information on the different circular business model strategies is missing, and 4) it remains hard to incentivise consumers to actually return the reusable packaging. The findings suggest that these meta-barriers are the culprit of the majority of the more specific barriers start-ups and established companies face. Therefore, recommendations are given to overcome these meta-barriers: 1) boost industry collaboration, 2) develop standards and guidelines for reusable packaging, 3) disperse information about the RBMS, 4) create more effective policies favouring the RBMS and disadvantaging disposable packaging, and 5) increase governmental efforts to lead the way and advocate for the RBMS.

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List of abbreviations

Abbreviation	Explanation
BM	Business model
CBM	Circular business model
CBMS	Circular business model strategy
CE	Circular economy
RBMS	Reuse business model strategy
SUPD	Single-use Plastics Directive

1 Introduction

Human impact on crucial planetary processes poses an urgent threat to human society, with possible deleterious or even disastrous consequences (Rockström et al., 2009; Steffen et al., 2007, 2018). So far, this impact has been causing (amongst others) climate change, biodiversity loss, ocean acidification, water, air, and soil pollution, and resource depletion (Geissdoerfer et al., 2017; Rockström et al., 2009). Changes in human activities are needed to stop and possibly reverse these negative consequences (Steffen et al., 2018). Therefore, according to scholars (e.g., Bocken et al., 2016; Geissdoerfer et al., 2017; Murray et al., 2017; Ranta et al., 2018; Stahel, 2016), institutions (e.g., Circle Economy, 2019; Ellen MacArthur Foundation, 2019), and governmental bodies (e.g., European Commission, 2020a), we must transition towards a circular economy (CE). A CE can be defined as an economic system that revolves around "reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, […] with the aim to accomplish sustainable development, […] to the benefit of current and future generations" (Kirchherr et al., 2017, pp. 224–225). Such an economy is completely different from the current global economy, which is structured around a linear 'take-make-use-dispose' model: resources are extracted from the earth to manufacture products, which are eventually discarded by the end users (Andrews, 2015; Bocken et al., 2016). Seeing that this linear economy is highly unsustainable (Murray et al., 2017), transitioning towards a CE represents a promising approach to combatting the threat to our society (Circle Economy, 2019; Ranta et al., 2018).

In transitioning towards a CE, the private sector plays an important role as changes in business models (BMs) are key to accomplishing a CE (Evans et al., 2017; Geissdoerfer, Morioka, et al., 2018; Henry et al., 2020; Pieroni et al., 2019; Veleva & Bodkin, 2018). Such changes are effectuated via implementing circular business model strategies (CBMSs). Although there are many CBMSs, some are more circular than others due to a higher value retention of resources or products (Henry et al., 2020; Kirchherr et al., 2017; Reike et al., 2018). Retaining maximum value of resources or products over the longest period of time is done by slowing down the flow of resources (Bocken et al., 2016). The reuse business model strategy (RBMS) is the highest-ranking CBMS focussed on slowing down the flow of resources and is therefore crucial for transitioning towards a CE (Bocken et al., 2016; Reike et al., 2018). By definition, the RBMS is concerned with bringing products back into the economy after initial use; thus extending the lifespan of products (Henry et al., 2020; Kirchherr et al., 2017; Reike et al., 2018). An example is a reusable cup system where consumers get their on-the-go coffee in a reusable cup that they later hand in at a convenient collection point; the cup will undergo quality inspection and cleaning, before redistribution to another consumer.

Interestingly, compared to other CBMSs (e.g., reduce and recycle), the RBMS is understudied (Delanoeije & Bachus, 2020). Although there are a few research papers dedicated to reusing specific goods (e.g., Farrant et al., 2010; Kissling et al., 2013; Thomas, 2011; Truttmann & Rechberger, 2006),

research into the general use of the RBMS is lacking (Delanoeije & Bachus, 2020). Consequently, the drivers and barriers specific to the adoption of the RBMS are also understudied. So far, such drivers and barriers have only been studied from a generic CE perspective (Guldmann & Huulgaard, 2020; Vermunt et al., 2019) without differentiating between CBMSs. For example, research has been performed on the general (e.g., de Jesus & Mendonça, 2018; Linder & Williander, 2017; Pheifer, 2017; Preston, 2012), region-specific, and sector-specific (e.g., Dekoninck et al., 2016; Kirchherr et al., 2018; Matus et al., 2012; Pan et al., 2015; Ranta et al., 2018; Shahbazi et al., 2016; van Buren et al., 2016) drivers and barriers for adopting the CE. However, little research has focussed on differentiating between drivers and barriers for different CBMSs. This is problematic since "ignoring the possibility of such differences could lead to unjustified generalizations about the barriers to implementing [CBMSs]" (Vermunt et al., 2019, p. 891), which could hinder the transition towards a CE. Therefore, it is important to look into the specific CBMSs to uncover strategy-specific drivers and barriers that affect adoption. Once this information is clear, it will be easier to accelerate the transition towards a CE.

Wanting to contribute to uncovering strategy-specific drivers and barriers to help the transition towards the CE, this research deep dives into the drivers and barriers for the crucial – yet understudied – RBMS. More specifically, this research looks into the difference between the drivers and barriers for start-ups adopting a RBMS and the drivers and barriers for already established companies adopting a RBMS, as these groups are likely to come across different ones (Guldmann & Huulgaard, 2020). For example, start-ups tend to have difficulties finding resources for the reverse logistics necessary for a reusable system (Veleva & Bodkin, 2018), whilst established companies may run into market cannibalisation as reusable products will compete with their existing lines of products (Abbey et al., 2015). Since start-ups and established companies play a different role in economical transitions (Schot & Geels, 2008), they should be looked at separately. To find out the specific drivers and barriers that these two groups experience, twenty semi-structured interviews were conducted. Then, using these interviews to build upon a framework based on research by Vermunt et al. (2019), Coelho et al. (2020) and Mont (2002), the following research question was answered:

What are the drivers and barriers for the adoption of the reuse business model strategy by start-ups and by already established companies?

The results of this research provide information that can be useful for positively changing the landscape in which companies that have a or want to adopt a RBMS currently reside within. This is because, by uncovering what drives and hinders start-ups and established companies in adopting the RBMS, lessons can be learned about how to positively change the landscape in a way that favours the adoption of the RBMS. Previous research has mainly focussed on bettering the adoption environment for the CE in general. However, in order to overcome unjustified generalisations (Vermunt et al., 2019), it is deemed important to focus on the adoption of specific CBMSs, also distinguishing between adoption by start-

ups and adoption by established companies. Consequently, this research provides governments, policymakers, investors and other change makers with elaborate information on where to focus their efforts in order to stimulate a more favourable landscape for start-ups and established companies that are trying to adopt a RBMS. Therefore, in this research, recommendations are given on how to positively change this landscape. As this will most likely result in higher adoption of the RBMS, which is one of the highest-raking CBMSs, acceleration of the transition towards a CE is expected to happen.

The research proposal is structured as follows. After this introduction, the *theory* chapter presents a brief outline of the theory that this research builds upon. It establishes important concepts and the coding framework that are utilised for this research. Then afterwards, the *methodology* chapter presents all the steps of the methodological approach. It explains how the research question was answered and why the specific methodological approach was chosen. In the *results* chapter, the interviews are analysed. Following this chapter, the research is discussed in the *discussion* chapter, and concluded in the *conclusion* chapter. In here, limitations of this research and recommendations for further research are included.

2 Theory

2.1 Circular business models and strategies

Relying on the literature concerning BMs (e.g., Teece, 2010; Wirtz et al., 2016; Zott et al., 2011), Geissdoerfer, Vladimirova, et al. (2018) define BMs as "simplified representations of the value proposition, value creation and delivery, and value capture elements and the interactions between these elements within an organisational unit" (Geissdoerfer, Vladimirova, et al., 2018, p. 402). Circular business models (CBMs) are BMs in which the principles of the CE are incorporated (Henry et al., 2020). Specifically, CBMs are "circular operations on the micro-level that aim at fully closing product or material loops and thereby making the 'end-of-life' concept obsolete or keeping resources in use for as long as possible through reducing, alternatively reusing, recycling or recovering them" (Henry et al., 2020, pp. 2–3). These strategies of reducing, reusing, recycling and recovering are so-called CBMSs: a general approach for companies towards effectuating the CE (Henry et al., 2020) by focussing on a specific type of value retention (Reike et al., 2018). A lot of research has gone into mapping all CBMSs, which has resulted in many different frameworks (e.g., Bocken et al., 2016; Geissdoerfer et al., 2020; Kirchherr et al., 2017; Reike et al., 2018). However, the 4R framework by Kirchherr et al. (2017) is frequently used in literature on this topic (Henry et al., 2020) and is based upon the European Union Waste Framework Directive (European Commission, 2008, 2020b). Kirchherr et al. (2017) define CBMSs in order from most circular to least circular: reduce, reuse, recycle and recover.

Although reduce is deemed the highest-ranking CBMS by Kirchherr et al. (2017), which revolves around using and manufacturing products in the smartest way possible (Kirchherr et al., 2017; Reike et al., 2018), this CBMS has a downside. Seeing that it is mainly concerned with "using fewer resources

per product" (Bocken et al., 2016, p. 309) through resource efficiency, an important aspect can easily be forgotten: resource efficiency is crucial for effectuating a CE, but, if the flow of resources or products is not simultaneously slowed down, "resource efficiency can easily lead to further speeding up of linear resource flows (selling more of a more efficient product), resulting in very little overall [environmental] savings" (Bocken et al., 2016, p. 310). Therefore, Bocken et al. (2016) argue that resource efficiency is not necessarily always circular and that to retain maximum value of resources or products over the longest period of time, the flow of resources should be slowed down. To do so, the RBMS is key as little to no new resources are needed for reuse of already existing products (Bocken et al., 2016).

2.2 The reuse business model strategy

The RBMS is concerned with bringing products back into the economy after initial use, thus extending the lifespan of products and their parts (Henry et al., 2020; Kirchherr et al., 2017; Reike et al., 2018). There are many different interpretations of this definition of the RBMS (Reike et al., 2018). For example, some interpretations include repairs or refurbishments as being part of the RBMS (Henry et al., 2020; Reike et al., 2018). However, Reike et al. (2018) did an extensive literature review and defined that the RBMS encompasses that reusable products work 'as new' (de Brito & Dekker, 2004), 'with the same purpose' (Bakker et al., 2014; Ghisellini et al., 2016), 'without refurbishment' (Silva et al., 2013), 'without rework' (Srivastava, 2008), and 'without repair' (Fleischmann et al., 1997). Only some quality inspections and cleaning might be required (Reike et al., 2018) before returning the product to the economy after initial use.

Moreover, Coelho et al. (2020) identified four different types of reusable packaging: (1) 'refillable by bulk dispenser', where consumers use refillable packaging (their own or the store's) to refill "in-store or at a mobile truck, making the use of further packaging unnecessary" (Coelho et al., 2020, p. 3); (2) 'refillable parent packaging', where consumers can refill the parent packaging with refill packaging that is made of less material than the parent packaging; (3) 'returnable packaging', where consumers empty the packaging, which will then be cleaned and refilled for reuse; and (4) 'transit packaging' to transport other products to the consumer, and which can be returned after usage.

The RBMS definition by Reike et al. (2018) and the four types of reusable packaging by Coelho et al. (2020) will be leading throughout this research. Additionally, this research will focus solely on reuse by consumers instead of also including reuse by companies. This choice was made because reuse is less frequently seen in the business-to-consumer market and because there is less knowledge on reuse in the business-to-consumer market, compared to the business-to-business market (Coelho et al., 2020).

