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Value co-creation processes in circular  
entrepreneurship: a problematizing review of value co-  
creation and a mixed-methods study.

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## Table of Contents

Executive summary.....	1
Introduction.....	5
1. Chapter 1: value co-creation theory in Management: a problematizing review.....	10
1.1 Introduction.....	11
1.2 Theoretical foundations: value creation and cocreation.....	13
1.3 Methodology.....	20
1.3.1 Step 1.....	22
1.3.2 Step 2.....	24
1.3.3 Step 3.....	26
1.4 Discussion .....	27
1.4.1 Service Marketing.....	30
1.4.2 Strategic Management.....	33
1.5 Conclusion and future research avenues.....	37
2. Chapter 2: value co-creation processes and underlying mechanisms in circular entrepreneurship: an exploratory study on born circular SMEs.....	39
2.1 Introduction.....	40
2.2 Theoretical background.....	42
2.2.1 Value co-creation.....	42
2.2.1.1 Value co-creation forms.....	44
2.2.2 Value co-creation in CE.....	46
2.2.2.1 Value co-creation mechanisms in CE.....	48
2.3 Methodology.....	49
2.3.1 Data collection.....	49
2.3.2 Data Analysis.....	57
2.4 Findings.....	58
2.4.1 Apepak.....	58
2.4.2 Rifö.....	59
2.4.3 Up2Go.....	60
2.4.4 Seay.....	61
2.4.5 Wrad.....	62
2.4.6 YouKoala.....	63
2.4.7 Kamupak.....	64
2.4.8 Lovia.....	65
2.4.9 Spinnova.....	65
2.4.10 Sulapac.....	66
2.5 Cross-case comparison and discussion.....	68
2.5.1 Co-creation forms.....	78
2.5.1.1 Firms-customers.....	78
2.5.1.2 Firms-suppliers.....	79
2.5.1.3 Firms-partners .....	80
2.5.2 Co-creation mechanisms.....	81
2.5.2.1 Firms-customers .....	81
2.5.2.2 Firms-suppliers .....	83
2.5.2.3 Firms-partners .....	84
2.5.3 Co-creation output.....	86
2.6 Conclusion.....	87
2.6.1 Theoretical contribution.....	88
2.6.2 Managerial contribution.....	89
2.6.3 Limitations and future research avenues.....	90

3. Chapter 3: value co-creation processes in circular entrepreneurship: a quantitative study on European firms.....	93
3.1 Introduction.....	94
3.2 Theoretical foundations.....	96
3.2.1 Value co-creation in circular entrepreneurship: value co-creation forms mechanisms, and output.....	96
3.3 Formulation of hypotheses.....	100
3.4 Data and methodology.....	103
3.4.1 Data sources and sample.....	103
3.4.2 Questionnaire.....	108
3.4.3 Analytical approach.....	110
3.4.4 Indicators for measurement model constructs.....	112
3.4.5 Controlling for common method bias: preliminary assessment using Cronbach’s alpha.....	115
3.4.6 Descriptive statistics.....	116
3.4.7 Assessing the formative measurement model.....	118
3.4.7.1 Step 1: convergent validity.....	119
3.4.7.2 Step 2: checking for collinearity issues.....	119
3.4.7.3 Step 3: significance and relevance of formative indicators.....	123
3.5 Results and discussion.....	124
3.5.1. Testing Measurement model #1.....	124
3.5.2 Testing Measurement model #2.....	127
3.6 Conclusion and future research avenues .....	130
4. Concluding remarks .....	131
4.1 Contribution to theory and practice.....	131
4.2 Policy Implications.....	133
References.....	135
List of Tables.....	148
List of Figures.....	149
Appendix 1 Quotes from the interviewees.....	151
Appendix 2 Questionnaire.....	161

## **Executive summary**

The present doctoral research addresses value co-creation processes in a timely context, i.e., circular entrepreneurship, and it relies on a mixed-methods research design including an exploratory qualitative study and a subsequent quantitative one. The thesis is composed of three interrelated chapters, each of which represents a paper addressing a specific research question.

The entire work is rooted in the value co-creation theory, which has been developed in service marketing literature with the seminal works by Prahalad and Ramaswamy (2004) and Vargo and Lusch (2004) and it has influenced many research streams within Business and Management. The theory evolved over time, and it has been further revised and improved in service marketing by the authors themselves (Vargo & Lusch, 2016) as well as by some influential scholars in the field (Grönroos, 2011; Echeverri & Skålén, 2011). However, the concept of “value co-creation” still appears blurry and it can be considered as one of the most elusively used concepts in service marketing and in Management at large (Carù & Cova, 2003; Sánchez-Fernández & Iniesta-Bonillo, 2007); it also lacks concrete and comprehensive conceptualization encompassing multiple research fields within the Management domain. Concurrently, the theory suffers from the fact that its underlying assumptions have been accepted by scholars, who, with a few exceptions (Grönroos, 2011; Grönroos & Voima, 2013; Cova et al., 2013), have mostly made a sort of “building exercise” (Alvesson & Sandberg, 2020, p.1) upon the theory, rather than an “opening up exercise” (ibid) aimed at improving the theory with novel insights that can generate new ways of thinking about the topic.

Having the latter issue in mind, the **first chapter** of this thesis proposes a review about value co-creation based on the problematization approach by including forty contributions belonging to the service marketing and strategic management fields, plus five classics. Through a critical analysis of these studies, we challenge some key underlying assumptions, and we offer

alternative assumptions aiming to open new ways of considering value co-creation within the Management literature.

The **second chapter** consists in an empirical work aimed at investigating value co-creation within dyads of actors through an ecosystem perspective. More precisely, this paper contributes to the entrepreneurship literature as for the empirical analysis of the mechanisms through which circular small and medium-sized enterprises (“born circular firms” – Zucchella and Urban, 2019) co-create value with their key stakeholders. The unit of analysis is represented by the dyadic co-creation processes including forms, mechanisms, and process output. This chapter represents the exploratory and qualitative step of a mixed-method study, and its final output consists of an empirical model of value co-creation in circular entrepreneurship and a set of research propositions.

The **third chapter** represents the quantitative part of the mixed-methods research. It aims to verify whether the findings that emerged from the exploratory study are generalizable. Departing from the propositions advanced in the second chapter, we develop two empirical models and a set of hypotheses about the relationships among the variables in the models. To test these hypotheses, we employed data collected through a survey administered to a representative sample of 80 European born circular firms by adopting the PLS-SEM technique (Hair et al., 2017).

At the end of the dissertation, an **Appendix** illustrates the methodological details of the performed studies (quotes from the interviewees, scheme of the questionnaire), thus providing those insights making the research process clear and fully transparent.

The conducted research presents a twofold contribution, both theoretical and managerial. From the theoretical perspective, the contribution lies in the adoption of a critical perspective on value co-creation theory, through which we examine the assumptions underlying the theory and we reflect upon its related shortcomings. Starting from them, we

propose alternative assumptions which can contribute to improving the extant theory by opening new ways to conceive the value creation within the analyzed research domains. Doing so, we take a step forward paving the way towards a less elusive and more comprehensive conceptualization of value co-creation which would encompass diverse research streams within the Management domain. The second key theoretical contribution lies in the empirical study we conducted (cf. chapter 2), which contributes to the value co-creation literature as concerns value creation processes and underlying assumptions in the context of circular entrepreneurship, i.e., defined as the “processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, slowing, and narrowing the loop of resources and regenerating/reconstituting natural capital” (Zucchella & Urban, 2019, p. 195). This context is particularly relevant in today’s economic scenario since the traditional linear approach to resources based on “take-make-dispose” is causing the fast depletion of natural resources and environmental damages that need to be urgently tackled, and therefore finding ways to transition towards a more sustainable economic paradigm represents a societal key priority. Circular entrepreneurs are showing that a possible alternative of doing business is possible and that adopting the “people, planet, and profit” (Elkington, 1994) approach is feasible. By investigating dyadic value co-creation processes between circular firms and each actor involved in the value co-creation process (Grönroos & Voima, 2013), and focusing on those mechanisms key underlying co-creation process (Lenka et al., 2017), we contribute to both value co-creation literature and the circular entrepreneurship literature (Cullen & De Angelis, 2020; Henry et al., 2020; Zucchella & Urban, 2019).

From the managerial perspective, this dissertation aims at making practitioners reflect upon the concept of value creation and at understanding how the establishment of value co-creation processes with key actors within the ecosystem can generate positive outcomes both



for the actors involved and for the ecosystem. We would like to inspire practitioners to establish/ involve key societal actors in a purposeful business through co-creation processes that can represent the path to making the world more sustainable.

This doctoral thesis has also implications in terms of policies implementation. Our findings suggest that governments wishing to encourage the transition towards circular economy may finance business opportunities through *ad hoc* investments for circular start-ups/firms, while concurrently fostering the establishment of partnerships among firms and all those partners having the proper skills, technologies, and expertise to implement circular practices.

## Introduction

*"Change is driven by individuals who can visualize a future they want to create. When we are motivated to apply our creativity and skills towards something that has purpose, we can truly unlock our human potential".*

Jules Hayward - EllenMacArthurFoundation

The world is facing a dramatic environmental crisis. Recent scientific studies report that the ecosystem is quickly deteriorating (Cheng et al., 2018; WWF, 2020) and human activities are harming the planet by causing increasing levels of pollution (Circularity Gap Report, 2021). We currently live in a linear economic system, meaning it is based on the “take-make-dispose” paradigm: we manufacture, we consume, and, finally, we throw goods away (Lacy et al., 2020). It has been estimated that only around 9% of the extracted resources return to the production system after their first cycle, as an input to create new products (ibid): this means that this linear system is causing the fast depletion of natural resources. The rising consumption needs are, in turn, encouraging higher production levels, which are causing an increasing level of CO<sub>2</sub> emissions, thus harming the whole planet (Furukawa et al., 2019). The negative impact this system is inducing in terms of pollution, waste, and degradation of natural ecosystems is catastrophic (ibid). Shifting towards more sustainable production and consumption paradigms is urgently needed (Bengtsson et al., 2018).

On the 1st of January 2020, we officially entered the Decade of action, namely 10 crucial years that should guide us towards the seventeen Sustainable Development Goals (SDGs). This transition has been on the top of the agenda of the European Commission ever since 2015, when it decided to launch the so-called “circular economy package”. The urgency of action is something clear in the political discourse. The 2021 United Nations Climate Change Conference (COP26), held in Glasgow between 31 October and 12 November 2021 under the presidency of the British politician Alok Sharma, represented the most significant

effort to bring together worldwide decision-makers to define an articulated and concrete plan to tackle the environmental damage by trying to keep the temperature rise within 1.5 degrees.

The push to take urgent actions to limit the damages stemming from the temperature rise has also come from bottom-up movements stemming from worldwide citizens in the last few years, such as Fridays for Future, Fashion Revolution, and Sunrise Movement. These interest groups around the globe manifested the idea that making a “change” in the way we live, produce, and consume, is necessary, if we, human beings, do not want to destroy our planet. There now exists many worldwide networks and initiatives having the ambition to encourage a significant transformation towards more sustainable and resilient societies, to generate a *transformative social innovation* (Avelino et al., 2015). These initiatives propose alternative visions to economies, which may be labeled as “Transformative Economies”, i.e., “Sharing Economy”, “Circular Economy”, “Social Impact Economy”, “Green Economy”, “Solidarity Economy”, all of them aiming to bring societal changes (ibid).

Among them, the circular economy (CE) is praised for providing practical solutions to shift towards more sustainable production and consumption practices. CE is defined by the Ellen MacArthur Foundation as “an industrial economy that is restorative or regenerative by intention and design” (Ellen MacArthur Foundation, 2013, p. 14). The CE does not seem to be a feasible solution solely to solve the environmental issues, but it also appears very attractive from the economic point of view: it has been estimated that it may represent a worldwide trillion-dollar opportunity in the near future (Accenture, 2014). Shifting from a linear to a circular economic system is what nowadays governments and institutions are striving for at all levels, especially through policies, education, and incentives to industries. The “Green Deal” the European Union has recently promoted represents a clear signal in this sense, providing a route to pursue this paradigmatic shift and actively reach the ambitious goal of making Europe climate neutral by 2050.

Firms as key economic actors have crucial responsibilities in taking action to limit climate change by reducing their impact on the environment (Wittneben et al., 2012). Their role is indeed particularly important in this sense since they “must provide their core business—and the scale advantages it offers—to create both positive societal impact and business benefits” (Beal et al., 2017). Firms could thus lead the transition from a linear to a circular economy. As reported by Veleva & Bodkin (2018), transitioning to a circular economy will require “massive innovation and mindset changes that cannot be anticipated” thus presenting a “tremendous entrepreneurial opportunity” (p. 20). The rising research stream specifically enquiring firms embracing the circular economy through the adoption of circular business models is circular entrepreneurship, which has been defined as “the processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, slowing and narrowing the loop of resources and regenerating/reconstituting natural capital” (Zucchella & Urban, 2019, p. 195). Involving actors is considered essential for circular firms since the actors “collaborate to maximize the value of products and materials and contribute to minimizing the depletion of natural resources and create positive societal and environmental impact” (Bocken et al., 2018, p. 79). Recent research (Ki et al., 2020; Pucci et al., 2020) underlines the importance of engaging stakeholders to foster the implementation of sustainable behaviors and circular practices. This is the reason why firms venturing the CE are likely to engage and cooperate with diverse actors along the supply chain as well as with their customers (Urbinati et al., 2017). These relationships might be so intense that it is possible to refer to them as value co-creation processes (Payne et al., 2021). Dealing with the conservation of natural resources combined with the development of creative and innovative business ideas, circular entrepreneurship represents a timely and inspiring context of analysis for the present research.

This doctoral dissertation has a threefold contribution:

- i) Contribute to advance the value co-creation theory (Vargo & Lusch, 2004, 2016) through a problematizing review as proposed by Alvesson and Sandberg (2020) by challenging the key underlying assumptions underlying the theory in two research streams within Management, i.e., service marketing and strategic management and by proposing alternative assumptions aiming at overcoming the shortcomings stemming from extant assumptions. The research question addressed is: how could value co-creation theory be improved within the management domain?
- ii) Contribute to the entrepreneurship literature on value co-creation (Lenka et al., 2017; Saarijärvi et al., 2013; Zhang & Chen, 2008) and the emerging circular entrepreneurship research stream (Cullen & De Angelis, 2021; Zucchella & Urban, 2019) through an empirical study aimed at investigating how firms co-create value with their key actors through an ecosystem perspective. To do so, we perform a multiple case study (N= 10 firms and related key actors) aimed at analyzing the co-creation processes and their underlying mechanisms in place between born circular firms and each of their key actor involved. This empirical investigation leads to the development of an empirical model and a set of propositions to be tested. The research question we address here is: how do circular firms co-create value with their key actors? Which are the underlying co-creation mechanisms?
- iii) Contribute to the entrepreneurship literature on value co-creation (Lenka et al., 2017a; Saarijärvi et al., 2013; Zhang & Chen, 2008) and the emerging circular entrepreneurship research stream (Cullen & De Angelis, 2021; Zucchella & Urban, 2019) by advancing two empirical models linking the variable “co-creation scope” with the process output “co-creation performance” and linking

them to the overall output for the ecosystem. To do so, we test the hypotheses stemming from the exploratory study by employing a survey administered to a self-built database of around 1000 circular firms collected from EU circular economy networks and hotspots as well as secondary data reported in the grey literature and social media. The responses provided by our sample (N=80 firms) allow us to test the emerged hypotheses by employing the PLS-SEM method (Hair et al., 2011, 2014).

To reach the stated objectives, we choose to rely on a *qualitative predominant* mixed methods approach, i.e., “the type of mixed research in which one relies on a qualitative, constructivist-poststructuralist-critical view of the research process, while concurrently recognizing that the addition of quantitative data and approaches are likely to benefit most research projects” (Johnson et al., 2008, p.124). This approach is coherent with the choice to combine a first exploratory investigation performed through a qualitative multiple case study research with a second quantitative study aimed at testing the emerged hypotheses. The mixed-methods (MM) research has been defined as a “type of research design in which QUAL and QUAN approaches are used in types of questions, research methods, data collection and analysis procedures, and/or inferences” (Thashakkori & Teddlie, 2003, p.711). Despite the traditional dichotomy between the epistemological positions of positivism versus interpretivism, which may lead to criticizing the combination of qualitative and quantitative data in the same research, we embrace the perspective of those scholars such as Johnson & Onwuegbuzie (2004) who support the idea that mixing research methods increases the likelihood of reducing biases and collecting richer and more meaningful data.

Here below we introduce the first Chapter of the present dissertation, entitled “value co-creation theory in Management: a problematizing review”.

## 1. CHAPTER 1: VALUE CO-CREATION THEORY IN MANAGEMENT: A PROBLEMATIZING REVIEW

*“The word Value, it is to be observed, has two different meanings, and sometimes expresses the utility of some particular object, and sometimes the power of purchasing other goods which the possession of that object conveys. The one may be called “Value in use”, the other “Value in exchange”. The Wealth of Nations (Book i., Chap. iv). “It is not clear what is meant by value creation” Grönroos (2011. p.280)*

### ABSTRACT

Since its introduction, Prahalad and Ramaswamy’s concept of value co-creation has attracted growing interest in scholarly conversations. In Business and Management research, the number of publications regarding value co-creation has exponentially increased in the last decade.

Nevertheless, the value co-creation theory has seen few major advances over the years since its underlying assumptions have mostly remained unchanged. Through a problematization approach, which is ideal to avoid compartmentalized thinking and proposing a critical and reflexive analysis of the extant literature in Management, we aim to improve the theory by critically evaluating its underlying assumptions. We analyze forty-five contributions addressing value co-creation in service marketing and strategic management and we challenge those key field assumptions we deem worthy of improvement. We subsequently advance alternative assumptions aimed at improving the shortcomings of extant assumptions, and we explain their potential to improve the co-creation theory. We finally propose future research avenues encouraging scholars to rethink co-creation in a way that could be more informative to both theory and practice.

**Keywords:** value co-creation; problematizing review; alternative assumptions; improving theory.

## 1.1 INTRODUCTION

The concept of value is elusive by nature (Woodall, 2003). The process of value creation is considered a way through which customers become better-off (Grönroos, 2008), or somehow increase their well-being (Vargo et al., 2008). The value co-creation concept was introduced by Prahalad and Ramaswamy's (2004) seminal paper and defined it as the “joint creation of value by the company and the customer” (ibid, p. 8). During the same year, the concept of value co-creation gained momentum as a pillar of the service-dominant (S-D) logic (Vargo & Lusch, 2004), which marked a turnaround in service marketing research, but it also influenced several research domains falling outside the focus of the present work, such as tourism (Chen et al., 2012; Mathis et al., 2016), public services (Osborne et al., 2016; Saha et al., 2020) and retail (Andreu et al., 2010; Felleson & Salomonson, 2016). In the last decade, research about co-creation in Business and Management has grown exponentially and scholars advanced reviews to systematize the findings by means of bibliometric analyses (Alves et al., 2016; Galvagno & Dalli, 2014; Saha et al., 2020). Recently, Ramaswamy and Ozcan (2018) made an important step to overcome the elusiveness of the value co-creation concept and introduced the novel conceptualization of “value-in-interactional creation” as value creation through interactions among actors. The authors define co-creation as “enactment of interactional creation across interactive system-environments (afforded by interactive platforms), entailing agency engagements and structuring organizations” (ibid, p. 200). Loureiro et al. (2020) praise this definition as it includes the term “engagement” thus emphasizing the active role that the parties involved in co-creation play within an interactive system-environment.

These studies, albeit offering a precise systematization of extant knowledge, do not contribute to advancing the value co-creation theory by critically evaluating its underlying assumptions. In fact, this theory presents shortcomings that need to be addressed, to make improvements



that would allow it to offer a more comprehensive and contemporary explanation of the value co-creation phenomenon encompassing diverse research streams.

To do so, it is necessary to adopt critical lenses. As pointed out by Post et al. (2020), reviews have the potential to advance theories through critical analysis and synthesis and to “stimulate readers to think differently about their own future research, having gained new insights from the review” (p. 372). This could be achieved, for instance, by analyzing assumptions in a body of literature and by developing alternative models/conceptual frameworks based on different assumptions (ibid, p. 355). Among the three broad sets of assumptions identified by (Alvesson & Sandberg, 2011), i.e., in-house assumptions, root metaphor, paradigm and ideology assumptions, and field assumptions, we opt for focusing on the latter ones, the “field assumptions”, which are “assumptions about a specific subject matter that are shared across different theoretical schools” (ibid, p. 254). We consider solely this type of assumptions since they are those that better suit our research aim, i.e., advance the value co-creation theory by offering a critical synthesis encompassing diverse theoretical assumptions.

By following the methodological protocol of the problematizing review recently advanced by Alvesson & Sandberg (2020), we review the key literature within service marketing and strategic management, and we challenge those key assumptions underlying the value creation theory in each research field. We then propose alternative assumptions having the potential to pave the way towards innovative ways to conceive and interpret value co-creation in Management. By doing so, we aim to open promising research avenues.

The paper is structured as follows. We devote the first part to presenting the theoretical foundations of the present work. Then, we illustrate in detail the methodological approach we employ, i.e., problematizing review. Subsequently, we discuss our findings, and we propose a table illustrating the field assumptions underlying each considered research domain, their

shortcomings, and the alternative assumptions we advance to stimulate scholars to rethink co-creation in a more comprehensive and managerially relevant way.

## **1.2 THEORETICAL FOUNDATIONS: VALUE CREATION AND CO-CREATION**

In the last decades, the conceptualization of value has faced a substantial evolution from being anchored to the concepts of *resource exchange* and *value-in-exchange* towards a focus on *resource integration* and *value in-use* (Eggert et al., 2018). This groundbreaking change marked a shift of the *locus* of value creation, which moved from being within the “producer” sphere towards being spread along the collaborative process of value co-creation between the involved parties. This shift has been particularly evident in marketing theory, which has been for a long time based on the goods-dominant (G-D) logic, i.e., “an economic-based view centered on firms and their creation and distribution of tangible goods” (Whalen & Akaka, 2016, p.64). Central to the G-D logic was the concept of *value-in-exchange*, which is the value embedded in products and whose conceptualization has its roots in Adam Smith’s (1776) concept of value as wealth creation through tangible units of output. According to Smith, indeed, “wealth consisted of tangible goods, not the use made of them” (Dixon, 1990, p.340). The value-in-exchange consists indeed of a “market offer of a product that is “embedded” with value, and the enterprise concerned with delivering that value to the customer” (Eggert et al., 2018, p.86). In the mid of the nineties, the conceptualization of value creation has had a significant input thanks to the work of Edith Penrose (1957). In her masterpiece, the author develops a theory of value creation which is based on the idea of firms’ endogenous growth through excess resources that are obtained through perennial intra-firm knowledge generation resulting from the division of labor, learning, and teamwork. Moreover, Penrose argues that firms create value with the aim to appropriate as much of it as possible since value creation

and appropriation are both part of the firms' strategy to make the greatest possible long term-profits.

Despite being very different, what unites the Smithian and the Penrosian conceptualizations of value is that firms do not involve customers as participants in the value creation, since the perspective adopted is firm-centric. This is opposite to the Aristotelian perspective on value, which would suggest that value is perceived during the "use" of a commodity (Smart, 1891) as a function of the outcome stemming from the good itself. The gradual shift toward a service-dominant (S-D) logic started during the late 90s, in so far as customers started "stepping out of their traditional roles to become cocreators as well as consumers of value" (Prahalad & Ramaswamy, 2000, p.80). The first signals of this shift can be found in the academic literature of the 1990s, when some management scholars started to overcome the concept of value-in-exchange by advancing the concept of *value-in-use*, which relates to the customers' value-generating processes (Grönroos, 2000) emerging in the customer sphere (Normann & Ramirez, 1994; Wikström, 1996). In the 2000s, the concept of value-in-use became the pillar of the S-D logic, whose central and groundbreaking idea is that customers are always co-creators of value (Vargo & Lusch, 2004). The value-in-use concept has as a substantial implication the fact that firms can solely offer value propositions but cannot create value themselves (Edvardsson et al., 2011; Grönroos, 2008; Peñaloza & Venkatesh, 2006; Shamim et al., 2017) since the latter arises from the clients in their own sphere. Under these lenses, engaging customers to contribute to firms' formulation of value propositions becomes of uttermost importance, starting from those that have been defined as "lead users" (Von Hippel, 1986). This emerges also by looking at the growing number of papers addressing the topic of customer engagement (Brodie et al., 2013; Jaakkola & Alexander, 2014; Nambisan & Baron, 2007).

The user-centric perspective of value co-creation has been the dominant view in the years following the introduction of the S-D logic (2004). The underlying idea behind this strand of thought was that value co-creation emerges during usage and it is a dynamic and experiential process in different social, temporal, and spatial settings (Helkkula et al., 2012; Voima et al., 2010). In this process, the user is the one experiencing it in an individual or social context (Grönroos & Voima, 2013).

In the same years, however, the focus on the dyad customer-firm and the user centric view started to be revised and questioned. Vargo (2008) and Vargo et al. (2008), started broadening the view and suggested that the concept of value-in-use could have been replaced by *value-in-context*, a concept implying that the customer is surrounded by a network of actors and the focal firm is just one of them. This view in turn implies a “network-to-network perspective, with value creation being understood in the context of a larger value-configuration space in which each actor is its own primary resource integrator” (Vargo, 2008, p. 213-214). Similarly, Chandler & Vargo (2011) highlighted the contextual factors like network relations in what they refer to as “value co-creation process” and they define context as a “set of unique actors with unique reciprocal links among them” (p. 40). Gummesson and Mele (2010) emphasized the crucial role of networks in value co-creation, supporting the idea that the latter stems from interactions and resource integration in actor-to-actor (A2A) relationships.

These studies marked the beginning of a research shift from the focus on firms and customers towards a multi-actor perspective of co-creation involving multiple actors, with diverse roles and resources (e.g., Akaka & Chandler, 2011). For instance, Grönroos & Voima (2013) advanced the concept of co-creation as “a process that includes actions by both the service provider and customer (and possibly other actors)” (ibid, p. 135). Research has progressively recognized the systemic nature of value creation (Akaka et al., 2013; Frow et al., 2014; Koskela-Huotari et al., 2016) therefore the importance to include other actors in the

studies about co-creation emerged. Some authors like Payne et al., (2008) called for investigating “the role of non-supplier partners and intermediaries in cocreation” (p.94) and a few years later, Lusch & Nambisan (2015), stated that “all [emphasis added] actors are potential innovators or co-creators of value” (p.16). Acknowledging this shift, a few years later, Vargo & Lusch (2016) advanced an extension and update of their theory and in particular, they changed their sixth fundamental axiom from “the customer is always a co-creator of value” into “value is cocreated by multiple actors, always including the beneficiary” (p. 8), thus supporting the idea that multiple actors - and not solely the dyad firm-customer - concur to value creation. Despite this shift in research towards a multi-stakeholder and ecosystem perspective, which reflects the growing importance of stakeholder integration in practice, the role of multiple stakeholders in value co-creation remains under-investigated and poorly comprehended (Kornum & Mühlbacher, 2013).

Scholars have recently started to enquire about value co-creation within ecosystems, considered as groups of actors interacting to co-create mutual benefits, i.e., ‘value’ (Autio & Thomas, 2014; Constantinides et al., 2018; Jacobides et al., 2018). Armstrong et al. (2015) define an ecosystem a set of diverse actors who “create and capture new value through both collaboration and competition” (ibid, p. 45). The concept of ecosystem within the S-D logic perspective has evolved towards “service ecosystems”, defined in the seminal work by Vargo and Akaka (2012) as “relatively self-contained, self-adjusting systems of resource-integrating actors connected by shared institutional logics and mutual value creation through service exchange”. Through the lenses of the S-D logic, service ecosystems are seen as emergent actor-to-actor networks in which value co-creation is conceived as a resource integration process between actors assuming diverse roles (Lusch & Nambisan, 2015). In this system, it is important to have a modular architecture coordinating actors and their service exchange.

The adoption of an ecosystem perspective offers a holistic and dynamic view about value co-creation (Wieland et al., 2012) and it is increasingly adopted by scholars in the field.

While service marketing literature has represented the cradle of co-creation theory, another field in Business and Management has substantially contributed to it, i.e., **Strategic Management** (Autio & Thomas, 2019). Value is a key concept in this research field. A fundamental distinction is between *shareholder value* creation and *total value* generated by the firm and its stakeholders. Classic economic theories further distinguish between *value creation* and *appropriation* between the firm and its value chain partners (Ritala et al., 2021). The total value creation along a supply chain is defined by Brandenburger & Stuart (1996) as the difference between the willingness to pay of the buyer and the opportunity cost of the supplier, while the value appropriation is split among the three main actors, i.e., customers, firms, and suppliers. This means that the value is determined by a pure market transaction: the firm increases its value when it reduces the production costs or when it increases the price that customers pay for its product/service, vice versa customers capture more value when their willingness to pay for the product increases or when the price paid decreases (Garcia-Castro & Aguilera, 2015). The same approach is adopted with many players, as “value is created by the chain of players as a whole, and willingness-to-pay and opportunity cost remain the key ingredients of the definition” (Brandenburger & Stuart, 1996, p.11). The concept of value in strategic management is thus merely economic and value creation results from the gap between market price and the cost of production (Autio & Thomas, 2019).

As in service marketing, also in strategic management the research perspective gradually moved from considering only the actors within the value chain (Brandenburger & Stuart, 1996) to a multi-stakeholder view including other actors, such as employees and governments (Bocken et al., 2013; Bridoux & Stoelhorst, 2013, 2019; Garcia-Castro & Aguilera, 2015; Stubbs & Cocklin, 2008). Scholars in strategic management recently shifted

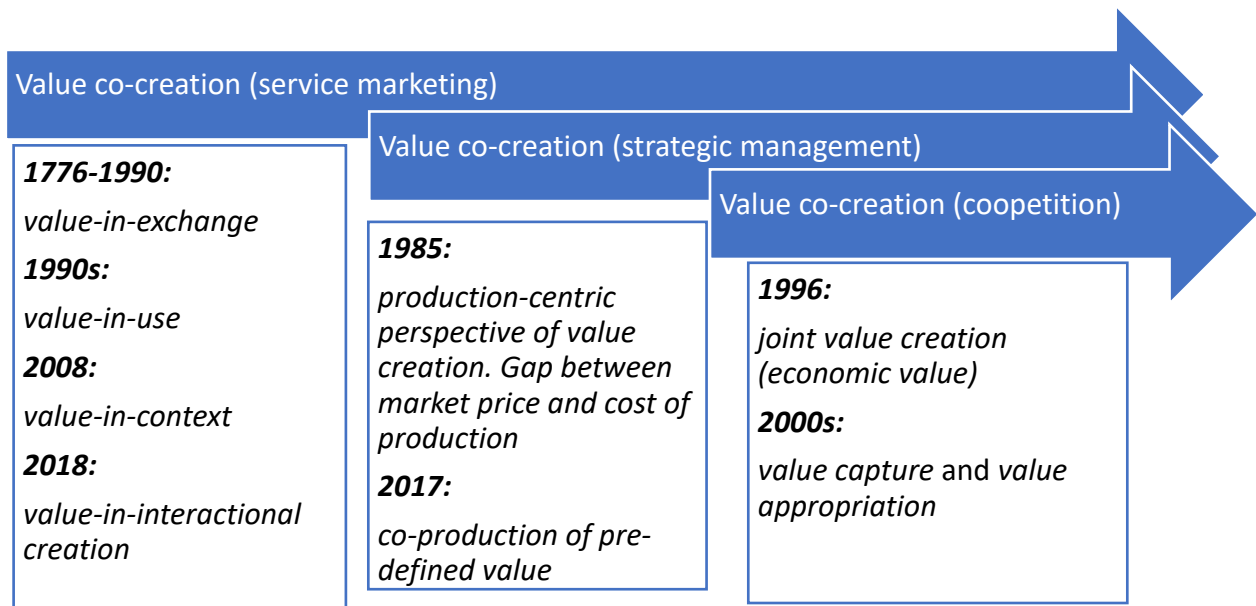
their focus on ecosystems and investigated those properties and governance mechanisms enabling the ecosystems to support value creation by several hierarchically independent actors (Adner, 2017; Jacobides et al., 2018). Adner (2017) distinguishes between *ecosystem-as-affiliation* and *ecosystem-as-structure*. The former focuses on traditional industry boundaries and on the symbiotic relationships in productive ecosystems; here the strategy lies in increasing the number of actors linking to a focal firm and in unlocking interactions among the actors to increase the overall value creation in the system. By doing so, the focal actor increases its bargaining power (e.g., Brandenburger & Nalebuff, 1996; Jacobides et al., 2006). The latter has its roots in the idea that there is a specific value proposition and that what is needed is to identify a set of actors to interact to make it concrete thus “participating actors in the system have a *joint value creation* effort as a general goal” (Adner, 2017, p.41). Strategy research on ecosystems has focused on how firms successfully balance cooperation and competition over time, on the one hand, focusing on *cooperation* and *value creation* - for instance by studying how bottlenecks affect innovation and firms’ ability to jointly create value (Adner & Kapoor, 2010; Hannah et al., 2016) - and on the other hand enquiring *competition* and *value capture* and showing how firms capture value for themselves by restricting competition in their own component, for instance by leveraging market power. Hannah and Eisenhardt (2018) reconcile the two research streams of value creation and value capture by exploring how firms balance cooperation and competition over time in the ecosystem to deliver value to customers. In their influential contribution (ibid), the authors identify three strategies to do so, i.e., bottleneck, component, and system strategies, and in doing so they develop a more complete and dynamic understanding of the system strategy.