2.3 Drivers and barriers for the reuse business model strategy

2.3.1 General drivers and barriers

According to Coelho et al. (2020), policy is a huge driver for the RBMS. "Bans of single-use packaging (e.g. Denmark), taxing of single-use packaging systems (e.g. Belgium, Denmark, Finland), or

compulsory deposit systems (e.g. Germany) are policy instruments that have been used" (Coelho et al., 2020, p. 8) to drive the adoption of the RBMS. However, consumer behaviour is an important barrier that hinders this adoption (Coelho et al., 2020; Vermunt et al., 2019). Zimmermann and Bliklen (2020) found that companies making use of RBMSs "identified the customer as the crucial point: returnable packaging systems can only be successful if the return from the customer to the packaging pool is successful" (Zimmermann & Bliklen, 2020, p. 181). In order to get consumers to actually return the reusable products, the RBMS requires a completely different consumer approach than linear BM strategies (Wastling et al., 2018). This is because "the changing aspect of ownership" (Wastling et al., 2018, p. 15) – typical for the CE – has a great impact on consumer experience. Therefore, in order for the RBMS to work, companies need to find ways to incentivise consumers to be active and engaged so that consumers actually return reusable products (Camacho-Otero et al., 2018; Tunn et al., 2019). Until then, consumer behaviour remains a barrier for both start-ups and established companies.

2.3.2 Drivers and barriers for start-ups

Coelho et al. (2020) note that nowadays, there is a growing acceptance in the market for switching to a RBMS. Especially start-ups may benefit from this market driver, seeing that, when they enter the new market, they are "not limited by existing relationships in the supply chain" (Coelho et al., 2020, p. 8). However and interestingly, according to Henry et al. (2020), start-ups tend to embrace the RBMS less frequently than other CBMSs. This could be due to the fact that reverse logistics, which are required for a reuse cycle, are organisationally complex and financially costly (Neely, 2008; Ramanathan, 2011; Ravi et al., 2005; Vermunt et al., 2019). Reverse logistics concern (amongst others) the collection of products, the inspection of their quality, the cleaning of the products, and eventually the redistribution of the products, which is not cheap nor easy for a company to arrange. Consequently, Veleva and Bodkin (2018) conclude that larger companies are more likely to have better resources for reverse logistics, compared to start-ups. Therefore, reverse logistics pose a barrier, specifically for start-ups.

2.3.3 Drivers and barriers for established companies

For established companies, switching to a RBMS could open up a new market with new consumers (Coelho et al., 2020), presenting a driver. Besides, since the RBMS "allows the low-cost introduction of electronic tagging (e.g. RFID)" (Coelho et al., 2020, p. 8), logistics can be simplified and costs for packaging and distribution can be lowered. This offers another driver for adopting the RBMS. However, when an established company decides to adopt the RBMS, there is a realistic concern about market cannibalisation (Abbey et al., 2015). Market cannibalisation is an effect where reusable products will compete with the sales of new, higher-priced products that are not reusable (Abbey et al., 2015). Seeing that most established companies already have existing lines of products that are not specifically made according to the RBMS, market cannibalisation can be especially problematic for them. This is not a problem for most start-ups, as these companies normally do not have existing lines of products that do

not embody the RBMS. Therefore, market cannibalisation is a realistic barrier for established companies. Additionally, established companies are also presented with a barrier regarding reverse logistics. Seeing that "not all distribution systems and supply chains are suitable for the use of reusable packaging systems" (Coelho et al., 2020, p. 8), switching towards a RBMS may present challenges.

2.4 Theoretical framework

Different frameworks exist for researching the drivers and barriers for the adoption of the CE (e.g., de Jesus & Mendonça, 2018; Kirchherr et al., 2018; Ranta et al., 2018; Vermunt et al., 2019). Throughout this research, an adaptation of the framework by Vermunt et al. (2019) will be utilised. Being one of the first to research CBM-specific barriers, Vermunt et al. (2019) developed a framework suitable for doing so, which was based upon research by Mont (2002) and an extensive literature review. However, as their framework focuses solely on researching barriers and omits drivers completely, the framework will be adapted to be made useful for this research by combining research by Coelho et al. (2020).

In Table 1, the adapted framework can be found. First, the barrier-focussed bias was taken out of the descriptions, to make it possible for the descriptions to be a barrier or a driver. Besides, the description "ineffective recycling policies" (Vermunt et al., 2019, p. 893) was transformed into 'availability of (in)effective policies', and "lack of standards and guidelines for quality of refurbishment products" (Vermunt et al., 2019, p. 893) into 'availability of standards and guidelines for quality of reusable products' to focus solely on the RBMS. Additionally, market cannibalisation was added to the list of market drivers/barriers, as this is important but not yet mentioned. Moreover, where Vermunt et al. (2019) split their institutional category into sub-categories to differ between formal (e.g., rules, contracts and regulations (North, 1990)) and informal (i.e., societal values, habits, and traditions (Crawford & Ostrom, 1995)) institutions, this research will omit the umbrella category and present two main categories: formal institutional and informal institutional (North, 1990). This was done to emphasise the distinction between the categories and highlight the importance of informal institutions by consumers for the adoption of the RBMS (Coelho et al., 2020). Additionally, three more descriptions were added to replace the "lack of awareness and sense of urgency within society" (Vermunt et al., 2019, p. 893) description and deepen the informal institutional category: 'awareness of the RBMS', 'stance on the importance of the RBMS', and 'changing aspect of ownership'. Lastly, an extra category of drivers was added during the coding process: 'Mission', which has two specific drivers. This was done as the coding framework fell short for certain quotes.

Table 1

Coding framework: Drivers/barriers for the RBMS.

Categories of drivers/barriers		Description of drivers/barriers
Internal	*Financial*	Availability of financial resources
		Amount of up-front investment costs
		Costs related to the new BM
		(Un)clear financial business case
	Organisational	Administrative burden or relief
		Organisation of reverse logistics
		Complexity of management and planning processes
	Knowledge and technology	Availability of technical know-how and expertise
		Availability of information and data
		Ability to deliver high quality products
		Design challenges or opportunities to create durable products
	*Mission**	Desire to make a sustainable impact*
		Desire to be an inspirer and forerunner*
External	*Supply chain*	Availability of partners and materials
		Amount of dependence on external parties
		Degree of information exchange between supply chain actors
		Conflicting or congruent interests between supply chain actors
		Amount of consideration on RBMS design from supply chain actors
		Reuse practices and amount of cooperation of third parties
	Market	Price of disposables
		Consumer interest/(non-)acceptance of the RBMS
		Degree of resistance from stakeholders with vested interests in the linear economy
		Possibility of market cannibalisation
	Formal institutional	Availability of (in)effective policies
		Incentives that promote or demote material consumption above services
		(In)appropriate accounting rules and management systems for the RBMS
		Availability of standards and guidelines for quality of reusable products
	Informal institutional	Awareness of the RBMS
		Stance on the importance of the RBMS
		Changing aspect of ownership

Note. Adapted from "Exploring barriers to implementing different circular business models", by Vermunt et al. (2019), *Journal of Cleaner Production, 222*, p. 893 and "Drivers and barriers for shifting towards more service-oriented businesses: Analysis of the PSS field and contributions from Sweden", by Mont (2002), *Journal of Sustainable Product Design, 2*, pp. 95 and "Sustainability of reusable packaging–Current situation and trends", by Coelho et al. (2020), *Resources, Conservation & Recycling: X, 6*, 100037. Text marked with a start (*) indicates to be solely for drivers.

In the framework displayed in Table 1, no distinction has been made to differentiate between drivers and barriers for start-ups and for established companies. The researcher has used the same framework for analysing data about both start-ups and established companies, whilst making sure that the results got categorised according to the company being a start-up or already established company. Nevertheless, the table makes a distinction between internal drivers and barriers and external drivers and barriers. Internal drivers and barriers are pressures from within a company, that drive or hinder the implementation of (in this case) the RBMS within that company (Mont, 2002). Such pressures are categorised: *financial* pressures are related to the financial situation of the company; *organisational* pressures concern pressures due to the organisational structure of the company; and *knowledge- and technology*-related pressures relate to the availability and employability of knowledge and technology (Mont, 2002; Vermunt et al., 2019).

External drivers and barriers are forces from outside of the company that drive or hinder the implementation of (in this case) the RBMS within that company (Mont, 2002). These external forces are differentiated: *supply chain* forces concern all driving and hindering forces within the supply chain; *market* forces relate to supply and demand that may drive or hinder adoption; *formal institutional* forces are all regulatory forces (Mont, 2002; North, 1990; Vermunt et al., 2019); and *informal institutional* forces are forces such as societal values, habits, and traditions (Crawford & Ostrom, 1995; North, 1990).

3 Methodology

Qualitative research using primary data was performed in order to gain insight into the drivers and barriers for the adoption of the RBMS by start-ups and already established companies. Start-ups and established companies that operate in the Netherlands are the focus of this research. The Netherlands is deemed to have "a vibrant movement working towards circularity" (Bauwens et al., 2019, p. 8) that is driven by public as well as private organisations. Therefore, this country is specifically interesting and useful for answering the research question. Nevertheless, to accurately answer the research question, start-ups and established companies needed to be differentiated. To this end, start-ups were defined as new companies (i.e., in their first three years of operation) (Bauwens et al., 2019) that are 'independent' (i.e., "designed to effectively develop and validate a scalable, repeatable and at least break-even business model" (Henry et al., 2020, p. 3)). Established companies were also defined as being 'independent', but are not new or young; these companies have been operating past the timescale of being a start-up.

3.1 Data collection

Data collection was carried out by conducting twenty interviews to obtain rich and detailed information (Bryman, 2016). Specifically, these interviews were semi-structured to ensure that certain important topics for answering the research question. Nevertheless, by not fully structuring the interviews, enough room was left over to explore topics and issues that were not anticipated beforehand (Bryman, 2016).

Interviewees were sampled by making use of a mix of purposive sampling and snowball sampling. The researcher was an intern at Mission Reuse – a collective initiative by Enviu, Recycling Netwerk Benelux and Natuur & Milieu. These companies' networks were a key entry point to reach a variety of interviewees. Because of this, interviewees that seemed most useful for this research were contacted directly by the researcher. During the actual interviews, interviewees were asked to recommend further candidates they deemed useful for this research.

Different kinds of stakeholders relevant to the RBMS were interviewed to ensure different perspectives to drivers and barriers – enhancing triangulation of data. The final sample is displayed in Tables 2 and 3. Six out of the twenty interviewees consisted of founders, co-founders, managers, and directors of start-ups, who possess in-depth knowledge about the adoption of the RBMS within their company. Another six interviewees were the same kind of employees, but instead from established companies. These people were deemed to have the most important knowledge that is required for answering the research question, because they are the ones to (have) experience(d) drivers and barriers first-hand. Additionally, two researchers in the field of uncovering drivers and barriers for adopting a RBMS and five RBMS experts were asked to share their knowledge. Lastly, one consumer who makes use of a RBMS was interviewed as consumers were assumed to provide supplementary knowledge to explain certain drivers and/or barriers. However, after interviewing the consumer, it quickly became clear that it was not possible to include the consumer perspective into the research appropriately: it appeared to be an entire research in itself (more information on this will be in the *discussion* chapter). Therefore, it was decided to exclude more consumers and solely focus on the start-ups, established companies, researchers, and experts, which resulted in an appropriate amount of useful data.

Table 2

Final sample expressed per stakeholder group.

Stakeholder group	Number of interviewees
Start-ups	6
Established companies	6
Researchers	2
Experts	5
Consumers	1
Total	**20**

Table 3

Final sample expressed per interviewee.

Interviewee	Position of interviewee	Date of interview	Interview duration
Interviewee 1	Researcher	February 2021	30 minutes
Interviewee 2	Co-founder at a start-up	February 2021	50 minutes
Interviewee 3	Researcher	February 2021	60 minutes
Interviewee 4	Sustainable packaging expert	February 2021	70 minutes
Interviewee 5	Co-founder at a start-up	February 2021	40 minutes
Interviewee 6	Reuse expert	February 2021	25 minutes
Interviewee 7	Sustainability advisor at an established company	February 2021	30 minutes
Interviewee 8	Manager at an established company	March 2021	20 minutes
Interviewee 9	Founder at a start-up	March 2021	30 minutes
Interviewee 10	Co-founder at a start-up	March 2021	40 minutes
Interviewee 11	Manager at a start-up	March 2021	30 minutes
Interviewee 12	Co-founder at a start-up	March 2021	30 minutes
Interviewee 13	Consumer	April 2021	25 minutes
Interviewee 14	Director at an established company	April 2021	35 minutes
Interviewee 15	Manager at an established company	April 2021	30 minutes
Interviewee 16	Manager at an established company	April 2021	40 minutes
Interviewee 17	Reuse expert	April 2021	35 minutes
Interviewee 18	Reuse expert	April 2021	40 minutes
Interviewee 19	Sustainability advisor at an established company	April 2021	20 minutes
Interviewee 20	Reuse expert	April 2021	30 minutes

The first two stakeholder groups (employees of start-ups and established companies) were asked five main questions: (1) to describe the application of the RBMS within their company, (2) to list the barriers that were encountered within the RBMS, (3) to explain how these barriers affected the adoption of the RBMS, (4) to list the drivers that were encountered within the RBMS, and (5) to explain how these drivers affected the adoption of the RBMS. The third and fourth stakeholder groups (researchers and experts) were asked four main questions: (1) to elaborate upon the RBMS-specific barriers for start-ups, (2) to elaborate upon the RBMS-specific barriers for established companies, (3) to elaborate upon the RBMS-specific drivers for start-ups, and (4) to elaborate upon the RBMS-specific drivers for established companies. Lastly, the consumer was asked three main questions: (1) to explain their experience with the RBMS, (2) to elaborate upon what hinders them from taking part/making policies about/providing logistics for the RBMS, and (3) to elaborate upon what drives them to take part/make policies about/provide logistics for the RBMS.

All of the interviews were conducted through online video calls via Zoom and Microsoft Teams, as meeting in person was discouraged due to the COVID-19 pandemic. The duration of these interviews varied between twenty minutes and one hour and ten minutes. During the interviews, the interviewees were asked to sign an 'informed consent form'. This form regarded their participation in this research and provided information on the data management practices being in line with GDPR regulations. Apart from being asked to sign this form, interviewees were also asked to allow recoding of the interview. All interviewees agreed, which allowed for dependable, elaborate and accurate transcription.

3.2 Data analysis

The interviews were transcribed in an intelligent verbatim manner. After transcription, a qualitative, deductive, directed content analysis – as described by Hsieh and Shannon (2005) – was performed using NVivo. The goal of a qualitative, directed content analysis is "to validate or extend conceptually a theoretical framework or theory" (Hsieh & Shannon, 2005, p. 1281). This is done by systematically coding and categorising "large amounts of textual information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication" (Vaismoradi et al., 2013, p. 400). As this research builds upon the theoretical framework as explained in Chapter 2.4, this type of analysis seemed most suitable.

To ease the process of coding and categorising the interviews, and ensure credibility and dependability, the coding framework was constructed as displayed in Table 1. Although no distinction between drivers and barriers specific for start-ups and established companies was made in this framework, the researcher carefully identified the drivers and barriers for start-ups and drivers and barriers for established companies separately whilst making use of the framework. However, in addition to identifying them, these drivers and barriers were also ranked according to frequency. Seeing that a qualitative, directed content analysis permits "measuring the frequency of different categories and themes" (Vaismoradi et al., 2013, p. 404), subsequentially, a type of frequency analysis was performed. Such a frequency analysis can be utilised to "measure the quantitative counts of the different codes" (Henry et al., 2020, p. 7). This enabled an assessment of the relative significance of the different drivers and barriers specific to start-ups and established companies and in general. Apart from the frequency analysis, the directed content analysis was performed to shed light on how certain drivers and barriers actually play out: instead of only inspecting the drivers and barriers one by one, an attempt was made to enhance understanding of their relevance by contextualising and interlinking them. By making use of these tools, the researcher was able to elaborate upon the cooccurrence of some drivers and barriers, explain how certain drivers and barriers might manifest themselves over time, and assess what can actually be done to address the drivers and barriers.

4 Results

Table 4 represents a frequency table of the results found in this research. This table displays per driver/barrier, how many interviewees named the driver/barrier to be a driver/barrier. This is indicated by the columns 'Number of interviewees', 'Driver', and 'Barrier'. In this table, differentiation is made between drivers and barriers for start-ups (abbreviated in the table via the column 'SU') and established companies (abbreviated in the table via the column 'EC'). In the below text of this *Results* chapter, the frequency table and all drivers and barriers are thoroughly named and explained. The order of the frequency table is utilised to present the results.

Table 4

Frequency table of the results.

Categories of drivers/barriers		Description of drivers/barriers	Number of interviewees			
			Driver		Barrier	
			SU	EC	SU	EC
Internal	*Financial*	Availability of financial resources	0	0	6	0
		Amount of up-front investment costs	0	0	3	6
		Costs related to the new BM	0	0	4	0
		(Un)clear financial business case	0	0	6	10
	Organisational	Administrative burden or relief	0	0	2	3
		Organisation of reverse logistics	0	0	14	12
		Complexity of management and planning processes	0	0	3	9
	Knowledge and technology	Availability of technical know-how and expertise	0	3	5	2
		Availability of information and data	2	1	7	7
		Ability to deliver high quality products	1	3	4	9
		Design challenges or opportunities to create durable products	8	0	7	11
	Mission	Desire to make a sustainable impact	9	9	0	0
		Desire to be an inspirer and forerunner	4	4	0	0
External	*Supply chain*	Availability of partners and materials	0	0	12	3
		Amount of dependence on external parties	0	0	4	4
		Degree of information exchange between supply chain actors	0	0	1	3
		Conflicting or congruent interests between supply chain actors	0	0	8	6
		Amount of consideration on RBMS design from supply chain actors	0	3	6	5
		Reuse practices and amount of cooperation of third parties	2	0	6	2
	Market	Price of disposables	0	0	4	4
		Consumer interest/(non-)acceptance of the RBMS	7	8	8	12

		Degree of resistance from stakeholders with vested interests in the linear economy	0	0	3	8
		Possibility of market cannibalisation	0	0	0	2
	Formal institutional	Availability of (in)effective policies	4	6	4	3
		Incentives that promote or demote material consumption above services	0	0	2	1
		(In)appropriate accounting rules and management systems for the RBMS	0	0	0	0
		Availability of standards and guidelines for quality of reusable products	0	0	0	2
	Informal institutional	Awareness of the RBMS	8	7	9	10
		Stance on the importance of the RBMS	0	0	5	8
		Changing aspect of ownership	0	0	2	0

Note. This table displays per driver/barrier, how many interviewees named the driver/barrier to be a driver/barrier. This is indicated by the columns 'Number of interviewees', 'Driver', and 'Barrier'. Besides, differentiation is made between drivers and barriers for start-ups (abbreviated in the table via the column 'SU') and established companies (abbreviated in the table via the column 'EC').

4.1 Financial

4.1.1 Availability of financial resources

Six interviewees named the limited availability of financial resources to be a barrier for start-ups who want to adopt the RBMS. Namely, start-ups seem to have difficulties finding and acquiring appropriate funding. Of course, most start-ups generally face this problem regardless of which BM they want to adopt. Nevertheless, start-ups working on the RBMS specifically additionally noticed that they do not qualify for a lot of the subsidies that should be available for circular companies. One interviewee pointed out that for the RBMS to work, start-ups have to reach scale quickly and that therefore it was expected that there would be subsidies available to do so. However, it was said that start-ups focussing on the RBMS, often do not qualify for those subsidies as those subsidies are either meant for start-ups that focus on new technological solutions, which the RBMS does not necessarily require, or because they are meant for start-ups focussed on processing waste – instead of preventing it by means of the RBMS. This does not seem to be a barrier for established companies as they seem to have enough financial resources secured due to their existing, profitable BMs.

4.1.2 Amount of up-front investment costs

The high amount of up-front investment costs that accompany the RBMS was named as a barrier for both start-ups and established companies by respectively three interviewees and six interviewees. For start-ups, the high up-front investment costs seem to be related to multiple different things. Interviewees claimed that the development of the right packaging that fits all requirements is expensive. Besides, in

order to make sure that the reusable packaging has an actual lesser impact on the environment compared to disposable packaging, a life cycle analysis should be performed. Nevertheless, performing a life cycle analysis is really expensive and thus requires a relatively high investment cost for start-ups. Additionally, since the RBMS often revolves around an elaborate system where start-ups remain the owner of the packaging that their consumers use, a large number of packaging needs to be acquired up-front. This also brings along a relatively big, up-front investment cost for start-ups since reusable packaging is expensive because it is durably made. Moreover, setting up the return logistics is expensive as well: (custom) washing stations, deposit machines, and those sorts of things are a big up-front investment. Thus, seeing that start-ups currently have to set up the entire ecosystem for their reusable packaging system, a relatively high amount of up-front investment costs is required.

Established companies run into high up-front investment costs for a somewhat different reason. Most established companies wanting to switch over to a RBMS, have to change up their current, linear system to a system that suits the RBMS: "*The linear or the disposable packaging system has to be modified in order to fit reusable concepts*", as one interviewee put it. Seeing that big investments were made to build up the linear system that ran their disposable packaging, another round of big financial investments is needed to rebuild the system in order to fit the RBMS. Although established companies can normally finance these changes, these high amount of up-front investment costs still seem to discourage or hold back some of them.

4.1.3 Costs related to the new BM

Four interviewees named the costs related to the new BM to be a barrier for start-ups. It can be expensive to operate a RBMS: if a start-up decides to go for a RBMS where the operational part of the return logistics is mostly or entirely done by the start-up itself (e.g., the start-up picks up the packaging at the home of the consumer and/or the start-up washes the packaging at its own facilities), the fixed and operational costs of the RBMS can be extremely high. The fixed costs are high due to the high up-front investment costs that this elaborate RBMS requires, and the operational costs are high because it requires a lot of time and effort to complete all the operational tasks. Surprisingly, this was not named a barrier for established companies as well. This could be because they already have an elaborate workforce available that is efficiently deployed, which cuts costs.

4.1.4 (Un)clear financial business case

The unclear financial business case of the RBMS is considered a barrier for both start-ups and established companies. Namely, six interviewees named it to be a barrier for start-ups and ten interviewees said the same for established companies. This unclear financial business case for start-ups seems to be closely related to the scarce availability of financial resources, high up-front investment costs and high costs related to the RBMS that start-ups face. Currently, start-ups have to invest in the entire ecosystem for their reusable packaging system, and also put in a lot of time, money and effort to

actually operate the RBMS. These high fixed and operational costs can make it really hard to guarantee continuity in the start-up, interviewees claimed. This is because in order to cover the costs, the price needs to go up. However, as one interviewee said: "*It means we've got to have a lot of scale to make it work, but then we won't get to a lot of scale if we're not affordable*", since the RBMS will not get a lot of adoption if it is significantly more expensive than disposables. Another way to go about scaling, is to get more financial resources such as subsidies. However, as said before, this can be difficult to do due to the scarce availability of financial resources. Therefore, since margins are small and scale is needed but hard to achieve, the financial business case is often deemed quite unclear.

Established companies are also faced with an unclear financial business case due to a different, but related reason. Their linear system that is based on disposable packaging, normally still runs perfectly fine and provides them with profit. To change up something that works fine, transition towards a system that requires high up-front investment costs, that requires more time and effort as well, and has not yet proven to be a gold mine, is often considered as a bad trade. As one interviewee said it: "*They don't have so much to gain out of it*". Another interviewee mentioned: "*They don't want to change the whole business model that they have to go for something that they are not sure it is going to work*". It requires a complete reorganisation for a BM that might turn out to be less profitable than the old one. It will (if done correctly) have a greatly lesser environmental impact, but companies' decisions often revolve around profit.

4.2 Organisational

4.2.1 Administrative burden or relief

The administrative burden when implementing a low-tech version of the RBMS (to cut high up-front investment costs), became higher for both start-ups and established companies. Two interviewees named this to be the case for start-ups and three interviewees spoke about this for established companies. Start-ups often seem to run into problems with the administrative side of the RBMS when starting out with and implementing a low-tech solution to cut the high up-front investment costs. For example, when operating the return logistics of the RBMS without proper technical applications to make things run smoothly, employees will try and keep record of the returns in makeshift documents. Besides, not all till systems can handle the insert of deposits – which some start-ups use. Therefore, workarounds with makeshift systems also come into play here. Seeing that this brings along additional tasks for the employees and as such makeshift systems leave room for human error, this can be considered an unwelcome addition to the normal tasks of operation. Thus, some interviewees claimed that the administrative burden can be quite high.