Within the strategic management literature, the research stream focusing on **coopetition**, i.e., “simultaneous cooperation and competition between firms” (Bengtsson & Kock, 2014, p.180) devoted particular attention to the concept of value creation stemming from

coopetitive relationships. Scholars in coopetition also focus on the concepts of *joint value creation*, *value capture* and *value appropriation* because of the collaboration/competition aspects inherent to coopetitive dynamics (Ritala & Hurmelinna-Laukkanen, 2009). Through the game theory lenses, coopetition appears rational when cooperating with a competitor makes it possible to increase the size of a market so that there is more value to be divided among the participants (Brandenburger & Nalebuff, 1996). This makes it clear that the purposes of joint value creation are solely economic. Ritala & Tidström (2014) focus on value creation and appropriation within coopetitive networks and they highlight that, while value creation happens at the network/relationships level, value appropriation is typically at the firm level, therefore partners in coopetition need to bargain and develop value-appropriation capabilities which of course are different from one firm to another (Adegbesan & Higgins, 2010; Lavie, 2006). According to Ritala & Tidström (2014), developing a dynamic *relational strategy* (including value creation and appropriation objectives and logics) in coopetitive networks is essential to set the boundaries of the value-appropriation objectives. Nevertheless, solely a few studies about coopetition have been conducted at the network level. For instance, Peng and Bourne (2009) studied coopetition between healthcare networks, and they ended up stating that coopetition existing between networks with compatible but different structures is easier to balance. Song and Lee (2012) have focused on value chains, and they investigated how both cooperation and competition among value chains enhance knowledge acquisition and the creation of logistics value. Apart from these contributions, the understanding of coopetition at the network level suffers from a paucity of research and it is therefore in need of further investigation. Figure 1 synthetizes the evolution diagram of value co-creation over time within the Management field across the analyzed research streams.



Figure 1 Evolution diagram of the value co-creation in Management. Source: own elaboration.



Once understood the diverse conceptualization of value co-creation across research streams, with the present paper we aim to identify the field assumptions underlying the value co-creation theory in each research stream, and to analyze those that we deem worthy to be challenged and refined to improve the co-creation theory. We finally advance possible alternative assumptions that may have the potential to overcome the shortcomings stemming from the extant assumptions and to pave ways to conceive and adopt value co-creation within Management domain.

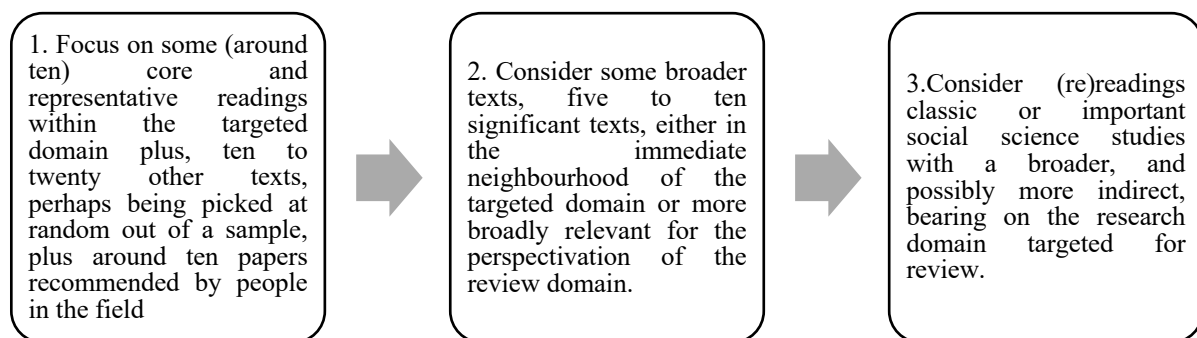
### 1.3 METHODOLOGY

By endorsing a contingency perspective according to which the conceptualization of value and value creation depends on the units of analysis at play (Lepak et al., 2007), this review aims to improve the conceptualization of value co-creation and value co-creation theory by benefiting from the cross-fertilization of contributions across different perspectives within Management domain. To reach this objective, the adoption of a systematic review would not be suitable, since it would not allow us to critically interrogate the extant literature, but solely to

summarize/systematize extant knowledge. Furthermore, the latter goal has already been exhaustively pursued by other scholars (see Galvagno & Dalli, 2014 and Saha et al., 2020). Consequently, we opt for embracing a methodological approach that better suits our research aim, which is the problematizing review (Alvesson & Sandberg, 2020) to “critically interrogate and reimagine existing literature in order to generate new and ‘better’ ways of thinking about specific phenomena” (ibid, p.2). This methodology aims to critically interrogate the extant literature, starting from a deep analysis of “revealing but manageable sample” (ibid, p.9) of papers (instead of very large, often hard to read in-depth, number of papers), with the ambition to “generate re-conceptualizations of existing thinking that trigger new ideas and theories” (ibid, p.8).

We thus follow the review protocol elaborated by Alvesson and Sandberg (2020), composed of three main steps (Figure 2).

*Figure 2. Steps of the problematizing review. Adapted from Alvesson and Sandberg, 2020, p. 9.*



The protocol first requires focusing on the core papers in the targeted domain of analysis, plus ten to twenty other texts that could be randomly picked out of a sample. To these works, in this phase it is recommended to add a further five to ten readings suggested by experts in the field. Second, researchers need to broaden the analysis including publications in neighborhood fields that are relevant for the targeted domain. Third, the research should consider adding some key classic publications in social sciences, that have critically influenced the studied topic. We report the chosen publications in tables, indicating for each of them the

author(s), title, and the journal it has been published on. To facilitate the understanding of the selection process, we indicate in the first column the sequential numbers of the readings we chose to include in the review.

### 1.3.1 Step 1

The first step requires selecting the core and representative manuscripts related to the core subject. The protocol envisages to “focus on, say, ten recognized core studies in the domain targeted and then, ten to twenty other texts, perhaps being picked at random out of a sample. Some people in the domain (informally or through a panel arrangement) could then be asked to recommend additional studies outside this sample and based on this, ten or so more studies could be added which are perceived as valuable to the collection of texts being carefully read or re-read” (Alvesson & Sandberg, p. 9). To select the ten most representative studies in the domain, we started reading the seminal publications concerning value co-creation and then we employed the snowball techniques to collect what we deemed were the most relevant papers. Doing so, we collected twenty papers, mainly (but not exclusively) belonging to service marketing literature – the discipline that historically contributed earlier to advance the topic. Through accurate analysis of their abstracts, we were able to progressively select among them the ten most representative ones for the targeted domain (Table 1). These ten publications all belong to the service marketing literature, a stream of research that contains the core readings of the topic.

*Table 1 Selected core publications belonging to service marketing. Source: own elaboration.*

<b>N.</b>	<b>Author(s) and Year</b>	<b>Title</b>	<b>Journal</b>
1	Akaka M.A, Vargo S. L. and Lusch R. F., (2012)	An exploration of networks in value cocreation: A service-ecosystems view	<i>Review of Marketing Research</i>
2	Barrett M, Davidson, E., Prabhu, J., & Vargo, S. L. (2015)	Service innovation in the digital age: Key contributions and future directions	<i>Journal of the Academy of Marketing Science</i>
3	Chandler J. D and Vargo S. L. (2011)	Contextualization and value-in-context: How context frames exchange	<i>European Business Review</i>

4	Edvardsson B., Tronvall, B. and Gruber, T. (2011)	Expanding understanding of service exchange and value co-creation: a social construction approach	<i>Journal of the Academy of Marketing Science</i>
5	Grönroos C. and Voima P. (2013)	Critical Service Logic: Making Sense of Value Creation and Co-creation	<i>Journal of the Academy of Marketing Science</i>
6	Lusch R. and Nambisan, S. (2015)	Service innovation: a service-dominant logic perspective	<i>MIS Quarterly</i>
7	Meynhardt T. D. Chandler J., Strathoff P. (2016)	Systemic principles of value co-creation: Synergetics of value and service ecosystems	<i>Journal of Business Research</i>
8	Storbacka K., Brodie R. J., Böhmman T., Paul P. Maglio P. P., Nenonen S. (2016)	Actor engagement as a microfoundation for value co-creation	<i>Journal of Business Research</i>
9	Vargo S. L. and Lusch R. (2016)	Institutions and axioms: an extension and update of the service-dominant logic	<i>Journal of the Academy of Marketing Science</i>
10	Vargo S. L., Maglio P. P. Akaka M.A. (2008)	On value and value co-creation: a service systems and service logic perspective	<i>European Management Journal</i>

To these papers, we added other five publications picked up at random from the sample of papers presented in the most recent bibliometric review, namely Saha et al. (2020) (Table 2).

Table 2 Five publications picked up randomly from Saha et al.'s bibliometric analysis (2019),

<b>N.</b>	<b>Author(s)</b>	<b>Title</b>	<b>Journal</b>
11	Grönroos (2011)	Value co-creation in service logic: a critical analysis	<i>Marketing Theory</i>
12	Hoyer, W.D., Chandy, R., Dorotic, M., Krafft, M., Siddharth, S. S. (2010)	Consumer cocreation in new product development	<i>Journal of Service Research</i>
13	Etgar (2008)	A descriptive model of the consumer co-production process.	<i>Journal of the Academy of Marketing Science</i>
14	Auh S. J. B, Colin S. M., Shih, E. (2007)	Co-production and customer loyalty in financial services	<i>Journal of Retailing</i>
15	Nambisan and Baron (2009)	Virtual Customer Environments: Testing a Model of Voluntary Participation in Value Co-creation Activities	<i>The Journal of Product Innovation Management</i>

In the following stage, we had the chance to have a couple of informal talks with academics belonging to the entrepreneurship and marketing fields, who provided us with suggestions regarding additional texts which had an influence on the topic. We also presented the working

paper to two workshops to have further confrontations with scholars. These opportunities for discussion allowed us to evaluate and include in the process further 10 contributions belonging to the service marketing field, which are presented in Table 3.

Table 3 Additional texts in Service Marketing. Source: own elaboration.

N.	Author(s)	Title	Journal
16	Ballantyne and Varey (2008)	The service-dominant logic and the future of marketing	<i>Journal of the Academy of Marketing Science</i>
17	Brodie R., Llic A. Juric B, Hollebeek L. D. (2013)	Consumer engagement in a virtual brand community: an exploratory analysis	<i>Journal of Business Research</i>
18	Frow and Payne, (2011)	A stakeholder perspective of the value proposition concept	<i>European Journal of Marketing</i>
19	Grönroos C. and Ravald A. (2011)	Service as business logic: implications for value creation and marketing	<i>Journal of Service Marketing</i>
20	Gummesson E. and Mele C. (2010)	Marketing as value creation	<i>Journal of Business Market Management</i>
21	Jaakkola E. and Alexander M. (2014)	The Role of Customer Engagement Behavior in Value Co-Creation: A Service System Perspective	<i>Journal of Service Research</i>
22	Lusch, R., Vargo S. L., and Tanniru, M. (2010)	Service, Value Networks and Learning	<i>Journal of the Academy of Marketing Science</i>
23	Payne A. F. Storbacka K. and Frow (2008)	Managing the co-creation of value	<i>Journal of the Academy of Marketing Science</i>
24	Peters (2016)	Heteropathic versus homopathic resource integration and value co-creation in service ecosystems	<i>Journal of Business Research</i>
25	Ramaswamy and Ozcan (2018)	What is co-creation? An interactional creation framework and the implications for value creation	<i>Journal of Business Research</i>

### 1.3.2. Step 2

In the second step, we proceeded with the selection of significant texts in the neighboring research domain to be included in the review. At this stage, we primarily relied on the paper titled “Value co-creation in ecosystems: insights and research promise from three disciplinary perspectives” by Autio and Thomas (2019), who analyze value co-creation in ecosystems through three main perspectives, i.e., service marketing, strategic management, and information systems research streams. If service marketing encloses key publications in value

co-creation, the strategic management literature reasons about value as “co-created in ecosystem contexts” (ibid, p. 7). The information system stream focuses on the context of software artifacts and platforms, which is far from our main study contexts, therefore we decided to exclude it from the present review. After reflecting on the analysis made by the authors and after finding confirmation in the contribution by Lepak et al. (2007), we acknowledged that strategic management could offer meaningful insights to the conceptualization of value co-creation. Hence, we decided to include ten publications belonging to the strategic management field, which are reported in Table 4.

Table 4 Publications in a neighboring area: Strategic Management. Source: own elaboration.

<b>N.</b>	<b>Author(s) and Year</b>	<b>Title</b>	<b>Journal</b>
26	Adner, R. (2017)	Ecosystem as structure: an actionable construct for strategy	<i>Journal of Management</i>
27	Adner, R. and Kapoor (2010)	Value innovation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations.	<i>Strategic Management Journal</i>
28	Freudenreich, B., Ludeke-Freund F. and Schaltegger, S. (2019)	A stakeholder theory perspective on business models: value creation for sustainability	<i>Journal of Business Ethics</i>
29	Frow, P. Nenonen, S. Payne, A. and Storbacka, K. (2015)	Managing co-creation design: a strategic approach to innovation	<i>British Journal of Management</i>
30	Garriga, E. (2014)	Beyond stakeholder utility function: stakeholder capability in the value creation process	<i>Journal of Business Ethics</i>
31	Jacobides M.G, Cennamo, C. and Gawer, A. (2018)	Towards a theory of ecosystems	<i>Strategic Management Journal</i>
32	Hannah, D. P., and Eisenhardt, K. M. (2018)	How firms navigate cooperation and competition in nascent ecosystems	<i>Strategic Management Journal</i>
33	Prahalad and Ramaswamy (2004)	Co-creating unique value with customers	<i>Strategy and Leadership</i>
34	Ritala P., Albareda L. and Bocken, N. (2021)	Value creation and appropriation in economic, social, and environmental domains: recognizing and resolving the institutionalized asymmetries	<i>Journal of Cleaner Production</i>
35	Zhang, X. and Chen, R. 2008	Examining the mechanism of the value co-creation with customers	<i>International Journal of Production Economics</i>

In addition, after confrontations with knowledgeable scholars during the informal talks we had with scholars in the field, we realized that a second group of papers (five) could have been considered “broadly relevant for the perspectivation of the review domain” (Alvesson &

Sandberg, p. 9). These papers belong to the coopetition literature (Table 5). Coopetition means “cooperation between competing firms” (Maria Bengtsson & Kock, 2014; Rijamampianina & Carmichael, 2005) and it implies joint value creation and collaboration between competing firms, to aspire to get a win-win situation for the actors involved. Despite being a quite new concept in Management research, the coopetition literature may have a significant influence over the conceptualization of value co-creation since it can shed some light on how value is created, co-created, and appropriated within B2B relationships. For this reason, we deemed this research stream was worthy of inclusion in our review.

Table 5 Publications in a neighboring area: subfield of Strategic Management "coopetition". Source: own elaboration.

<b>N.</b>	<b>Author(s) and Year</b>	<b>Title</b>	<b>Journal</b>
36	Ansari Garud R. and Kumaraswamy, A. (2016)	The disruptor’s dilemma: Tivo and the U.S. television ecosystem	<i>Strategic Management Journal</i>
37	Eklund and Kapoor (2019)	Pursuing the new while sustaining the current: incumbent strategies and firm value during the nascent period of industry change	<i>Organization Science</i>
38	Khanagha S. Ansari, S., Paroutis, S. and Oviedo L. (2020)	Mutualism and dynamics of new platform creation: a study of cisco and fog computing	<i>Strategic Management Journal</i>
39	Kumaraswamy, A., Garud, R. and Ansari S. (2018)	Perspective on disruptive innovations	<i>Journal of Management Studies</i>
40	Ritala, P. and Tidstrom, A. (2014)	Untangling the value-creation and value-appropriation elements of coopetition strategy: A longitudinal analysis on the firm and relational levels	<i>Scandinavian Journal of Management</i>

### **1.3.3 Step 3**

Following Alvesson and Sandberg’s (2020) protocol, we continued with the third step of the review by considering the inclusion of some key classic publications which address topics that have a significant influence on the investigated research domain. We started the selection of these publications by analyzing the bibliographical references of included papers, as well as the milestone of social science literature addressing the concept of value creation. Finally, we asked scholars in the field to provide us with further readings to be added as “classic”. After

this exchange of opinions, we ended up including five classic books and papers that we considered the most relevant for the aim of our study (Table 6).

*Table 6 Key classic publications influencing the topic. Source: own elaboration.*

N.	Author(s) and Year	Title	Journal/Editor
41	Penrose, E. (1959)	The theory of the growth of the firm	<i>New York: John Wiley.</i>
42	Smith A. (1776)	The wealth of nations	<i>New York: the modern library</i>
43	Von Hippel (1986)	Lead Users: a source of novel product concepts.	<i>Management Science</i>
44	Brandenburger Adam M. and Nalebuff Barry J. (1996)	Co-opetition: A Revolutionary Mindset That Redefines Competition and Cooperation.	<i>Bantam Doubleday Dell</i>
45	Smart, William (1891)	An Introduction to the Theory of Value.	<i>London: MacMillan and Co.</i>

The entire selection procedure led us to identify a total number of **forty-five contributions** that we included in this problematizing review. In the next section we illustrate the findings emerging from the analysis of the considered publications.

#### 1.4. DISCUSSION

By adopting a problematization approach, we aim to improve the co-creation theory starting from critically examining the shortcomings stemming from the current theory. To do so, we first make those implicit field assumptions in each identified research stream explicit and then we underline which are the shortcomings stemming from those assumptions. Subsequently, we advance possible alternative assumptions that have the potential to overcome the identified shortcomings and to improve the extant co-creation theory within the analyzed research areas (see Table 7).



Table 7. Challenging assumptions and improving co-creation theory. Source: own elaboration.

Domain literature	Major assumptions	Evaluation of key assumptions and related shortcomings	Development of alternative assumptions	Potential to improve extant theory
<b>Service Marketing literature</b>	<p>Value is co-created by multiple actors, always including the beneficiary</p> <p>Actors (e.g., firms) cannot deliver value but can participate in the creation and offering of value propositions.</p> <p>Value is always uniquely and phenomenologically determined by the beneficiary.</p> <p>Each actor maintains a static role throughout the value creating process.</p>	<p>Actors can generate value propositions, but it is uniquely the beneficiary which determines and actualizes value in its own sphere, therefore value is endogenously determined.</p> <p>By conceptualizing value as “defined by the user”, this perspective makes the conceptualization of value tautological.</p>	<p>Value is co-created through joint direct interactions between two or more actors, and it is not necessarily unidirectional, as there could be a “value in return” which can be a form of value stemming from the beneficiary to the provider and/or diverse forms of value for the belonging context (economic, social, and environmental value).</p> <p>The value co-creation processes among actors within the ecosystem stem from interactions and resource integration and generate value not solely for the actors involved, but also for the environment and the society.</p>	<p>A theory of value co-creation can be developed starting from the assumption that value may not be always phenomenologically determined only by the beneficiary, and that value co-creation processes need to be defined within specific contexts. The concept of value needs to encompass multiple dimensions, including the environmental and social ones.</p>
<b>Strategic Management literature</b>	<p>Value creation results from the gap between market price and the cost of production. Customers are passive target of firms’ value proposition. The concept of value is merely economic.</p> <p>Value is exogenously determined by the market through price mechanism</p>	<p>The fact that value is exogenously determined by the market through competition among firms excludes the involvement of customers in value creation.</p> <p>This literature overlooks the value creation processes in alternative market-structures such as those emerging in business ecosystems, whereby value is not exogenously created,</p>	<p>Value is endogenously and simultaneously co-created by firms, suppliers, and customers, through complementarities and synergies.</p> <p>Value creation is the result of negotiations among the actors, and it cannot be determined ex-ante, but it also include the social and environmental</p>	<p>Starting from the assumption that firms may not know in advance what is valuable for the targeted customers, the latter should be included in the process of definition of value creation by encouraging their interactions with the firms through value co-creation processes.</p> <p>A theory of value co-creation can be developed by</p>

<p><b>Coopetition (Subset of Strategic Management)</b></p>	<p>and contractual agreements.</p> <p>The concept of value creation is solely economic and value creation is the result of informal negotiations among firms, aiming to increase value both for the firms involved (economic) and for the customers (in terms of satisfaction). Customers do not take part in value creation, therefore what is considered valuable for them is determined ex-ante by the coopeting firms.</p>	<p>but it rather emerges endogenously through negotiations and complementarities among actors.</p> <p>The fact that value is exogenously determined ex-ante by coopeting firms through informal negotiations excludes the involvement of customers in value creation.</p> <p>Value appropriation concerns only the coopeting firms, thus excluding the customers from the discourse and completely ignoring the desires and the benefits they seek from the products/services offered by coopeting firms.</p> <p>The value created by the coopeting firms is merely economic, thus it completely leaves out the social and environmental dimensions of value creation.</p> <p>The concept of value co-creation is not sufficiently developed.</p>	<p>dimensions of value creation.</p> <p>Value is co-created by firms through informal agreements by including customers in the process, and concurrently embedding the social and environmental dimensions of value in its conceptualization.</p>	<p>considering that value may not be determined ex-ante by firms/suppliers via price setting mechanisms, but it is rather determined ex-post (emerging value) through complementarities and synergies among negotiating actors. The latter should include the social and environmental dimensions in the value creation.</p> <p>A theory of value co-creation can be developed by considering that what is valuable for customers cannot be taken for granted by negotiating firms, but it rather needs to be discovered over time also by including customers (and other key actors within the network) in the value creation process. The value creation and appropriation by coopeting firms need to include the social and environmental dimensions of value.</p>
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### 1.4.1 Service Marketing

The service marketing literature has initially focused on firms and customers as main dyads involved in the co-creation process. The core and groundbreaking idea brought forward in this research field is that customers are always co-creators of value (Grönroos, 2008; Payne et al., 2008; Vargo & Lusch, 2004) and “value is defined by and cocreated with the consumer rather than embedded in output” (Vargo & Lusch, 2004, p.6). Through these lenses, the conceptualization of value that marketing inherited from economics, based on the “utility” embedded in products (Beckman, 1957; Smith, 1776) gives ways to a service-oriented view of value creation requiring to learn from customers and to be “adaptive to their individual and dynamic needs” (Vargo & Lusch, 2004, p. 6). The S-D logic implies that firms cannot create value themselves, but solely value propositions since value emerges in the customers’ sphere as *value-in-use*, namely emerges during the usage or possession of resources, as highlighted in the S-D logic’s foundational premises (Vargo & Lusch, 2004, 2008).

The most impactful implication stemming from this premise is that the firm cannot engage itself with the customer’s value creation and take part in it: since value is “always uniquely and phenomenologically determined by the beneficiary” (ibid), only the customer can determine what value is and experience it during the resources’ usage. Our criticism arises from the belief that this perspective of value as “defined by the user” makes the conceptualization of value itself tautological. Moreover, the expression “phenomenologically” encloses many meanings since it assumes that value is endogenously determined and not context-dependent and therefore it does not contribute to overcome the elusiveness of the concept of value itself. We share with Grönroos (2011) the intuition that the axiom of S-D logic “value is always uniquely and phenomenologically determined by the beneficiary” (Vargo & Lusch, 2004) may be improved by acknowledging that “value can be considered experientially perceived and also experientially determined” (Grönroos, 2011, p.295) thus incorporating the idea that value is

not only determined but also experienced by customers, therefore it is contextually perceived. Our main point here is that the contextual aspect of value creation needs to be included and expanded within the value co-creation discourse.

Understanding the *locus* of value co-creation is the key to overcome the tautological conceptualization of value as stemming from the seminal contributions by Vargo and Lusch (2004, 2008). In this regard, Grönroos (2011) proposed a critical analysis identifying as a key point the fact that the creation of value in-use by the user and value creation as an all-encompassing process including activities by both firms and customers are distinct: while the former assumes that value is created by the user for the user, the latter includes the provider's activities in the value creation (from design to delivery). Consequently, the two approaches lead to a different conceptualization of value co-creation and if they are concurrently adopted, they risk contradicting each other's. The author suggests that the key to overcoming this critical issue lies in interpreting value co-creation as lying in the *interaction* between firms and customers. Without understanding and enquiring the interaction between firms and customers, it is not possible to identify the locus, nature, and content of value co-creation. If interaction is conceived as a "joint value creation process", it is right there that the provider intervenes as co-creator of value (value-in-use) with the customer, meaning that through interactions, providers get opportunities to become co-creators of value with their customers, and joint value creation is made possible.

As highlighted in the theoretical foundations of this paper, service marketing scholars have recently shifted their focus from value-creation between the dyad firm-customers towards networks of actors involved in *A2A relationships* (Gummesson & Mele, 2010) that generate *service ecosystems* (Akaka et al., 2013). The latter involve diverse actors embedded in a supportive environment and are conceived to create *mutual value* between the actors involved.

Moreover, very recently, Ramaswamy and Oczan (2018) have emphasized the concept of *value-in-interactional creation*, which sees co-creation as enactment of interactional creation.

Despite broadening the perspective including multiple actors within the ecosystem represents a step forward in the theoretical foundations of the theory, we argue that the concept of value remains anchored to the sphere of the actors involved without considering the impact that the co-creation processes may have in terms of value generated for the entire ecosystem (environmental and social). This aspect is relevant because value co-creation theory cannot solely include *who* generates value and the *locus* of value creation, but it also needs to acknowledge the overall value generated for the surrounded context, the *value-in-context* as conceived by Chandler & Vargo, (2011), which includes micro, meso, and macro levels. Actors and their contexts can be considered as mutually constitutive, or also as partially defined by one another (Giddens, 1979). Contextual factors are critical as “how actors draw upon one another as resources is critically dependent on the contexts in which they are embedded” (ibid, p. 38). Because each actor in the context is always integrating and exchanging resources with other actors in continuous interactions, this flow causes constant changes in the context, which need to be acknowledged and included in the theory. By considering the growing importance that incorporating environmental and social aspects within value creation is playing in the current scenario – see for instance the groundbreaking theory of *shared value* recently advanced by (Porter & Kramer, 2019) - we believe that to advance co-creation theory it is necessary to consider value creation not just considering the actors involved in the process and their intercurrent interactions, but also their contextual dimension, including the environmental and social spheres.

To conclude, what emerges from the service marketing literature is that whatever the value is conceptualized as *value in-use*, *value in-context*, or *mutual value creation*, and whatever one considers a dyadic or an A2A dimension, the main assumption underpinning the

S-D logic is that value is conceived as a phenomenological experience happening in the sphere of the beneficiary. Moreover, the value co-creation theory assumes that the roles of service provider and beneficiary within value co-creation theory are static, while in reality “the well-defined roles that actors traditionally played to create value no longer exist. A customer in one activity can simultaneously be a competitor, supplier, or partner in another activity” (Bengtsson & Kock, 2014, p.181). By following this reasoning, and by overcoming the unidirectional conceptualization of value from the provider to the beneficiary, we argue that value is co-created through joint direct interactions between two or more actors, and it is not necessarily unidirectional, as there could be a “value in return” which can be a form of value stemming from the beneficiary to the provider and/or diverse forms of value for the belonging context (economic, social, and environmental value).

To advance extant value co-creation theory, we propose that it might be necessary to overcome the conception of value as phenomenologically determined by the beneficiary, and to include a contextualization of value which would benefit from the clarification of the following elements: i) the dyads involved in the value co-creation process, ii) the type of (perceived) value in the A2A relationships within networks/ecosystems, iii) the fact that value may result from a process of negotiation in actor-to-actor relationships, iv) the value generated within and for the context (economic, social, and environmental value).

#### **1.4.2. Strategic Management**

Strategic management literature is rooted in industrial organization economics, where business firms are subject to precise competitive forces and compete in an open market with their products/services (Porter, 1980, 1985).

By following the industrial organization tradition, strategic management assumes that the “value of products and services is determined by the balance of supply and demand within

markets composed of segments of homogeneous, predefined user preferences that determine their willingness-to-pay” (ibid, p. 6). The underlying assumption is that value is exogenously determined by the market uniquely in monetary terms as the resulting difference between market price and the cost of production (Brandenburger & Stuart, 1996). Hence, customers are not considered active agents in value (co)creation since strategists (managers and entrepreneurs) know in advance what is valuable for the former. Consequently, value propositions are the mere results of firms’ strategies and customers are not involved in their definition (Autio & Thomas, 2019).

We believe the first shortcoming stems from the fact that strategic management considers value merely from the economic perspective and customers as simply targets of firms’ value propositions. To overcome this shortcoming, we propose to consider as an alternative assumption the fact that firms may not know in advance what is valuable for the targeted customers (emerging value), therefore the latter should be included in the process of definition of value creation through interactions with the firm.

A second issue regards the business ecosystems which are mostly treated by strategic management as “multi- stakeholder venues for value (co-)production” (Adner, 2017). Under these lenses, co-creation appears closer to “co-production” of a pre-determined value, which does not benefit from the discovery and creation of novel forms of utility for the customers. Strategic management is thus still anchored to the supply-chain, and the conventional supply chains are made of a series of contractual relationships with suppliers aimed at mitigating opportunistic behaviors (Williamson, 1991, 1999). The issue arises from the fact that in ecosystems “not all supplier relationships are contractually governed” (Autio & Thomas, 2019, p.6) and therefore the value that firms offer to customers depends on different elements, such as the availability of complementary products and services (ibid). The alternative assumptions we develop are based on the idea that value cannot be not determined *ex-ante* by contractual

agreements and negotiations among the actors involved in the value chain, but it rather emerges in ecosystem interactions from the complementarities and synergies stemming from the network of actors (Adner, 2017; Adner & Kapoor, 2010).

To improve the highlighted assumptions underlying the conceptualization of value creation in strategic management, we thus argue that it may be worthy to overcome the idea that “value” is exogenously created. A possible alternative assumption we suggest may thus imply that value cannot be determined *ex-ante*, but it is rather endogenously and simultaneously co-created by firms, suppliers, and customers, through continuous complementarities and synergies (emerging value). Moreover, the inclusion of the social and environmental aspects of value creation, as underlined for the service marketing, would represent a step forward to further refine the concept of value creation including its implications on the contextual dimension (micro, meso, and macro).

As underlined in the theoretical section of this paper, value creation has also been discussed within the **coopetition** literature. Coopetition refers to the “simultaneous cooperation and competition between firms” (Bengtsson & Kock, 2014, p.180) and consists in the fact that competing firms decide to cooperate with each other to create value and a bigger market for each participant; later on, the same firms compete to get the created value (Brandenburger & Nalebuff, 1996; Brandenburger & Nalebuff, 1995). The logic behind coopetition is that “mutual cooperation makes it possible for all players to gain a bigger payoff than other available options” (Ritala & Hurmelinna-Laukkanen, 2009, p.821). Coopetition has its distinctive features stemming from its specificity as it implies joint value creation and collaboration between competing firms, aiming at increasing the value both for the firms involved (economic) and for the customers (in terms of satisfaction)

The literature on coopetition distinguishes between *value creation* and *appropriation*: the former is the total sum of value that the involved firms can generate, while the latter is the



individual share of the value that a firm can capture. The objective of coopetition is “to create a bigger business pie, while competing to divide it up” (Brandenburger & Nalebuff, 1996). This may give rise to contradictions since value creation is a collective action, value appropriation is an individual one, and therefore the concepts of value creation and appropriation need to be clearly distinguished (Brandenburger & Nalebuff, 1996; Ritala & Hurmelinna-Laukkanen, 2009). This specific feature “sets coopetition apart from other types of interorganizational relationships and networks” (Ritala & Tidstrom, 2014, p. 499) because value creation and appropriation objectives depend on both the relational and the firm level. The value co-creation approach in the relational strategy is synergy seeking, i.e., “there is a joint aim to create value in cooperative network through combining the resources and capabilities of the actors and increasing inter-firm learning and adaptation” (ibid, p. 512). At the firm-level strategy the value creation approach tends to be collaborative, implying a “value creation through collaboration with other firms in the cooperative networks” (ibid), but at the same time also competitive, as “value creation happens through individual objectives in the domain of the cooperative network” (ibid). Regarding the value appropriation approach within relational strategy, competing firms have a joint aim to increase their market share and sales, while for the firm-level strategy, the aim is to search firm-specific benefits. According to Ritala & Tidstrom (2014), the relational strategy can provide a broader framework in which the value co-creation objectives are included.

The main underlying field assumption here is that the concept of value is merely economic and value creation is the result of informal negotiations among firms and it largely depends on the “common knowledge about markets and technologies the involved parties possess” (Ritala & Hurmelinna-Laukkanen, 2009, p.826). As said above, firms try to collectively increase the overall value generated and then they individually find ways to appropriate it. Within these processes, customers are not contemplated since what is considered

valuable them is determined *ex-ante* so that there is no need to involve them in the value creation definition. Moreover, value appropriation concerns only the coopeting firms, thus excluding the customers as well as other societal actors from the discourse, thus completely ignoring their desires and the benefits they seek from the products/services offered by coopeting firms. The concept of value created and appropriated by the coopeting firms is merely economic. To overcome these shortcomings, we propose that a possible alternative assumption may depart from the idea that what is valuable for customers cannot be taken for granted by negotiating firms, but it rather needs to be discovered over time by firms through informal agreements which also need to include customers (and maybe other key actors within the network) in the process. As for the other research streams, we support the idea that value creation and appropriation by coopeting firms would also need to include social and environmental dimensions of value since focusing solely on the economic sphere of value means ignoring the contextual environment the firms are embedded in and impact upon.

## **1.5. CONCLUSION AND FUTURE RESEARCH AVENUES**

This study was aimed at proposing a problematizing review of the assumptions underlying value co-creation within diverse research fields in Management. Through a critical analysis of forty-five contributions in the Management domain, we contributed to the scholarly conversation about value co-creation by making implicit related field assumptions explicit. We then problematized some key assumptions underlying the co-creation theory within service marketing literature, where co-creation theory has been shaped and developed, and strategic management literature. After examining the key assumptions that we deemed worthy to be challenged, we advanced alternative assumptions having the potential to improve the value co-creation theory. We suggest Management scholars to start considering these alternative assumptions in their future conceptual as well as empirical contributions.

This work is not devoid of limitations. First, the methodology employed has been introduced very recently and only one published paper has adopted it so far, i.e., Dzhengiz et al. (2021). This means it was not possible to learn from other scholars' implementation of the methodological approach recently advanced by Alvesson and Sandberg (2020), and therefore this study represents a forerunner from the methodological perspective. We acknowledge that the problematizing approach gives the researchers wide freedom in terms of choosing the papers to critically reflect upon and to be included in the review, and this aspect may be a double-edged sword. The wide discretion given to the researchers to choose the assumptions to be challenged may be indeed criticized for making the review process not sufficiently systematic and easily replicable, yet we believe this is also the major strength of the problematization approach. Only if we do not let a standardized procedure decide what is relevant for our research and what is not, we can substitute what Alvesson and Sandberg (2020) define as “building exercise” (p.1) with an “opening up exercise” upon the theory, thus paving new ways for groundbreaking research.

We also acknowledge that some limitations stem from the fact of focusing solely on value co-creation in the Business and Management research domain, while excluding other research streams that have contributed to the theory, such as Information Systems. We deliberately made this choice to narrow down our search thus being able to perform an accurate and critical evaluation of the selected contributions and the field assumptions underlying the research streams they belong to. Future studies may depart from our investigation and aspire to develop a more comprehensive and overarching problematizing review, maybe also benefiting from the cross-fertilization of other social science disciplines (e.g., psychology, sociology, and political science).

## **2. CHAPTER 2: VALUE CO-CREATION PROCESSES AND UNDERLYING MECHANISMS IN CIRCULAR ENTREPRENEURSHIP: AN EXPLORATORY STUDY ON BORN CIRCULAR SMEs.**

*“Extensive interaction and collaboration are therefore prominent, and of critical importance in value co-creation contexts characterized by intricate exchange, but the mutual processes of value co-creation have seldom been empirically studied” (Aarikka- Stenroos & Jaakkola, 2010, p.15).*

*“We know very little about the process of value creation when it starts, what it includes and when it ends” (Gronroos, 2011, p. 282).*

*“It is unclear how actors other than firms participate in value co-creation processes” (Akaka & Chandler, 2010, p. 250)*

### **ABSTRACT**

This article contributes to the entrepreneurship literature regarding the empirical analysis of the dyadic co-creation processes through which small and medium-sized enterprises (SMEs) co-create value with their key actors. The context of analysis is circular entrepreneurship, which concerns the processes of formation and exploitation of opportunities to address key environmental challenges. Circular firms tend to develop collaborative value co-creating processes with different actors to narrow, slow, and close the resource loops. Through a multiple case study methodology, involving ten born circular SMEs established in Italy and Finland and their key co-creating actors, we analyze the dyadic value co-creation mechanisms between circular firms and each actor. We contribute to the emerging circular entrepreneurship literature by developing an empirical model of circular co-creation processes and their underlying mechanisms and by advancing a set of Propositions to be tested in future research.

Keywords: value; co-creation; circular entrepreneurship; SMEs; born circular firms.

## 2.1 INTRODUCTION

The creation of value is the core purpose and focal process of any economic exchange (Vargo et al., 2008). During the last two decades, the concept of value co-creation - defined as “the process by which products, services, and experiences are developed jointly by companies and their stakeholders, opening up a whole new world of value” (Ramaswamy, 2009, p.11) - gained attention among scholars and its importance raised to such an extent that it has been proposed as a core foundation, a “building block” in marketing (Sheth & Uslay, 2007). Since Prahalad and Ramaswamy (2000) first introduced the concept, several studies addressing co-creation have been undertaken, mainly belonging to the service science field (Autio & Thomas, 2019; Galvagno & Dalli, 2014b).

Despite the importance of the topic in the mentioned streams of research, quite surprisingly, scant attention has been paid to the phenomenon of co-creation in the entrepreneurship literature. We still have little knowledge regarding value co-creation processes in practice (Echeverri & Skålén, 2011; Vargo et al., 2008), and their key underlying dynamics and mechanisms (Grönroos & Voima, 2013; Lenka et al., 2017). Researchers have been called for “systematically identifying and analyzing the mechanisms in more detail” (Saarijärvi et al., 2013, p. 382). In particular, there is a paucity of empirical investigations on mutual value co-creation in knowledge-intensive contexts (Aarikka-Stenroos & Jaakkola, 2012a), and within business-to-business contexts (Payne et al., 2008), especially those involving non-supplier partners (*ibid*). The process view “accentuates the need to view the relationship between the provider and the customer as a longitudinal, dynamic, interactive set of experiences and activities performed by the provider and the customer, within a context using tools and practices that are partly overt and deliberate, and partly based on routine and unconscious behavior” (*ibid*, p. 85). Also the value outcome stemming from these processes has not been sufficiently investigated (Aarikka-Stenroos & Jaakkola, 2012). Very recently, Echeverri

(2021) has tried to fill the gap identified by himself in 2011 by investigating the micro-practice of interactive value formation; he developed an analytical framework to explain the mechanisms of value formation in service ecosystems. However, his empirical analysis has been conducted in the health care and transport service ecosystems, which are quite distant from the context of the present study, i.e., circular entrepreneurship. By considering co-creation as “joint creation of value by the firm and its network of various entities (such as customers, suppliers, and distributors) termed here actors” (Perks et al., 2012, p. 934), we aim to answer the following research question: how do circular firms co-create value with their key actors?

The context of this study is circular entrepreneurship (CE), i.e., “the processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, slowing, and narrowing the loop of resources and regenerating/reconstituting natural capital” (Zucchella & Urban, 2019, p. 195). Circular entrepreneurs are motivated by the will to change the way of doing business in terms of people and the environment (Zucchella & Urban, 2019); therefore, they tend to overcome a traditional economic value-centric view of value creation to include ecological and social values (Patala et al., 2016), with the potential of generating the so-called “Total Societal Impact” (TSI) (Beal et al., 2017), which captures the economic, social, and environmental impact generated by their entrepreneurial ventures.

To reach these ambitious goals, circular entrepreneurs tend to establish synergies with diverse actors, which can be so intense as to become value co-creation processes. Research focusing on value co-creation in the CE context still in infancy, especially studies focusing on smaller ventures (Dey et al., 2020). We hereby contribute to filling this gap by analyzing how

ten SMEs born circular firms<sup>1</sup> (Zucchella & Urban, 2019) develop co-creation processes with their key actors<sup>2</sup>.

Our investigation offers a twofold contribution. First, we contribute to the value literature in entrepreneurship by providing a thorough analysis of value co-creation (Grönroos & Voima, 2013), including their key underlying mechanisms (Lenka et al., 2017) and the actors involved. Second, we contribute to the emerging circular entrepreneurship literature (Cullen & De Angelis, 2020) from the perspective of smaller organizations by advancing an empirical model that describes “circular co-creation processes” by including actors, underlying co-creation mechanisms, and outputs.

The remainder of this paper is structured as follows. First, we present the background literature on co-creation, and we illustrate the shortcomings that we aim to address with the present study. Subsequently, we accurately illustrate the methodology employed and our case firms. We then describe our main findings. We propose an empirical model of circular co-creation processes and a set of Propositions and avenues for future research. Finally, we conclude the study by identifying our key theoretical contributions and implications for practice and propose a set of avenues for future research.

## **2.2. THEORETICAL BACKGROUND**

### **2.2.1 Value co-creation**

Since its introduction in the early 2000s (Prahalad & Ramaswamy, 2000; Vargo & Lusch, 2004), value co-creation has gradually emerged as a new paradigm in the management literature.

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<sup>1</sup> Born circular firms are defined as ventures that “have been founded originally adhering to circular economy principles” (Zucchella and Urban, 2019, p.91).

<sup>2</sup> In the circular economy, stakeholders have a key role: “they collaborate to maximize the value of products and materials and contribute to minimizing the depletion of natural resources and create positive societal and environmental impact” (Bocken et al., 2018, p. 79).

The value-creating process can be defined as “a set of activities starting with the design and development of what is going to be produced” (Vargo et al., 2008, p. 361). The concept of value has faced radical changes from the transaction (G-D) logic dominating the consumer goods market until the more recent service-dominant (S-D) logic (Vargo & Lusch, 2004), which has at the core the concept of service as “the process of doing something for and with another party” (Maglio et al., 2009, p.399). As underlined by Payne et al. (2008), “processes include the procedures, tasks, mechanisms, activities, and interactions which support the co-creation of value” (p.58).

The gradual shift toward S-D logic started as early as in the late 1990s, when changes could be observable from consumers, in so far as they started “stepping out of their traditional roles to become cocreators as well as consumers of value” (Prahalad & Ramaswamy, 2000). Their role keeps increasing over years. In 2007, Sheth and Uslay, recognized that the “success of the value cocreation process relies heavily on customers’ efforts and involvement” (p.305). Customers are recognized as “empowered actors” in the development of brands (Payne et al., 2009). This is especially true for “working consumers”, who voluntarily contribute to providing value for an organization (Bauer & Gegenhuber, 2015) in a constructive way (Cova et al., 2011). The revolutionary scope brought by the S-D logic is unanimously acknowledged. If the goods-dominant logic (G-D) was marked by a clear split between producer and user, and it was rooted into the value-in-exchange concept, the S-D logic assumes that the roles of producers and consumers are not distinct, and that “the customer is always a co-creator of value” (Lusch & Vargo, 2006). Through this perspective, value-creating processes cannot be performed separately from firms and customers: the *locus* of value creation is the interaction between them (Prahalad & Ramaswamy, 2004; Vargo et al., 2008).

Over the last two decades, several studies have advanced the positive outcomes stemming from co-creation processes both from the firms’ and the customers’ side (Prahalad &



Ramaswamy, 2004a, 2004b). On the one hand, customers tend to feel satisfied thanks to their participation in firms' processes (Nambisan & Baron, 2007) and typically perceive a higher value (Kelley et al., 1990; Anderson & Sullivan, 1993), and a sort of control over the offerings (Lengnick-hall, 1996). Moreover, they may also consider the economic advantages (Bitner et al., 1997) stemming from their participation, which tend to assume the form of discounts. On the other hand, several are the recognized benefits that firms can gain through customer engagement in value co-creation processes, for instance, the increase in brand loyalty (Jaakkola & Alexander, 2014), the improvement of the offerings (Bitner et al., 1997; Mills et al., 1983), better product quality (Füller et al., 2011), the attraction of new customers (Pilgrimiene et al., 2015b; Saarijärvi et al., 2013), and the reception of inputs for innovation (Magnusson et al., 2003; Nambisan, 2002; Von Hippel, 2001).

Frow et al. (2015) analyze the motives for engaging in co-creation by firms. Building upon Sheth and Uslay (2007), thanks to an in-depth analysis of the literature plus workshops and interviews with practitioners, the authors identify nine motives for which firms co-create with customers. For instance, initiating co-creation practices may be motivated by the willingness to access resources (Holcomb & Hitt, 2007), to increase customer commitment (Gentile et al., 2007; Ogawa & Piller, 2006), to create more competitive offerings, especially through co-design and co-conception (Carbonell et al., 2009), and to build brand awareness, mainly through co-promotion (Schau et al., 2009). The process of co-creation highly depends on many factors, such as the environment, the type of sectors (manufacturing versus service), the industry maturity, the extent of industry intermediation, and the organization size.

### **2.2.1.1 Value co-creation forms**

The literature identifies a number of co-creation forms between firms and customers (Sheth & Uslay, 2007). Frow et al. (2015) made a first attempt to systematize co-creation forms by

specifically advancing the following twelve types - which nevertheless are still lacking a precise conceptualization (Re et al., 2021). Co-conception of ideas (joint developing of projects and solutions), co-meaning creation (sharing of meaning within the communities of users), co-design (customers provide their knowledge in the design of products or services) (Piller & Walcher, 2006; Von Hippel, 1986), co-consumption (sharing of consumption experiences with fellow customers), co-experience (experience products/services through social interaction, thus providing them a collective meaning). Some co-creation forms specifically concern the firms' traditional marketing mix: co-production (customers are included in the production process as well as in the value proposition design), co-promotion (customers enthusiastically promote the brand through their channels), co-pricing (customers manifest their willingness to pay according to the value they assign to the product/service), and co-distribution (involvement of customers in the distribution activities). Eventually, co-maintenance, co-outsourcing, and co-disposal are the last value co-creation forms, which lack precise definitions. Co-maintenance is vaguely considered as the involvement of customers in refurbishment and/or recovery activities, co-outsourcing seems to imply that "customer resources are integrated into the company's [...] outsourcing processes" (Saarijärvi, 2012, p. 383), while co-disposal refers to post-consumption's actions allowing recycling products and materials.

Despite much of the studies enthusiastically highlights the benefits of co-creation for both sides, the co-creation process is not devoid of criticism. Cova and Dalli (2009) argue that customers' involvement in the value creation process may be considered as a form of exploitation since there is not adequate compensation for the contribution provided. Other authors even talk about customer manipulation through co-creation (Bonsu & Darmody, 2008; Zwick et al., 2008). From the firms' perspective, it may also be difficult to recognize potentially successful ideas among the ones suggested by customers and to manage their expectations alike (Hoyer et al., 2010). Moreover, one should not forget that co-creating value can also be risky.

It may be possible, indeed, that value could be co-destroyed through interaction (Plé & Cáceres, 2010), especially when customers and firm resources are nonintegrated (Yin et al., 2019). All these aspects need to be carefully considered while performing an inductive case study research: biases should be avoided by being open to contrary evidence (Yin, 2014).

While the value co-creation theory was initially focused on the dyad firm/customer (Vargo & Lusch, 2004a), the perspective gradually became broader: some authors (Driessen & Hillebrand, 2013; Perks et al., 2012) pointed out the importance of including multiple actors in the co-creation discourse. Consequently, studies about value co-creation started to include a wider range of actors (Akaka et al., 2013; Frow et al., 2015), such as customers, suppliers, and distributors. A few years later, Vargo and Lusch, (2016) revisited their sixth axiom by stating that “value is cocreated by multiple actors, always including the beneficiary” (ibid, p.8). Consequently, all the following studies, both conceptual and empirical (Aarikka-Stenroos & Ritala, 2017; Autio & Thomas, 2019; Meynhardt et al., 2016; Phillips & Ritala, 2019) embraced this wider perspective of service ecosystems, i.e., “relatively self-contained, self-adjusting system of resource - integrating actors connected by shared institutional logics and mutual value creation through service exchange” (Lusch & Vargo, 2014, p. 161). Recently, Bettiga and Ciccullo (2019) empirically investigated the co-creation processes firms establish with customers and suppliers in co-creation, but they did explain of the underlying mechanisms, and they do not consider other co-creating actors such as partners. The dyadic co-creation processes between a focal firm and each of its key co-creating actors within a service ecosystem remain largely unexplored.

### **2.2.2. Value co-creation in CE**

The CE context is particularly suitable for analyzing co-creation processes: developing a sustainable economic system is likely to require synergies between firms and other

stakeholders (Aarikka-Stenroos et al., 2021; Freudenreich et al., 2020; Zucchella & Previtati, 2019), and therefore circular firms may be particularly prone to co-creating with diverse actors. Creating circular ecosystems, i.e., “communities of hierarchically independent, yet interdependent heterogeneous set of actors who collectively generate a sustainable ecosystem outcome” (Aarikka-Stenroos et al., 2021, p.20) is a way circular firms shape value creation across value chains and networks (Keränen, 2017; Ranta et al., 2018).

According to Zucchella and Urban (2019, p. 195), circular entrepreneurship is “the processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, slowing, and narrowing the loop of resources and regenerating/reconstituting natural capital”. The proposed definition encompasses the different entrepreneurial processes of opportunity exploration and exploitation (Shane & Venkataraman, 2000), as well as encompassing different organizations, from new ventures to established firms: circular firms can either be innovative young start-ups wishing to unleash their creativity and care for sustainability, the so-called “born circular firms”, or they may be established companies – “growing circular firms” (Zucchella & Urban, 2019). The former are firms “born with” a circular business model, the latter organizations transitioning from a linear towards a circular business model. The present study focuses on the former. Since their foundation, born circular firms tend to establish tight relationships with a series of actors prone to developing circular practices, thus becoming orchestrators of circular ecosystems (Aarikka-Stenroos et al., 2021). Involving actors within the ecosystem is considered essential for circular firms since the actors “collaborate to maximize the value of products and materials and contribute to minimizing the depletion of natural resources and create positive societal and environmental impact” (Bocken et al., 2018, p. 79). Recent research (Ki et al., 2020; Pucci et al., 2020) has underlined the importance of engaging stakeholders to foster the implementation of sustainable behaviors and circular practices. This is the reason

why circular firms are likely to engage and cooperate with diverse actors along the supply chain as well as with their customers (Urbinati et al., 2017). These relationships might be so intense that it is possible to refer to them as co-creation processes (Polese et al., 2017; Payne et al., 2021). The present study aims at shedding some light on these relationships.

### **2.2.2.1 Value co-creation mechanisms in CE**

The mechanisms underpinning value co-creation processes received scant attention in the literature so far. Among the few works addressing the topic, Zhang and Chen (2008) propose a theoretical model of co-creation systems including three constructs, i.e., key co-creation activities, customerization capability, and service capability. The idea behind the model is that co-creation activities are positively associated with both capabilities, meaning that firms integrating customers in their activities “may gain new competence, thus obtaining more competitive advantages” and also “enhance firm’s customerization capability” (ibid, p. 243). Saarijärvi et al. (2013) consider mechanisms as “firm-, customer-, or even community-led activities through which additional resources are offered for the use of other actors” (p.11) and they identify three main firm-customers co-creation mechanisms, i.e., co-production, co-design, and co-development. More recently, Goyal et al. (2020) advance a model of co-creation mechanisms showing that customer co-creation and partner sourcing are positively associated with knowledge creation and innovation and their effect is moderated by knowledge dissemination capability.

With respect to the dyad firm-supplier, the marketing and industrial marketing literatures have provided some pieces of evidence of the intercurrent interactions. For instance, Payne et al., (2008) identify the series of ongoing interactions and transactions between firms and suppliers as “encounter process”, which can assume three forms: communication, usage, and service encounters (ibid, p. 90). Aarikka-Stenroos and Jaakkola (2012) consider co-creation as

a set of activities aimed at joint problem solving within the dyads involved in knowledge intensive services. Lacoste (2016) investigates the role of sustainability in B2B value co-creation relationships and she develops a framework of sustainable value co-creation, by also specifying the underlying co-creation mechanisms, i.e., analysis, training, and communication of both B2B and end customers and creation of end user sustainability awareness. Recently, Bettiga and Ciccullo (2019) have been studying the process of new product development between firms and suppliers, by identifying four possible co-creation steps within this process, i.e., ideas generation, ideas assessment, product design and development, and product testing and launch.

Despite the significant contribution of the mentioned studies in advancing our knowledge regarding co-creation mechanisms, the investigation of co-creation processes and their underlying mechanisms between firms and other types of actors such as suppliers and partners are still overlooked in the circular entrepreneurship literature. The explanation of “how” circular firms co-create value with key actors is still in need of empirical investigation. The following empirical work contributes to - at least partially - filling this gap.

## **2.3. METHODOLOGY**

### **2.3.1 Data collection**

Our study aims to study the dyadic co-creation processes between circular firms and the actors involved in the process. We choose to focus our analysis on dyadic relationships through an ecosystem perspective. This allows us to make a much more punctual and thorough analysis of co-creation processes in place between our studied dyads, and to comprehend their underlying mechanisms. Due to the exploratory nature of the study (cf. Patton, 1989), we opt for a qualitative multiple case study methodology (Eisenhardt, 1989; Stake, 1995; Yin, 2014),

which is ideal to create managerially relevant knowledge (Amabile et al., 2001; Leonard-Barton, 1990).

In total, we conducted thirty-nine interviews: sixteen of them involved the informants of the ten circular firms (in the case of Up2Go, we had two key informants), while the other twenty-three addressed their co-creating actors. To collect data, we departed from a database called Atlante Storie di Economia Circolare (an official Italian database of circular ventures, which reports 249 cases of Italian circular firms) and Sitra (an official Finnish database reporting 123 firms adopting circular practices), plus specific case studies suggested by expert scholars in the circular economy research topic. We selected these two countries because Italy is the EU Country showing the best performance index in terms of circular economy (Circular Economy Network & ENEA, 2020) while Finland is a forerunner in the circular economy, which is expected to add about 3 billion euros to Finland's national economy by 2030, according to the Finnish Innovation Fund Sitra (Business Finland, 2021).

We proceeded with the purposeful case study selection (Patton, 2015) of firms that could meet our research scope. The purposeful selection of firms was based on the following criteria. (i) Firms had to belong to the category of micro, small and medium-sized enterprises (SMEs), as defined by the European Commission, i.e., enterprises with fewer than 250 employees. This choice is dictated by the fact that SMEs represent the 99% of all businesses in the EU<sup>3</sup> and these firms have the highest potential to push the economy towards circularity principles and cleaner production (OECD, 2019). (ii) Firms had to pursue from inception a circular business model, being regarded as “born circular firms” (Zucchella & Urban, 2019). We thus excluded from our research the so-called “growing circular firms” (ibid), which are those currently transiting from linear to circular principles. (iii) Firms had to adhere to different circular business models i.e., circular supply chain, resource recovery and recycling, product

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<sup>3</sup> [https://ec.europa.eu/growth/smes/sme-definition\\_en](https://ec.europa.eu/growth/smes/sme-definition_en).

life extension, sharing, product as a service (Lacy & Rutqvist, 2014) and to include the widest variety in terms of industry (packaging, textile, footwear, leasing services). (iv) Last, firms' founders, or, alternatively, the most knowledgeable informants within the organization (Eisenhardt & Graebner, 2007), had to make themselves available for repeated in-depth semi-structured interviews during the research time.

By following these criteria, we proceeded with the selection stage, which led us to restrict our cases to fifty firms that could meet our research scope. Subsequently, we started emailing these firms to check the availability of the founder(s)/knowledgeable informants for repeated semi-structured interviews and we obtained the consensus of twelve firms. Our final sample is composed of ten case studies, each one including a circular firm and the actors it co-creates value with. Table 8 below offers an overview of the selected case studies and of our interviewees.

We started our data collection during March 2019 with the first two case studies (Apepak and Rifò). Our data collection lasted approximately two years and ended in April 2021 when we reached theoretical saturation (Bowen, 2008; Glaser & Strauss, 1967; Strauss & Corbin, 1994), i.e., when we stopped identifying significant variation in the concepts and relationships emerging from new cases we were collecting.

Before each interview, we anticipated the questions to the participants to make them feel at ease during the interview and to prepare them for the main topic of discussion. To establish communicative validity, we always started our interviews with an explanation of the co-creation concept. We also provided respondents with the table of the co-creation forms by Frow et al. (2015) to ensure they understood the different shades of the concept. During the interviews, we asked the participants the following main questions: "Can you describe your firm's circular business model?", "Which actors have played a role in implementing it?" "Have you co-created value with these actors?", "Could you describe the co-creation process with



each of the mentioned actors (people involved, interactions, type of value created/expected)?”, “Which mechanisms underpin such processes?” and “Which is the outcome stemming from each co-creation process?”. We finally concluded each interview by asking the respondents to provide us with the contact details of the mentioned co-creating actors. Doing so, we could proceed in contacting these actors to ask them their availability to perform a semi-structured interview. We could perform an interview with almost all the actors mentioned by our focal firms’ interviewees (only some of them were not responsive, i.e., Apepak’s customers, Womsh’s and Rifò’s suppliers and customers and Spinnova’s supplier Suzano). To overcome the lack of primary data related to these actors, we triangulated the core information provided by the focal firm with secondary sources (companies’ newsletters, online press releases, and social media pages). The final number of interviewed actors is equal twenty-two as illustrated in Table 8, and we reached a total number of interviews equals thirty-nine.

BEATRICE RE – AEM XXXIV CYCLE

Table 8 Case studies. Key facts and figure

Focal firm (interviewee)	Country	N. of interviews	Actors involved (interviewee)	N. of employees	Industry	Circular business model	Circular mission	B2B/B2C
<b>Apepak</b>	Italy	5	-Massimo Massarotto, founder -Supplier L’Incontro Industria 4.0 (Antonio Famularo, Commercial Director) -Supplier CONAPI (Nicoletta Maffini, General Manager)	3	Packaging	Circular supplies/ product life extension	<i>“Our mission is to offer an alternative to the plastic film: a beeswax envelope for food which is 100% natural, washable and reusable”</i>	B2C and B2B
<b>Rifò</b>	Italy	6	- Niccolò Cipriani, founder -NaturaSi (Marco Burani, Owner) -Pinori Filati (Raffaella Pinori, founder) -EcoBi/Project Recooper (Davide Gaglioti, Project Manager)	6	Textile	Recovery and recycling	<i>“Rifò makes high quality garments and accessories, using 100% upcycled textile fibers. We transform old clothes into a new yarn which we use to craft new warm and soft products”</i>	B2C
<b>Up2Go</b>	Italy	5	- Elena Sassi, (Co-founder) and Elena Colli, (Business Developer) - Customer Barilla (Davide Stocchi, Rental car Manager) -Partner GreenApes (Gregory Eve, CEO) -Final user Barilla (Ewa Kanclerska, Project Manager) -Partner Municipality of Parma (Angela Chiari, Mobility Manager)	10	Information service activity – software development	Sharing platform	<i>“Up2Go is the ideal carpooling solution to be implemented in firms and institutions in a fast and easy way. It allows to reduce costs, be sustainable and facilitate commuters’ home-work journeys”.</i>	B2B

BEATRICE RE – AEM XXXIV CYCLE

<b>Seay</b>	Italy	4	<ul style="list-style-type: none"> <li>- Alberto Bressan (CEO &amp; Co-founder)</li> <li>-Partner Eurotextilati (Teresa Cadura, Marketing Manager)</li> <li>-Partner Social Cooperative Insieme, (Giorgia Dall'Osteria – Sustainable Development)</li> </ul>	10	Textile	Recovery and recycling	<p><i>“SEAY draws, produce and distributes beach wear, accessories for men and women at high technological value by using textiles and technologies which require the recycle of plastic and waste materials, with the aim to minimize the environmental impact and to improve the quality”</i></p>	B2C
<b>Wrad</b>	Italy	4	<ul style="list-style-type: none"> <li>- Alice Fortuna (Communication Manager)</li> <li>-Incubator, supplier and partner Alisea B Corp (Susanna Martucci, CEO)</li> <li>-Supplier Manteco (Luca Querci, Project Manager)</li> <li>-Supplier Tecno E.D.M. (Antonio Filiardi, Sales Director)</li> <li>-Client and ambassador Cristina Valli</li> </ul>	6	Textile	Circular supply chain	<p><i>“WRÅD design is motivated by the current environmental crisis and inspired by contemporary social needs, in sync with the Sustainable Development Goals adopted by world leaders at the UN in 2015. WRÅD Focus design, engineered for a better future. Because change can happen, and WE can lead it”</i></p>	B2C and B2B
<b>YouKoala</b>	Italy	4	<ul style="list-style-type: none"> <li>-Vincenzo Rusciano (Co-founder)</li> <li>-Customers (Elena Garau and Valentina Silvestri)</li> </ul>	3	Leasing service	Product as a service	<p><i>“YouKoala offers a shared wardrobe of baby clothes to avoid the problem of the excessive purchase of children’s clothes by parents and the related environmental consequences”</i></p>	B2C
<b>Kamupak</b>	Finland	3	<ul style="list-style-type: none"> <li>- Karri Lehtonen (Co-founder)</li> <li>- Supplier Orthex (Alexander Rosenlew, CEO)</li> <li>- Customer Cafeteria Silta (Heidi, restaurant Manager)</li> </ul>	3	Leasing service	Product as a service	<p><i>“Kamupak’s mission is to help consumers reduce their carbon footprint by providing sustainable and reusable solutions instead of disposable”</i></p>	B2B

BEATRICE RE – AEM XXXIV CYCLE

<b>Lovia</b>	Finland	3	<ul style="list-style-type: none"> <li>-Emmi Nguyen (Showroom Manager Lovia)</li> <li>-Anu Varila (Customer)</li> <li>-Supplier pelletteria Clio (Fulvio Galbiati, co-owner)</li> <li>-Supplier Kokkolan Nahka (Juha Ornberg, CEO)</li> </ul>	5	Textile	Resource recovery (upcycling)	<i>“Our mission is to create modern circularity - benchmarking the way nature works”</i>	B2C
<b>Spinnova</b>	Finland	2	<ul style="list-style-type: none"> <li>-Emmi Berlin (Head of Communications)</li> <li>-Customer Bergans Sportwear (Johannes Flem, designer)</li> </ul>	40	Textile	Circular supply chain	<i>“Our “Why” is that we want to make the world a better place with our skills and experience of cellulose. We want to help fill the textile industry’s sustainability deficit by offering the most sustainable fibre option available”</i>	B2B
<b>Sulapac</b>	Finland	3	<ul style="list-style-type: none"> <li>- Maija Pohjakallio (Sustainability Director)</li> <li>- Partner Quadpack (Lyne Hélène Bouchard, Sustainability Specialist)</li> <li>- Partner Lumene (Essi Arola, Head of R&amp;D and packaging)</li> </ul>	30	Packaging for cosmetics	Circular supply chain	<i>“Almost 300 million tons of plastic is being produced every year. A lot of that plastic is necessary to make useful things that last. But all too often, the plastic we use ends up in the wrong place. Right now, our oceans are filling up with plastic that degrade into smaller and smaller pieces of microplastics. If nothing changes, by 2050 there will be more plastic waste in our oceans than fish. Our oceans need a new wave of sustainable solutions”</i>	B2B

In case our informants were mentioning some co-creating processes in a development phase, we asked them to have the chance to have follow-up interviews after some time, to then be able to investigate the occurred process. Each semi-structured interview lasted from 30 to 60 minutes, was

recorded through an electronic device, and transcribed within 24 hours. The interviews with the Italian respondents have been performed in Italian and then accurately translated into English after being transcribed, while those with Finnish respondents have been performed directly in English. To ensure internal validity, per each case firm we triangulated the gathered data with secondary sources of information (mainly web articles, firms' websites, and social media pages) (Denzin, 1978). We also opted for investigator triangulation, meaning that we confronted the performed data analysis within our research team until reaching a shared agreement (ibid).

### **2.3.2 Data Analysis**

The data analysis proceeds first with single-case analyses and then with a cross-case comparison to identify similarities and variation across cases. Our unit of analysis is the dyadic co-creation process between the circular firm and each co-creating actor. In order to explain the process and the key underlying mechanisms, the key dimensions we take into account in each dyad involved are: (i) the co-creation forms (Frow et al., 2015), (ii) the underpinning co-creating mechanisms, and (iii) the process output. To ensure internal validity, we triangulate our data source with secondary sources of information (e.g., online reports, companies' websites, and social media pages), as required by the established protocols (Denzin, 1978; Yin, 2014). We also opt for investigator triangulation (ibid), i.e., we share and discuss the outcome of the data analysis within the research team. We started our analysis by carefully reading the interviews' transcripts to become "intimately familiar with each case" (Eisenhardt, 1989, p. 540). Then, we analyze each single case study through NVivo software: we coded each interview by identifying the sentences ascribable to the main variables of interest: co-creation forms, mechanisms, and process output. Appendix 1 reports further sentences pronounced by our interviewees. After performing the dyadic within-case analyses, we undertake a cross-case analysis, aimed at recognizing patterns across the cases. Finally, we advance a set of five Propositions to be tested in future quantitative studies.