This is the same for established companies. They also noticed that their administrative burden became higher when implementing a low-tech solution to try out the RBMS. They noticed that their inventory management became much more complicated and inconvenient. One interviewee even

mentioned that if the low-tech solution was the only solution out there for the foreseeable future, they would not continue working with the RBMS. Namely: "*When we reopen [after the COVID-19 pandemic] and we have to serve guests, the focus will be 100 percent on that. That's what we're good at, what's important. And we don't want too much... Yeah, you just have to be able to work efficiently*". Thus, the administrative burden can make established companies want to shift away from the RBMS, and therefore affects the adoption of the RBMS.

4.2.2 Organisation of reverse logistics

The organisation of reverse logistics seems to be the most frequently named barrier for both start-ups and established companies as, respectively, fourteen interviewees and twelve interviewees spoke about this. This is because the organisation of reverse logistics is said to be complex, costly and risky. Seeing that the ecosystem for successfully running a RBMS is currently lacking (e.g., washing facilities or elaborate return points for all sorts of reusable packaging are currently non-existent), both start-ups and established companies have to invest in and organise the entirety of the reverse logistics – which is an elaborate task. Since this has not yet been done and tested extensively, there is no exact format for how to go about this. Figuring out the specifics is still a balancing game between making sure that consumers are actually incentivised to return the reusable packaging and simultaneously to staying affordable. As one interviewee said: "*It's a really interesting balance trying to figure out the way, because if it's significantly more difficult for the customer than what they're doing now, then it won't get adoption. But then if you do it in the way that's easiest with the logistics all in the backend, then you need to have quite a lot of traffic in order to be able to cover your overhead*". This makes it more complicated and riskier for start-ups, interviewees claimed, as start-ups generally start out small.

Established companies, who can generally operate at scale quite easily, run into different problems. Most established companies operate on a linear system that is entirely based on disposables. To switch this over to a circular system that caters the RBMS is a complicated task that requires a lot of work. Established companies will have to figure out what parts of the old logistical system can stay, what parts needs to be rebuilt, what logistical parts have to be added, how personnel can be retrained, et cetera. The new logistics will most likely become more complicated than the old system, because reverse logistics ask for an extended responsibility over the packaging. And this responsibility comes with more tasks. It is not just the simple sale of products after which responsibility over the packaging is passed on – like established companies are normally used to. The organisation of reverse logistics for the RBMS asks for a lot more work, which may discourage established companies to switch over to the RBMS.

4.2.3 Complexity of management and planning processes

The complexity of management and planning processes was named a barrier for start-ups by three interviewees, and for established companies by nine interviewees. For start-ups, the complex organisation of reverse logistics increases the complexity of management and planning processes.

Starting out small – as start-ups generally do – has the disadvantage that all consumers are new and have to be thoroughly informed of the new, circular way of doing things in order for the new system to work. Unlike established companies, who inform their existing consumer base of the new development, start-ups have to constantly repeat this new information to all new consumers. This requires a more complex management and planning process as time, effort and money have to be invested into constantly repeating this information to make sure the system works properly and no packaging leaks out of the circular system.

This is different for established companies. Most established companies are very good at efficiently running the logistical processes for their existing, linear system that caters disposables. Everything is engineered and developed to be as fast, cheap, and precise as possible. Introducing the RBMS will disrupt this entire efficient system and set in place a less efficient system since the RBMS is relatively new and therefore needs further development to become efficient. Besides, which was not mentioned by start-ups, extra supervision is required to maintain hygienic standards. For example, when working with big dispenser units, there has to be extra supervision to make sure that it stays hygienic. This extra supervision makes the management and planning processes more complicated. As one interviewee said: "*They have to control it really well, they have to make sure that it is sealed and that nothing goes in. It's harder to take care of*". Or as another interviewee mentioned: "*Reuse systems require a little more maintenance and it has to look spotless because otherwise, the sales numbers will rapidly decrease*". So, the RBMS generally complexifies a lot of management and planning processes. Therefore, established companies are not always keen to switch over to the RBMS as it means they often have to take a step back in efficiency.

4.3 Knowledge and technology

4.3.1 Availability of technical know-how and expertise

The availability of technical know-how and expertise was named to be both a driver and a barrier. Namely, three interviewees claimed it to be a driver for established companies, whilst five interviewees mentioned it to be a barrier for start-ups, and two interviewees claimed it to be a barrier for established companies. Start-ups do not have all the technical know-how and expertise readily available because they might not be able to afford third-party help, or because it is just not existent yet. Therefore, it hinders start-ups in their process to implement a proper RBMS. For example, as start-ups do not tend to be packaging experts, problems may arise when developing the reusable packaging. If start-ups want to bring in the help of experts, it brings along a high cost, which not all start-ups can afford. Additionally, when designing the return logistics for the RBMS, start-ups may opt to make use of makeshift documents and systems in the beginning to keep track of all the packaging, because the proper technical systems and know-how are currently not yet available or really expensive. This can hinder the convenience of the RBMS, which can hinder its adoption. Moreover, it is still quite unknown how to

incentivise consumers to bring back the reusable packaging without putting too much strain on the consumers; nobody has found the "*holy grail*" yet, one interviewee claimed.

Established companies experience the same scarce availability of technical know-how and expertise. However, for them, it seems to be less of a problem as they can easily afford third parties to help them out with technical know-how and expertise topics they are currently unfamiliar with and need a solution for. This helps established companies greatly in progressing their switch from a BM based on disposables, towards a system based on the RBMS. Therefore, three interviewees claimed that the existence of such third-party experts who possess the needed technical know-how and expertise, drives their adoption of the RBMS. Thus, it can be a small hold-up for established companies when they are getting started with the RBMS as the technical know-how and expertise is not readily available. However, once the right third party is hired, this is no longer a barrier, but transforms into a driver.

4.3.2 Availability of information and data

The availability of information and data is considered both a driver and a barrier for both start-ups and established companies. Two interviewees mentioned it to be a driver for start-ups, whereas seven said that it was a barrier. For established companies, this was respectively one interviewee versus seven interviewees. Namely, there is quite some information and data available in supportance of adopting the RBMS. This has driven both start-ups as well as established companies to pick out the RBMS as the CBMS to go for. Recent publications by "*major institutions like the Ellen MacArthur Foundation*" were named to exemplify such available information and data. As one interviewee explains: "*You become increasingly convinced that you are doing the right thing. In all statements from the Ministry, publications on LinkedIn, in our work groups, reuse becomes more and more apparent. We want to go in that direction more and more, convinced that we have made the right choice*".

Thus, as said in the aforementioned paragraph, information and data on the importance of the RBMS is available. However, it seems as if other information and data on the RBMS is scarce. For example, information and data on how to go about adopting a RBMS or how it plays out in the long run is not yet widely available. Therefore, there are still a lot of insecurities and unknowns about the RBMS and how and if it can properly and sustainably work. Start-ups seem to struggle with this as they have to find everything out for themselves. Consequently, when start-ups were asked to provide information on the reusability of their packaging, not all start-ups could answer this question properly. Some had performed tests in laboratories to find out how often the packaging could be reused. However, in practice, it always differs and depends heavily on the way the reuse logistics and consumer incentive are build up. Since the RBMS has not yet been rolled out on a large scale and during a prolonged period of time, this information was unavailable.

This lack of information and data regarding more than just the importance of the RBMS also hinders established companies. This has mainly to do with the fact that there are a lot of unknowns for established companies surrounding the RBMS, so a leap of faith is required when getting into the

RBMS. However, business decisions at established companies are normally not based upon leaps of faith. As one interviewee said: "*It's just very thrilling to introduce an innovation that intervenes at all points in the supply chain, not knowing exactly how many consumers will use it, what they will think of it, what kind of things you will encounter in practice. Yeah, that is a direct risk to their existing business model, at which they excel*". Therefore, the scarce availability of data may hold back established companies from switching over to the RBMS, as there are too many unknowns regarding the new model.

4.3.3 Ability to deliver high quality products

The ability to deliver high quality products is also considered both a driver and a barrier for start-ups and established companies. One interviewee named it to be a driver for start-ups, whilst four said it was a barrier. Respectively, three interviewees said it was a driver for established companies, whilst nine named it to be a barrier. For start-ups, one interviewee mentioned that the adoption of the RBMS was closely related to the ability to deliver high quality products. Some interviewees were simply done with the amount of plastic garbage they offered their consumers on a daily basis: "*I don't want to give plastic junk to my customers. So that's why we've done everything sustainably*". Besides, the same interviewee said that by utilising reusable packaging, an extra dimension was added to their offerings: "*We also want to make something beautiful out of it and that people really think: wow, this is a really nice experience*".

This was a similar driver for established companies. They considered the ability to deliver high quality products as another plus for the adoption of the RBMS. One interviewee mentioned that the RBMS allows them to "*provide an extra element of hospitality – because that is what this is; it is a kind of service you provide. Just like when you come by on a hot summer day with extra carafes of water. You do not immediately have a return on it, but it is something that contributes to the experience of [your consumers]*". When established companies see that the RBMS can contribute to the delivery of high-quality products and services, it helps the adoption of the RBMS.

However, the RBMS can also pose a barrier for start-ups to deliver high quality products. Namely, seeing the aforementioned point about scarcity of technical know-how and expertise, start-ups' ability to deliver high quality products can be questioned. As one interviewee said: "*[Start-ups], ideally, would measure the life cycle impact of [their] product. And to do this, it is very costly. There are companies that only work with this, and they ask for a lot of money to do this*". Instead, the same interviewee noticed that, often, start-ups choose materials "*because it looks good, or the consumer liked it*". However, in the end it can turn out that the environmental impact of the material is really bad, the interviewee said. Money needs to be invested into researching a proper RBMSs, but this remains a problem for start-ups. So, although start-ups should actually be very thorough in deciding upon the different components of the RBMS, the scarcity of the technical know-how and expertise hinders start-ups' abilities to develop high quality products.

Established companies run into different problems regarding their ability to deliver high quality products. Logically, the RBMS asks for the reuse of packaging. However, by using reusables,

established companies run a higher risk at delivering unhygienic packaging to consumers. This is due to the extra steps in the logistics process where used, dirty packaging is returned, cleaned, checked and then used for redistribution for new products. There is a lot more that can go wrong compared to the simple use of disposables. One mistake of delivering unhygienic packaging to a consumer could damage an established company's entire brand. Although the risk is the same for start-ups, brand damage will not as big as with established companies. Besides, interviewees mentioned that, currently, reusable packaging might not be considered 'sexy' enough by marketing departments. Established companies have perfected their brands and packaging to their specific likings. Therefore, reusable packaging that is already readily available might not meet the high aesthetic and functional standards established companies have. Thus, established companies' ability to deliver high quality products is at risk when introducing the RBMS and consequently seems to interfer with the adoption of the RBMS.

4.3.4 Design challenges or opportunities to create durable products

Design challenges or opportunities to create durable products seemed to be a driver and a barrier for start-ups as eight interviewees said that this was a driver and seven said that this was a barrier. For established companies, this seems to be only a barrier according to eleven interviewees. The design opportunities to create durable products was mentioned as one of the main reasons start-ups adopt a RBMS. Interviewees expressed to be really annoyed by unnecessary disposables: "*I just think single use is so unnecessary. Like nobody ever did it for all of the thousand years of our history up until about fifty years ago and the invention of plastic. And now we've become sort of incapable of imagining things any other way*". Therefore, many interviewees saw an opportunity to create durable products to fix this problem. As one interviewee said: "*I find it very disturbing that there is a lot of waste... So, an easy and simple alternative for other people to prevent that waste. And, actually, my own annoyance in that, that there wasn't, was actually my biggest motivation to start*".

However, when adopting the RBMS, start-ups run into various design challenges to create durable products. The biggest design challenges revolve around setting up the return logistics, determining a proper consumer incentive to return the packaging, and making sure the reusable packaging adheres to all the requirements in order to be easy to use, easy to return, and easy to clean. A big part of these design challenges can be fixed by technical know-how, expertise, information and data, which is unfortunately scarcely available for start-ups. Therefore, in the meantime, start-ups are learning on the go and have to make compromises in order to start figuring out how they can best set up their RBMS. It is a learning process that nobody seems to have figured out yet, but all start-ups are working on separately.

This is similar, but a bit different for established companies. When switching over to the RBMS, established companies will logically change their packaging from disposables to reusables. However, as their existing consumer base is used to the old, disposable packaging, established companies have to make sure that the new, reusable packaging matches or exceeds the aesthetic and functional

requirements that the disposable packaging adhered to. Simultaneously, it has to adhere to the requirements of the RBMS. Thus, the new packaging and entire RBMS system has to replace the old packaging in such a way that the old packaging will not be missed, otherwise, consumers might reject the new RBMS. Therefore, this switch brings along quite some design challenges. Especially, the reusable packaging and system options that are currently out on the market might not have been fully developed to adhere to all requirements that these established companies require. Consequently, established companies have to overcome quite some design challenges to create durable packaging that equals or exceeds their disposable packaging options.

4.4 Mission

4.4.1 Desire to make a sustainable impact

The desire to make a sustainable impact seems to be the most frequently named driver for both start-ups and established companies as nine interviewees expressed this for start-ups and nine interviewees claimed the same for established companies. The main reasons for start-ups with a RBMS to be created seemed to be the desire to make a sustainable impact. Interviewees mentioned their inherent yearning to contribute to a more sustainable world and felt like this was their way to go about it. Their intrinsic motivation may stem from personal annoyance regarding disposables, an activistic nature to do good, and/or a love for the environment. The interviewees really believe that "*you should also measure and know that what you are doing really contributes to a better environment and a better society*". Some even put their desire to make impact before of their desire for business continuity, as one interviewee said: "*We are really here for impact. So even if one of the big companies sees what we're doing and goes: we could do that. Then, great! That, to us, would still feel like a massive win because anything that takes plastic out of the system is great*".

For established companies, the desire to make a sustainable impact was similar to start-ups for adopting the RBMS. More and more established companies seem to implement this desire into the entirety of their company. One of the interviewees said: "*We want to be sustainable. This is reflected in our core values, in our mission and vision. It has all been written down, but we also want to disseminate this message throughout our actions*". However, it is not always clear whether this desire stems from an intrinsic desire to do good and to be sustainable, or if the desire to make a sustainable impact stems from external pressures such as consumer demand and changing legal and regulatory frameworks. It could also be a combination of both. However, interviewees mentioned that this desire is a great contributor to the adoption of the RBMS by established companies.

4.4.2 Desire to be an inspirer and forerunner

The desire to be an inspirer and forerunner was also a driver for both start-ups and established companies as respectively four interviewees and four interviewees said so. For start-ups, adopting the RBMS had partly to do with the desire to be an inspirer and forerunner. As one interviewee said: "*If we do it, it must*

be done well, and we have to be an inspirer". Therefore, when talking about the annoyance regarding disposable packaging, the same interviewee said: "*We think it should be done differently. Thus, we want to inspire and lead the way*". It may not be the main reason to start up a company that handles a RBMS, but it was certainly mentioned as a contributor to the increase the adoption of the RBMS.

Established companies had a somewhat different reason to adopt the RBMS to satisfy the desire to be an inspirer and forerunner. As the landscapes are changing for many established companies due to external pressures such as consumer demand and changing legal and regulatory frameworks, change within their companies is also needed. Instead of missing the boat and endangering business continuity by not anticipating these changes, established companies rather want to become inspirers and forerunners. As one interviewee explained: "*So the larger companies I have spoken to are all sort of looking for: how can we adjust our business model so that we are at least some sort of green forerunner? So, that consumers will buy our product, our reusable product, instead of that of the competitor. So, I have the idea that the motivator there is much more in continuing your own company, to keep abreast of the times and to be a forerunner of changes in the legal and regulatory framework*".

4.5 Supply chain

4.5.1 Availability of partners and materials

After the organisation of reverse logistics, the scarce availability of partners and materials is the most frequently named barrier for start-ups as twelve interviewees spoke about this. For established companies, only three interviewees mentioned the scarce availability of partners and materials to be a barrier. A proper ecosystem for the RBMS where start-ups do not have to set up all parts on their own (e.g., develop reusable packaging, set up cleaning facilities and/or return logistics) would be crucial for scaling the RBMS: as it would spread out the amount of work and costs over multiple companies. However, since the RBMS is relatively unexplored at this point in time, networks of suitable suppliers, cleaning facilities, manufacturers, knowledge partners, et cetera, are also relatively scarce. Tapping into existing networks of linear solutions is not always an option since the RBMS requires a circular way of working, which is difficult for linear solutions to adhere to. Besides, the supply chain actors that were thinking about starting with the RBMS before the COVID-19 pandemic started have put it on hold due to having to shift their attention to not going bankrupt due to this COVID-19 pandemic. "*It is a very difficult period in time to launch a new system*", one interviewee said. The scarcity of possible partners and materials makes it quite hard for start-ups to scale, which therefore poses a problem for the adoption of the RBMS, as mentioned before.

Established companies run into similar problems, but also different ones. Namely, established companies who want to test out the RBMS via a low-tech system whilst making use of already existing reusable packaging options often run into the problem that the packaging does not suit their needs. One interviewee phrased it as follows: "*We are constructing our dishes according to the [reusable packaging*

options] we have currently available, instead of having materials that are shaped according to what we are doing". Another interviewee added that established companies who want to switch over to reusables often find that reusable packaging options are limited compared to disposable packaging options. As said by one of the interviewees: "*They now have about twenty, thirty or fifty kinds of packaging that they have been using for many years and they want to convert them into a reusable variant and then they see that there are only five or six alternatives at the moment*". This scarce availability of materials seems to slow down the adoption of the RBMS by established companies; some are willing but feel as if they are unable to make the switch due to the limited options available.

4.5.2 Amount of dependence on external parties

Start-ups and established companies seem to regard the amount of dependence on external parties as, for both, four interviewees spoke about this. For start-ups, interviewees mentioned that start-ups need to cooperate with established companies in order to be able to scale. That is why the big established companies are "*key to help us get reusable into our system*", one interviewee said. Besides, the entire supply chain has to be accustomed to the RBMS in order for it to work properly. For example, one interviewee mentioned that "*it's everybody else's logistics as well*". Their start-up ran into trouble wanting to return the bulk packaging they need for their RBMS to their supplier. However, their supplier does not accept returns, so the start-up had to recycle the packaging – which did not affect their B2C RBMS but is still not ideal when wanting to implement a RBMS. Moreover, start-ups mentioned that, even though you can have the best RBMS out there, if the (external) party who is in direct contact with the consumer does not promote it, the adoption rate suffers. Thus, the success of the actual usage of the RBMS may also depend highly on external parties.

Established companies also experience a relatively high amount of dependence on external parties when implementing the RBMS. This relates closely to Sub-chapter 4.5.1 in which the established companies that seek reusable packaging materials from others are discussed. These established companies have a relatively high dependence on their external partners due to their demand for reusable packaging options that they seem to not be able to produce themselves. When there are no reusable packaging options available for them, the adoption of the RBMS is compromised. Additionally, established companies who enlist the help and services of external parties when introducing a RBMS are also relatively dependent on those external parties. If such a party underdelivers, the switch towards the RBMS within the established company can be hindered.

4.5.3 Degree of information exchange between supply chain actors

The degree of information exchange between supply chain actors is considered a barrier for start-ups and established companies as respectively one and three interviewees spoke about this. Currently, as mentioned before, start-ups working on the RBMS have a scarce availability of technical know-how, expertise, information and data. However, as start-ups and other companies along the supply chain that

are working on the RBMS keep their acquired information and knowledge to themselves, everybody is separately trying to 'reinvent the wheel'. Since the degree of information exchange is so low, everybody is trying to find out the same thing without sharing much with other companies. Of course, this has to do with trying to get ahead of competitors and thus gaining a competitive advantage. However, it does hinder the adoption of the RBMS as the interviewee mentioned that better information exchange between parties could help to partly solve the scarcity problem and thus progress the adoption of the RBMS.

For established companies, the low degree of information exchange between supply chain actors has different consequences. Namely, when the importance of actively praising consumers the reusable packaging of the RBMS is not passed on down the supply chain, the adoption of the RBMS is way lower, established companies noticed. Since established companies generally have a lot of employees, making sure that the importance of the RBMS is properly disseminated could be difficult. Moreover, one interviewee noticed that there is a low degree of information exchange between established companies and producers: "*When you talk to a big company for example, they will say that the producer cannot do this or do that. And then you talk to the producer and then they say, no the company does not want it. So, they want to do it. You never know what is happening*". This may indicate that these supply chain actors do not communicate well enough regarding this topic, through which the adoption of the RBMS suffers.

4.5.4 Conflicting or congruent interests between supply chain actors

Conflicting interests between supply chain actors appear to be a barrier for start-ups and established companies. Respectively, eight interviewees named it to be a barrier for start-ups and six interviewees said the same for established companies. Start-ups need established companies to scale. However, introducing a circular solution into a linear system is extremely difficult, especially when you are a small start-up. Consequently, important established companies that could really make a difference by changing up their linear system and transforming it into a circular one, hesitate to collaborate with these start-ups. The established companies currently either experience no need to change their existing BM because it remains profitable are not interested due to shifting priorities because of the COVID-19 pandemic, and rather choose circular solutions that actually still fit into their linear system (e.g., biodegradable packaging or recyclable packaging) or give no explanation as to why they do not want to collaborate. It can also happen that established companies want proof that the RBMS works, but start-ups cannot provide this information yet, because they need to scale in order for the RBMS to prove itself. Yet, they cannot scale without the help of established companies. Thus, start-ups need help from established companies, but established companies cannot or do not always want to help.

Established companies that are ready to adopt the RBMS also experience conflicting interests between actors in the supply chain. Some of their supply chain actors do not yet seem to want to make the shift towards the RBMS intrinsically. They do not think it is the right timing due to the COVID-19

pandemic, want to wait till the dust has settled to determine if the RBMS is something they want to focus their efforts on, have conducted pilots in the past that did not go too well, et cetera. As one interviewee said: "*Only a select group sees the necessity*". Besides, amongst some of the supply chain actors, there is a fear of becoming obsolete when restructuring the entire supply chain. One interviewee indicated that, if the supply chain of the established company in question were to restructure to make the RBMS work, some of the other actors along the supply chain would be out of business. Consequently, there is a fear of collaboration between some supply chain actors due to the possibility of going out of business. Additionally, some did not fear for obsoleteness, but for losing their brand identity when collaborating with multiple supply chain actors. Therefore, it can be stated that the conflicting interests between actors in the supply chain are a problem for implementation of the RBMS.

4.5.5 Amount of consideration on RBMS design from supply chain actors

The amount of consideration on RBMS design from supply chain actors can be considered both a driver and a barrier. For start-ups, it is solely a barrier, according to six interviewees. However, three interviewees mentioned it to be a driver for established companies, whilst five said it to be a barrier. For start-ups, the amount of consideration on RBMS design from supply chain actors is considered pretty low. Nowadays, most supply chain actors seem to be used to 'lesser' circular strategies such as recycling, but the 'higher' RBMS is still quite unknown. Interviewees explained that this has to do with the fact that the RBMS asks for a disruptive system change, whilst strategies such as recycling can still fit into the old, linear system: going for biodegradable packaging or recyclable packaging does not change much in companies their linear BM, whilst the RBMS asks for a total reorganisation. Therefore, start-ups wanting to introduce the RBMS along a supply chain do not get much traction as it demands a lot from the supply chain actors to choose the RBMS over the 'easier' options such as recycling.

However, established companies seem to experience a slow increase in amount of consideration on RBMS design from supply chain actors. These supply chain actors that are considering the RBMS do help and drive the adoption of the RBMS. This is because it presents these other supply chain actors with an incentive to switch to a RBMS. As one interviewee said: "*As a result of [supply chain actor]'s new sustainability ambitions, we have started on a number of projects related to reusables. [Supply chain actor] actually wants to get rid of single-use plastic as soon as possible. And that is why we do our best to provide our services in line with that*". Nevertheless, the greatest part of their supply chain actors also tends to choose for the 'lesser' circular strategies that they can implement in their linear system (e.g., biodegradable or recyclable packaging). This, because they think they do not have much to gain out of switching towards a RBMS, still adhere to the legal and regulatory framework with their existing model, or due to other unclear reasoning. However, this means that when switching over to a RBMS, new supply chain partners have to be found that do consider the RBMS. Therefore, the low consideration on RBMS design from supply chain actors can be considered a problem.