## 2.4. FINDINGS

### 2.4.1. Apepak

Apepak is an envelope to store food in the fridge, it is made of organic cotton and beeswax, and it can be washed and reused, thus representing a sustainable alternative to the disposable plastic film. Its production is outsourced to the social cooperative “L’Incontro Industria 4.0”, located in the Veneto region (North-East of Italy), whose main goal is to promote the social reintegration of disadvantaged people. Apepak bought the equipment, while L’Incontro made its know-how available and started an industrial production, assuming the role of an industrial incubator. The fact of sharing common values in terms of the environmental and social impacts contributed to making the relationship between the actors progressively tighter, through an increasing commitment from both sides which is leading to conceive and develop new products together. L’Incontro was not into the packaging industry, it was producing electric cables, but it deemed the opportunity relevant, as explained by our informant, the director, and consequently re-organized its resources and capabilities accordingly. As highlighted by our respondent:

“Before being contacted by Massarotto, we had never produced anything similar. We valued the production of Apepak as we thought it would have been a great opportunity to re-employ disadvantaged people, which is the main role we have in our territory”.

Apepak’s founder Massimo Massarotto highly values the co-creation concept and he implemented it also with his customers from the very beginning of his entrepreneurial journey: a group of Italian clients has been involved to test the product, and to provide feedback, being rewarded for their contribution. The “feedback loop” the firm has established with customers is virtuous for both: Apepak constantly improves its marketing mix, while its clients feel appraised by the firm and proud for their contribution to the environmental cause. In 2021 Apepak enlarged the spectrum of co-creating actors by asking an organic beeswax provision from the biggest Italian bees’ consortium, i.e., CONAPI. The two firms are developing co-

branded products, they are planning to co-distribute them through their respective channels and they are co-promoting them through online channels, press conferences, and physical stores. The process was still at the beginning when the interview took place. What CONAPI expects as an output of the ongoing co-creation process is the production of a high-quality co-branded product made of organic beeswax.

#### **2.4.2 Rifò**

Rifò is a circular fashion firm founded in 2017 in Prato (Tuscany) by two young founders Niccolò Cipriani and Daniele Ceni, and it produces wool and cotton garments by recycling existing textile materials. In addition to providing initial financial capital, the first customers buying the products through the crowdfunding platform allowed the firm to test the market: through their orders and feedback, Rifò could understand customers' preferences and then organize its product range accordingly (for instance, in terms of sizes, colors, and materials). Co-creating with customers is highly valued by the firm and customers are constantly answering questionnaires to provide suggestions and feedback. Based on them, the firm improves its existing products and introduces new ones. As stated by Cipriani:

“We send questionnaires to our customers pretty often. Now we are increasingly involving them in the product development phase: customers will become part of the conception and design of new clothes”.

At the beginning of 2019, Rifò started a new project, called “Re-think your Jeans”, which received the attention of the local press, and it has been praised by the Major of Prato as virtuous for the community. This project provides that NaturaSì shops (an Italian chain of grocery stores focused on natural and sustainable products) makes available boxes to collect pair of old jeans from virtuous citizens who, in return, are given a 10 Euro discount on the purchase of Rifò products. Subsequently, the jeans garments collected from the citizens get recycled thanks to the expertise of two key partners: Recooper and Pinori Filati and the yarns are brought back to Rifò's manufacturers to produce jeans bags and sweaters, thus resulting in



a reverse logistics operation. This means that Rifò's suppliers are not employing raw materials, but they are instead spinning yarns obtained from recycling the garments collected from Rifò's customers. This operation allows closing the resource loops. The developed project is creating a tangible environmental impact: to make each Rifò jeans sweater, around five pairs of jeans are needed, and 80 liters of water are used, against the 3000 liters required by an identical sweater in virgin cotton. This leads to a water reduction amounting to 97% which combines with the 77% savings of energy and a decrease of 95% of CO<sub>2</sub> emissions.

### **2.4.3 Up2Go**

Up2Go is a platform-based firm founded by five women in 2013 in the Emilia-Romagna region (Centre of Italy) with the mission to promote carpooling service within firms/organizations located in Italy. Up2Go has recently developed another service, the "Bike to Work". The firm is constantly improving its features thanks to the feedback provided by its customers and final users. As explained by Elena Colli:

"We are mediators between our corporate customers and the final users. They both provide us with comments and feedback, which are fundamental for our development: we continuously adapt our offer according to them".

One of the first customers helping Up2Go to improve the service has been Barilla (the well-known Italian pasta producer), whose employees tested both the carpooling and the "Bike to Work" services. Thanks to the co-creation process with final users consisting in a constant "feedback loop", Up2Go improves its service, while the final users get rewards (incentives) for their activation. The integrated rewarding system is provided by GreenApes, a Benefit corporation consisting of a platform targeted to single users, which connects sustainable actions with rewards, the latter often linked to local activities (e.g., vouchers to buy in local stores). Barilla is satisfied with the integrated service provided by Up2Go and GreenApes and it has

recently adhered to the consortium of firms within the municipality of Parma adopting sustainable measures while concurrently benefiting from the incentives of the Region. These co-creation processes between Up2Go and these actors, as well as the interactions among the actors themselves, are creating value for the entire community of Parma, i.e., spread of sustainable behaviors and promotion of the local shops and restaurants.

#### **2.4.4 Seay**

Seay is a circular start-up and a Benefit corporation born in 2019 in Vicenza (North-East of Italy), from the idea of two founders, Alberto Bressan and Simone Scodellaro. Its core business consists in designing and selling apparel and beachwear items made from recycled materials. In 2019, the founders decided to take a step forward, by introducing a “green bonus”, consisting of a 20% discount to those citizens returning old garments while buying Seay’s products. The management of old clothes is made through a system they invented, called RE3 model, and it involves two key partners: the social cooperative “Insieme”, based in the same town (Vicenza), and the firm Eurotextilati, based in Trento (North of Italy). The first has the mission to restore value to used objects while contributing to re-employing disadvantaged people, while the latter has as core business is to distribute synthetic yarns and to produce semi-finished yarn products for industrial applications. As stated by our interviewee, Seay’s founder Alberto Bressan:

“Both players (cooperative “Insieme” and Eurotextilati) showed interest in the project, it was a new thing, we sat around a table, and we found a way to realize what I had in my mind [...] We reached the RE3 model through a continuous dialogue, and we evaluated all possible alternatives”.

The three partners are now performing an 18-months test. So far, the project is proving to be quite successful. Seay has recently created a co-branding product line with Womsh, a circular firm born close to Seay’s town, in Veneto Region, which commercializes recyclable sneakers for young people passionate about sustainability. The returned clothes will enter the

RE3 system, while the shoes will be recycled by the local firm ESO Benefit Esosport, to support the project “Il Giardino di Betty” (Betty’s Garden), aiming at recycling materials to renovate the children playgrounds areas’ pavements.

#### **2.4.5 Wrad**

Wrad is a Benefit corporation and a Focus Design company founded in 2015 by three young entrepreneurs, Matteo Ward, Silvia Giovanardi, and Victor Santiago, all motivated by the willingness to make a positive impact in the fashion industry. The firm focuses on consultancy and communication activities for several clients, and it also has a homonymous fashion brand. In early 2017, following a life-changing meeting Matteo Ward had with Susanna Martucci, founder of Alisea (B Corp), the business idea has been shaped and put into practice.

The first product developed by Wrad was a t-shirt called Graphi-Tee, dyed with graphite coming from the firm Tecno EDM, a firm producing graphite electrodes, that was Alisea’s supplier. Wrad’s ability to co-create with several actors is evident also from the very recent relationship established with a supplier, Manteco, which is an Italian textile company founded in 1943 and specialized in sustainable luxury fabrics and jerseys. The shared values and vision between the firms led them to realize a co-branded shirt, made from Manteco fabric and sponsored also through Wrad’s channels (mainly Instagram).

Finally, customers play a key role for the firm. They are not considered as mere customers but as part of the Wrad Community, which is constantly growing, and they are active in giving their feedback to improve products’ features also during the design phase, as well as in constantly providing suggestions also through social media. As stated by our interviewee Alice Fortuna:

“Our final clients are active, they are not merely purchasers, but they contribute to our activities, for instance by providing suggestions to co-design new garments with us”.

As emphasized by a client and ambassador, Cristina Valli, the willingness to promote brand comes from a profound adherence to the company's values and the will to make an impact.

#### **2.4.6. YouKoala**

YouKoala is a startup born in 2018 from the idea of Vincenzo Rusciano and it offers a leasing service of baby clothes, in the form of kits that be leased through a monthly subscription.

The co-creation with clients started from the very beginning, during the development of the entrepreneurial idea. Even before starting, they talked to around 70 mums from across Italy, trying to understand whether they liked the business idea and they found it useful for their needs. Then, they made some questions via Facebook among acquaintances to grasp their feelings about the possibility to lease baby clothes instead of buying them. Thanks to the suggestions provided by these potential customers, YouKoala could better structure the service, both in terms of the types/number of baby clothes and in terms of appropriate monthly rates for the clothes kits. As reported by Vincenzo Rusciano:

“We modified the service according to the feedback provided to us by the mums involved through Facebook. For instance, we thought that a set of two jumpsuits, four bodies, and two hats would have been enough, but the mums told us their children would have needed more items per month”.

For instance, our respondent Elena suggested to YouKoala to consider the use of washable nappies in their request for clothes' size. These co-creation processes overall result in saving up liters of water to produce brand new baby clothes. Moreover, green education is promoted since childhood.

### **2.4.7. Kamupak**

Kamupak is a firm founded in 2018 and offering a circular takeaway solution addressed to restaurants and grocery stores. Kamupak's reusable packaging can be leased to final clients through payment of a 3-euros deposit to the restaurant/takeaway place. The co-creation process started from the very beginning when Kamupak engaged in discussions with the supply chain to understand the grocery stores/restaurants regarding the use of packaging. Our respondent Silta Cafeteria is one of the customers adopting the service to avoid the overuse of plastic and to minimize waste: clients pay the deposit for the reusable packaging, buy their take-away food, and they return the empty package that is washed by the cafeteria. After the launch, Silta provided feedback to Kamupak to improve the service according to final clients' reactions and usage behavior. For instance, they found out that clients were not using the application, which was rather employed mainly by the firm for statistical purposes about the product usage, and that clients were discouraged to adopt it because of the lack of cash while being at the cashier. The firm relies on another important co-creating actor, namely its supplier, Orthex, a large Finnish company producing household products and committed towards sustainable practices since the 1990s (e.g., use of a material made from industrial plastic waste). Through constant dialogue and interactions, Orthex and Kamupak could develop an innovative reusable product: they decided the size, the material and how the system could work, so a co-production took place between them, together with a co-promotion through their respective channels. As argued by our interviewee Karri Lehtonen:

“With Orthex we are finding ways to collaborate especially when the package comes to the end of life, so the producer will be able to take the material back and maybe new products, so this is something that in order to close our loop, we would need to collaborate with the producer, and this is something we are experimenting with them”.

#### **2.4.8. Lovia**

Lovia is a fashion firm founded in 2014 by the young designer Outi Korpilaakso and selling high-quality bags, accessories, and jewelry made through upcycling processes, i.e., using leftover materials to create quality products. Transparency is a key concept in Lovia's philosophy, that's why the entire value chain is accurately explained and made visible to the customers. Finding the right actors to co-create with has been a challenge for Lovia: it had to look for partners that were open to its innovative business model, prone to change to act develop circular practices and that had the necessary expertise in the field. A key co-creating actor is the supplier Kokkolan, a leather firm providing Lovia with leftovers of elk leather and which considers Lovia as a "spotlight" in the transition towards circular practices. A co-creating actor is the Italian "Pelletteria Clio", a firm specialized in producing leather items, whose owner Fulvio Galbiati has a long experience in working with leather. Fulvio is highly committed to the circular business model proposed by Lovia and the two have developed a strong trust and mutual understanding, two key features that made their relationship unique and valuable. Lastly, Lovia co-creates also with its final clients: it constantly asks for feedback and insights after purchase, and it organizes co-design events during which customers can design their own bags that will subsequently be produced by Fulvio in Italy. As stated by our respondent Emmi Nguyen:

"Based on some customers' feedback, we have changed some models, some details, it is an ongoing process. We also organize a co-design event/workshop: anyone can design its own bag".

#### **2.4.9. Spinnova**

Spinnova is a technological start-up founded in 2017 in Finland with the aim to produce a disruptively sustainable fiber devoid of chemicals and with the potential to revolutionize the textile industry. The firm has been working for three years with the production firm, Suzano, located in Brazil: this close relationship and sharing of expertise let them reach their common

goal to develop a sustainable fiber. Motivated by the same aspirations, Spinnova and Suzano have become very close and have recently established a joint venture to share both the R&D and the financial expenses. Another key Spinnova's co-creating actor is its customer Bergans, a high-quality sportswear clothing company, which represented an essential actor to test the market through a tangible product. Spinnova. In fact, the two firms combined their knowledge to produce co-branded orange anoraks made of Spinnova's fiber and sold through Bergans' distribution channels. Their reciprocal trust, commitment, and will to experiment made them proceed with intensive testing aimed to produce sustainable backpacks. The first prototypes have been commercialized to pioneering clients and Bergans played a key role in this phase as it engaged its clients in the circular mission by asking them to provide constructive feedback and to return the products to Bergans at the end of their lives, to be recycled. Doing so, the co-creation process led the firms to entirely close the resource loop. As illustrated by Johannes Flem from Bergans:

“The foundation of our relationship is circularity; we knew we would not have done anything that would have broken the concept of circularity. What we also brought to the whole project was that we wanted to challenge not only the technical side, but also customers, we wanted to challenge them regarding the perception of what is pollution, what circularity really means, and what is the value of the materials”.

#### **2.4.10. Sulapac**

Sulapac is a company founded in 2016 by two biochemists, Suvi Haimi and Laura Tirkkonen-Rajasalo and it produces bio-based, and biodegradable granulates that are used to make packaging for cosmetics. The firm is R&D-centered since it focuses on developing innovative materials and technologies to constantly improve the “look and feel” and the sustainability of the granulates it produces. Customers have a key role in Sulapac's business model since they are involved in take-back campaigns (co-disposal) and asked to bring the jars back to the firm after use, so that the granulates are transformed into new items. As illustrated by our interviewee Maija Pohjakallio:

“Currently, we are developing take-back campaigns together with our customers so that for example when you have used your Sulapac jars, you can bring them back to the shop where you bought them, and they will be recycled and transformed into new jars, so it is a reverse logistics, quite common in the circular economy”.

One of the most important customers and partner Sulapac co-creates with is the firm Lumene, the Finnish most famous cosmetics company. Jointly with Lumene, Sulapac has been testing the products for a long time, making joint research to produce biodegradable packaging materials for cosmetics and making them in such a way that they have a long shelf life.

Another key co-creating actor is a global manufacturer of jars for beauty brands, Quadpack. The partnership with Quadpack started in 2019 and it was dictated by the will to find a leading and knowledgeable partner in the cosmetic segment which was also strongly committed to sustainability. What Quadpack was able to do was to inject Sulapac’s granulates into the cosmetics jars it produces. By leveraging on reciprocal expertise, Sulapac and Quadpack have developed a unique offer that nobody has in the market and their mutual commitment and joint goals are leading the partnership towards the expansion of Quadpack’s own Q-Line range (fully customizable) by using Sulapac material. The two firms constantly co-promote their joint products, as illustrated by our respondent Mrs. Pohjakallio:

“We have as important partner Quadpack, a big cosmetics jar producer brand and they also do marketing together with us, selling our jar. They made us more visible and credible towards companies and brands”.



## 2.5 CROSS-CASE COMPARISON AND DISCUSSION

In this section, we compare our case studies to find similar patterns, and differences, across cases, regarding our key variables of interest, i.e., value co-creation forms among the analyzed dyads, underpinning co-creation mechanisms, and process output (see Table 9). We finally propose an empirical model (Figure 3) and a set of Propositions to be tested in a quantitative study (cf. Chapter 3).

Table 9 Cross-case analysis of the dyadic co-creation processes. Source: own elaboration.

	Actor involved and classification (legal form)	Co-creation form(s)	Co-creation mechanisms	Process output [expected]
<b>Apepak</b>	Customers	Co-design Co-promotion	In the launching phase, Apepak engages 200 people in the product testing phase via a Facebook post. Customers test the product and answer an online questionnaire, providing suggestions and feedback. In exchange, customers obtain a discount to order Apepak. Then, initial testers and further customers are included in a Facebook group, and they are invited to provide their opinion regarding for example product features, distribution and promotion. Apepak improves its marketing mix according to this feedback.  ENGAGEMENT, ACTIVATION, FEEDBACK, REWARD	<b>Apepak:</b> -Improvement of the offer in terms of product features and distribution strategy -Increased brand loyalty and advocacy  <b>Customers:</b> -Greater perceived value -Perception of control over the offerings -Satisfaction for being “active” in the environmental cause -Economic value (discounts)
	L’Incontro Industria 4.0 – supplier (Social Cooperative)	Co-production	Apepak contacted L’Incontro to start producing the envelopes on an industrial scale. Gradual strengthening of the relationship based on joint product development. Industria 4.0 is transiting from its role as a basic supplier to become a co-producer of new sustainable products. The idea for the next future is to merge the two companies.	<b>Apepak</b> -Social value in terms of labor reintegration -Industrialization of the production process -Accessing know-how  <b>L’Incontro Industria 4.0</b>

			CO-DEVELOPING THE PRODUCT ON AN INDUSTRIAL SCALE STRENGTHENING OF THE RELATIONSHIP	-Recruitment of disadvantaged people -Product diversification -Storytelling to the local community
	CONAPI (Consortium) – partner	Co-distribution Co-promotion	Mutual engagement through a co-branding project. CONAPI enters a new business by supplying for its first time some organic beeswax to produce Apepak envelopes. An updated packaging is made to include the logo of CONAPI. A co-distribution strategy is now under implementation.  CO-BRANDING, JOINT COMMUNICATION	<b>Apepak</b> -Development of a high-quality product -Legitimization, trust, and transparency towards customers -Brand reputation  <b>CONAPI</b> -Product diversification -Enter a new business in a new industry (packaging) giving its associates the chance to sell natural beeswax -Attraction of new customers
<b>Rifò</b>	Customers	Co-design Co-disposal Co-maintenance Co-promotion	Rifò initially engaged potential customers through a crowdfunding platform, asking them to pre-order items and then to provide feedback on them. The interaction between Rifò and its customers became more intensive both at the production level (customers can propose new garment design and features) and at the disposal level (customers bring their woollen and cotton sweaters back and receive a discount on a purchase). Citizens are also activated through the NaturaSi points of collection of jeans.  ENGAGEMENT, ACTIVATION, FEEDBACK REWARD	<b>Rifò:</b> -Improvement of the offer in terms of product features -Increase customer satisfaction -Increase brand loyalty and advocacy -Attraction of new customers  <b>Customers:</b> -Economic value (discounts) -Satisfaction for being “active” in the environmental cause -Feeling of being part of a community
	Suppliers	Co-design	Local suppliers are constantly interacting with Rifò and co-designing new products. In the project “Rethink your jeans”, the recycled yarns are brought back to Rifò’s suppliers to manufacture jeans bags and sweaters, thus implementing a reverse logistics operation.  MUTUAL COMMITMENT, REVERSE LOGISTICS OPERATION	<b>Rifò:</b> -Testing product ideas in a short time -Mutual commitment and reciprocal trust -Establishment of a long-lasting relationship  <b>Suppliers:</b> -Feeling of being part of the firm’s

				<p>mission and project</p> <ul style="list-style-type: none"> <li>-Mutual commitment and reciprocal trust</li> <li>-Establishment of a long-lasting relationship</li> </ul>
NaturaSi (Inc) - partner	<ul style="list-style-type: none"> <li>Co-conception of ideas</li> <li>Co-disposal</li> <li>Co-promotion</li> </ul>	<p>NaturaSi foresees an opportunity in becoming a partner of Rifò, therefore it proposes to become a collection point of old jeans coming from local citizens. Through a mutual engagement through co-planning, the project “rethink your jeans” comes to life.</p> <p>CO-PLANNING, MUTUAL ENGAGEMENT AND PROMOTION</p>	<p><b>Rifò:</b></p> <ul style="list-style-type: none"> <li>-Increase brand awareness</li> <li>-Increase sales and loyalty</li> </ul> <p><b>NaturaSi:</b></p> <ul style="list-style-type: none"> <li>-Attraction of an increasing number of clients, especially the younger market segments</li> <li>-Economic value (increase sales)</li> <li>-Brand reputation</li> </ul>	
EcoBi (Consortium of social cooperatives) – partner project Recooper	<ul style="list-style-type: none"> <li>Co-conception of ideas</li> <li>Co-disposal</li> <li>Co-promotion</li> </ul>	<p>Recooper is interested in Rifò as a partner to recycle the collected garments made of mixed fibers. Rifò seizes the opportunity to engage Recooper in the planning of the project “rethink your jeans”, with objective to access the know-how and the selection plants, as well as to include a partner involved in social causes.</p> <p>CO-PLANNING, STRENGTHENING OF THE RELATIONSHIP BY SHARING EXPERTISE</p>	<p><b>Rifò</b></p> <ul style="list-style-type: none"> <li>-Overcome the legal barriers to implement the project</li> <li>-Access to Recooper’s expertise in sorting garments</li> </ul> <p><b>Recooper</b></p> <ul style="list-style-type: none"> <li>-Access to Rifò’s technologies to recycle mixed fibers</li> <li>-Getting some pairs of jeans to be sold in its shops</li> <li>-Benefit from Rifò’s communication skills</li> <li>-Access to a valuable network of actors</li> </ul>	
Pinori Filati – partner (Inc)	<ul style="list-style-type: none"> <li>Co-conception of ideas</li> <li>Co-disposal</li> <li>Co-promotion</li> </ul>	<p>Rifò contacts Pinori Filati to propose it to join the “rethink your jeans” project. Pinori contributes to refine the project, together with the other actors. It receives the sorted jeans by Recooper and it recovers them by making yarns, which become an input to Rifò for the production of sweaters.</p>	<p><b>Rifò</b></p> <ul style="list-style-type: none"> <li>-Legitimization through a well-known partner that is engaged in recycling projects</li> <li>-Benefits from Pinori Filati’s expertise</li> <li>-Economic value from the regenerated denim yarn that turns into</li> </ul>	

			CO-PLANNING	<p>new sweaters</p> <p><b>Pinori Filati</b>                      -Brand reputation                      -Economic value (selling the yarns to Rifò)                      -Promotion through Rifò’s channels and the press</p>
Up2Go	Customer Barilla (Inc)	Co-experience Co-promotion	<p>Barilla contributes to test the Up2Go carpooling service and then, every time a new service is introduced (e.g., “Bike to Work”), the internal employees take part in the testing phase. Both of the firms organize engagement activities with Barilla’s internal employees to promote the usage of the app.</p> <p>MUTUAL ENGAGEMENT</p>	<p><b>Up2Go</b>                      -Improvement of the quality of the service                      -Brand loyalty</p> <p><b>Barilla</b>                      -Greater value perceived                      -Brand reputation (CSR)</p>
	GreenApes - partner (B corp)	Co-design Co-promotion	<p>Up2Go and GreenApes decide to integrate their services to create a joint and more complete offer to the firms. The joint communication of the co-created offer helps both of the firms to improve the brand awareness and to increase the number of adhering clients.</p> <p>COMPLEMENTARITY OF EXPERTISE JOINT COMMUNICATION</p>	<p><b>Up2Go</b>                      -Improvement of the offer                      -Brand awareness among citizens</p> <p><b>GreenApes</b>                      -Improvement of the offer                      -Increased economic value                      -Brand awareness among employees</p>
	Users (Ewa)	Co-design	<p>Barilla’s employees (final users) are engaged in the adoption of Up2Go through dedicated activities jointly organized by Barilla and Up2Go. Then, they are involved in the testing phase of the services offered by Up2Go and they are asked to provide feedback to report malfunctions and to improve the service. Finally, when they start using the service, they are rewarded for their activation through GreenApes’ integrated rewarding system.</p>	<p><b>Up2Go</b>                      - Improvement of the App features and of the quality of the service                      -Brand loyalty</p> <p><b>Users</b>                      -Satisfaction for being “active” in the environmental cause                      -Economic value (reward)</p>

BEATRICE RE – AEM XXXIV CYCLE

			ENGAGEMENT, TESTING, FEEDBACK, ACTIVATION, REWARD	
	Municipality of Parma - partner	Co-conception of ideas Co-meaning creation	The municipality of Parma proposes to Up2Go to activate the service within a network of local firms. Mutual commitment: the municipality promotes Up2Go and constantly collects feedback, while Up2Go improves the service accordingly. The two communicate their joint projects through the respective channels.  MUTUAL COMMITMENT JOINT COMMUNICATION	<b>Up2Go</b> -Access to a valuable network of firms -Brand awareness across town  <b>Municipality</b> -Offering an integrated system to promote sustainable actions within citizens -Improvement of the urban mobility -Fostering green behaviours
<b>Wrad</b>	Alisea - partner (B Corp)	Co-conception of ideas Co-production Co-promotion Co-distribution Co-meaning creation	Alisea made the graphite, its patents on dyeing, its network, and its expertise at the disposal of Matteo Ward to give him and his team the chance to find a promising product to be launched in the market. The Wrad t-shirt and the pencil Perpetua by Alisea are often sold together.  CO-DEVELOPMENT OF THE START-UP, MUTUAL COMMITMENT, JOINT COMMUNICATION	<b>Wrad</b> -Access to a valuable know-how and expertise -Use of Alisea’s patent “g_pwdr technology” -Free procurement of input material -Access to a valuable network of actors -Raise initial financial resources -Promotion through Alisea’s channels  <b>Alisea</b> -Extension of a corporate dream and of the sustainable mission -Promotion through Wrad’s channels -Economic value (royalties from Wrad sales)
	Manteco – supplier and partner (Inc)	Co-production Co-promotion	Inspired by the innovativeness of Wrad, Manteco proposes itself as a supplier of high-quality fabrics. The two actors soon realized that they had the common vision to change the fashion industry towards sustainable frontiers, so they first started developing a co-branded shirt made with a fabric	<b>Wrad</b> -Getting sustainable and high-quality fabrics -Access to Manteco’s expertise in the material selection - Expansion of the product portfolio (co-branded shirt and upcycled scarf)

BEATRICE RE – AEM XXXIV CYCLE

			<p>provided for free by Manteco. Now there is an increasing commitment by both parties: Manteco helps Wrad in choosing fabrics and Wrad upcycles its waste materials. Together, they develop an efficient awareness-raising communication.</p> <p>CO-BRANDING, JOINT COMMUNICATION</p>	<p><b>Manteco</b></p> <ul style="list-style-type: none"> <li>-Brand reputation</li> <li>-Benefit from a youthful and innovative communication style</li> </ul>
	Tecno EDM – supplier and partner (Ltd)	Co-disposal Co-promotion	<p>Tecno EDM meets Alisea in 2011 during an industrial fair and Alisea succeeds in finding an application to its discarded graphite: the pencil Perpetua is born. After Wrad’s foundation, Tecno EDM starts to be work with it, and it gets involved in joint communication projects, such as the launch of the electric Fiat 500. Wrad makes a capsule collection specifically for this event, with the graphite collected from Fiat’s electrodes, and Tecno EDM showcases the electrodes during the event and reports it on its website.</p> <p>JOINT COMMUNICATION</p>	<p><b>Wrad</b></p> <ul style="list-style-type: none"> <li>-Free procurement of input material</li> <li>-Brand awareness</li> <li>-Promotion through Tecno EDM’s channels and press</li> </ul> <p><b>Tecno EDM</b></p> <ul style="list-style-type: none"> <li>-Brand reputation</li> <li>-Economic value (avoid the dismantling cost)</li> <li>-Promotion through Wrad’s channels and press</li> </ul>
	Customers	Co-design Co-promotion	<p>Wrad engages its customers on Instagram and launches a “call of action” asking customers to respond to random questions or to a survey to ask their opinions about the new products’ design and features (e.g., materials, colors, motifs). The firm would like to further develop this tight relationship by creating live “brainstorming sessions” with its customers.</p> <p>The nascent “Wrad Ambassador Program” addresses clients and offer a remuneration for advocacy activities.</p> <p>ENGAGEMENT, ACTIVATION, FEEDBACK, AMBASSADOR PROGRAM, REWARD</p>	<p><b>Wrad</b></p> <ul style="list-style-type: none"> <li>-Improvement of the offer in terms of product features</li> <li>-Increasing customer satisfaction</li> <li>-Brand loyalty and advocacy</li> </ul> <p><b>Customers</b></p> <ul style="list-style-type: none"> <li>-Satisfaction for being “active” in the environmental cause</li> <li>-Feeling of being part of a community</li> </ul>
<b>Seay</b>	Customers	Co-disposal	<p>Seay asks its customers to send an old garment back while buying a new one, and it confers them a 20% “green bonus” on the new item. Customers then</p>	<p><b>Seay</b></p> <ul style="list-style-type: none"> <li>-Turning material waste into a resource</li> <li>-Brand loyalty and advocacy</li> </ul>

BEATRICE RE – AEM XXXIV CYCLE

			track the conferred garment through a blockchain-based tracking system.  ENGAGEMENT, ACTIVATION, REWARD	-Establishment of a long-lasting relationship with its clients  <b>Customers</b> -Satisfaction for being “active” in the environmental cause -Economic value (reward)
	“Insieme” – partner (Social Cooperative)	Co-conception of ideas Co-disposal Co-promotion	Seay looks for a partner to sort and re-sell the old garments collected from its activated clients. Thanks to a constant dialogue and mutual engagement through co-planning, the system RE3 is created.  CO-PLANNING, COMPLEMENTARITY OF EXPERTISE	<b>Seay</b> -Implementing the take-back of old garments -Increased Brand reputation  <b>Insieme</b> -Access to a valuable know-how -Access to a network of actors -Being part of a new project
	Eurotextilati – partner (Inc)	Co-conception of ideas Co-disposal	Seay looks for a partner to recycle the garments in bad conditions that cannot be re-sold and regenerated by “Insieme”. Thanks to a constant dialogue and mutual engagement through co-planning, the system RE3 is created.  CO-PLANNING, COMPLEMENTARITY OF EXPERTISE	<b>Seay</b> -Managing the take-back of items -Implementing the take-back of old garments  <b>Eurotextilati</b> -Increased Brand reputation -Access to a network of actors -Implementing a new project
	Womsh - partner	Co-design Co-disposal Co-distribution Co-promotion	A similar circular aim and the geographical proximity mean that Seay starts interacting with Womsh. Now the two firms are developing a co-branded product line including t-shirts and shoes. Womsh benefits from the RE3 system, while Seay will access Womsh’s distribution channels abroad.  CO-BRANDING, JOINT COMMUNICATION	<b>Seay</b> -Access to Womsh’s distribution channels and clients abroad -Brand awareness -Development of a new product line -Economic value (increase sales)  <b>Womsh</b> -Access to Seay’s system RE3 -Development of a new product line -Economic value (increase sales)
<b>YouKoala</b>	Customers (Elena Garau and Valentina Silvestri)	Co-design Co-maintenance		<b>YouKoala</b>

BEATRICE RE – AEM XXXIV CYCLE

			<p>To initially refine the business idea, YouKoala initially asks for suggestions to 70 mums on Facebook and, in exchange, offers free gadgets and special rates for subscriptions. Then, it engages potential customers through sponsored Pages on Facebook. Interested people can interact directly with Vincenzo and then start leasing baby clothes. In case the items get broken during the usage, YouKoala listens to the customers to understand why the damage occurred (e.g., incorrect washing), and improves the instructions for use accordingly, to prevent future damages. Both through surveys and direct interactions, customers provide YouKoala with suggestions to improve the service.</p> <p>ENGAGEMENT, FEEDBACK, REWARD, JOINT PROBLEM SOLVING</p>	<p>-Improvement of the offer (number, types, and sizes of baby clothes in the leased packages) -Increased brand loyalty and advocacy</p> <p><b>Customers</b> -Satisfaction for being “active” in the environmental cause -Perception of control over the offerings (almost customized offer) -Economic value (lower monthly expenditure)</p>
<b>Kamupak</b>	Orthex - partner	Co-production Co-design	<p>Kamupak looked for a partner to develop its business idea and the big firm Orthex showed interest in it. Kamupak and Orthex defined the product together: size, materials, and the leasing service have been progressively defined through a mutual learning process.</p> <p>LEARNING, COMPLEMENTARITY OF EXPERTISE</p>	<p><b>Kamupak</b> -Access to Orthex’s expertise -Access to Orthex communication channels</p> <p><b>Orthex</b> -Supporting innovative ideas -Increase Brand reputation -Green innovation</p>
	Cafeteria Silta – partner	Co-promotion	<p>Cafeteria Silta is one of Kamupak’s clients and it represents a key actor in engaging final clients in its mission and in providing suggestions to Kamupak according to final clients’ feedback.</p> <p>ENGAGEMENT, MUTUAL COMMITMENT</p>	<p><b>Kamupak</b> -Benefit from a solid client base -Improving the service according to feedback</p> <p><b>Cafeteria Silta</b> -Economic value: saving up money not buying disposable packaging -Brand image: pro-environmental actions</p>
<b>Lovia</b>	Anu Varila (Customer)	Co-design	<p>Anu enthusiastically embraces Lovia’s philosophy based on sustainability and transparency. She took</p>	<p><b>Lovia</b> -Improvement of the offer in terms of colors, style and design</p>



BEATRICE RE – AEM XXXIV CYCLE

			part in the design event organized by Lovia inside the store in Helsinki and she designed the bag that Lovia later on produced. Anu became advocate of the brand and she feels a sustainable customer. ENGAGEMENT, ACTIVATION	-Brand awareness through the design events <b>Customers</b> -Learning and becoming aware of sustainable practices -Feeling proud for having designed their own bags
	“Pelletteria Clio” - supplier	Co-design Co-production Co-disposal	Clio has been chosen by Lovia because of its long expertise in the leather industry. Clio receives the materials from Lovia through a reverse-logistics operation. MUTUAL COMMITMENT, REVERSE LOGISTICS OPERATION	<b>Lovia</b> -Access to unique know-how and expertise in the leather industry -Benefit from the Italian creativity and know-how <b>Pelletteria Clio</b> -Benefit from a youthful and innovative communication style -Brand awareness thanks to Lovia’s transparency
	Kokkolan Nahka - supplier	Co-production	Lovia engaged Kokkolan in its mission by explaining the advantages coming from the implementation of sustainable practices. Kokkolan supplies leftover elk leather, and it becomes increasingly committed to making improvements in the quality of the supplied leather to make long-lasting bags and also to make the production more sustainable.  MUTUAL COMMITMENT	<b>Lovia</b> - Accessing a very high-quality material from a well-known company  <b>Kokkolan</b> - Learning an innovative way of doing business -Benefit from a youthful and innovative communication style -Economic value (new customers contacting the firm thanks to Lovia’s transparency)
<b>Spinnova</b>	Bergans Sportswear - customer	Co-planning Co-disposal	Bergans met Spinnova in 2019 and it realized they had common values and the same sustainability-oriented mindset. The two started to experiment how to use the innovative fabrics to make circular products. Bergans involved its customers in the testing phase of the backpack collection and asked them to return the products to let Spinnova recycle the fibers.	<b>Spinnova</b> -Fast time to market -Approaching final customers, feedback loop -Development of a prototype collection  <b>Bergans</b> -Accessing a very innovative material

			COMPLEMENTARITY OF EXPERTISE EXPERIMENTATION, REVERSE LOGISTICS OPERATION	-Experimenting and learning process -Starting the transition towards a circular business model
Sulapac	Quadpack - partner	Co-production Co-conception of ideas	Sulapac was looking for a partner that could produce the jars with its sustainable materials and they found Quadpack, a leading cosmetics company having the production capacity to bring the jars production to an industrial level. Quadpack realized the potential of Sulapac’s innovative biodegradable materials to its transition towards circularity. Quadpack is now diversifying its product line by using Sulapac material and both firms are communicating the partnership through their channels.  COMPLEMENTARITY OF EXPERTISE, JOINT COMMUNICATION	<b>Sulapac</b> -Economic value -Scalability: access to Quadpack’s worldwide distribution channels and clients  <b>Quadpack</b> -Accessing a very innovative material -Brand image (orientation to sustainability) -Transition toward circularity
	Lumene - partner	Co-production Co-promotion	In 2018, Sulapac was looking for a brand owner for its patented granulates aiming to develop biodegradable packaging for cosmetics. Lumene introduced its manufacturers to Sulapac, to start testing the materials and since then, a sort of “marriage” began, until the final development of compostable jars.  COMPLEMENTARITY OF EXPERTISE EXPERIMENTATION	<b>Sulapac</b> -Economic value -Increasing brand awareness  <b>Lumene</b> -Accessing a very innovative material -Brand image (orientation to sustainability) -Transition toward circularity

## 2.5.1 Value co-creation forms

### 2.5.1.1 Firms– customers

Our narratives suggest that customers enjoy providing feedback and taking part in circular firms' creation of value. This can be ascribable to the fact that innovative circular offers are attractive, especially for those “circular pioneers” who feel aligned with circular firms' values and mission and are proud of contributing to them.