4.5.6 Reuse practices and amount of cooperation of third parties

The reuse practices and amount of cooperation of third parties is considered both a driver and a barrier. Two interviewees said it was a driver for start-ups, whilst six said it was a barrier. Two interviewees said it was only a barrier for established companies. For start-ups, the reuse practices and amount of cooperation of third parties was said to have driven some interviewees to adopt the RBMS. Seeing that big established companies cannot or do not want to move towards the RBMS (yet), made some interviewees want to start their own company in order to do it differently. For instance, one interviewee said: "*And then we decided, well, if the big guys are sort of not able to figure out how to put reusables into their system, then we're going to go ahead and start our own experience*". Besides, others saw the 'so-called reuse practices' of third parties and were not satisfied with the way it was done. For example, one interviewee said that some companies that claim to operate a RBMS, do it in a completely unsustainable way. Therefore, the interviewee decided that it should be done differently: "*Our motivation to start with this was actually because we thought: this could be done better. The whole sustainable story, that's wonderful, but then it also has to be implemented sustainably*".

Nevertheless, because start-ups need established companies to help scale the RBMS, the low reuse practices and amount of cooperation of third parties is therefore also considered a barrier. This relates closely to Sub-chapter 4.5.5: start-ups cannot get traction in a supply chain that rather focusses on circular solutions that fit into a linear system, instead of the RBMS that requires a new, actual, circular system. Consequently, start-ups have to set up the entire ecosystem they need in order for the RBMS to work. However, this proves difficult because start-ups require additional financing and/or cooperation of established companies in order to scale, but funding is scarce and established companies are not keen to collaborate.

For established companies, the reuse practices and amount of cooperation of third parties is similarly considered quite low and even fragmented. Due to the unwillingness to adopt the RBMS by some supply chain actors, the reuse practices and amount of cooperation of third parties is considered low. Besides, due to some supply chain actors' fears to become obsolete or lose brand identity when collaborating with other supply chain actors, the reuse practices and amount of cooperation of third parties is considered fragmented. One interviewee fears for this fragmentation, since different parties are separately working on the RBMS where they could (or maybe even should) be collaborating. This interviewee said: "*Look, if everyone is going to try and invent the same thing, you will soon have eight to twelve systems in the Netherlands - which is already small. Then the landscape will become so fragmented, that it will be of no use to anybody*".

4.6 Market

4.6.1 Price of disposables

The price of disposables was considered a barrier for both start-ups and established companies according to respectively four interviewees and four interviewees. The current *price of disposables* is extremely low compared to reusables. "*Disposables remain cheap. There is very little tax on it. The polluter does not pay*", one interviewee said. This makes it difficult for the RBMS of start-ups to compete against disposables. This is because consumers and supply chain actors are reluctant to choose for the RBMS because, in practice, reusable cups fulfil the same function as disposable cups, but they are normally higher in price and less convenient to use. However, it seems like an unfair comparison because the externalities of disposables are not included in the price, whilst most of the externalities of reusables are included in the price. As one interviewee put it: "*Disposables are easy to use. They do not return. As a company, you are just done with it. You do not pay much for it and it is gone, it will never return. It becomes someone else's problem*".

Established companies experience the same problem as start-ups regarding the low price of disposables. As one interviewee said: "*Someone who acquires and sells disposables, does not pay the actual price. They can buy virgin plastic dirt-cheap. But they do not pay the actual price; they do not pay for the entire life cycle. They do not pay for the littering of nature or for the consequences this has or the costs of waste processing. They do not pay for that*". However, established companies run into an additional problem as well: established companies whose entire BM is focussed on disposable packaging are not incentivised to shift away towards a RBMS, since it will only mean that they will take a step back in costs. This is because the RBMS does actually take into account the life cycle of the packaging. Disposables are easy to use and cheap to buy. Therefore, many established companies do not see the need to shift away from them. Unfortunately, this hinders the adoption of the RBMS.

4.6.2 Consumer interest/(non-)acceptance of the RBMS

The consumer interest/(non-)acceptance of the RBMS seems to be both a driver and a barrier for both start-ups and established companies. For start-ups, seven interviewees named it to be a driver, whilst eight claimed it to be a barrier. Simultaneously, eight interviewees claimed it to be a driver for established companies. Besides, twelve interviewees said it to be a barrier. This is, apart from the organisation of reverse logistics, the most frequently named barrier for established companies. For start-ups, quite a few interviewees mentioned the consumer interest and acceptance of the RBMS as one of the main reasons to adopt the RBMS. As one interviewee mentioned: "*Customer demand is screaming for a zero-waste solution*". These interviewees noticed that there is a growing consumer demand for zero-waste solutions that is/was not met by the current supply of circular products and services. "*The willingness of consumers to make a difference with their products or with their purchases and moving towards more sustainable practices such as reusing*" is growing, one interviewee mentioned.

Consequently, these interviewees saw this unmet demand as an opportunity they wanted to play into by creating a new company that operates a RBMS, in the hope to satisfy (part of) the consumer demand for zero-waste solutions.

This increasing consumer interest and acceptance of the RBMS also drives the adoption of the RBMS by established companies. Of course, established companies already have a consumer base for their existing products and/or services. However, there is an increasing demand from their consumers that they want a zero-waste option. As one interviewee explained: "*Some companies realise that this is a demand, it is getting more of a demand because consumers are shocked by the packaging waste and all the ocean waste. So they want to change. Some get direct complaints from packaging waste of their products. So they want to review how they are doing. Some do realise that their impact would be smaller. But yeah. I think that if there wasn't the pressure to change, I think that most of them would not. So it's also the consumer pressure right now that is helping boost our way to reusable*". Besides, some established companies that did already experiment with the RBMS received positive reviews from their consumers, they said. It seems as if consumers are ready for the introduction of the RBMS not necessarily as a replacement of the old system though, but rather as an additional option.

However, despite the increase in consumer interest and acceptance of the RBMS, in order for the RBMS to really take off, the "*critical mass*" needs to start using the RBMS, so it can reach scale. As one interviewee said it, "*there is a group of people and they do it because they know it is more sustainable. But that's not the mass of people. The mass of people just don't feel like it at all. So how are we going to make sure they feel like it? So that is a very big challenge*". First of all, if the costs for the RBMS are higher compared to disposables, consumers seem less prone to go for the RBMS. Secondly, consumers seem hesitant to use the RBMS due to concerns about convenience. Some just do not feel like putting in the extra effort to return reusable packaging. Even when it is not less convenient than disposables, they might just assume it is more difficult to use the RBMS and therefore not go for the RBMS. Lastly, interviewees said that some consumers expressed their concerns about the hygiene of the RBMS – especially during the COVID-19 pandemic. This also seems to discourage consumers to use the RBMS. Therefore, although consumer interest and acceptance of the RBMS is increasing, more is needed to positively increase the adoption of the RBMS by start-ups and established companies.

Additionally, established companies have their own problems with consumer interest and acceptance of the RBMS. There is a fear amongst established companies that, when they switch over to a RBMS, their consumers will not accept the change and, consequently, they will run out of business. As one interviewee explains: "*If we clearly see that the consumer really wants it, then we will transform immediately to cater them and make sure it works. If we see that there is a growth in our turnover [for reusables], it will go much faster. But yeah, it is what I said before: we actually see the opposite*". Thus, some established companies do not dare to take the risk. According to another interviewee, these established companies often say the following: "*They say: yeah, but the consumer does not want it. But how do you know? The consumer has no other choice*". Luckily, there are some established companies

that want to employ the old system and the RBMS system simultaneously to make consumers get used to the new system. However, this assumption by established companies is unfortunate since the established companies currently cater the critical mass that is needed for making a successful switch towards the RBMS.

4.6.3 Degree of resistance from stakeholders with vested interests in the linear economy

The degree of resistance from stakeholders with vested interests in the linear economy is considered a barrier for both start-ups and established companies as respectively three and eight interviewees said so. As discussed before, currently, the economy is based on a linear system. However, interviewees said that over the past few years, efforts have been made by the government, municipalities and established companies to try and move towards the circular economy by investing in recycling. Unfortunately, this means that these governments, municipalities and established companies are literally invested in keeping up the system that they currently have, which is fit for recycling, but unfit for handling a RBMS. Besides, these governments, municipalities and established companies were able to reach scale and grow due to their existing (linear) BM, which is based on disposables. Consequently, there is a lot of resistance to change such 'successful' BMs. This is because switching towards the RBMS means that established companies and/or their supply chain actors shift away from their successful formula to take part in something new, which is considered risky. Some established companies do not see the benefits which the RBMS provides over their existing BM. These established companies rather focus on other 'lesser' circular strategies that are easily implemented in their linear models (e.g., recycling). This also means that big established companies are less benevolent to help start-ups reach scale with their RBMS, which affects the adoption of the RBMS.

4.6.4 Possibility of market cannibalisation

Two interviewees claimed that the possibility of market cannibalisation was a barrier for established companies. Established companies that do not entirely switch over to the RBMS at once but do this gradually by handling the old, linear system and new, circular system simultaneously, might experience market cannibalisation. Namely, this happens when consumers choose for the established company's products that are from the RBMS instead of the disposable products that are from the old, linear system. This does not necessarily mean that the established company's market grows; its consumer base just shifts from using their older products to their newer products. This is not necessarily good or bad but might be perceived as bad when established companies their profit margin is highest for the older, linear system.

4.7 Formal institutional

4.7.1 Availability of (in)effective policies

The availability of (in)effective policies is considered both a driver and a barrier for both start-ups and established companies. Four interviewees said it was a driver for start-ups, whilst four said it was a barrier. In addition, six said it was a driver for established companies, whilst three said it was a barrier. For start-ups, the availability of effective policies was named as a small 'enabler' by interviewees, not a big one. Namely, start-ups mentioned that the Single-use Plastics Directive (SUPD) mainly contributes to the consumer awareness regarding the problem of single-use plastics. As one interviewee said: "*I think it makes consumers think differently about things like: hey, it is actually pretty crazy that so much waste is created in those markets. And indeed, we really need to be more aware of the choices we make here. So, I think of it more as an enabler of sorts ... Yes, it speeds up the process, I think, yeah*". Thus, it does not necessarily drive the adoption of the RBMS by start-ups directly. However, by making consumers more aware of the underlying problem of disposables, the SUPD indirectly drives consumer demand for more zero-waste solutions.

Nevertheless, multiple interviewees said that, according to them, the SUPD does not cover enough materials and kinds of packaging to be able to make the difference it is intended for. For example, one interviewee said the following: "*They're not banning any single use plastics that actually matter, which is unfortunate. Like I don't see single use plastic water bottles on the list*". Therefore, established companies are not incentivised hard enough by effective policies to actually think about helping start-ups scale their RBMSs – which is a barrier for start-ups. Current policies are deemed too loose or too vague. One interviewee said: "*[Established companies] can actually still get away with working with the 'lesser' [circular strategies] in order to adhere to the new EU regulations*". The same interviewee said: "*There are quite a lot of established companies that are resisting, trying their hardest to prevent stricter regulations. As long as the regulations are without obligations…*". It is deemed that regulatory pressure is needed but not prevailing strong enough for established companies to really make an effort. Instead, as said, established companies often rather switch towards the 'lesser' circular strategies (e.g., recycling) and avoid having to reorganise their entire logistics.

Nevertheless, established companies did claim that the availability of effective policies directly drives the adoption of the RBMS as it poses a barrier for them. Multiple interviewees expressed their concern for the continuity of their established company, due to the introduction of the SUPD. As one interviewee said: "*Of course, we were quite surprised one and a half, two years ago, that a large part of our products will be banned and the other products that we produce, food packaging, that something would change for that as well. We had to think more intensively about the future of this company*". Thus, even though the SUPD does not ban all single-use plastic items, it does move established companies to rethink their offerings and future. Consequently, when looking for alternatives that secure business

continuity for the long term, some established companies switch towards the RBMS – thus benefiting the adoption of the RBMS.

Additionally, start-ups run into other problems. Something that makes it difficult for the RBMS to scale is that, in the legal and regulatory framework, reusable packaging is considered as waste. Consequently, when trying to work together with municipalities to organise drop-off points for consumers to return reusable packaging close to their homes, one interviewee ran into problems. It could not be done as these drop-off points would be considered 'waste' in the public space, which is unwanted. However, this is only considered as 'waste' due to the legal and regulatory framework not being suited to treat reusable packaging as something that actually reduces waste. Reusable packaging "*is not waste, but it is characterised as such*", as one interviewee said.

4.7.2 Incentives that promote or demote material consumption above services

There is one incentive that promotes material consumption above services, which poses a barrier for both start-ups and established companies according to respectively two and one interviewee(s). These interviewees spoke about the fact that the negative externalities of disposables are not included in its price. For instance, the time, effort and money that goes into cleaning up all the litter it causes, is not included in the price; *the polluter does not pay*. Instead, such litter is cleaned up by municipalities and thus the taxpayer pays for it. In contrast with disposables, start-ups and established companies remain responsible for all processes in the life cycle of the reusable packaging, making it considerably more expensive. Thus, the price of reusables is high in comparison to disposables, which makes it hard for start-ups to get a fair chance at competition with disposables. Start-ups cannot experiment with lowering prices – unlike established companies – as they have no financial buffer and only a scarce availability of financial support. Nevertheless, since existing, linear BMs of established companies are based upon lower costs than is possible with the new RBMS, it promotes material consumption above services. Seeing that voluntarily switching over to a system that has higher costs is not a choice that established companies would automatically go for, the adoption of the RBMS is affected.

4.7.3 (In)appropriate accounting rules and management systems for the RBMS

Existence of (in)appropriate accounting rules and management systems for the RBMS appeared to be neither a driver nor a barrier for the adoption of the RBMS; none of the interviewees spoke about this.

4.7.4 Availability of standards and guidelines for quality of reusable products

Two interviewees claimed that the scarce availability of standards and guidelines for quality of reusable products poses a barrier for established companies. Established companies attach a lot of importance to the quality of their products. This is because their entire brand can easily be damaged if the quality of their products is compromised. However, the return logistics of the RBMS make it much more complicated to control and guarantee the quality of products since a lot more can go wrong. Seeing that

there are little to no existing standards and guidelines to assure quality of reusable products, established companies might hesitate to adopt the RBMS.

4.8 Informal institutional

4.8.1 Awareness of the RBMS

The awareness of the RBMS seems to be both a driver and a barrier for both start-ups and established companies. Eight interviewees said that this was a driver for start-ups, whilst nine said it was a barrier. Besides, seven interviewees said it was a driver for established companies, whilst ten said it was a barrier. Start-ups and established companies have noticed that the awareness of the RBMS is increasing. One of the reasons is the following, according to one interviewee: "*There are a lot of ongoing discussions about plastic, and I think that helps. People are becoming more aware of what they do with their packaging and with their waste*". This is partly due to the SUPD and the pandemic-driven increase in delivery and its accessory waste, interviewees said. As another interviewee put it: "*It has become a current topic, there is momentum and consumers really acknowledge that they are fed up with all the [disposable] containers and bags*". People are looking into alternative, zero-waste options such as reusable packaging. Consequently, this increasing awareness of the RBMS drives the adoption of the RBMS for both start-ups and established companies.

However, although the awareness of the RBMS is increasing, it seems as if this is mainly amongst a niche segment of consumers who want to go the extra mile for a sustainable option. Amongst the critical mass that is needed for start-ups to reach scale, it seems as if the RBMS is still quite unknown. Therefore, interviewees claimed that most of the people who are offered their reusable packaging hesitate to use it at first because they are unfamiliar with such a system. A lot seems to rely on the introduction and explanation of the RBMS when consumers first come into contact with the new system. This seems to require quite extensive marketing and communication. This is a barrier for start-ups, but can be done by established companies. Nevertheless, because established companies notice that not all of their consumers are aware yet of the RBMS, they are hesitant to make the switch to a RBMS. This is because they are afraid that their consumers do not want to make the switch with them, which might mean that they will lose business and thus threatens their business continuity. Nevertheless, as one interviewee said: "*[Currently,] the consumer has no other choice*". Therefore, it can be questioned if the critical mass will ever become familiar with the RBMS if established companies keep hesitating or keep not wanting to make the switch towards a RBMS.

4.8.2 Stance on the importance of the RBMS

The unjustified stance on the importance of the RBMS seems to be a barrier for both start-ups and established companies. Five interviewees claimed it to be a barrier for start-ups, whilst eight claimed it to be a barrier for established companies. Namely, people (e.g., consumers or supply chain actors) aware of the RBMS do not always have a well-grounded stance on the importance of the RBMS. Some people

seem to believe that reuse can interchangeably be used with recycling, one interviewee pointed out. Other interviewees said that people often think that biodegradable, bio-based, or recycling have a lower environmental impact compared to the RBMS. Therefore, they would prefer those options over the RBMS. This may hinder the uptake of the RBMS. Besides, interviewees stated that a large amount of consumers seem to be improperly informed of the possibilities, benefits, and importance of the RBMS. This is a barrier for start-ups, because, although start-ups do try to inform their consumers, due to their small reach, word does not spread quickly. Established companies have a wider reach, and thus do not run into this problem.

4.8.3 Changing aspect of ownership

Two interviewees mentioned the changing aspect of ownership to be a barrier for start-ups. Namely, the changing aspect of ownership is a new way of thinking for most consumers. Start-ups may introduce this new system to their consumers; however, the critical mass currently seems to remain sceptical/uninformed because they are unfamiliar with the idea of sharing reusable packaging. Moreover, start-ups noticed that, in the first few months, there is an enormous leakage of their reusable packaging out of their system. One interviewee said that some consumers just want to keep a few of the reusable packaging items for themselves because they like the looks of it, some consumers hoard the packaging if there is no pressure to bring it back in a timely manner, and others see it is a nice 'cheap' way to score some quality packaging items to use at home. Either way, the changing aspect of ownership is not yet thoroughly embedded in the consumers, which causes start-ups to experience leakage of pricy reusable packaging out of their system. Interestingly, this was not mentioned by established companies, although it was expected they would run into the same problems.

5 Discussion

5.1 Interpretations and implications

5.1.1 Drivers

Currently, start-ups and established companies are slowly moving towards the adoption of the RBMS. Start-ups operating a RBMS seem to mostly arise due to their founders' inherent annoyance about the problems and troubles that accompany the usage of disposable packaging, such as heaps of (unnecessary) waste that ends up littering nature. They seem to think that the big, established companies are not doing enough about this problem. Therefore, these people want to tackle this problem head-on through adopting the RBMS that prevents the usage of such waste altogether by providing high quality reusable packaging (services), whilst simultaneously making a living out of it. That is why start-ups in the RBMS realm seem to be intrinsically motivated to make a change, inspire, do good and contribute to lessening humanities environmental impact by means of their innovative products and services. Besides, they say that consumer demand is screaming for zero-waste solutions due to the growing

consumer awareness regarding the harmfulness of disposable packaging. Additionally, the changing legal and regulatory framework, such as the implementation of the SUPD seems to act as a *small* enabler.

Established companies, on the other hand, seem to want to make the shift from disposable packaging to reusable packaging due to more external pressures. They are facing a changing legal and regulatory framework that is slowly but surely banning the usage of more and more single-use plastics that their BMs heavily rely on. When looking for alternative packaging options to be able to stay in business, current information and data seems to steer them towards the RBMS. Moreover, due to the growing exposure in society regarding the problems and troubles surrounding the usage of disposable packaging, there is a growing consumer demand for zero-waste options – which does not go unnoticed by established companies. Additionally, there are some established companies that have people at the top who are intrinsically motivated to contribute to a more sustainable world and therefore want to shift towards the RBMS. Notwithstanding, established companies making the shift towards a RBMS seems to be mostly motivated by ensuring business continuity and thus adapting to the changing landscape, preferably as forerunner and inspirer so to gain an advantage over competitors.

Most of these findings correspond with existing research by Mont (2002) and Coelho et al. (2020). For example, Mont (2002) and Coelho et al. (2020) also uncovered that there is a growing consumer demand and growing acceptance in the market for adopting a RBMS, which is driving the adoption of the RBMS. Besides, Mont (2002) and Coelho et al. (2020) also uncovered that the changing legal and regulatory framework is a huge driver for the adoption of the RBMS. However, as this research shows, this statement is mainly true for established companies; start-ups see this changing legal and regulatory framework merely as a small 'enabler'. Another difference is that, for established companies, Mont (2002) and Coelho et al. (2020) claim that adopting a RBMS can present them with new markets and new consumers, which is considered a driver. Although this may be true, none of the interviewees mentioned this to be a driver in this research. Moreover, where Coelho et al. (2020) uncovered that the innovation of electronic tagging would drive the adoption of the RBMS, none of the interviewees from this research have mentioned anything about this being a driver.

To conclude, most drivers found in this research correspond well with what can be found in existing research by Mont (2002) and Coelho et al. (2020). However, this research is not simply a repetition because it adds value by examining all drivers more extensively than is done in the research by Mont (2002) and Coelho et al. (2020). Besides, this research differentiates between drivers for start-ups and drivers for established companies, which has not been done explicitly in existing research. Therefore, this research uncovered that in adopting a RBMS, start-ups are mostly driven by internal drivers combined with consumer demand, whilst established companies are mostly driven by external drivers combined with a desire to become an inspirer and forerunner.

5.1.2 Barriers

Most barriers that start-ups and established companies seem to experience when adopting a RBMS revolve around the lack of a complete and set ecosystem for the RBMS (e.g., return logistics and cleaning facilities). Therefore, both start-ups and established companies are trying to set up and operate ecosystems for themselves, which proves costly and complex as existing research confirms (Neely, 2008; Ramanathan, 2011; Ravi et al., 2005; Vermunt et al., 2019). For start-ups, this is especially difficult due to their limited financial resources. For established companies, this is especially costly because they have to reengineer their existing logistics. Coelho et al. (2020) also uncovered this to be problematic. Besides, in order for the RBMS to be feasible, it is required to reach economies of scale. It is important that the smallest number of packaging articles is in circulation and are being used the maximum number of times to make reusable packaging doable, profitable, and to make the environmental impact as small as possible. In order for this to happen, the entire ecosystem needs to be in place and efficient. If every company goes about this separately, no one will be able to reach economies of scale. The introduction of multiple different systems will only decrease the uptake of all systems, as consumers have to get used to varying systems that do not support each other, also due to a lack of standards and guidelines on reusable products. Only when companies start collaborating and sharing an ecosystem, economies of scale will be possible.

Another reason why the adoption of the RBMS is hindered, is because disposables are extremely low in price and very convenient. This, combined with the lack of effective policies that advantage the usage of the RBMS and disadvantage the usage of disposable packaging, discourages the adoption of the RBMS. Established companies struggle with the current balance between discouragement of using disposables and encouragement to use the RBMS, because it does not give them enough incentive to switch to the RBMS if disposables remain so extremely cheap. As most established companies have based their existing BM around disposables, switching over to the RBMS will make their products and services more costly and less convenient to use in the short run. However, this is not only a problem for established companies. Start-ups also have to compete with the low prices and convenience of disposables, as reusable packaging is inherently more expensive due to the inclusion of externalities. Due to this, setting up a RBMS requires balancing consumer convenience and price attractiveness: if the new system is more difficult or costly to use than disposable packaging, the critical mass is not keen on using reusable packaging. Therefore, companies have to balance complexifying their own business processes to make the system more convenient for consumers, with making sure it does not become too expensive, which is a difficult balance to reach since investment costs and operational costs are relatively high compared to the usage of disposables.