Customers take an active role in all our case firms, by adopting a variety of co-creation forms: co-design, co-maintenance, co-disposal, co-promotion. Co-design (Apepak, Rifò, Up2Go, Wrad, YouKoala, Lovia, and Spinnova) mainly consists in customers' participation in the refinement of the product/service features, which reveal essential to let the firm formulate a value proposition that could be appreciated by its present and prospective customers. Co-maintenance (Rifò, YouKoala, and Kamupak) can be of two different types: either customers buy a product, or they opt for leasing it. In both cases, they must maintain the product accurately knowing that at the end of its life they will be bringing it back to the firm (purchase)/return it in the same conditions as they bought it / leased it.

Customers co-create value with our case firms also through co-disposal (Rifò, Seay, and Kamupak) and co-promotion (Apepak, Rifò, Up2Go, Wrad, and Kamupak). Co-disposal consists in customers bringing their products back to the firm after use so that the latter can recycle/reuse/regenerate them. This is probably the co-creation form that requires the greatest commitment by customers, and which is typical of circular business models. Co-promotion is related to customers' advocacy about the circular firms' products/services, through their personal social media profiles and word of mouth. The co-promotion can also concern, more in general, the adoption of circular consumption practices.

*Proposition 1. The more customers engage in co-creation processes with born circular firms the more they engage in active roles by taking part in the following activities:*

- a) *co-designing products/services;*
- b) *testing products/services;*
- c) *providing feedback to improve the company's offer;*
- d) *co-maintaining the leased products;*
- e) *giving the products back to the firm after use to be recycled (co-dispose);*
- f) *co-promoting firms' products/services and circular practices*

### **2.5.1.2 Firms – suppliers**

According to our case evidence, *suppliers* and circular firms establish a close relationship that tends to evolve towards co-creation, mainly in the forms of co-production, co-distribution, and co-promotion (Apepak, Wrad, Kamupak, Lovia, and Sulapac). This is more likely to happen whenever supplying firms do have an orientation towards sustainability and a similar vision as the circular firms: the former see an opportunity in co-creating with innovative circular firms that have a fresh communication style but may lack business expertise. Developing co-branded products often seems a way to benefit from reciprocal expertise and jointly communicate the project through their respective channels. Sometimes, as for the dyad Wrad-Manteco, the communication reaches a step forward, aiming not only at the promotion of the product itself, but also at increasing environmental awareness.

An interesting finding is that, through mutual commitment, suppliers can act as incubators for developing a circular start-up (as for the dyad Alisea-Wrad) or for co-producing a circular product on an industrial scale (as in the cases of Incontro Industria 4.0-Apepak, Orthex-Kamupak, and Suzano-Spinnova). The first case appears particularly intriguing as Alisea is one of the few firms which were “born circular” during the 1990s and its founder realized she could provide extensive expertise to support Wrad in taking its first steps as a start-up. This is

so far the first empirical evidence we have about this interesting phenomenon, which might broaden with the progressive growth of established circular firms.

Finally, circular firms implement reverse logistics operations with their suppliers, i.e., firms collect old/scrap materials from their customers, then they deliver them to partners to be transformed into secondary raw materials that are returned to suppliers. Consequently, the latter can use as input the materials collected from the circular firms and reworked by the involved actors, to make new products/components out of it, thus closing the resource loop. To do so, it is necessary to implement close synergies along the value chain. This is the case of Rifò with the project “Re-think your jeans” whereby the firm and its partners collect old jeans from citizens and transform them into yarns that are provided to suppliers to make new garments.

*Proposition 2. The more circular firms’ suppliers are aligned with the firms’ sustainable mission and vision, the more their relationship evolves towards either:*

*a) a co-design / co-production / co-distribution of (co-branded) products/services, along with a joint communication strategy through their available channels;*

*and/or*

*b) reverse logistics operations: circular firms collect secondary raw material from partner firms/customers and confer it to their suppliers;*

*or*

*c) a relationship whereby the supplier acts as an incubator, providing know-how and expertise to develop the start-up phase for the circular product/service.*

### **2.5.1.3 Firms - partners**

Our findings suggest that partners co-create with circular firms through various co-creation forms: co-conception of ideas, co-disposal, and co-promotion.

Implementing ideas requires expertise and know-how that born circular firms may not own internally, therefore they may need to source it from external partners, as shown by our case

firms (Rifò, Up2Go, Seay, Sulapac, and Spinnova). Thanks to the specific know-how offered by each partner and the continuous dialogue among the partners themselves and the firm, the involved actors refine ideas and integrate the complementary skills to develop (even complex) circular projects, such as the collection, sorting, and recycling/recovery of old garments (Seay). Furthermore, the interactions among partners and circular firms allow co-disposal processes, which occur in five of our case studies (Rifò, Seay, Sulapac, Spinnova, and Kamupak). Co-disposal consists in creating a material flow among the involved actors, each of them performing a specific step in some item's disposal, and then their re-collection, with the aim to reuse, recycle, and regenerate the collected materials to restore their economic value. Finally, partners and circular firms co-promote the implemented projects (Rifò, Up2Go, Seay, Sulapac, and Spinnova), via their platforms (Facebook, Instagram, and websites), offline and online newspapers, and public events organized by local municipalities. Doing so, they may also represent a source of inspiration for aspiring circular entrepreneurs as well as for firms willing to start the transition towards circular practices.

*Proposition 3. The more value partners (such as firms and social cooperatives) develop a close relationship with circular firms, the more the relationship evolves towards:*

- a) a co-conception of ideas: circular firms and their partners, formulate and co-develop new projects;*
- b) a co-disposal: through the partners' expertise, resources are prevented from landfill and are given a new economic value;*
- c) a co-promotion: circular firms and partners promote the co-developed projects through their respective institutional channels and media.*

## **2.5.2 Co-creation mechanisms**

### **2.5.2.1 Firms-customers**

Our case firms co-create value with customers via the following co-creation mechanisms: i) engagement through social media; ii) activation as a response to a precise “call to action” made by the firm; iii) feedback regarding the product/service and iv) reward to customers in the form of incentives or discounts on purchases. Engagement is the first key mechanism to involve customers in being an active part of the firm’s circular mission. By leveraging social media such as Facebook and Instagram (Apepak, Rifò, Seay, Wrad, YouKoala, and Lovia) as well as local events (Up2Go and Lovia), our case firms explain their product/service features, and communicate their goals and vision, by employing storytelling techniques and arousing emotional engagement. Wrad engages customers also by meeting them through online video calls, as well as thanks to having introduced an ambassador program for those customers willing to participate in the firm’s activities, including those aimed at promoting education for sustainability. In all, these initiatives strengthen customers’ intensity of engagement with the firm and the feeling of being part of a committed community. We thus confirm the importance of engagement to foster sustainability-oriented practices (Ki et al., 2020; Pucci et al., 2020), and we add that in the circular entrepreneurship context engagement is aimed not only at involving customers to take part in the firm’s circular mission, but more in general at fostering and spreading consumption practices for a sustainable change.

The second key co-creation mechanism adopted by our case firms is a “call for action” for customers, which could be of different types, e.g., a testing process (Apepak, Up2Go, and Spinnova), the subscription to a service (YouKoala and Kamupak), a survey to be answered (Wrad), or the return of old items (Rifò, Seay, Sulapac, and Spinnova). After being activated, customers are asked to provide feedback to the firm. Through “feedback loops”, circular firms and their co-creating customers constantly interact and establish a fruitful dialogue. Finally, the reward mechanism intensifies the relationship through the monetization of customers’ commitment, and it can take different forms: discounts (Apepak, Rifò, Seay), incentives

through an integrated reward system (Up2Go), gadgets, and special subscription rates (YouKoala), or payment based on sales (Wrad). These findings expand the existing literature (e.g. Saarijärvi et al., 2013) on value co-creation processes, providing a more thorough explanation of the dyadic interactions between firms and customers.

*Proposition 4a. The co-creation of value by born circular firms with customers is associated with engagement, feedback, activation (“call to action”), and reward co-creation mechanisms.*

#### 2.5.2.2 Firms-suppliers

With regards to the co-creation mechanisms between circular firms and suppliers, our empirical evidence highlights that the more they share the same commitment to shift towards more sustainable practices, the more likely is that they progressively strengthen their relationship through co-branding and joint communication (Apepak, Wrad, and Spinnova). Co-branding implies a joint commitment to create the co-branded product(s), and it allows the circular firm to build brand awareness by being associated with a well-known supplying firm (such as CONAPI in the case of Apepak), while the supplier increases its brand reputation for being involved in sustainability-oriented projects. Joint communication implies synergistic development of marketing campaigns, that can also go beyond traditional product sponsorships, to include *ad hoc* activities such as educational seminars in schools to generate environmental awareness (Wrad).

These findings allow us to confirm that in fostering sustainable value co-creation within firm-supplier dyads, the “communication” mechanism identified by Lacoste (2016) plays a key role, as well as the creation of end-user sustainability awareness (ibid). We at the same time add that circular firms, with their innovativeness and willingness to change the *status quo*, play for their suppliers the role of a “spotlight” in co-creation mechanisms, being the ones



suggesting co-branding and analyzing the market to then perform engaging marketing and communication campaigns.

*Proposition 4b. The co-creation of value by born circular firms with suppliers is associated with co-branding and joint communication.*

### 2.5.2.3 Firms-partners

Circular firms and their partners leverage their complementary expertise to plan and implement co-developed projects, which are then communicated to customers and citizens via their available channels (Rifò, Seay, Up2Go, and Sulapac). This means that circular firms find and engage the appropriate actor(s) into the circular projects the entrepreneurs had in mind and then together, they share ideas and expertise with them to find the best possible way to implement the planned projects. Some of the co-developed projects are innovative: Seay, for instance, together with its partners, has been developing a brand-new recycling model called “RE3 system”. This model consists in collecting customers’ used pieces of clothing, that are sorted by Cooperativa Insieme, and then resold as they are, donated to people in need, or regenerated, according to their conditions. Each garment is linked to a QR code so that customers can follow the donated items through a blockchain-based tracking system. These findings allow us to provide empirical evidence of the positive correlation found by Goyal et al. (2020) between partner sourcing and innovation, while at the same time offering novel insights as for the mechanisms of value co-creation between the firm-partner dyad. We find that the joint motivation in implementing circular projects permeates and facilitates the implementation of the mentioned co-creation mechanisms, thus leading to positive output (see next section).

*Proposition 4c. The co-creation of value by born circular firms with partners is associated with co-planning and with the complementarity of expertise and joint communication.*

Overall, the co-creation mechanisms analyzed can be looked also in the perspective of “open innovation” (Chesbrough, 2003) defined as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively” (Chesbrough, 2006, p.1). As Mount & Martinez (2014, p. 124) argue in their study about the use of social media as a tool for open innovation, “by understanding what consumers’ value and engaging in active dialogue and interaction, companies are able to develop superior value propositions that are more relevant to their target audience”. In our case firms, social media are employed to interact with customers in several ways: to ask suggestions regarding new products’ design and features (Apepak and Wrad), to post content created by customers and encouraging old garments’ take-back (Rifò), or updates about news and events (Up2Go and Lovia), as well as to sharing informative and promotional content (Seay, YouKoala, and Lovia). Those firms that succeed in establishing two-way conversations with their customers - for example through the Instagram “stories” tool (e.g., in the case of Wrad) not only can develop more refined value propositions (Mount & Martinez, 2014) but can also give birth to a community of enthusiast co-creators. The latter are typically not just fond of the brand but also of circular principles in general, and therefore they are willing to become the firm’s and sustainability advocates. Circular firms may thus consider leveraging on their clients’ commitment to building a community of “circular pioneers” through their social media.

We acknowledge that open innovation literature considers co-creation as “a concept concerned with involving individual external contributors in a company’s innovation projects” (Tekic & Willoughby, 2019, p.14), thus having a view on co-creation constrained into the innovation field. By considering value co-creation from a broader academic perspective, our

findings are not constrained to the innovation stream of research and make us shed some light on the overall multifaced mechanisms and output of value co-creation processes in circular entrepreneurship (see next section).

### **2.5.3 Co-creation output**

Our findings suggest that the output stemming from the dyad firm-customers can have many facets. Apart from confirming those already mentioned in the extant literature such as the improvement of the offer, increased perceived value, increased economic value and the reception of inputs for innovation (Anderson & Sullivan, 1993; Bitner et al., 1997; V. Hippel, 2001; Kelley et al., 1990; S. & Nambisan & Baron, 2007; Nambisan, 2002), our empirical investigation suggests a few novel outcomes. In all our cases, the co-creation processes between firms and customers lead the latter to feel satisfied for having taken an active part in the environmental cause. Customers involved in co-creation processes with the analyzed circular firms are committed to making an impact through pro-environmental actions. Consequently, the chance to contribute to the circular firms' innovative value proposition, which is aligned with their mindset, makes them proud of being pioneers in the paradigmatic change towards more sustainable consumption frontiers. This explains also why co-creating customers tend to become brand advocates, by sponsoring the circular firms they have co-created with through social media and word of mouth, while at the same time promoting, more in general, the adoption of circular practices. The customers' active participation is at the same time positive for the firm, which benefits from brand loyalty and advocacy and in most cases also from an increased economic value (Apepak, Rifò, Up2Go, Wrad, and Lovia). As an overall result, a long-lasting relationship is established between the firm-customer dyad.

Our empirical investigation allows us to ascertain that co-creating with customers has positive outcomes for both the firms and the customers involved and that the latter are

important sources of knowledge and innovation as found in the literature about open innovation (Mount & Martinez, 2014). *Vice versa*, we do not encounter instances of negative consequences stemming from customers' involvement in co-creation processes, such as value co-destruction (Plé & Cáceres, 2010).

Our case firms developing co-creation processes with their suppliers (Apepak, Rifò, Wrad, Kamupak, Spinnova, and Lovia) reveal that the co-creation output lies mainly in the improvement of the offer, both in terms of quality and in the way it is communicated to the final customers. This finding allows us to confirm what has been found by Lacoste (2016), namely that “sustainable value co-creation between supplier and customer leads to increased value being created at the end of the value chain” (p. 160). The process is beneficial for both actors involved: suppliers can diversify their product line (Apepak, Rifò, and Lovia), benefit from circular firms' fresh communication style (Wrad and Lovia), and gain brand reputation, while circular firms learn from their suppliers' expertise and create brand awareness through co-branded products (Apepak, Wrad, and Kamupak).

As for the firm-partner dyadic processes, the main intriguing aspect concerns the synergistic implementation of complex projects which could not have been performed separately (Rifò, Seay, Up2go, Sulapac, and Spinnova). Circular firms and their partners, characterized by different yet complementary skills, are mutually committed to reaching the same objective, i.e., tackling environmental issues by finding business solutions to avoid any kind of waste. The co-creation process among them leads also to increase their brand awareness and reputation as well as to the establishment of circular ecosystems.

Finally, all the dyadic co-creation processes in place between circular firms and each actor, have an impact on the external environment. More specifically, the outcome stemming from all the above-mentioned processes is multifaceted since it does not concern only the economic sphere (e.g., revenues from the commercialization of circular products/services) but

it also involves the creation of a TSI (Total Societal Impact), which includes economic, social, and environmental spheres of values.

*Proposition 5a. The value stemming from born circular firm-customer dyads is associated with an increased economic value for both the firm and its customers and the creation of a long-lasting relationship. Moreover:*

- *for what concerns customers: the feeling of pride by customers for the contribution to the environmental cause;*
- *for what concerns the firm: an improvement of the offer.*

*Proposition 5b. The output value stemming from born circular firm-supplier dyads is associated with increased economic value for both the actors involved, and reciprocal reinforced trust and commitment.*

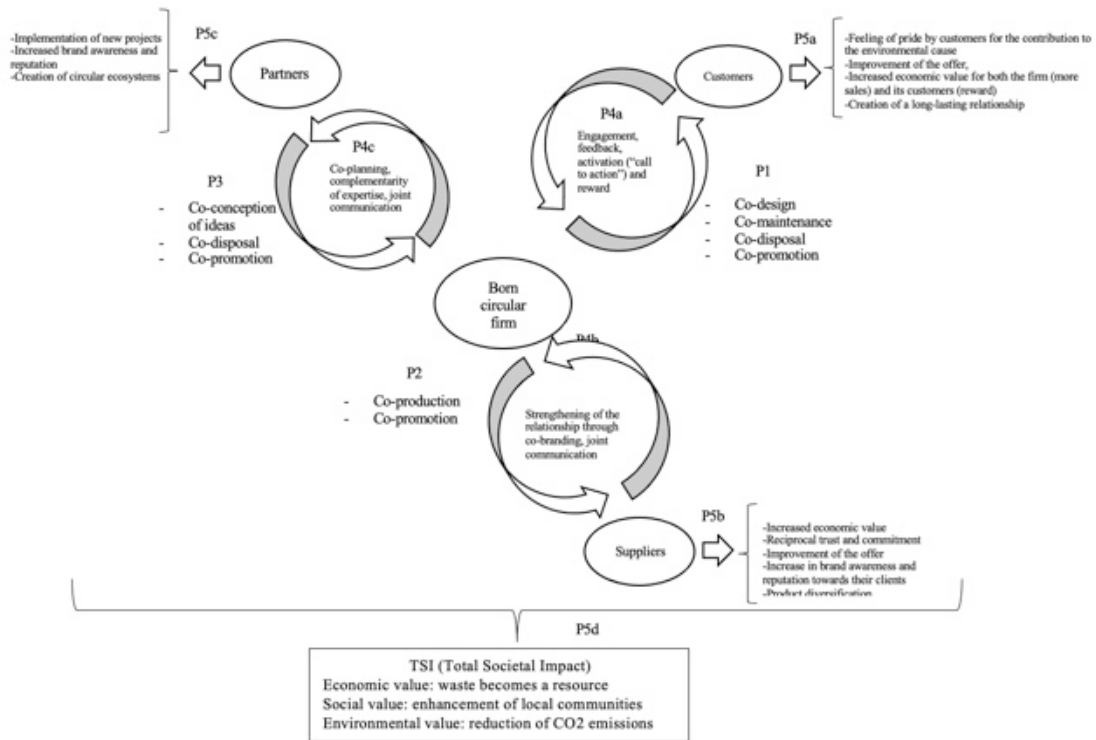
*Proposition 5c. The output value stemming from born circular firm-partner dyads is associated with further implementation of joint projects and increased brand awareness and reputation.*

*Proposition 5d. Overall, the dyadic co-creation relationships among born circular firms and the actors they co-create value with, are associated with the creation of TSI and in particular with:*

- *economic value thanks to the transformation of waste into a resource;*
- *social value through the enhancement of local communities;*
- *environmental value via an overall reduction of CO<sub>2</sub> emissions.*

Cross-case comparison enabled us to draw up an empirical model of value co-creation in circular entrepreneurship (Figure 3).

Figure 3 A model of value co-creation in circular entrepreneurship. Source: own elaboration.



## 2.6 CONCLUSION

This paper aimed to contribute to the entrepreneurship literature by providing a thorough analysis of value co-creation processes and underlying key mechanisms (Grönroos & Voima, 2013; Storbacka et al., 2016). Thanks to an exploratory study of ten Italian and Finnish born circular SMEs we were able to empirically investigate and explain value co-creation processes, by focusing on underlying co-creation mechanisms and linking them to process output. An empirical model explaining co-creation processes and a set of Propositions were proposed to be tested in future research (cf. Chapter 3).

### **2.6.1 Theoretical contribution**

Overall, according to Sandberg & Alvesson's (2020) theoretical contribution typology, ours can be regarded as a “comprehending” type of contribution.

First, by focusing on the process of value co-creation we have responded to the calls of some Authors (Frow et al., 2015; Lenka et al., 2017; Saha et al., 2020) about identifying and analyzing the underlying mechanisms, at the empirical level. Moreover, while the extant literature has mostly focused on value co-creation between firms and customers (Luu, 2019; Saarijärvi et al., 2013; Zhang & Chen, 2008), the present research sheds some light on value co-creation between firms and some of the key actors that have been previously overlooked, i.e., suppliers, and other types of partners. Thanks to thick description and narratives, within a qualitative research design, we have elucidated the theoretical meaning of the phenomenon of co-creation – through its various co-creation forms - within the circular entrepreneurship context, informing about its character and key aspects. In doing so, we have contributed to two specific streams of study: the value creation literature in entrepreneurship (Grönroos & Voima, 2013; Lenka et al., 2017), and the emerging circular entrepreneurship literature (Cullen & De Angelis, 2020; Zucchella & Urban, 2019), from the perspective of SMEs and circular start-ups (Henry et al., 2020).

Second, we did not only take into account the co-creation processes between firms and customers, which is already well explored in the literature, but – in an ecosystem perspective – we consider the co-creation processes circular firms establish with suppliers and other value partners, thus contributing to the literature on co-creation in ecosystems (Autio & Thomas, 2019; Meynhardt et al., 2016; Pera et al., 2016).

Third, our choice to adopt the point of view of multiple actors in the context of circular entrepreneurship, allowed us to contribute to the emergent literature on circular ecosystems (Aarikka-Stenroos et al., 2021; Konietzko et al., 2020). In particular, by taking as the unit of

analysis the dyadic process, we were able to shed light on value creation within circular ecosystems.

### **2.6.2 Managerial contribution**

Our findings suggest firms venturing into the circular economy may start from the very beginning to establish value co-creation processes with key actors, such as customers, suppliers, and partners. In doing so, several benefits can arise for all the parties taking part in the processes. Moreover, born circular firms choosing as partners well-known and established brands may also obtain a legitimization in the market through them, while partners increase their economic value and gain in terms of brand reputation towards clients. Managers and entrepreneurs should also acknowledge the benefits circular co-creation processes generate for the context, as a total societal impact (TSI), and they need to find the most efficient way to communicate them. Furthermore, marketers can develop marketing campaigns dedicated to encouraging wider groups of customers, not just the circular pioneers, to engage in virtuous co-creation processes with circular firms. To this end, firms could more extensively leverage social media platforms such as Facebook, which is increasingly employed as a tool for stakeholder engagement (Mount & Martinez, 2014).

Our findings may also inform policymakers for the development of incubators dedicated to born circular firms as well as for the establishment of networking projects aiming to connect the various actors that can be involved in virtuous circular practices. Overall, the positive value stemming from dyadic co-creation processes within circular entrepreneurship should be emphasized and communicated at the public level, so to encourage participation in the circular economy.



### **2.6.3 Limitations and future research avenues**

The paper presents some limitations. First and foremost, the number of cases is limited to ten: as expected by the chosen methodology (Yin, 2014), the stemming results allow the analytical generalization but not the statistical generalization (ibid). Our case studies are also limited in terms of size (SMEs) and industries (textile, packaging, leasing, and software services), and geographical location (Italian and Finnish areas). Further research may study value co-creation processes and underpinning mechanisms with their key actors by investigating firms of bigger sizes and situated in a different geographical context. Moreover, it would be interesting to further inquiry the co-creation with other actors within the ecosystem, for instance public institutions such as municipalities, which have been named by some of our respondents as current/potential co-creating entities. We suggest it would be worthy to perform a longitudinal case study research to monitor the evolution of the already existing co-creation processes, as well as the birth of new ones. Finally, future quantitative research may test the hypotheses that can be formulated from the emerged Propositions, to see whether and to what extent the results of the present study are generalizable.

### 3. CHAPTER 3: VALUE CO-CREATION PROCESSES IN CIRCULAR ENTREPRENEURSHIP: A QUANTITATIVE STUDY ON EUROPEAN FIRMS

*“The EU’s transition to a circular economy will reduce pressure on natural resources and will create sustainable growth and jobs. It is also a prerequisite to achieve the EU’s 2050 climate neutrality target and to halt biodiversity loss” – European Commission*

*“Supporting the transition to a circular economy requires – among other things – redirecting capital flows towards sustainable investment. For the private sector, this means integrating environmental, social and governance factors into the investment decision-making process on top of economic ones. It also requires mobilizing available public funding sources to make sure circular projects, whatever their technical readiness level, get the resources they need to unlock scalable solutions” – European Circular Economy Stakeholder Platform*

#### ABSTRACT

In this paper, we depart from the previously undertaken empirical study (cf. chapter 2) by advancing two empirical models of value co-creation between circular firms and their key co-creating actors and testing the emerging hypotheses, i.e., the elapsing relationships among the latent variables “co-creation scope”, “co-creation performance” and “ecosystem output”. We at the same time assess the moderating effect of value alignment. To do so, we rely on data collected through a questionnaire-based survey of 80 European circular firms from a self-built database, by using the PLS-SEM method. Our results seem to partially confirm the findings of the exploratory study. We found that value co-creation scope between born circular firms and each of the co-creating actors (e.g., customers, suppliers, partners, and public institutions) is significantly and positively associated with dyadic value co-creation performance. At the same time our findings do not find significance in the relationship between dyadic value co-creation performances and ecosystem output, nor in the “value alignment” as a moderating variable between the dyadic value co-creation scopes and performances.

Keywords: value co-creation; empirical models; PLS-SEM; European firms.

### 3.1 INTRODUCTION

Since its introduction in the early 2000s (Prahalad & Ramaswamy, 2000; Vargo & Lusch, 2004), the concept of value co-creation has become a milestone in the management literature. The seminal paper of Vargo and Lusch (2004) laid the foundation of the widespread concept of Service-Dominant (S-D) logic, which has deeply influenced the marketing theory. Nevertheless, the value co-creation process is still in need of explanations as “we know very little about the process of value creation when it starts, what it includes and when it ends” (Grönroos, 2011, p.282) and “how actors other than firms participate in value co-creation process” (Akaka & Chandler, 2011, p.250). Moreover, we know little about the mechanisms underlying co-creation processes between firms and their key actors (Lenka et al., 2017). These research gaps are particularly noticeable in the context of analysis of circular entrepreneurship, which is defined as the “processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, narrowing, and slowing the loop of resources and of regenerating/reconstituting natural capital” (Zucchella & Urban, 2019, p. 195). Since a sustainable economic system might be possible only thanks to the implementation of virtuous circular behaviors by both firms and other stakeholders (Freudenreich et al., 2020) in the context of circular entrepreneurship firms are likely to involve many stakeholders to pursue their circular mission (Realacci & Starace, 2018). While the role of customers in fostering circular practices has been acknowledged by several scholars (Camacho-Otero et al., 2018; Kirchherr et al., 2017; Re et al., 2021), there is a paucity of studies addressing the involvement of actors others than customers in the transition towards circular practices. In particular, the interactions of these actors with the circular firms, and the entire co-creation processes and underlying mechanisms are still in need of further investigation. In Chapter 2, we addressed this empirical gap by performing an exploratory multiple case study research involving six Italian and four Finnish firms and their key co-

creating actors. The performed study led to the formulation of an empirical model of value co-creation processes, including value co-creation forms, mechanisms, and output, as well as a related set of emerging propositions. We argue that there are some latent variables emerging during the study, namely “value co-creation scope”, a multi-item construct composed of co-creation forms and mechanisms, and “value co-creation performance”, a multi-item construct composed of variables related to value co-creation output. Consequently, the present paper aims to shed some light on the latent variables and elapsing relationships, by offering the following contributions:

- i. Developing and testing a first empirical model linking the latent variable “value co-creation scope” including dyadic forms and mechanisms with the latent variable “value co-creation performance”, and then linking the performances with the ecosystem output;
- ii. Developing and testing a second empirical model including the moderating effect of “value alignment” between firms and each of their co-creating actor;
- iii. extending the previous exploratory study undertaken in Italy and Finland to other EU countries, to see whether the developed propositions are generalizable.

To date, there are still no studies advancing a model to represent co-creation processes including co-creation mechanisms and output (both for the dyads involved and for the ecosystem). Moreover, while the output stemming from co-creation processes is partially known with respect to customers, still much needs to be known concerning other key actors (Akaka & Chandler, 2010), such as suppliers, partners, and public institutions. We hereby develop two empirical models, and we test a set of hypotheses to assess the relationships between the latent variables “value co-creation scope” and “value co-creation performances” and to investigate the role of value alignment as a moderator between the two.

## 3.2 THEORETICAL FOUNDATIONS

### 3.2.1 Value co-creation in circular entrepreneurship: value co-creation forms, mechanisms, and output

The creation of value is the core purpose and focal process of any economic exchange (Vargo et al., 2008). However, value is perhaps the most elusive concept in service marketing and management (Carù & Cova, 2003; Sánchez-Fernández & Iniesta-Bonillo, 2007; Woodall, 2003). In general, scholars agree upon the fact that value creation is a process aimed at increasing the customer's well-being, such that the latter becomes better off in some respect (Grönroos, 2008; Nordin et al., 2011; Vargo et al. 2008). The recognition of the key role that customers assume in the value creation process led to the emergences of the value co-creation theory (Vargo & Lusch, 2004), which focuses on the idea that customer “is always a co-creator of value” and the “enterprise cannot deliver value, but only offer value propositions” (Vargo & Lusch, 2008, p.7). The initial focus on the dyad firm/customer became gradually broader: some authors (e.g., Driessen & Hillebrand, 2013; Perks et al., 2012) pointed out the importance of including multiple actors in the co-creation discourse. Consequently, studies about value co-creation started to include a wider range of actors (e.g., Akaka et al., 2013; Frow et al., 2015), such as customers, suppliers, and distributors. Nevertheless, there has been lack of studies investigating dyadic co-creation processes between firms and each of their key actors. In chapter 2, we addressed this gap through a qualitative study involving ten circular firms and their key co-creating actors within the context of circular entrepreneurship (CE).

In our empirical study we have analyzed value co-creation processes by focusing on three key variables, value co-creation forms, mechanisms, and output that we conceptualized as follows.

- Value co-creation forms: we adopt this variable conceptualizing it according to the study of Frow, Nenonen, Payne, & Storbacka (2015). Managing co-creation design: a strategic approach to innovation. We thus consider the twelve co-creation forms

they identify, i.e., co-conception of ideas, co-design, co-production, co-promotion, co-pricing, co-distribution, co-consumption, co-maintenance, co-outsourcing, co-disposal, co-experience, co-meaning creation.

- Value co-creation mechanisms explain “how” the interactions take place. They are not clearly defined in the literature, therefore we advance our own definition as “the modes of interaction among actors aimed at co-creating value”. The mechanisms that we found out through our empirical investigation are the following ones: engagement, feedback, activation (“call to action”) and reward; with respect to suppliers co-branding and joint communication; concerning partners we found as mechanisms co-planning, the complementarity of expertise and joint communication.
- Value co-creation output represents the outcome of value co-creation processes for each analyzed dyad.

With respect to the dyad firms-customers, the academic literature has already advanced the following output related to the dyadic co-creation processes:

- a) Improvement of the offerings (Bitner et al., 1997; Mills et al., 1983);
- b) better product quality (Füller et al., 2011);
- c) the attraction of new customers (economic value) (Piligrimiene et al., 2015; Saarijärvi et al., 2013).
- d) the reception of inputs for innovation (Bitner et al., 1997; Von Hippel, 2001; Magnusson et al., 2003; Sawhney et al., 2005);
- e) improving consumption/usage experiences (Gentile et al., 2007; Payne et al., 2008);
- f) increase in brand loyalty (Jaakkola & Alexander, 2014);
- g) improvement of business performance (Lengnick-Hall et al., 2000; Macdonald et al., 2011).

Our empirical study in the context of circular entrepreneurship allowed us to include another co-creation output within the dyad firm-customers, i.e., a feeling of pride by customers for the contribution to the environmental cause. Moreover, by following Plé & Cáceres' (2010) discourse about co-destruction, we decided to evaluate the possibility that value could be co-destroyed through the interactions between actors, therefore we asked our surveys' respondents (i.e., the circular firms) to what extent there has been co-destruction with each mentioned actor. Since the responses regarding co-destruction have mostly been negative, thus signaling that the value-creating relationships did not lead to destroying value, for the sake of simplicity we decided to drop the answer about co-destruction from our analysis.

Suppliers have been considered to a limited extent in the co-creation literature. Nevertheless, the importance to integrate suppliers alongside a new product development (NPD) process has been widely acknowledged in research (Cadden & Downes, 2013; Sunil Kumar & Routroy, 2016). The involvement of suppliers is deemed crucial at each stage of the NPD as they might assume a key role in providing initial resources, investments, information, and ideas (Le Dain et al., 2010; van Echtelt et al., 2007), enriching the know-how to further develop the products/service, and to overcome constraints (Le Dain et al., 2010), and in supervising the process by preventing problems (Song et al., 2011). However, the outcome of the dyadic co-creation between firms and suppliers has not been illustrated. Our empirical study allowed us to propose three main co-creation outputs:

- a) Increased economic value
- b) Reciprocal trust and commitment
- c) Improvement of the offer
- d) Increase in brand awareness and reputation towards their clients
- e) Product diversification

With respect to partners and public institutions, the academic literature has not addressed the dyadic value co-creation between them and the firms. Our investigation offers a contribution in this direction, too. During the conducted exploratory study our interviewees referred to several partners being involved in co-creation (Rifò, Up2Go, Seay, and Sulapac), and some of them also mentioned public institutions (Up2Go and Sulapac). While we included partners in the empirical model developed in chapter 2 (Figure 2), we opted to not include the public institutions due to a scarcity of empirical evidence. However, the few insights we have got, made us argue that public institutions may represent key co-creating actors in the circular entrepreneurship. Thus, we decided to include them in the empirical models we develop in the present chapter to test at the European level whether the relationships between co-creation scope firms-public institutions and related co-creation performance might be significant.

We advanced the following co-creation output concerning partners:

- a) Joint implementation of new projects;
- b) acquired knowledge and expertise;
- c) increased level of brand awareness and reputation towards clients and the entire society;
- d) access to the respective networks of actors;
- e) implementation of industrial symbiosis

And the following ones concerning public institutions:

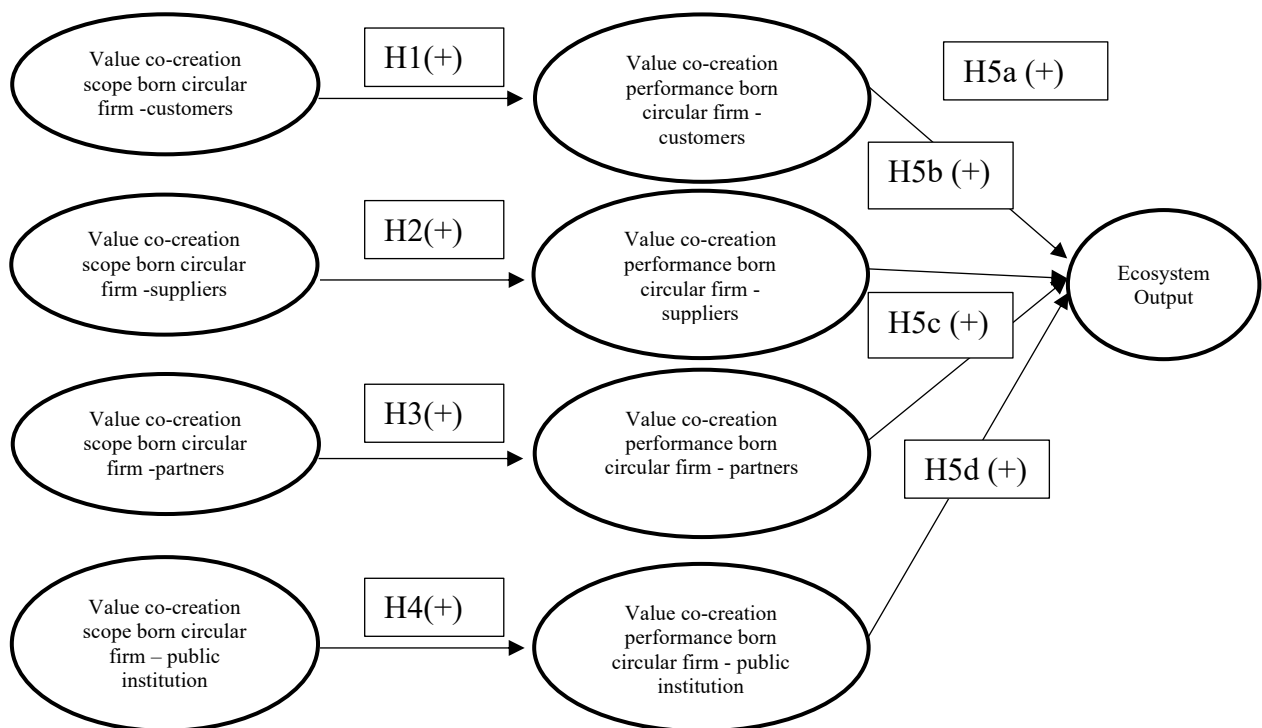
- a) Circular firms access a key network of actors while the institution increases its reputation within the community;
- b) favoring the citizens' engagement in sustainable practices;
- c) development of knowledge to implement concrete sustainable solutions;
- d) increasing local employment;
- e) stimulating knowledge transfer and venture creation.



### 3.3 FORMULATION OF HYPOTHESES

Based on the findings of the exploratory study, we develop two empirical models, differing with respect to the presence of the moderator “values alignment” within the relationship of each dyad. The first model (Figure 4) hypothesizes no moderating effects of values alignment, i.e., “sharing common values” (Malshe & Friend, 2018), while the second one (Figure 5) hypothesizes that value alignment moderates each intercurrent dyadic relationship. The choice of the moderator stems from the qualitative step of the present mixed-methods study (cf. Chapter 2): the respondents of our qualitative study often highlight the fact that their co-creating actors are somehow aligned with their values especially concerning the commitment to make an impact to change the economic systems towards more sustainable frontiers.

Figure 4 Model 1: value co-creation processes in circular entrepreneurship.



Source: own elaboration.

The following set of hypotheses are developed to test this first model:

**H1:** The greater is the value co-creation scope between the firm and the customer, the higher the value co-creation performance.

**H2:** The greater is the value co-creation scope between the firm and the suppliers, the higher the value co-creation performance.

**H3:** The greater is the value co-creation scope between the firm and the partners, the higher the value co-creation performance.

**H4:** The greater is the value co-creation scope between the firm and the public institutions, the higher the value co-creation performance.

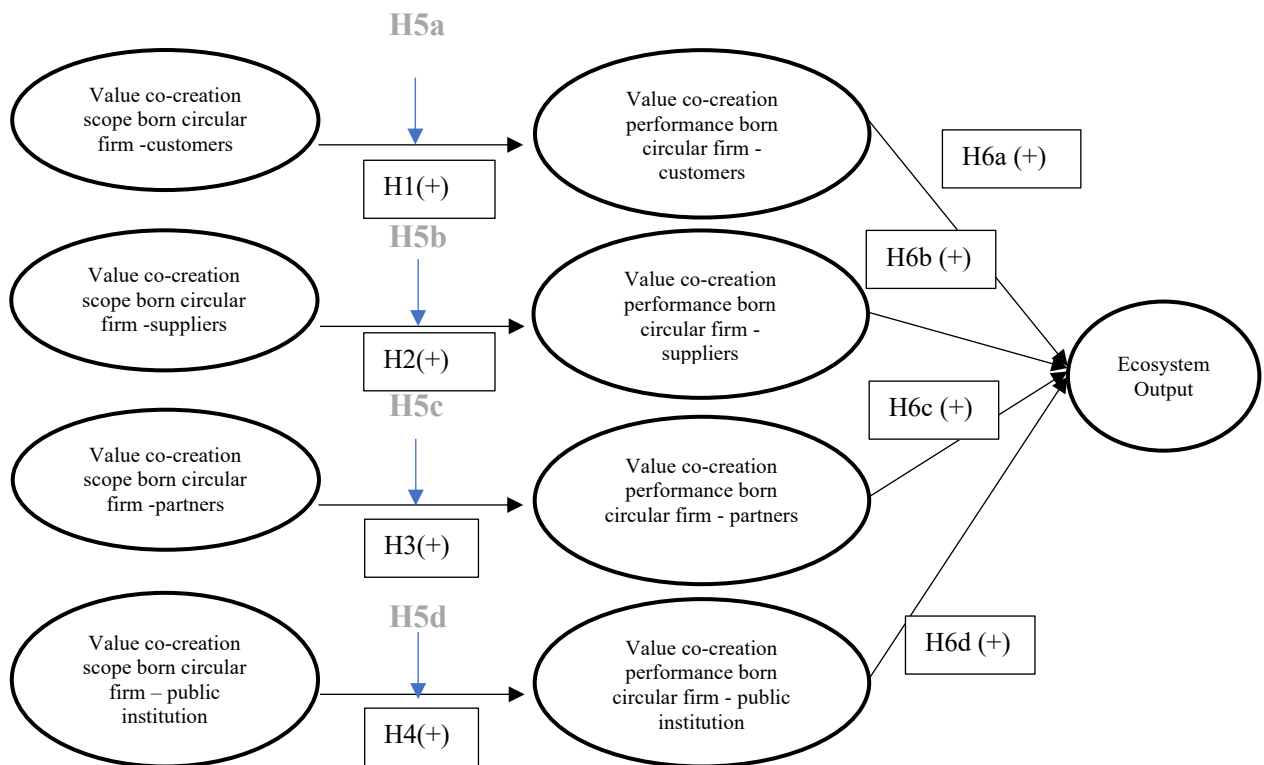
**H5a:** The higher is the value co-creation performance between firms and customers, the higher the ecosystem output (economic, social, and environmental).

**H5b:** The higher is the value co-creation performance between firms and suppliers, the higher the ecosystem output (economic, social, and environmental).

**H5c:** The higher is the value co-creation performance between firms and partners, the higher the ecosystem output (economic, social, and environmental).

**H5d:** The higher is the value co-creation performance between firms and public institutions, the higher the ecosystem output (economic, social, and environmental).

Figure 5 Model 2: value co-creation processes in circular entrepreneurship with a moderating effect.



Source: own elaboration

The following set of hypotheses are developed to test the second model:

**H1:** The greater is the value co-creation scope between the firm and the customer, the higher the value co-creation performance.

**H2:** The greater is the value co-creation scope between the firm and the suppliers, the higher the value co-creation performance.

**H3:** The greater is the value co-creation scope between the firm and the partners, the higher the value co-creation performance.

**H4:** The greater is the value co-creation scope between the firm and the public institutions, the higher the value co-creation performance.

**H5a:** The relationship between the value co-creation scope between a circular firm and its customers and the value co-creation performance is positively moderated by “values alignment”<sup>4</sup>.

**H5b:** The relationship between the value co-creation scope between a circular firm and its suppliers and the value co-creation performance is positively moderated by values alignment.

**H5c:** The relationship between the value co-creation scope between a circular firm and its partners and the value co-creation performance is positively moderated by values alignment.

**H5d:** The relationship between the value co-creation scope between a circular firm and the public institutions and the value co-creation performance is positively moderated by values alignment.

**H6a:** The higher is the value co-creation performance between firms and customers, the higher the ecosystem output (economic, social, and environmental).

**H6b:** The higher is the value co-creation performance between firms and suppliers, the higher the ecosystem output (economic, social, and environmental).

**H6c:** The higher is the value co-creation performance between firms and partners, the higher the ecosystem output (economic, social, and environmental).

**H6d:** The higher is the value co-creation performance between firms and public institutions, the higher the ecosystem output (economic, social, and environmental).

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<sup>4</sup> Value alignment is an ordinal variable measured through a Likert scale ranging from 1 to 5.

### **3.4 DATA AND METHODOLOGY**

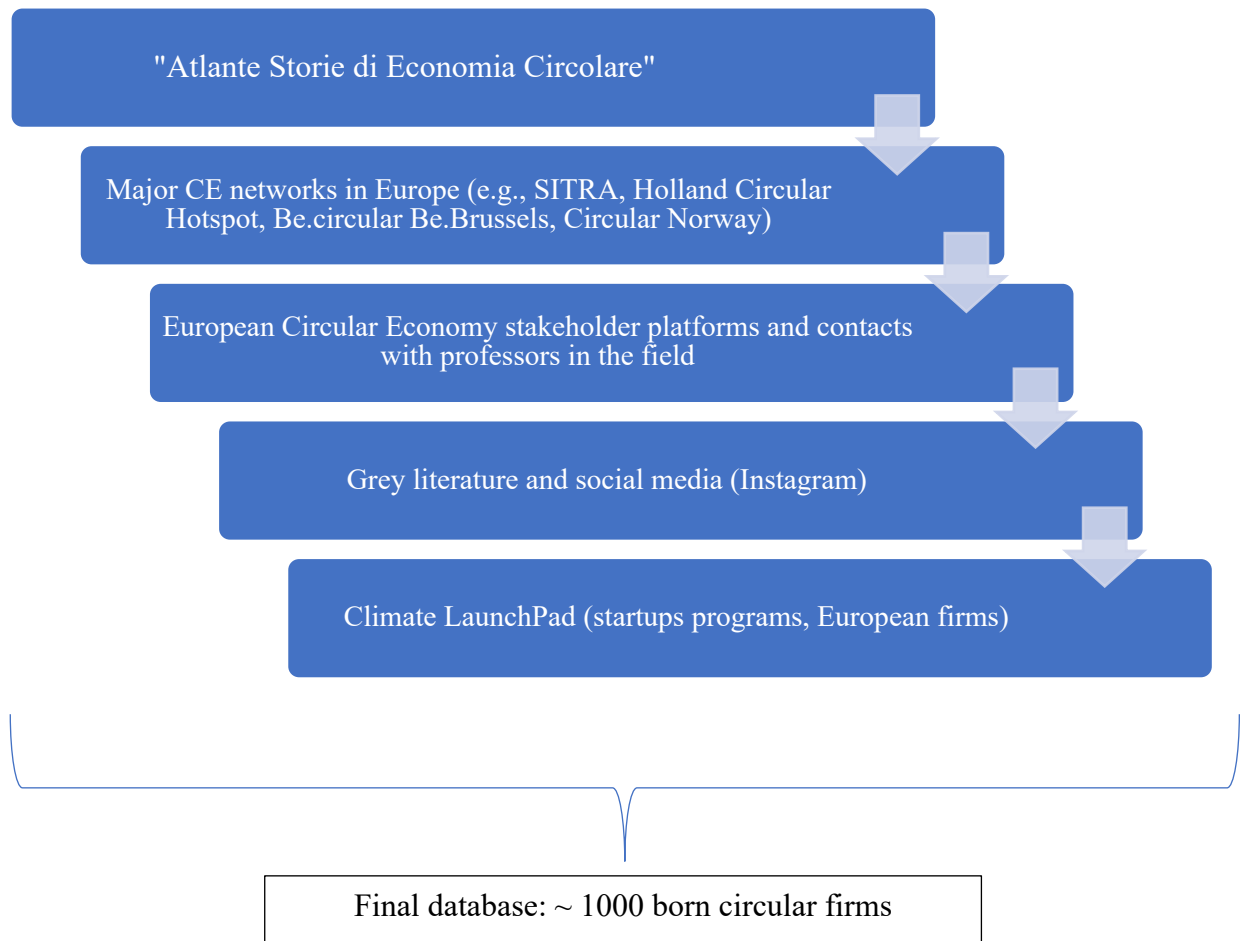
In this section, we illustrate the methodological procedure adopted to answer the research question and to test the hypotheses we presented in the above section. More in detail we explain: i) every single step undertaken throughout the data collection and ii) the variables and the related measurements adopted in the questionnaire stemming from the exploratory qualitative part of the study (cf. Chapter 2).

#### **3.4.1 Data sources and sample**

Our methodology involved gathering data through a questionnaire administered to a representative sample of born circular firms in Europe, i.e., firms that are born adopting a circular business model since the very beginning and have been established in Europe. Since this database is currently not available from European institutions due to the novelty of the research topic, we had to proceed with gathering data on our own. To do so, we started from the Italian context by considering the Italian database “Atlante Storie di Economia Circolare” which reports 249 firms both born circular and growing circular (i.e., in the transition towards circular business models) (Zucchella & Urban, 2019). For the present study’s purposes, we selected only those “born circular”, equals to 185 firms. We then proceeded with reading the report “Major circular economy networks in Europe”, released in April 2020 by the Institute Nationale de l’Economie Circulaire and Orée. This report identifies twenty-eight networks, i.e., “places where actors involved in the circular economy are interconnected, often linked to each other” (ibid, p. 11), and they could be, for instance, associations and semi-public entities. We contacted all these networks specifically asking for lists of born circular firms. Some of these networks had already a dataset available (i.e., Sitra and Holland Circular Hotspot), while others provided us with some case studies of firms meeting our criteria and we included them

in our database. In addition, we added circular firms from the European Circular Economy stakeholder platform, as well as circular cases presented in the grey literature and social media (mainly Instagram). Then, we inserted further case firms that have been suggested us by European professors specifically working on the topic. Furthermore, we also added circular start-ups that have been funded through ClimateLaunchPad, the accelerator by Climate-KIC, supported by the European Union. This articulated data collection procedure allowed us to build up a database of around 1000 born circular firms established in Europe. Figure 5 illustrates the path we followed to build the database.

Figure 6 Data collection process: building the database of European circular firms.



Source: own elaboration

In the Excel database we initially reported the name of the firms and their countries of foundation, and subsequently we collected the email contacts of all the firms by making Google searches and searching on respective websites. In case there were specific email addressing of the CEO or the Communication Manager, we reported his/her contact instead of the generic company's email, otherwise we had to stick to the latter.

Table 10 shows the distribution in terms of industries. We decided to adopt the classification of economic sectors made by Ghisellini and Ulgiati, (2020)<sup>5</sup> since they specifically refer to CE industries within the circular economy. As emerges from the table, the most frequent industries in our sample are “clothing and accessories” and “mixed used objects (second hand)”, respectively representing the 16,25% and the 8.75% of the total sample. 11 firms in our sample (13.75%) belong to “other” industries.

*Table 10. Description of our sample of firms in terms of industry. Source: own elaboration.*

<b>Industry</b>	<b>Number of firms</b>	<b>Number of firms (%)</b>
Agri-food	6	7.5%
Automation and other manufacturing industries	3	3.75%
Bio-chemical and pharmaceuticals	2	2.50%
Clothing and accessories	15	18.75%
Construction	6	7.5%
Culture/arts/tourism/sport	2	2.5%
Electronics	5	6.25%
Energy and compost from post-consumption waste	3	3.75%
Furniture	5	1.5%
Finance	0	-
Housewares	3	3.75%

<sup>5</sup> See Figure 6 at page 7 “Distribution of the organizations in the sample according to the economic sectors”.

Mixed used objects (second hand)	8	8.75%
Paper industry	0	-
Packaging	6	6.25%
Research centers/universities	0	-
Secondary raw materials	1	1.25%
Waste Management	4	5.00%
Other	11	13.75%
<b>Total</b>	<b>80</b>	<b>100 %</b>

Table 11 shows the distribution of our firms in terms of size according to the number of employees: micro firms (less than 10 employees), small firms, (less than 50 employees), medium firms (between 50 and 249 employees), big firms (more than 249 employees). Our sample is composed mostly by micro firms (61) equals 76,25% of the sample. This can be justified by the fact that circular entrepreneurship is blooming these days (Zucchella & Urban, 2019) and that most of the firms that are adopting circular business models since their inception have been founded recently by following the growing societal interest and investments in sustainability issues, and they are now in the scaling-up phase.

*Table 11. Sample distribution in terms of sizes. Source: own elaboration.*

<b>Firm size</b>	<b>Number of firms</b>	<b>Number of firms (%)</b>
Micro	61	76.25%
Small	12	15%
Medium	6	7.5%
Big	1	1.25%
<b>Total</b>	<b>80</b>	<b>100%</b>

With respect to the export activity, we observe two scenarios. On the one hand, around half of the firms in our sample (39) has not started the internationalization process yet. On the other hand, the other half has been proactively engaged in international activities, started exporting

since the first years of their foundation (41) and 4 of them declare that their export accounts for more than the 70% of their revenues. One firm did not complete this question.

Table 12 shows the distribution of our firms in terms of country of foundation. 76 firms out of 80 provided this information. We underline that 44.7% of firms are Italian: the highest response rate in Italy compared to the other EU countries can be justified by the fact that respondents felt more involved in this research since it has been conducted by Italian researchers via an Italian institutional email address. Moreover, the administration of the questionnaire in Italian has probably generated a higher willingness to answer.

*Table 12. Sample distribution in terms of Country. Source: own elaboration.*

<b>Country</b>	<b>Number of firms</b>	<b>Number of firms (%)</b>
Italy	34	44,7%
Finland	3	3.94%
Belgium	5	6.58%
Czech Republic	1	1.31%
UK	2	2.63%
The Netherlands	8	10.53%
Switzerland	5	6.58%
Poland	2	2.63%
Sweden	1	1.31%
Estonia	3	3.94%
Denmark	2	2.63%
Portugal	2	2.63%
Austria	2	2.63%
France	2	2.63%
Spain	1	1.31%



Greece	2	2.63%
Romania	1	1.31%
Total	76	95%

### 3.4.2 Questionnaire

Between January and March 2021, we made a structured questionnaire to proceed with the data collection. Due to the linguistic barrier Italian firms may encounter with respect to English, we opted for formulating the questionnaire in two languages, one in Italian specifically addressed to Italian firms, and another in English to be administered to European firms (see Appendix 1 for the full questionnaires – both versions). We decided to not include mandatory responses to avoid making the respondent under pressure to answer. We wanted all the answers to be spontaneous.

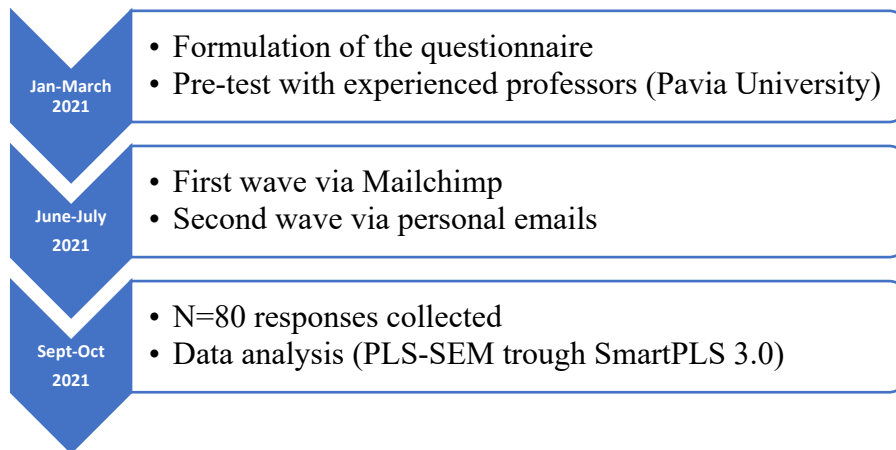
After drafting a first version of the questionnaire, we asked for peer feedback from four experienced scholars belonging to the Department of Economics and Management of the University of Pavia. This phase has been fundamental to substantially improve the questions so that they could have been more understandable by our respondents. Subsequently, between February and March 2021 we asked for the circular firms' feedback by sending it to the founders/knowledgeable informants of six born circular firms in Italy and Finland we had already established a close relationship with during the qualitative data collection phase.

Both pre-test phases have been crucial for us to further improve the clarity and the reliability of the survey instrument. The received feedback helped us to refine the questionnaire: we reduced the lack of clarity or vagueness in the items, and we varied the structure of questions (nominal scale, Likert scale, and categorical scales) to minimize anchoring bias (Podsakoff et al., 2003).

The software platform we used to create and administer the survey was Webropol 3.0. In June 2021, we sent the final version of the questionnaire to all the firms of our self-built database (~1000 firms) through Mailchimp, and after two weeks we performed a second wave of the survey. In July 2021, to increase the response rate, we decided to send personal emails containing the link to the survey to each non-respondent firm. Figure 6 illustrates the process we followed to administer the questionnaire.

We finally ended up with 80 responses, corresponding to an 8% response rate. This number of responses was deemed sufficient to run statistical analyses with the structural equation modeling technique, as it is compliant with the “ten times rule of thumb” (Barclay et al., 2015; Hair et al., 2014), which recommends a “minimum sample size of ten times the maximum number of independent variables in the outer model and inner model” (Hair et al., 2012, p. 325). Three could be the possible reasons explaining why we got quite a low response rate. First, the fact that the questionnaire was sent in English to all European firms and not all the respondents might have had the appropriate knowledge of English to respond. Secondly, some respondents might have not considered the email since it was coming from a mailing list (Mailchimp) and then from a foreign University (the sending email address is under the domain of the University of Bergamo). Third, the disruptive consequences of the Covid-19 pandemic on business-as-usual might have significantly affected the response rate. All the 80 observations are considered valid since the missing data did not exceed the 15%, as required by the employed methodology (Hair et al., 2017).

Figure 7. Process followed to administer the questionnaire.



Source: own elaboration

### 3.4.3 Analytical approach

To test the advanced model and related research hypotheses, we employed structural equation modelling (SEM) which is a statistical methodology undertaking a multivariate analysis concerning multi-causal relationships among real-world phenomena. It is defined as “a class of multivariate techniques that combines aspects of factor analysis and regression, enabling the researcher to simultaneously examine relationships among measured variables and latent variables (assessment of measurement theory) as well as between latent variables (assessment of structural theory)” (Hair et al., 2017, p.11).

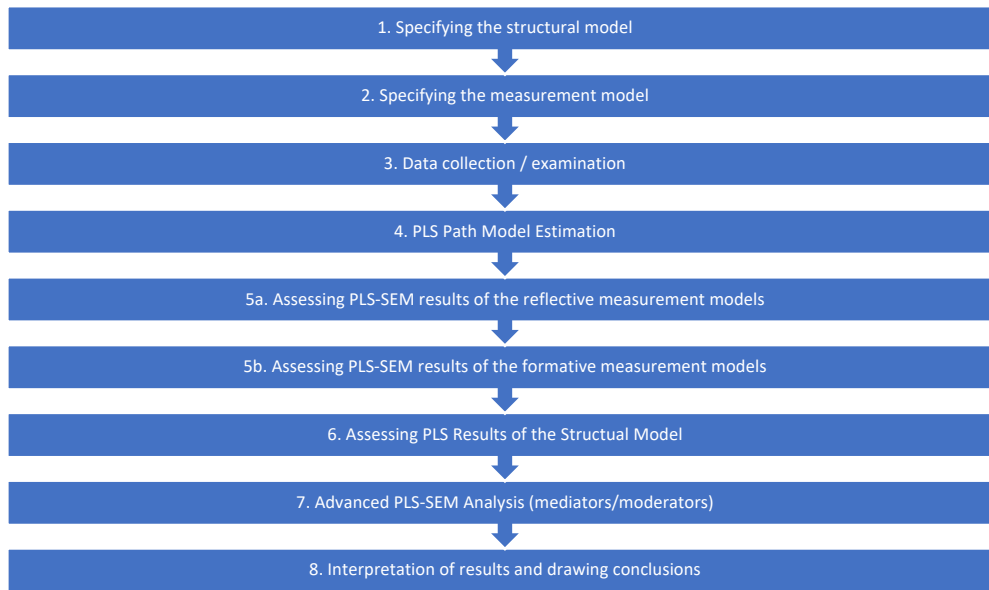
SEM can be considered a quasi-standard tool for analyzing complex interrelationships between observed and latent variables, and it is “among the most useful advanced statistical analysis techniques that have emerged in the social sciences in recent decades” (Ringle et al., 2018). SEM can be interpreted as a form of theoretical empiricism because it combines theory with method and observations (Bagozzi & Heatherton, 1994). Hair et al. (2010, p. 616) stated that SEM examines “the structure of interrelationships expressed in a series of equations”.

These interrelationships express the causality among constructs, and both the exogenous and the endogenous variables, which are employed in the analysis (*ibid*).

This technique allows to measure and interpret complex interrelated dependence relationships and to include the measurement error on the structural coefficients (Hair, et al., 2010; MacKenzie et al., 2001). Byrne (1998) has illustrated that SEM has two statistical pivots: (1) the causal processes are illustrated through a series of structural relations; and (2) these equations can be modeled to conceptualize the theory under investigation. Among the two most widespread approaches to conducting SEM, namely covariance-based SEM (CB-SEM) and composite-based PLS-SEM, we decided to opt for the latter because it works efficiently with small sample sizes and complex models, and it makes basically no assumptions about the underlying data (Cassel et al., 1999), thus being more suitable for our purposes. Moreover, prior studies employing PLS-SEM have shown its advantages related to its employment with non-normal data and formative measures of latent variables (Ringle et al., 2012). PLS-SEM is a casual modelling approach aiming at maximizing the explained variance of the endogenous latent variables and widely used across disciplines such as marketing (Henseler et al., 2009) and the public sector (Kim, 2012).

We hereby follow the PLS-SEM procedure as illustrated by Hair et al. (2017) (Figure 8).

Figure 8 Systematic procedure for applying PLS-SEM.



Source: Adapted from Hair et al. (2017, p.45).

We now proceed with the preliminary data analysis (descriptive statistics), and we specify the measurement models to subsequently perform the analysis by means of SmartPLS 13 Software.

### 3.4.4 Indicators for measurement model constructs

Table 13 summarizes the indicators of our measures, and it specifies whether they are *reflective* or *formative*. The former is the type of measurement model setup in which measures represent the effects (or manifestations) of an underlying construct, meaning that causality is from the construct to its measures (indicators) (Hair et al., 2017). In contrast, formative indicators form the construct by means of linear combinations, and each indicator captures a specific aspect of the construct's domain, implying that omitting an indicator potentially alters the nature of the construct. In formative measurement models, the assumption is that the indicators cause the construct (Hair et al., 2014).

Table 13. Summary of indicators for measurement model constructs. Source: own elaboration.