Moreover, there are other important barriers that both start-ups and established companies face, related to the lack of proper information on the different CBMSs – and specifically the RBMS – amongst different stakeholder groups. Quite a lot of consumers and supply chain partners seem reluctant to choose for a RBMS because they are, for example, convinced that biodegradable or compostable options

for packaging are much better. Besides, the current view amongst stakeholder groups on doing something that contributes to a lesser environmental impact seems to revolve mainly around recycling. Such CBMSs seem more popular due to lack of knowledge and due to these CBMSs fitting perfectly into the linear system. Indeed, a RBMS is not always the most sustainable option for every packaging stream. However, there seem to be a lot of misconceptions and misunderstandings about the higher CBMSs and specifically the RBMS, which seems to hinder the adoption of the RBMS. Start-ups cannot always reach a large group of stakeholders since they have not built up such large stakeholder groups yet. Established companies, however, can communicate effectively to their existing, widespread stakeholders about the importance of the RBMS, but seem to hesitate to do so due to the expectation of aversion.

Additionally, once consumers have chosen reusable packaging instead of disposable packaging, another barrier for both start-ups and established companies arises: how can companies incentivise consumers to return reusable packaging to ensure that it will remain in the loop? This barrier has also been pointed out by existing research (Coelho et al., 2020; Vermunt et al., 2019; Wastling et al., 2018; Zimmermann & Bliklen, 2020). The RBMS requires a completely different consumer approach than linear BM strategies. This is because the changing aspect of ownership has a great impact on consumer experience. Getting consumers to use reusable packaging is a first step, but it is an entirely different task to make sure that consumers return the packaging. This requires a delicate balance between making sure the consumer receives an incentive or nudge that is strong enough so that the package is returned, but not too strong so that it will scare of the consumer from using the packaging; this is in agreement with research by Camacho-Otero et al. (2018) and Tunn et al. (2019). Both start-ups and established companies are working extensively on working out the specifics as to how this barrier can be fixed.

Interestingly, whereas existing research by Abbey et al. (2015) spoke about market cannibalisation being a big barrier for established companies, market cannibalisation turned out to be only mentioned by one interviewee. This is probably because most established companies that adopt the RBMS do so as a replacement BM for the long run, instead of a supplementary BM. Therefore, market cannibalisation in the short run (e.g., when the RBMS is implemented alongside the existing BM as a transition) does not seem to be a big barrier for established companies as their goal with the adoption of the RBMS is to replace the old BM anyway.

To conclude, this research found a lot of supplementary barriers to the barriers already uncovered by existing research. In addition, this research adds supplementary value by not only uncovering these barriers, but also by differentiating between barriers for start-ups and barriers for established companies. Seeing that start-ups and established companies play a different role in the transition towards a circular economy (Schot & Geels, 2008), it was expected that they would face different barriers with regards to the adoption of the RBMS. And they do. However, although they face differing barriers, as can be deduced from the *Results* chapter, the barriers seem to stem from corresponding, overarching meta-barriers: a complete and set ecosystem is missing for different

companies to make use of; disposables are extremely cheap compared to reusables; proper information on the different CBMSs is missing; and it remains hard to incentivise consumers to actually return the reusable packaging. It seems as if these overarching meta-barriers are the culprit of the majority of the more specific barriers start-ups and established companies face.

5.2 Limitations and recommendations for further research

This research is based upon theory and frameworks by Vermunt et al. (2019), Coelho et al. (2020) and Mont (2002). Specifically, the coding framework used in this research was an adaptation of the coding framework used by Vermunt et al. (2019), which was general for CBMSs and not specific for the RBMS. To fit the research, the coding framework was adapted in order to fit the RBMS. Notwithstanding, this presents a limitation of the research. When adapting the coding framework, existing literature on the RBMS was used. However, since the RBMS is understudied, this existing literature was scarce. Therefore, this means that the adaptations made to the framework might or might not have been sufficient. Seeing that the coding framework has been leading throughout this research, it might imply that important codes were missed. This appeared to be true during the coding process, as the coding framework fell short for certain, important quotes. In an attempt to remedy this limitation, an extra category of drivers was added during the coding process: 'Mission', which has two specific drivers. Consequently, it can be argued that the coding framework used in this research was incomplete.

Additionally, it is important to mention that this research uses the frequency table as a way to rank the drivers and barriers and thus indicate some sort of importance. It can be argued if this is a correct way to do so. Namely, the importance of a driver or barrier does not necessarily have to solely depend on the number of interviewees who mentioned the driver or barrier. Therefore, using this method, it is likely that crucial drivers and barriers are regarded as less crucial than they actually are, or the other way around. It is suggested that further research should be done to determine which drivers and barriers are most important. Consequently, it can be explored which drivers should be amplified and which barriers should be resolved mainly and foremostly to accelerate the adoption of the RBMS.

Lastly, it is suggested that further research should be done to uncover the consumer perspective regarding usage of the RBMS. Only one consumer was interviewed for this research. Moreover, it appeared that a completely different approach is needed to ensure that the consumer perspective is appropriately integrated into the results. The focus of this research is on start-ups and established companies. Interviewing consumers did, unexpectedly, not provide the data needed for answering the research question. Notwithstanding, the consumer perspective is crucial in uncovering how the adoption of the RBMS can be progressed. Namely, consumers are the people for whom the system is made, who have to voluntarily choose to use it, eventually use the system, and hopefully will continue doing so.

6 Conclusions

This research has explored the drivers and barriers for the adoption of the RBMS by start-ups and already established companies. By means of twenty semi-structured interviews with start-ups, established companies, experts, researchers, and consumers, data was collected. This data was analysed by means of a qualitative, directed content analysis. The results were presented in a frequency table and were thoroughly discussed and compared. We discuss conclusions now. Start-ups seem mostly driven by internal motivators to lessen humanity's environmental impact by adopting the RBMS, whereas established companies mostly seem to adopt the RBMS to cope with external landscape changes that threaten their business continuity. Both are faced with a lot of obstructing barriers. Start-ups seem to struggle most with the lack of a complete and set ecosystem for their RBMS that they thus have to set up and operate themselves, which requires high investment and operational costs. Due to a scarcity of financial resources and opportunities to secure such financial resources, the adoption of the RBMS by start-ups proves difficult. Established companies on the other hand, seem to be most obstructed by their own current linear systems based on disposable packaging. Changing their entire – still profitable – BM into a RBMS that is more complex and costly may not be their preferred choice. Although they generally have the financial resources to make the change, they seem hesitant to adopt the RBMS due to the lack of security that the RBMS is going to provide them with (the same amount of) profit.

As expected, start-ups and established companies face different drivers and barriers with regards to the adoption of the RBMS as they play a different role in the transition towards a circular economy (Schot & Geels, 2008). However, although they do face differing drivers and barriers, the specific barriers seem to stem from corresponding overarching meta-barriers. Namely, a complete and set ecosystem is missing for companies to make use of; disposables are extremely cheap compared to reusables; proper information on the different CBMSs is missing; and it remains hard to incentivise consumers to actually return the reusable packaging. It seems as if these meta-barriers are the culprit of the majority of the more specific barriers start-ups and established companies face. Thus, to overcome the specific barriers, these meta-barriers have to be resolved. This will advance the adoption of the RBMS for both start-ups and established companies. To resolve these meta-barriers, a few recommendations are given.

Firstly, it is extremely important to *boost industry collaboration*. In order to reach economies of scale and make the RBMS a profitable opportunity for all business partners involved, a shared ecosystem for the RBMS is needed. It would be ideal if all parties involved were to share reverse logistics, cleaning facilities, a network, et cetera. All parties would benefit from a shared ecosystem because it reduces financial costs and the organisational burden. Besides, if the ecosystem is presented to consumers as one system with different products by different companies, it would benefit the uptake of the system and help it scale. Namely, consumers will have to get used to only one RBMS system that

is broadly adopted by multiple companies. Governments could play a crucial role in connecting different start-ups and established companies, and help set up such industry collaboration.

Secondly, the *development of standards and guidelines for reusable packaging* can help greatly in setting up one shared ecosystem. Seeing that there is a current lack of standards and guidelines for reusable packaging, the development of this will help unify such a shared ecosystem. All parties involved will follow the same standards and guidelines, which reduces operational costs and makes the organisational burden less, because reusable packaging would be standardised. It is worth noting that standardisation does not mean that there is no room for personalisation anymore. Just have a look at beer bottles; they are standardised but can still be personalised.

Thirdly, *dispersion of information about the RBMS* is needed. The critical mass is needed to progress the adoption of the RBMS. It seems as if communication is key in making sure that the critical mass is aware of the RBMS and its importance. Although the growing exposure in society regarding the problems and troubles surrounding the usage of disposable packaging has triggered a growing consumer demand for zero-waste options, more can be done. People do not always seem aware of the difference in CBMSs and why some are more important to focus on than others. Others do not understand the concept of the RBMS and can then hinder the functioning of the RBMS by not returning or throwing away reusable packaging. Therefore, consumers should be notified of what a RBMS is, why it is important, and how it works. Improving the dispersion of such information could help people make a more informed decision when they are presented with a choice between different CBMSs. Thus, more and better information should be dispersed by governmental bodies and companies so that the importance of focussing on CBMSs that score higher in terms of circularity – such as the RBMS – prevails.

Fourthly, *more effective policies favouring the RBMS and disadvantaging disposable packaging* are needed. As said in previous chapters, the low price of disposables makes it incredibly hard for start-ups to compete with disposable packaging, since the RBMS is more costly in the short run as it internalises externalities. Besides, the low cost of disposables makes it unattractive for established companies to switch to the more costly RBMS because it means that they will earn less profit in the short run as they have to abandon their existing, profitable BM. Governmental support to decrease the price of reusable packaging (e.g., through subsidies), increasing the price of disposable packaging (e.g., through tax), and extending the SUPD to ban more single-use packaging articles seem like necessary changes to make sure the adoption of the RBMS progresses.

Fifthly and lastly, *governments should increase their efforts to lead the way and advocate for the RBMS* as it is the right thing to do. The focus should be less on recycling and more on the higher CBMSs, such as the RBMS. Governmental bodies could help the adoption of the RBMS progress in multiple ways. For example, they could help by favouring companies that work on the RBMS over companies that work with disposables through, for instance, subsidies or during public tendering. Additionally, governmental bodies could help making sure that it is as easy as possible to return reusable

packaging. They could help set up the needed ecosystem, including convenient return points in places that people visit often (e.g., waste disposal stations, supermarkets or train stations). Governmental bodies could also opt to adopt the RBMS themselves to show others that it is a desirable and doable change.

To conclude, start-ups and established companies seem to experience different drivers for adopting the RBMS and appear to be hindered by differing barriers. Nevertheless, most of these barriers seem to stem from overarching meta-barriers. These overarching meta-barriers must be fixed in order to progress the adoption of the RBMS. This research has presented recommendations for the steps to be taken to overcome these meta-barriers and consequently progress the adoption of the RBMS. Seeing that the RBMS is the highest-ranking CBMS focussed on slowing down the flow of resources, this is crucial for transitioning towards a CE.

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Acknowledgements

Throughout the course of writing this thesis, I have kindly received a great deal of support and guidance.

First of all, I want to thank my thesis supervisor Dr. Bauwens and second reader Dr. ir. Janssen. Your critical feedback and valuable insights have brought my work to a higher level. Thank you for supervising me, being patient with me, and providing me with guidance along the way.

Secondly, I want to express my gratitude to all the colleagues at Mission Reuse. Stijn, Dieuwertje, Inge, Lenneke, Sterre, and Noa, it has been a pleasure working alongside all of you. Thank you for helping me get started in the field of reusable packaging and for connecting me to all the amazing people whom I got to interview for this thesis. Especially, I want to express my gratitude to Stijn, who has acted as my mentor throughout my time at Mission Reuse. Stijn, you have very kindly shown me the ropes and I am very grateful for that.

Thirdly, I want to thank my family. Flieps, Miems and Wesje, I would like to pay special regards to you. Your unconditional love and support have always helped me throughout my life. You three have always been, and will always be, my rocks.

Lastly, but most importantly, I want to express my deepest gratitude to Oscar. Thank you for lovingly supporting me, inspiring me, and motivating me. Without your daily provision of coffee, hugs, and encouraging words, this thesis would not have been possible.