<b>Co-creation scope firm-customers (<i>formative</i>)</b>	
CLFORM_CO-DESIGN	Co-design products/services
CLFORM_TESTING	Test products/services with them and create a “feedback loop” to constantly improve the company’s offer
CLFORM_MAINTENANCE	Co-maintain leased/shared products
CLFORM_CO-DISPOSE	Co-dispose the products by getting them back from the customers after use
CLFORM_CO-PROMOTION	Co-promote the firms’ products/services
CLMECH_PRELAUNCHFEED	Involve our customers through crowdfunding platforms and we asked them feedback before our launch
CLMECH_ENGAGEMENT	We involve our customers in our circular mission through engagement activities
CLMECH_ACTIVATION	Activate customers through asking them to perform a concrete action (e.g., bringing old garments back to our firm)
CLMECH_FEEDBACKLOOP	Ask constantly our customers to give us feedback about our products/services
CLMECH_REWARD	Offer a reward to our customers for their action (e.g., discount)
<b>Value co-creation performance firm-customers (<i>formative</i>)</b>	
OUTCL_IMPROVOFFER	Improvement of the offer in terms of product/service features
OUTCL_ENGAGEMENT	Customer engagement
OUTCL_LOYALTY	Customer loyalty
OUTCL_INVOLVCIRCOMISSION	Customers’ involvement in the environmental cause
OUTCL_ECONOMICVALUE	Higher economic value (revenues for firms and discounts for customers)
<b>Co-creation scope firm-suppliers (<i>formative</i>)</b>	
SUPFORM_CODESIGN	Co-design products/services
SUPFORM_COPRODUCTION	Co-produce products/services (e.g., study and choice of materials)
SUPFORM_CODISTRIB	Co-distribute the final products through respective channels
SUPFORM_CODISPOSAL	Co-dispose materials (e.g., the materials collected by the clients become input for suppliers)
SUPFORM_COMEANING	Jointly provide meaning to our businesses (e.g., by promoting environmental education)
MECHSUP_COBRANDING	Develop co-branded products
MECHSUP_JOINTCOMMUNICATION	Jointly communicate the project through respective channels
MECHSUP_INVERSELOG	Co-create through reverse-logistics (provide to our suppliers input to make products)

MECHSUP_KNOWINNOV	Suppliers provide know-how and expertise while the firm offers innovative sustainable vision
<b>Value co-creation performance firm-suppliers (formative)</b>	
OUTSUP_TRUST	Increased reciprocal trust and commitment
OUTSUP_IMPROVOFFER	Overall improvement of our offer
OUTSUP_PRODDIVERS	Product diversification
OUTSUP_BRANDRECOG	Increased brand awareness and reputation towards final clients and the entire society
<b>Co-creation scope firm-partners (formative)</b>	
FORMPARTNERS_COCONCEPTION	Co-conception of ideas: we formulate and co-develop new projects together
FORMPARTNERS_CO-DISPOSAL	Co-disposal: through the partners' expertise, resources are prevented from landfill and are given a new economic value
FORMPARTNERS_CO-PROMOTION	Co-promotion: we promote the co-developed projects through respective institutional channels and media
FORMPARTNERS_CO-MEANING	Co-meaning creation: together, we provide meaning to the circular practices we implement
MECHPARTNERS_CO-PLANNING	We co-plan joint projects
MECHPARTNERS_COMMONGOALS	We are committed to reach a common goal
MECHPARTNERS_COMPLEMENTARITYSKILLS	We share a complementarity of skills
MECHPARTNERS_SHARINGKNOWLEDGE	We share our respective knowledge
MECHPARTNERS_JOINTCOMMUNICATION	We jointly communicate the project through our respective channels
<b>Value co-creation performance firm-partners (formative)</b>	
OUTPARTNERS_JOINTPROJECTS	Joint implementation of new projects
OUTPARTNERS_SHAREKNOWLEDGE	Acquired knowledge and expertise
OUTPARTNERS_BRANDAWARE	Increased level of brand awareness and reputation towards clients and the entire society
OUTPARTNERS_ACCESSNETWORK	Access to the respective network of actors
OUTPARTNERS_INDUSTRIALSYM	Implementation of industrial symbiosis
<b>Co-creation scope firm-public institutions (formative)</b>	
FORMPA_COPLANNINGPROJECTS	Co-plan projects to be implemented at the local level
FORMPA_CO-DESIGNPRODUCTS	Co-design products/services
FORMPA_COPRODUCTION	Co-produce products/services
FORMPA_IMPROVEMENTOFFER	Co-maintain and improve the joint projects/products/services
FORMPACO-PROMOTION_PROJECTS	Co-promotion of the implemented projects/products/services
MECHPA_SOCIETALNEEDS	Mutual commitment to respond to societal and collective needs
MECHPA_SHARINGKNOWLEDGENETWORK	Sharing respective knowledge and network
MECHPA_SHARINGIDEAS	Exchange views and feedback to improve the joint project

MECHPA_JOINTCOMMUNICPROJECTS	Jointly communicate the projects through our respective channels
<b>Value co-creation performance firm-public institutions (<i>formative</i>)</b>	
OUTPA_NETWORKACTORS	Access a key network of actors and the institution increases its reputation within the community
OUTPA_INVOLVEMENTCITIZENS	Favoring the citizens' engagement in sustainable practices
OUTPA_DEVELOPINGKNOWLEDGE	Development of knowledge to implement concrete sustainable solutions
OUTPA_INCREASINGEMPLOYMENT	Increasing local employment
OUTPA_TRIGGERDISSEMINATEKNOWLEDGE	Stimulating knowledge transfer and venture creation
<b>Output ecosystem (<i>reflective</i>)<sup>6</sup></b>	
OUTPUT_ECO	Overall output/value stems from all the mentioned co-creation processes (Economic, social, environmental)

### 3.4.5 Controlling for common method bias: A preliminary assessment using Cronbach's alpha<sup>7</sup>

Before sending the questionnaire, we *ex-ante* performed a pilot test by sending the questionnaire to six circular firms in Europe, to refine the preliminary version by deleting potential ambiguous or unfamiliar terms and to maintain the questions simple and concise by avoiding complicated syntax. *Post-hoc analysis* to reduce common method variance has been performed by employing statistical tools via SPSS software. First, we checked for **internal consistency**, meaning that the scale items should all measure the same construct and be highly correlated by using Cronbach's alpha. The literature agrees upon the lower limit of Cronbach's alpha equals 0.70, although it is acknowledged that it might decrease to 0.60 in exploratory research (Hair et al., 2014). Hereafter list the scores for our variables.

- Co-creation scope firm-customers (i.e., the co-creation extent measured with co-creation forms and mechanisms, total of 10 items) scored 0.778.

<sup>6</sup> By following the PLS-SEM approach, one-item constructs are considered as reflective (Hair et al., 2014).

<sup>7</sup> In PLS-SEM Cronbach's alpha is treated as a "conservative" measure of internal consistency reliability.



- Co-creation performance firm-customers (i.e., output of dyadic co-creation, total of 5 items) scored 0.824.
- Co-creation scope firm-supplier (i.e., the co-creation extent measured with co-creation forms and mechanisms, total of 9 items) scored 0.90.
- Co-creation performance firm-supplier (i.e., output of dyadic co-creation, total of 4 items) scored 0.902.
- Co-creation scope firm-partner (i.e., the co-creation extent measured with co-creation forms and mechanisms, total of 10 items) 0.919.
- Co-creation performance firm-partner (i.e., output of dyadic co-creation, total of 5 items) scored 0.882.
- Co-creation scope firm-public institution (i.e., the co-creation extent measured with co-creation forms and mechanisms, total of 9 items) scored 0.912.
- Co-creation performance firm-public institution (i.e., output of dyadic co-creation, total of 5 items) scored 0.844.

The dependent variable ecosystem performance is measured with one-item scale and therefore there is no need to calculate Cronbach’s alpha.

### 3.4.6 Descriptive statistics

Descriptive statistics report minimum, maximum, and mean values, as well as the standard deviation, for all the observed variables included in a study. In the table below (Table 14) we present the descriptive statistics of our sample.

*Table 14. Descriptive statistics of the research variables. Source: own elaboration.*

		Num observations	Unit	Min	Max	Mean	Std. Deviation

BEATRICE RE – AEM XXXIV CYCLE

<b>Firm specific variables</b>	TURNOVER_2019 <sup>8</sup>	73	Number (range)	1	4	1,14	,384
	EXPORT_INTENSITY <sup>9</sup>	79	Number (range)	1	6	2,24	1,579
	BM_CIRCSUPPLYCHAIN	80	Binary (yes/no)	0	1	,38	,487
	BM_RECOVRECYCL	80	Binary (yes/no)	0	1	,59	,495
	BM_PRODUCTLIFETENSION	80	Binary (yes/no)	0	1	,39	,490
	BM_SHARING	80	Binary (yes/no)	0	1	,19	,393
	BM_PRODUCSERVICE	80	Binary (yes/no)	0	1	,20	,403
<b>Co-creation scope firm-customers</b>	CLFORM_CO-DESIGN	61		0	5	2,90	1,524
	CLFORM_TESTING	61	Likert Scale (0-5)	0	5	3,31	1,218
	CLFORM_MAINTENANCE	61	Likert Scale (0-5)	0	5	2,21	1,634
	CLFORM_CO-DISPOSE	61	Likert Scale (0-5)	0	5	2,51	1,867
	CLFORM_CO-PROMOTION	61	Likert Scale (0-5)	0	5	3,31	1,421
	CLMECH_PRELAUNCHFEE D		Likert Scale (0-5)				
		63		0	5	2,29	1,549
	CLMECH_ENGAGEMENT	63	Likert Scale (0-5)	0	5	3,43	1,456
	CLMECH_ACTIVATION	63	Likert Scale (0-5)	0	5	3,05	1,764
	CLMECH_FEEDBACKLOOP	63	Likert Scale (0-5)	0	5	3,54	1,305
	CLMECH_REWARD	63	Likert Scale (0-5)	0	5	2,62	1,621
<b>Co-creation performance firm-clients</b>	OUTCL_IMPROVOFFER	63	Likert Scale (0-5)	0	5	3,68	1,202
	OUTCL_ENGAGEMENT	63	Likert Scale (0-5)	0	5	3,86	1,090
	OUTCL_LOYALTY	63	Likert Scale (0-5)	0	5	3,89	1,033
	OUTCL_INVOLVCIRCMISSI ON	63	Likert Scale (0-5)	0	5	3,90	1,146
	OUTCL_ECONOMICVALUE	63	Likert Scale (0-5)	0	5	2,98	1,374
<b>Co-creation scope firm-suppliers</b>	SUPFORM_CO-DESIGN	49	Likert Scale (0-5)	0	5	3,12	1,348
	SUPFORM_CO- PRODUCTION	49	Likert Scale (0-5)	1	5	3,24	1,331
	SUPFORM_CODISTRIB	49	Likert Scale (0-5)	0	5	2,35	1,535
	SUPFORM_CO-DISPOSAL	49	Likert Scale (0-5)	0	5	2,22	1,611
	SUPFORM_CO-MEANING	49	Likert Scale (0-5)	0	5	3,16	1,463
	SUPMECH_CO-BRANDING	49	Likert Scale (0-5)	0	5	2,47	1,596
	SUPMECH_JOINTCOMMUN ICATION	49	Likert Scale (0-5)	0	5	2,92	1,455
	SUPMECH_INVERSELOG	49	Likert Scale (0-5)	0	5	2,73	1,483
	SUPMECH_KNOWINNOV	49	Likert Scale (0-5)	1	5	3,61	1,351
<b>Co-creation performance firm-suppliers</b>	OUTSUP_TRUST	49	Likert Scale (0-5)	1	5	3,61	1,057
	OUTSUP_IMPROVOFFER	49	Likert Scale (0-5)	0	5	3,78	1,026
	OUTSUP_PRODUDIVERS	49	Likert Scale (0-5)	0	5	3,67	1,107
	OUTSUP_BRANDRECOG	49	Likert Scale (0-5)	0	5	3,45	1,324
<b>Co-creation scope firm-partners</b>	FORMPARTNERS_CO- CONCEPTION	49	Likert Scale (0-5)	0	5	3,53	1,276
	FORMPARTNERS_CO- DISPOSAL	49	Likert Scale (0-5)	0	5	2,92	1,579
	FORMPARTNERS_CO- PROMOTION	49	Likert Scale (0-5)	0	5	3,71	1,208
	FORMPARTNERS_CO- MEANING	49	Likert Scale (0-5)	0	5	3,88	1,252
	MECHPARTNERS_CO- PLANNING	49	Likert Scale (0-5)	0	5	3,61	1,304
	MECHPARTNERS_COMMO NGOALS	47	Likert Scale (0-5)	0	5	3,91	1,195
	MECHPARTNERS_COMPLE MENTARITYSKILLS	49	Likert Scale (0-5)	1	5	3,67	1,068

<sup>8</sup> Measured from 1 to 4 (million euro: <2 micro firm, <10 small firm, 10 to 50 medium firm, >50 large)

<sup>9</sup> Measured from 1 to 6 (% foreign sales out of total sales: 1=0%, 2=1-10%, 3=10-30%, 4=30-50%, 5=50-70%, 6=70%-100%)

## BEATRICE RE – AEM XXXIV CYCLE

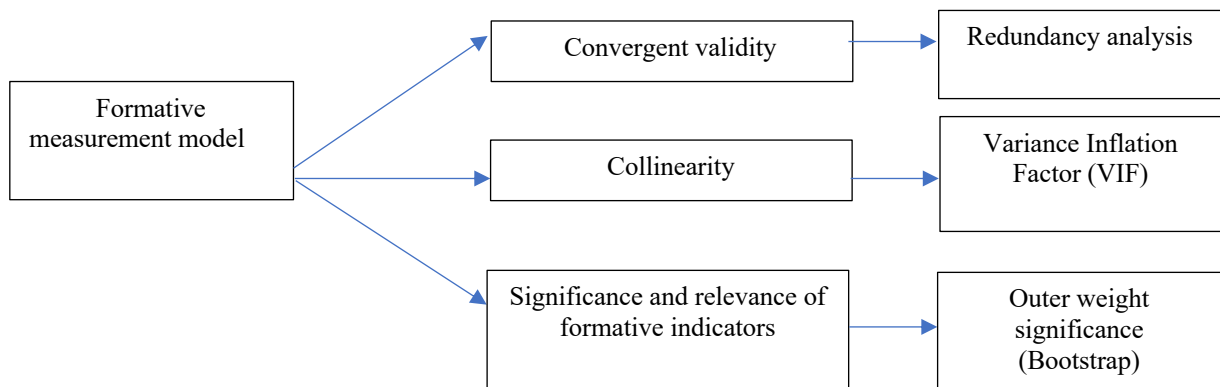
	MECHPARTNERS_SHARIN GKNOWLEDGE	49	Likert Scale (0-5)	0	5	3,71	1,242
	MECHPARTNERS_JOINTC OMMUNICATION	49	Likert Scale (0-5)	0	5	3,71	1,225
<b>Co-creation performance firm-partners</b>	OUTPARTNERS_JOINTPRO JECTS	49	Likert Scale (0-5)	0	5	3,47	1,340
	OUTPARTNERS_SHAREKN OWLEDGE	49	Likert Scale (0-5)	1	5	3,78	,985
	OUTPARTNERS_BRANDAWA RE	49	Likert Scale (0-5)	1	5	3,82	1,014
	OUTPARTNERS_ACCESSN ETWORK	49	Likert Scale (0-5)	0	5	3,76	1,071
	OUTPARTNERS_INDUSTRI ALSYM	49	Likert Scale (0-5)	0	5	3,04	1,322
<b>Co-creation scope firm- publicadministr ation</b>	FORMPA_COPLANNINGPR OJECTS	37	Likert Scale (0-5)	1	5	3,73	1,239
	FORMPA_CO- DESIGNPRODUCTS	37	Likert Scale (0-5)	0	5	2,70	1,372
	FORMPA_COPRODUCTION	37	Likert Scale (0-5)	0	5	2,49	1,304
	FORMPA_IMPROVEMENTO FFER	37	Likert Scale (0-5)	0	5	2,86	1,437
	FORMPA_CO- PROMOTION PROJECTS	37	Likert Scale (0-5)	0	5	3,08	1,588
	MECHPA_SOCIETALNEEDS	36	Likert Scale (0-5)	2	5	3,86	,990
	MECHPA_SHARINGKNOWL EDGENETWORK	36	Likert Scale (0-5)	1	5	3,47	1,298
	MECHPA_SHARINGIDEAS	36	Likert Scale (0-5)	0	5	3,03	1,383
	MECHPA_JOINTCOMMUNI CPROJECTS	35	Likert Scale (0-5)	1	5	3,26	1,442
<b>Co-creation performance firm- publicadministr ation</b>	OUTPA_NETWORKACTORS	36	Likert Scale (0-5)	0	5	3,06	1,286
	OUTPA_INVOLVEMENTCIT IZENS	36	Likert Scale (0-5)	0	5	3,69	1,215
	OUTPA_DEVELOPINGKNO WLEDGE	36	Likert Scale (0-5)	0	5	3,25	1,574
	OUTPA_INCREASINGEMPL OYMENT	36	Likert Scale (0-5)	0	5	3,06	1,393
	OUTPA_TRIGGERDISSEMI NATEKNOWLEDGE	36	Likert Scale (0-5)	0	5	3,08	1,628
<b>Output for the ecosystem</b>	OUTPUT_ECO	79	Likert Scale (0-5)	0	5	3,99	1,489

### 3.4.7 Assessing the formative measurement model

To assess the formative measurement model, the PLS-SEM analysis (Hair et al., 2014) requires to proceed with the following three steps (as illustrated in Figure 9):

- 1) Assess convergent validity.
- 2) Address collinearity issues.
- 3) Assess the significance and relevance of the formative indicators.

Figure 9. Assessing a formative measurement model.



Source: Adapted from Hair et al. (2014).

#### 3.4.7.1 Step 1: Convergent validity

Convergent validity is the extent to which a measure correlates positively with other measures (indicators) of the same construct, and this analysis is known as redundancy analysis (Chin, 1998). According to Hair et al. (2017), this analysis can be performed by using formative construct as exogenous latent variable which predicts the same construct operationalized by reflective indicators (through a reflective measurement with an established scale) or by a global single item summarizing the meaning of the construct that the formative indicators are intended to measure. The path coefficient linking the constructs is requested to be at least above the threshold of 0.70 to assess the convergent validity of the formative construct (ibid).

When we designed the questionnaire prior to data collection we did not add questions concerning global scale items, therefore we could not assess the convergent validity of our constructs. Consequently, we report this issue as a limitation of our research (see section 3.5).

#### 3.4.7.2 Step 2: Check for collinearity issues

Collinearity consists in high correlations between two formative indicators (Hair et al., 2014). High levels of collinearity between formative indicators are problematic since they impact on the estimation of weights and their statistical significance, causing an increase in standard

errors (ibid), therefore multicollinearity needs to be accurately evaluated in formative measurement models (Diamantopoulos & Winklhofer, 2001). To assess the level of collinearity in PLS-SEM, the indicator to be checked is the Variance Inflation Factor (VIF): a level equals to 5 or higher signals a potential issue with collinearity problem (Hair et al., 2011).

As shown in Table 15, our VIF analysis highlights that our indicators do not have collinearity issues (VIF lower than 5), except for two indicators, i.e., OUTSUP\_IMPROVOFFER and OUTSUP\_PRODUDIVERS.

Table 15 Step 2. Collinearity statistics VIF. Source: own elaboration

	VIF
CLFORM_CODESIGN	2,285
CLFORM_CODISPOSE	1,504
CLFORM_COPROMOTION	1,525
CLFORM_MAINTENANCE	1,249
CLFORM_TESTING	2,657
CLMECH_ACTIVATION	2,240
CLMECH_ENGAGEMENT	1,941
CLMECH_FEEDBACKLOOP	1,319
CLMECH_PRELAUNCHFEED	1,283
CLMECH_REWARD	1,328
FORMPACOPROMOTION_PROJECTS	4,352
FORMPARTNERS_COPROMOTION	3,826
FORMPARTNERS_COCONCEPTION	3,608
FORMPARTNERS_CODISPOSAL	2,294
FORMPARTNERS_COMEANING	1,672
FORMPA_CODESIGNPRODUCTS	3,325
FORMPA_COPLANNINGPROJECTS	2,202
FORMPA_COPRODUCTION	3,984
FORMPA_IMPROVEMENTOFFER	2,878
MECHPARTNERS_COMMONGOALS	1,674
MECHPARTNERS_COMPLEMENTARITYSKILLS	3,336
MECHPARTNERS_COPLANNING	4,109
MECHPARTNERS_JOINTCOMMUNICATION	3,318
MECHPARTNERS_SHARINGKNOWLEDGE	3,008
MECHPA_JOINTCOMMUNICPROJECTS	2,917
MECHPA_SHARINGIDEAS	2,298
MECHPA_SHARINGKNOWLEDGENETWORK	3,180
MECHPA_SOCIETALNEEDS	1,761

OUTCL_ECONOMICVALUE	1,537
OUTCL_ENGAGEMENT	2,748
OUTCL_IMPROVOFFER	1,838
OUTCL_INVOLVCIRCMISSION	2,129
OUTCL_LOYALTY	3,495
OUTPARTNERS_ACCESSNETWORK	2,120
OUTPARTNERS_BRANDWARE	2,354
OUTPARTNERS_INDUSTRIALSYM	1,570
OUTPARTNERS_JOINTPROJECTS	3,415
OUTPARTNERS_SHAREKNOWLEDGE	3,350
OUTPA_DEVELOPINGKNOWLEDGE	2,880
OUTPA_INCREASINGEMPLOYMENT	2,015
OUTPA_INVOLVEMENTCITIZENS	1,288
OUTPA_NETWORKACTORS	3,371
OUTPA_TRIGGERDISSEMINATEKNOWLEDGE	2,407
OUTPUT_ECO	1,000
OUTSUP_BRANDRECOG	1,945
OUTSUP_IMPROVOFFER	8,143
OUTSUP_TRUST	2,646
OUTSUP_PRODUDIVERS	5,647
SUPFORM_CODESIGN	3,391
SUPFORM_CODISPOSAL	2,164
SUPFORM_CODISTRIB	2,104
SUPFORM_COMEANING	3,304
SUPFORM_COPRODUCTION	3,370
SUPMECH_COBRANDING	2,464
SUPMECH_INVERSELOG	1,848
SUPMECH_JOINTCOMMUNICATION	3,229
SUPMECH_KNOWINNOV	2,086

Since the two indicators OUTSUP\_IMPROVOFFER and OUTSUP\_PRODUDIVERS could not overcome the rule of thumb of  $VIF < 5$ , we followed the remedy procedures advised by (Ramayah et al., 2018), consisting in considering deleting the indicator one at a time, by making sure that deleting any indicator does not alter the meaning of the construct, and by following the criterion of VIF score  $> 10$  (Hair et al., 2010). Therefore, we proceeded by deleting the first indicator with the highest VIF, i.e., OUTSUP\_IMPROVOFFER and we checked the resulting VIF scores by performing the PLS Algorithm again. The adopted remedy was effective: we

obtained all the VIF values lower than 5 thus indicating that there are no collinearity issues (Belsley, 1991) (Table 16). This means we could proceed with the Step 3, i.e., assess the significance and relevance of formative indicators.

Table 16. Step 2. Collinearity statistics VIF after the remedy. Source: own elaboration.

	VIF
CLFORM_CODESIGN	2,285
CLFORM_CODISPOSE	1,504
CLFORM_COPROMOTION	1,525
CLFORM_MAINTENANCE	1,249
CLFORM_TESTING	2,657
CLMECH_ACTIVATION	2,240
CLMECH_ENGAGEMENT	1,941
CLMECH_FEEDBACKLOOP	1,319
CLMECH_PRELAUNCHFEED	1,283
CLMECH_REWARD	1,328
FORMPACOPROMOTION_PROJECTS	4,352
FORMPARTNERS_COPROMOTION	3,826
FORMPARTNERS_COCONCEPTION	3,608
FORMPARTNERS_CODISPOSAL	2,294
FORMPARTNERS_COMEANING	1,672
FORMPA_CODESIGNPRODUCTS	3,325
FORMPA_COPLANNINGPROJECTS	2,202
FORMPA_COPRODUCTION	3,984
FORMPA_IMPROVEMENTOFFER	2,878
MECHPARTNERS_COMMONGOALS	1,674
MECHPARTNERS_COMPLEMENTARITYSKILLS	3,336
MECHPARTNERS_COPLANNING	4,109
MECHPARTNERS_JOINTCOMMUNICATION	3,318
MECHPARTNERS_SHARINGKNOWLEDGE	3,008
MECHPA_JOINTCOMMUNICPROJECTS	2,917
MECHPA_SHARINGIDEAS	2,298
MECHPA_SHARINGKNOWLEDGENETWORK	3,180
MECHPA_SOCIETALNEEDS	1,761
OUTCL_ECONOMICVALUE	1,537
OUTCL_ENGAGEMENT	2,748
OUTCL_IMPROVOFFER	1,838
OUTCL_INVOLVCIRCMISSION	2,129
OUTCL_LOYALTY	3,495
OUTPARTNERS_ACCESSNETWORK	2,120
OUTPARTNERS_BRANDWARE	2,354
OUTPARTNERS_INDUSTRIALSYM	1,570

OUTPARTNERS_JOINTPROJECTS	3,415
OUTPARTNERS_SHAREKNOWLEDGE	3,350
OUTPA_DEVELOPINGKNOWLEDGE	2,880
OUTPA_INCREASINGEMPLOYMENT	2,015
OUTPA_INVOLVEMENTCITIZENS	1,288
OUTPA_NETWORKACTORS	3,371
OUTPA_TRIGGERDISSEMINATEKNOWLEDGE	2,407
OUTPUT_ECO	1,000
OUTSUP_BRANDRECOG	1,817
OUTSUP_TRUST	2,104
OUTSUP_PRODUDIVERS	2,211
SUPFORM_CODESIGN	3,391
SUPFORM_CODISPOSAL	2,164
SUPFORM_CODISTRIB	2,104
SUPFORM_COMEANING	3,304
SUPFORM_COPRODUCTION	3,370
SUPMECH_COBRANDING	2,464
SUPMECH_INVERSELOG	1,848
SUPMECH_JOINTCOMMUNICATION	3,229
SUPMECH_KNOWINNOV	2,086

3.4.7.3 Step 3: Significance and relevance of formative indicators

This step requires to evaluate the significance and relevance of each formative indicators. To do so, the bootstrapping technique is adopted to assess the level of significance of each indicator weight. We performed the bootstrapping procedure with the replacement of 5000 samples as recommended by the PLS-SEM literature (Ramayah et al., 2018), by opting for a 95% bias-corrected and accelerated bootstrap interval (the BCa interval). Our results are showed in Table 17.

Table 17. Step 3. Significance and relevance of formative indicators. Source: own elaboration.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
CO-scope firmcustomers -> Co-performance firmcust	0,694	0,779	0,067	10,338	0,000
CO-scope firmsup -> Co-performance firmsup	0,831	0,872	0,045	18,466	0,000



Co-scope firmpartners -> Co-performance firmpartners	0,896	0,928	0,029	31,053	<b>0,000</b>
Co-scope firmpa -> Co-performance firmpa	0,807	0,838	0,325	2,479	<b>0,013</b>
Co-performance firmcust -> OUTECO	-0,104	0,055	0,234	0,444	<b>0,657</b>
Co-performance firmsup -> OUTECO	0,300	0,255	0,128	2,338	<b>0,019</b>
Co-performance firmpartners -> OUTECO	-0,020	-0,023	0,127	0,157	<b>0,875</b>
Co-performance firmpa -> OUTECO	0,195	0,176	0,196	0,997	<b>0,319</b>

By observing the P-values of the outlined eight relationships, we deduce that three relationships are highly significant (p-value<0.001), two are significant (p-value< 0.05), while the remaining three are not significant (i.e., co-performance firmcustomers → OUTECO, co-performancefirmsup → OUTPUT\_ECO, and co-performance firmpa → OUTPUTECO).

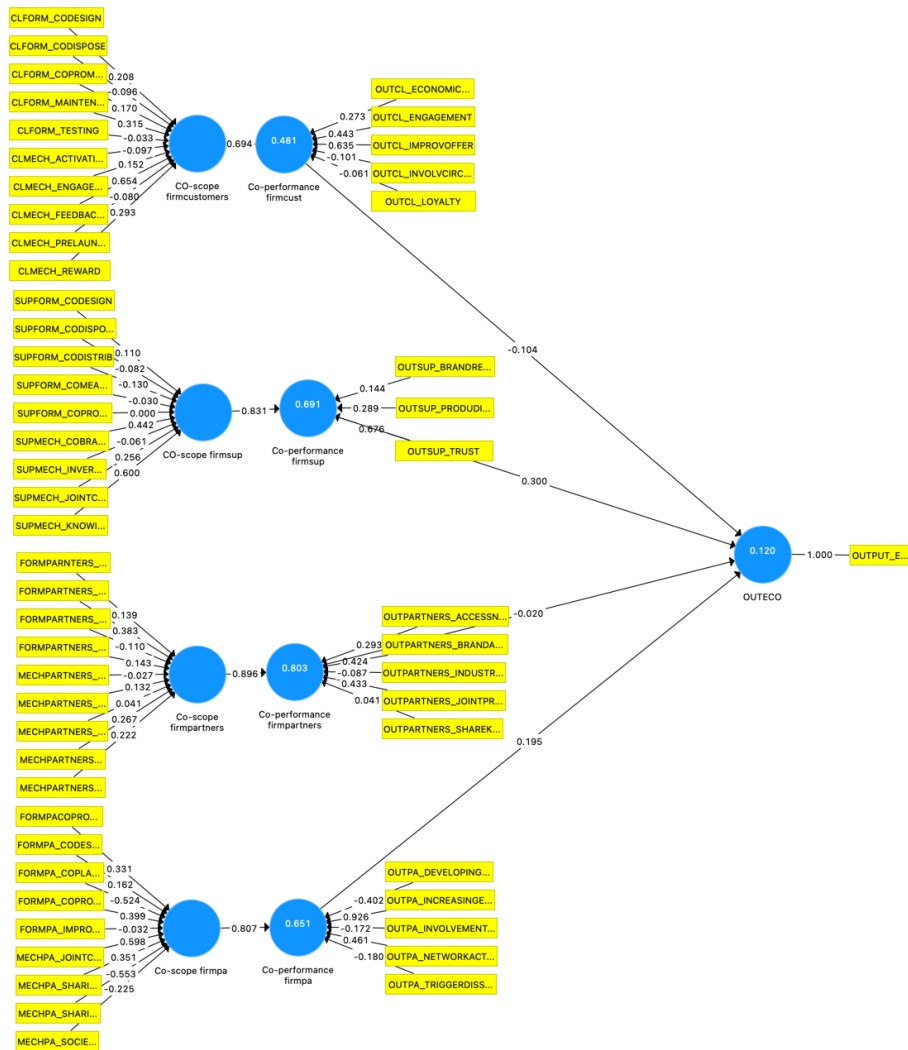
### 3.5 RESULTS AND DISCUSSION

#### 3.5.1 Testing Measurement model #1

First, we test the model 1 which does not contain any moderating effects. The statistical significance of the structural model was assessed by using bootstrapping procedures with 5000 samples replacement, as recommended in the literature (Ramayah et al., 2018). Figure 10 shows the evaluation of the measurement and structural model built through SmartPLS 3.0 version software, it is a graphical representation of the path coefficients ( $\beta$ ), and the significance level of each relationship and the explained variance ( $R^2$ ) within the blue circles. Co-performance firm-customers, firm-suppliers, firm-partners, and firm-pa respectively explain the 48,1%, 69,1%, 80,3%, and 65,1% of the variance in the model (Table 18).

# BEATRICE RE – AEM XXXIV CYCLE

Figure 10 Evaluation of the measurement and structural Model #1.



Source: Own elaboration.

Table 18. R-squares of the model #1. Source: own elaboration.

	<b>R Square</b>	<b>R Square Adjusted</b>
Co-performance firmcust	0.481	0.474
Co-performance firmsup	0.691	0.687
Co-performance firmpartners	0.803	0.800
Co-performance firmpa	0.651	0.646
OUTECO	0.120	0.073

Results of path analysis are obtained by extracting T Statistics values from the Path Coefficients table [(at least  $t > 1.96$ ) to meet .050 significance level (Chin, 1998)]. These results

show that hypotheses H1 ( $p < .001$ ), H2 ( $p < .001$ ), H3 ( $p < .001$ ), H4 ( $p < .05$ ) and H5b ( $p < .05$ ) are confirmed, while H5a, H5c and H5d are not (Table 19 and Table 20).

Table 19. Structural model #1: Results. Source: own elaboration.

Structural path	Coef ( $\beta$ )	T Statistics	P Values
Co-scope firmcustomers $\rightarrow$ Co-performance firmcust	0,694	10,338	<b>0,000***</b>
Co-scope firmsup $\rightarrow$ Co-performance firmsup	0,831	18,466	<b>0,000***</b>
Co-scope firmpartners $\rightarrow$ Co-performance firmpartners	0,896	31,053	<b>0,000***</b>
Co-scope firmpa $\rightarrow$ Co-performance firmpa	0,807	2,479	<b>0,013*</b>
Co-performance firmcust $\rightarrow$ OUTECO	-0,104	0,444	0,657
Co-performance firmsup $\rightarrow$ OUTECO	0,300	2,338	<b>0,019*</b>
Co-performance firmpartners $\rightarrow$ OUTECO	-0,020	0,157	0,875
Co-performance firmpa $\rightarrow$ OUTECO	0,195	0,997	0,319

Table 20. Hypotheses testing model #1. Source: own elaboration.

Hypotheses		Confirmed, $p$ / Non-significant, n.s.
H1	The greater is the value co-creation scope between the firm and the customer, the higher the value co-creation performance.	*** $p < .001$
H2	The greater is the value co-creation scope between the firm and the suppliers, the higher the value co-creation performance.	*** $p < .001$
H3	The greater is the value co-creation scope between the firm and the partners, the higher the value co-creation performance.	*** $p < .001$
H4	The greater is the value co-creation scope between the firm and the public institutions, the higher the value co-creation performance.	* $p < .05$
H5a	The higher is the value co-creation performance between firms and customers, the higher the ecosystem output (economic, social, and environmental)	n.s.
H5b	The higher is the value co-creation performance between firms and suppliers, the higher the ecosystem output (economic, social, and environmental).	* $p < .05$
H5c	The higher is the value co-creation performance between firms and partners, the higher the ecosystem output (economic, social, and environmental).	n.s.
H5d	The higher is the value co-creation performance between firms and public institutions, the higher the ecosystem output (economic, social, and environmental).	n.s.
*** $p < .001$ ** $p < .01$ * $p < .05$ † $p < .1$ (two-tailed test)		



Co-performance firm-customers, firm-suppliers, firm-partners, and firm-pa respectively explain the 49,5%, 71,8%, 80,9%, and 65,4% of the variance in the model (Table 21).

Table 21 R-squares of the model #2. Source: own elaboration.

	<b>R Square</b>	<b>R Square Adjusted</b>
Co-performance firmcust	0.495	0.475
Co-performance firmsup	0.718	0.707
Co-performance firmpartners	0.809	0.802
Co-performance firmpa	0.654	0.640
OUTECO	0.128	0.081

Results of path analysis are obtained by extracting T Statistics values from the Path Coefficients table [(at least  $t > 1.96$ ) to meet .050 significance level (Chin, 1998). These results show that hypotheses H1 ( $p < .001$ ), H2 ( $p < .001$ ), H3 ( $p < .001$ ), H4 ( $p < .01$ ), H6b ( $p < .05$ ) are confirmed, while H5a, H5c, H5d, H6a, H6b, H6c, and H6d are not (Table 22 and Table 23). Hence, we cannot conclude that the variable “value alignment” affects the dyadic relationships between the variables “co-creation scope” and “co-creation performance”.

Table 22. Structural model #2: Results. Source: own elaboration.

<b>Structural path</b>	<b>Coef (<math>\beta</math>)</b>	<b>T Statistics</b>	<b>P Values</b>
Co-scope firmcustomers → Co-performance firmcust	0,698	7,124	<b>0,000***</b>
Co-scope firmsup → Co-performance firmsup	0,654	5,385	<b>0,000***</b>
Co-scope firmpartners → Co-performance firmpartners	0,817	12,429	<b>0,000***</b>
Co-scope firmpa → Co-performance firmpa	0,862	2,917	<b>0,004**</b>
Co-performance firmcust → OUTECO	-0,097	0,422	0,673
Co-performance firmsup → OUTECO	0,305	2,396	<b>0,017*</b>
Co-performance firmpartners → OUTECO	-0,020	0,154	0,878
Co-performance firmpa → OUTECO	0,202	0,992	0,321
Moderating effect 1 → Co-performance firmcust	-0,098	0,814	0,416
Moderating effect 2 → Co-performance firmsup	-0,017	0,356	0,722
Moderating effect 3 → Co-performance firmpartners	-0,003	0,079	0,937
Moderating effect 4 → Co-performance firmpa	0,056	0,795	0,427

Table 23. Hypotheses testing model #1. Source: own elaboration.

Hypotheses		Confirmed, <i>p</i> / Non-significant, n.s.
H1	The greater is the value co-creation scope between the firm and the customer, the higher the value co-creation performance.	*** <i>p</i> < .001
H2	The greater is the value co-creation scope between the firm and the suppliers, the higher the value co-creation performance.	*** <i>p</i> < .001
H3	The greater is the value co-creation scope between the firm and the partners, the higher the value co-creation performance.	*** <i>p</i> < .001
H4	The greater is the value co-creation scope between the firm and the public institutions, the higher the value co-creation performance.	** <i>p</i> <.01
H5a	The relationship between the value co-creation scope between a circular firm and its customers and the value co-creation performance is positively moderated by “values alignment”	n.s.
H5b	The relationship between the value co-creation scope between a circular firm and its suppliers and the value co-creation performance is positively moderated by “values alignment”.	n.s.
H5c	The relationship between the value co-creation scope between a circular firm and its partners and the value co-creation performance is positively moderated by “values alignment”.	n.s
H5d	The relationship between the value co-creation scope between a circular firm and the public institutions and the value co-creation performance is positively moderated by “values alignment”.	n.s.
H6a	The higher is the value co-creation performance between firms and customers, the higher the ecosystem output (economic, social, and environmental).	n.s.
H6b	The higher is the value co-creation performance between firms and suppliers, the higher the ecosystem output (economic, social, and environmental).	* <i>p</i> < .05
H6c	The higher is the value co-creation performance between firms and partners, the higher the ecosystem output (economic, social, and environmental).	n.s.
H6d	The higher is the value co-creation performance between firms and public institutions, the higher the ecosystem output (economic, social, and environmental).	n.s.
*** <i>p</i> < .001 ** <i>p</i> <.01 * <i>p</i> <.05 † <i>p</i> <.1 (two-tailed test)		

Both the two tested empirical models show that the variable “value co-creation scope” has a positive and significant impact on the “value co-creation performance” in all the four considered dyadic relationships. The high statistical significance between the two latent variables across our models supports the idea that the more the circular firms engage in co-creation with key actors (customers, suppliers, partners, and public institutions) the more they get a positive outcome stemming from the co-creation (the value co-creation performance).

These findings support the mentioned literature concerning value co-creation with customers and with suppliers (see section 3.2.1), and they concurrently shed some light on co-creation processes respectively between firms and partners and between firms and public institutions, which have been overlooked by previous literature. The fact that the variable “value co-creation performance” does not have a significant impact upon the ecosystem output (except in the case of the relationship between firms and suppliers) could be explained by arguing that the outcome stemming from established dyadic co-creation processes may not have a direct influence upon the ecosystem. Hence, the effect - that we empirically found - of the value co-creation processes upon the ecosystem needs further explanation from a quantitative perspective. Finally, we suggest considering the variable “output ecosystem” as a multi-scale by including multiple Likert scales to be able to capture the economic, social, and environmental dimensions of value.

### **3.6 CONCLUSION AND FUTURE RESEARCH AVENUES**

The purpose of this study was to test whether the results of the empirical model (cf. chapter 2) were generalizable, by testing the hypotheses developed from the stemming propositions. We test two alternative models. Model #1 is the base model and does not include value alignment as a moderator between each dyadic co-creation scope and performance. Model #2 assesses whether value alignment affects the relationship between the variables value co-creation scope and value co-creation performance.

This study contributes to the value creation literature in entrepreneurship and to the growing circular entrepreneurship literature by offering two models of value co-creation in the circular entrepreneurship context. We found that the value co-creation scope respectively between customers, suppliers, partners, and public institutions positively and significantly impacts upon related co-creation output. Conversely, we do not find significance in the effect of value co-creation performance upon ecosystem output, except for the value co-creation

performance firm-suppliers which seems to impact upon the ecosystem output significantly and positively. We do not find either a significant effect of the moderating variable “value alignment” between the latent variables value co-creation scope and performance, therefore we cannot conclude that value alignment affects the relationship between value co-creation scope and performance.

Our study presents some main limitations that need to be acknowledged. First of all, the sample size, although being sufficient according to the “ten times rule of thumb” (Barclay et al., 2015; Hair et al., 2014) is limited to 80 firms and therefore this may affect the overall results of the study. Second, as stated above, we could not assess the convergent validity as we did not have a global single item measure to perform the redundancy analysis. Third, the variable “output ecosystem” has been measured through a single-item scale. As suggested before, it may be worthy to measure it through multiple Likert scales. Moreover, scholars may find ways to better conceptualize “value alignment” as a possibly significant mediator among the dyadic latent variables.

#### **4. CONCLUDING REMARKS**

The present thesis consisted of a problematizing review of the co-creation theory and a mixed-methods study involving both qualitative and quantitative research methodologies. By doing so, we have contributed to the value co-creation theory, and to the entrepreneurship and circular entrepreneurship literature. The stemming results offer significant insights to practitioners as well as policymakers, as illustrated below.

##### **4.1 CONTRIBUTION TO THEORY AND PRACTICE**

The present doctoral dissertation has offered contributions to both theory and practice. From the theoretical point of view, in the first paper, we contributed to advancing the value co-creation theory (Vargo & Lusch, 2004, 2016) through a problematizing review as proposed by



Alvesson and Sandberg (2020). By challenging the key underlying assumptions underlying the theory in two research streams within Management, i.e., service marketing and strategic management, we highlighted the shortcomings stemming from them, and we advanced alternative assumptions having the potential to improve the extant theory and at paving new ways to conceptualize and consider value co-creation within Management. Through the empirical study conducted in the second paper, we contributed to the entrepreneurship literature on value co-creation (Lenka et al., 2017; Saarijärvi et al., 2013; Zhang & Chen, 2008) as well as to the emerging circular entrepreneurship research stream (Cullen & De Angelis, 2021; Zucchella & Urban, 2019). By empirically illustrating co-creation processes and the underlying mechanisms in place between firms and each of their key actor involved, we contributed to fill the gaps identified – among others - by Grönroos (2011), Akaka and Chandler, (2010), Lenka et al. (2017), and Aarikka-Stenroos and Jaakkola (2010) regarding the understanding of co-creation processes between firms and other key actors. We also shed some light on the value co-creation forms which have been introduced in the literature (Frow et al., 2015), but they suffer from empirical investigations. We contributed to the same literature in the third paper, too, by proposing two models of co-creation processes between circular firms and key actors (i.e., customers, suppliers, partners, and public institutions). Through the two models we advanced, we also offered a conceptualization of the latent variable “co-creation scope” as a multi-scale construct composed of several dyadic co-creation forms and mechanisms, and of the latent variable “co-creation performance” as a multi-scale construct composed of variables concerning co-creation output. The choice of a timely and still understudied context of analysis, i.e., circular entrepreneurship, represents a further element of novelty of the present research.

Finally, among the most important contributions of the present dissertation is the database of around 1000 European born circular firms that has been created to perform the

quantitative part of this study (cf. Chapter 3). We believe this database of European circular firms could represent a point of departure to better understand and enquire the phenomenon of circular entrepreneurship, through both qualitative and quantitative studies.

We are aware that the present doctoral dissertation only partially covers the underlined research problems and gaps. However, we do hope that our contribution has offered significant insights for future research to take further steps in extending and improving the value co-creation theory and the growing circular entrepreneurship field, from all theoretical, methodological, and empirical points of view.

## **4.2 POLICY IMPLICATIONS**

Scholars in Business and Management, as well as research centers that are supporting the transition towards a circular economy as a feasible path towards more sustainable production and consumption paradigms have advanced several suggestions for policymakers to foster the implementation of circular practices (e.g., (Alonso-Martinez et al., 2021; Antoniou et al., 2019; Esposito et al., 2018; MacArthur, 2021).

We believe that a key contribution in this direction comes from Gusmerotti et al. (2019), who support the idea that governments could provide several incentives for technological innovation supporting the transition to CE, fiscal benefits, and systems to calculate the environmental footprint caused by their activities. While agreeing with the authors, we at the same time argue that public institutions in Europe may have not been sufficiently proactive in this sense so far, especially in fostering collaborations, synergies, and co-creation processes between circular firms/traditional firms and the series of actors within the ecosystem (customers, suppliers, distributors, research centers, and so on). Consequently, we encourage them to get more involved in stimulating the interactions and the exchange of knowledge and skills among diversified actors within the ecosystem, with the aim to find concrete solutions to

implement circular practices. This goal could be achieved for instance through the establishment of “**circular hubs**”, places devoted both to think-thanking, events, and workshops and to the establishment of long-term interactions among diversified actors aiming at developing new circular business ideas as well as synergistic projects. Customers, especially the “innovators” (Rogers, 1962), that are currently those that are involved the most in co-creation activities with circular firms may assume a key role as active players in these hubs, as their contribution could be very significant, as illustrated in our model by the significant positive relationship between value co-creation scope and co-creation performance. Finally, we suggest that finding ways to encourage customers in taking part in circular firms’ mission, maybe through “nudging” as theorized by the Nobel Prize Richard Thaler in 2008, should be a key goal of firms and policymakers alike.

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## LIST OF FIGURES

Figure 1 Evolution diagram of the value co-creation concept across disciplines.....	20
Figure 2 Steps of the problematizing review.....	21
Figure 3 A model of value co-creation in circular entrepreneurship.....	89
Figure 4 Model 1: value co-creation processes in circular entrepreneurship.....	100
Figure 5 Model 2: value co-creation processes in circular entrepreneurship, with a moderating effect.....	101
Figure 6 Data collection process: building the database of European circular firms.....	104
Figure 7 Process followed to administer the questionnaire.....	110
Figure 8 Systematic procedure for applying PLS-SEM.....	112
Figure 9 Assessing a formative measurement model.....	119

Figure 10 Evaluation of the measurement and structural Model #1.....125

Figure 11 Evaluation of the measurement and structural Model #2.....127

**LIST OF TABLES**

Table 1 Selected core publications belonging to service marketing.....22

Table 2 Five publications picked up randomly from Saha et al. (2019) .....23

Table 3 Additional texts in Service Marketing..... 24

Table 4 Publications in a neighboring area: Strategic Management.....25

Table 5 Publications in a neighboring area: subfield of coopetition..... 26

Table 6 Key classic publications influencing the topic..... 27

Table 7 Challenging assumptions and improving co-creation theory..... 28

Table 8 Case studies. Key facts and figures.....53

Table 9 Cross-case analysis of the dyadic co-creation processes.....68

Table 10 Description of our sample of firms in terms of industry.....105

Table 11 Sample distribution in terms of sizes.....106

Table 12 Sample distribution in terms of Country ..... 107

Table 13 Summary of indicators for measurement model constructs..... 113

Table 14 Descriptive statistics of the research variables..... 116

Table 15 Step 2. Collinearity statistics VIF.....120

Table 16. Step 2. Collinearity statistics VIF after the remedy.....122

Table 17 Step 3. Significance and relevance of formative indicators.....123

Table 18 R-squares of the model #1. ....125

Table 19. Structural model #1: Results.....126

Table 20. Hypotheses testing model #1.....126

Table 21 R-squares of the model #2.....128

Table 22. Structural model #2: Results.....128

Table 23. Hypotheses testing model #2.....129

### Appendix 1: quotes from the interviewees

Dyad		Co-creation form(s) and mechanisms	Co-creation output
Apepak	Customers	<p>“Everything was born from the Facebook post, where I wrote “we offer some Apepak prototypes, in exchange for feedback, because we need to understand what you think about them. These testers have tried the products and after 2 months they received via email a questionnaire to be answered, that was the only commitment we were asking. Some questions we asked them in the questionnaire were: Do you like the smell? Where do you store it? Do you think it is expensive? Where would you find it? Is the texture okay or would you prefer to have it less sticky? Does it seem it is releasing substances that compromise the flavors of dishes? These were all questions to understand the product’s usage and liking”.</p> <p>(Apepak, founder)</p>	<p>“Once they are engaged in a project, the people feel passionate about it. To me, the fact to become passionate about a product like ours is dictated by the will to do something great, and at the same time to feel you have contributed to the firm’s decisions- If you create a positive system to create true value, the co-creation becomes a success spiral, vice versa if you have negative principles behind and you merely look at the profit, without considering the environmental damages, the spiral is destructive”.</p> <p>(Apepak, founder)</p>
Apepak	L’Incontro Industria 4.0	<p>“L’Incontro is not just a supplier, it is a kind of industrial incubator for us. Basically, we bought all the machines, we explained it how to make the product, we gave it the recipes and it organized the production for us”.</p> <p>(Apepak, founder)</p> <p>“I would like the product to become ours too, we need to have products of this type to be managed, because beyond the impact it can have on a concrete level in terms of reduction in waste, the idea is to co-participate in a concrete way in this product and have the possibility at a certain point to be able to create something else to put alongside this type of product. We are in the design phase regarding the development of a joint product”.</p> <p>(L’Incontro Industria 4.0, Sales Director)</p>	<p>“We are trying to merge the two companies together, the idea is to try to find an agreement not only on a contractual level as suppliers-customers, but to create a company in which they have shares”.</p> <p>(Apepak, founder)</p> <p>“If the mission is to promote the re-employment, the value lies in being able to tell the community the activities you perform, through your product and around it, to save the community, which is one of those things that are most needed, to communicate within your territory. The value is thus twofold: the people you re-employ, and the visibility you gain, in terms of "telling your mission, your story”, so the function of these products is to make a commitment tangible”.</p> <p>(L’Incontro Industria 4.0, Sales Director)</p>
Apepak	CONAPI	<p>“For us, this partnership with CONAPI is fundamental. With a view to controlling and respecting our supply chain, we have made an important choice: instead of going to buy a wax that can come from commercial agriculture, and therefore exploitation of bees, we make sure that the beeswax comes from sustainable and organic beekeeping.</p>	<p>“The expected result is the creation of a co-branded product, that can be sold in various channels specialized in organic products, but also through the large-scale distribution to meet broader customer groups who care about sustainability”.</p> <p>(CONAPI, General Manager)</p>

		<p>This partnership sees CONAPI and us in a tight relationship. CONAPI is not only a supplier, but also a distributor: it gives us the organic beeswax, we make the Apepak envelops with both our brands on the packaging, and then CONAPI contributes to distributing them through the channels where it already sells honey”.</p> <p>(Apepak, Founder)</p> <p>“We started this activity precisely for Apepak. We initially conferred it 50Kg of organic beeswax as an initial test and now we are providing the remaining 150Kg. On the Apepak packaging, there will be our logo and the explanation that the wax comes from CONAPI’s organic beekeepers. There is co-branding”.</p> <p>(CONAPI, General Manager)</p>	
Rifò	Customers	<p>“We always make changes based on customers’ feedback. For example, the color of the t-shirts we made last year was too transparent, this year we made it a little more united, because we listened to our clients’ opinion. Clients are gradually taking part in the process of designing and creating the product, and they are also bringing back old garments, especially cashmere sweaters and jeans, already in their possession, not from Rifò. Jeans can be brought back through the initiative with NaturaSi. About the “Rethink your jeans” project, we will soon start to send questionnaires to customers via newsletters to get insights from them”.</p> <p>(Rifò, co-founder)</p>	<p>“If the clients intervene in the design process, then they feel more "attached" to that garment and to the firm as well”.</p> <p>(Rifò, co-founder)</p>
Rifò	NaturaSi	<p>“NaturaSi participated in the initiative because they liked the project itself and the message conveyed with it. We have several values in common. The proposal came from them, by the owner of the shop in Prato. They contacted us to say: “what could we do together?”. So, then, we worked together, and we included also two other actors, Pinori Filati and Recooper. They also made their contribution to defining the project. Inside the NaturaSi stores, there is a box with our logo. Now we are in the pilot phase of the project, we are evaluating the results and then we will think about expanding it”.</p>	<p>“Expected output from this project: increased brand awareness”.</p> <p>(Rifò, co-founder)</p> <p>“It all starts with a discarded item, a pair of jeans that remains in the closet, which often ends up in the trash, or it is given to shops that resell fabrics to finance social projects. We instead reinsert the material into an economic process, therefore a new life is given to it, which becomes a bag or a sweater. The ethical value is strong because we talk about</p>

		<p>(Rifò, co-founder)</p> <p>“The idea was born of me because, thinking like an entrepreneur, I wanted to bring more people to the store. After noticing that Rifò was not dealing with the recovery of jeans, I thought that it could be an opportunity to become its partner. We were thinking that Rifò could ask its customers and, more in general, to citizens to bring old jeans to NaturaSi collection’s points. In doing so, even if these people were not initially oriented towards organic products, they could have taken the opportunity to take a tour in the shop and try some products”.</p> <p>(NaturaSi, owner)</p>	<p>giving value back to what is considered as a waste that would be disposed of in another way”.</p> <p>(NaturaSi, owner)</p>
Rifò	Recooper	<p>“The meetings we had with the actors had been very interesting from the point of view of the mutual acquaintance. We are all actors keen on sustainable development and therefore getting to know each other gave us the opportunity to share our own experiences, and this is certainly positive. The communication of the project through social media has also a great impact, it allows us to show something of what we do. This should not be taken for granted because for example in the past we did things without communicating them, and it was our mistake. Rifò is much better in the communication because it has greater attention towards social media than us, so we appreciate this strategic approach”.</p> <p>(Recooper, Project Manager)</p>	<p>“If customers bring to NaturaSi some pairs of jeans that can be reused, I resell them in stores. The project certainly creates social and environmental values. We allow reintegration and employment of disadvantaged people, such as ex-prisoners and people with addictions, people with physical and psychological disadvantage, that are responsible for the clothes collection and selection”.</p> <p>(Recooper, Project Manager)</p>
Rifò	Pinori Filati	<p>“The proposal made by Rifò to take part in the project has stimulated my interest. We brought know-how within the project, and we can say that there is co-promotion with Rifò. The economic interest lies in the fact that Rifò buys the yarns that we sell, coming from the discarded jeans”.</p> <p>(Pinori Filati, co-founder)</p>	<p>“The expected output for this project is an increased brand awareness and brand reputation. The project is also able to connect actors that before were not connected”.</p> <p>(Pinori Filati, co-founder)</p>
Up2Go	Customer Barilla	<p>“When we introduce a new feature, Barilla is the first interlocutor to whom we propose to test it. Barilla itself, if it wants to improve its mobility service, can ask us for some support and also some materials to circular within the firm (articles and so on)”.</p>	<p>“Barilla is not just a customer, it is a Key player that allowed us to test the project with 50 employees and it opened up a great network.”.</p> <p>(Up2Go, co-founder)</p>

BEATRICE RE – AEM XXXIV CYCLE

		(Up2Go, co-founder)	<p>“The process output is an increased brand reputation towards our clients and our employees. We would like to express our constant effort to implement sustainable projects, we are promoters of change. The intention is to continue improving Up2Go and the service it provides, and to use this App for a long time”.</p> <p>(Barilla, Mobility Manager)</p>
Up2Go	GreenApes	<p>“GreenApes makes ad hoc catalogs for us: the basic rewards are those that GreenApes has of its own, but if a customer of ours wishes to have specific rewards, GreenApes also acts as a repository for these specific rewards, thus taking care of the management process (e.g., coupons, download vouchers, and so on).</p> <p>We integrate our App with GreenApes as for this part and we keep on planning and designing the integration together. We have the will to create value together. Co-promotion element: where I promote Up2Go, I also involve GreenApes in some way, and when GreenApes goes to do its promotion on sustainability, it always mentions us in the chain of partners with whom it collaborates”.</p> <p>(Up2Go, co-founder)</p> <p>“It happened to me a couple of times that we mentioned Up2Go to companies who asked us if we knew carpooling services. Then, Up2Go was able to send offers to them. In other cases, Up2Go was in contact with some companies that were interested in our service, therefore we have been introduced to them by Up2Go”.</p> <p>(GreenApes, CEO)</p>	<p>“We were able to give each other value, and to translate it in advantages both for the end user and for the B2B customer, to whom we could both offer a more complete service”.</p> <p>(Up2Go, co-founder)</p> <p>“The integration is interesting both for B2C and B2B clients. B2C is interesting for us because it is our core, and we can attract more customers to the platform. As for the B2B, Up2Go opens up the way to us since it sells to companies, improves its service by including the reward dynamics, while GreenApes, on the other hand, can have contact with firms that may not be only interested in the carpooling, but also a more extensive program”.</p> <p>(GreenApes, CEO)</p>
Up2Go	User	<p>“I believe that performing the testing activity and adhering to the service are not dictated to the offered rewards but rather to a real belief in these sustainable activities”.</p> <p>(Ewa, user Barilla)</p>	<p>“I really appreciate very much the company's attention to sustainability; I am proud of it”.</p> <p>(Ewa, user Barilla)</p>

		<p>“For both carpooling and “Bike to Work” services, thanks to our Barilla’s colleagues who tested the App, and the feedback that was given by them - through myself acting as an intermediary between the internal testers and Up2Go – the firm could improve the App’s functionality. We decided to propose to the employees the discounts dedicated by GreenApes and connected to Up2Go. Those colleagues who subscribed to Up2Go could then have credits accrued and with the owned credits they downloaded discounts from GreenApes’ platform”.</p> <p>(Barilla, Mobility Manager)</p>	<p>“Beyond the fact that the activity is part of my job, it represents a pride from this point of view to be able to contribute to dealing with activities of this type and I like to spend myself to ensure that these opportunities are seized by the company. When you see certain projects implemented and therefore see an effective and effective adherence to what you want to implement, I would say it is a great satisfaction. Being part of a group, of a company, which is keen to promote from the smallest to the largest, is a source of pride, and it is also for end users”.</p> <p>(Barilla, Mobility Manager)</p>
Up2Go	Municipality of Parma	<p>“We intervene by keeping the App monitored, I asked colleagues if they used the App, why they didn't use it, what problems they encountered. The issues were then discussed with Elena in order to try to solve them. Check in and check out problem: home and work address with problems of tracing the check in and out points. With the new release the problems have been solved and the “smart working” service has also been introduced. Up2Go has tried to make the App attractive to users”.</p> <p>(Mobility Manager, Municipality of Parma)</p>	<p>“It is not simply a contract. Up2Go wanted to create this service on Parma, also because it is its city, and belonging to the territory helps the common goal. Making the city more sustainable”.</p> <p>(Mobility Manager, Municipality of Parma)</p> <p>“This is a project that we have driven together, with the local community. It has a positive effect on the city, also because the rewards you collect are in the city, from local stores”.</p> <p>(Up2Go, co-founder)</p>
Wrad	Customers	<p>“Our direct customer for us is not considered a customer. It is truly active. Every time someone makes a purchase here, he/she sponsors and take part in our research and development. In fact, we very often do co-design activities”.</p> <p>(Wrad, communication Manager)</p>	<p>“The co-creation process is very nice because maybe you ask a question to your clients’ community and they also say “did you think about this too?”, and they give you extra interesting ideas”.</p> <p>(Wrad, Communication Manager)</p>
Wrad	Alisea	<p>“Matteo, co-founder of Wrad, was in our offices until last year, he breathed the air of a company that has been in the circular economy for 25 years, he learned and saw things, and then we started putting down company's ideas. I made the graphite available and gave him everything I could. I started working in order to be able to give him something unique”.</p> <p>(Alisea, CEO)</p>	<p>“Alisea made available its 25 years of experience in the circular economy, their network of contacts, and supported the start at a financial level. They gave us the opportunity to use their patents for the first time in dyeing”.</p> <p>(Wrad, Communication Manager)</p>



BEATRICE RE – AEM XXXIV CYCLE

Wrad	Manteco	<p>“We are not just suppliers, with Matteo and Silvia I am in touch almost daily to talk about how to set up effective communication, what paths we could take in the future. It is not just a customer-supplier relationship, it is a participation to try to raise awareness among the final consumer to buy products that respect the environment, which are made with social ethics, with passion and responsibility. Together we study a new way of approaching the customer to raise environmental awareness”.</p> <p>(Manteco, project Manager)</p>	<p>“The process output consists in the fact that we have a super quality material by not paying for the raw material and they have a return in communication that otherwise they would hardly have had, or for which they would have had to spend a lot. They intervened on the choice of materials that could be more suitable for what they wanted to do”.</p> <p>(Wrad, communication Manager)</p>
Wrad	Tecno EDM	<p>“Since the end of the last year, we started interacting with Wrad because we collaborated on the launch of the electric 500. We sent Wrad a series of electrodes that we had proposed precisely for the production of the central mask of the 500 Abarth to be able to exhibit them at the presentation of the 500 and show where the graphite Wrad uses for its production comes from”.</p> <p>(Tecno EDM, Sales Director)</p>	<p>“It is not a purely economic relationship, it is an ethical question, a question of the relationship between people and the companies in which these people work. It is about relationships of mutual trust. Since it is not about invoicing and selling, it goes beyond that. It reflects the philosophy of the respective companies and us as people”.</p> <p>(Tecno EDM, Sales Director)</p>
Seay	Cooperative “Insieme”	<p>“Alberto literally “knocked on our doors” proposing the project he had in mind. After an accurate evaluation, we decided to taking part in the co-planning and the implementation of it”.</p> <p>(Cooperative “Insieme”, Sustainable Development)</p>	<p>“We carried on joint action with three players, and I think it is a good engine to start something positive. We are now evaluating the impact. I would call the impact as social value”.</p> <p>(Seay, co-founder)</p>
Seay	Eurotextilati	<p>“We contribute to the last phase of the RE3 model, but our role is a bit on the sidelines. We were part of the design in the sense that we saw a little what the need was, and we became an active part in the collection of used items and their sorting for the regeneration part of these materials. We then have third party partners, who are the ones who will actually regenerate the material”.</p> <p>(Eurotextilati, Marketing Manager)</p>	<p>“The process output consists in the reduction of energy consumption and CO2 emissions when it is possible to have a second raw material, value is created for that alone. Respect for the environment. The more you can recycle and regenerate raw material, the less you disturb the environment. Creation of a model that will, perhaps, also be used by third parties, meaning that we are helping to create culture about the circular economy theme”</p> <p>(Eurotextilati, Marketing Manager)</p>
Seay	Womsh	<p>“We are doing a collection co-branded with Womsh, which includes two types of shoes and some of our own clothing. The product has been co-created and the RE3</p>	<p>“Womsh will use part of our Italian agencies for the shoes’ distribution, and we will rely on its foreign agencies for the distribution of our clothing”.</p>

BEATRICE RE – AEM XXXIV CYCLE

		system is released, because they are going to lean on our platform, so it's a complete co-creation, it's a nice project". (Seay, co-founder)	(Seay, co-founder)
YouKoala	Customers	<p>"I registered on the YouKoala Facebook page after seeing the sponsored page and after contacting the team on Facebook. They redirected me to their website page, where, after creating an account and a personal page, I could fill out a questionnaire with the sizes of my little girl. Then I got the first kit based on what I had requested and tailored to my kid's sizes. The first kit was almost perfect, but I had to get in touch with YouKoala to fix some things, one of them concerned the fact that my daughter uses washable nappies, that required a bigger pants' size". (Elena, customer)</p>	<p>"The people we collaborated with (the 70 testers) received preview t-shirts, selected some items, had particular subscription conditions". (YouKoala, founder)</p> <p>"First of all, each package that we delivered was the equivalent of liters and liters of water that the environment has saved. So, every single box made sense. It was nice to see the customers took part in the project". (YouKoala, founder)</p> <p>"My feedback was used on the one hand to create a personalized offer (ad hoc for me) and on the other to improve the offer by including in the initial questionnaire the information that turned out to be relevant for me, and that could be relevant for others, too (e.g., use of washable nappies). The co-creation process is beneficial for both of us: the firm understands clients' needs, and at the same time I am satisfied to have made a contribution, and therefore I am encouraged to adopt the service, I am very happy to support Vincenzo". (Elena, customer)</p>
Kamupak	Orthex	<p>"We can talk about "co-production", the aim is to reduce the supplier's materials with a more sustainable one, I think it could be beneficial for everyone. With Orthex we are finding ways to collaborate especially when the package comes to the end of life, so the producer will be able to take the material back and maybe we'll make new products together. In order to close the resource loop, we would need to collaborate with the producer, and this is something we are experimenting with them. (Karri Lehtonen, CFO Kamupak)</p> <p>"We have had a close relationship with some of our restaurants in order to prototype our system, validate our functions, so we have had some of the restaurants with</p>	<p>"The output of the co-creation process consists in improving the products, in a wider application of the platform from our perspective, in experimenting and learning from our consumers' behaviors, in a co-innovation: finding ways to solve the reuse on a larger scale". (Karri Lehtonen, CFO Kamupak)</p>

BEATRICE RE – AEM XXXIV CYCLE

		whom we operate in a collaborative sense through piloting” (Karri Lehtonen, CFO Kamupak)	
Kamupak	Cafeteria Silta	<p>“We have had a close relationship with some of our restaurants in order to prototype our system, validate our functions, so we have had some of the restaurants with whom we operate in a collaborative sense through piloting. For instance, we were engaging in discussions with supply chain, to figure out what were the needs of these grocery stores/restaurants chains as regarding the use”. (Karri Lehtonen, CFO Kamupak)</p> <p>“We gave Kamupak some suggestions regarding the size or the type of packaging while it was developing its application. They asked me what kind of modification I would want in the application, if it is easy to use and then after launching the application Kamupak asked me about how customers approached and use the application and service”. (Heidi Reis, Restaurant Manager)</p> <p>“I have both takeaway packages and disposable packages behind me on the counter and when a client comes and asks for a packaging, I explain them that they can choose Kamupak as the more ecological option by paying a 3-euros deposit”. (Heidi Reis, Restaurant Manager)</p>	<p>“Kamupak is also good for our business: we do not have to buy those disposable packaging that much” (Heidi Reis, Restaurant Manager)</p>
Lovia	Customers	<p>“Because we are small, we try to be as close as to customers as we can, we want to know what they think about the design, we want them to give us feedback. Every time we sell a bag or a jewelry, we say that if it comes any problem or if they feel like giving some inputs, we would love to hear from them and we can take them into account” (Emmi Nguyen, Showroom Manager)</p>	<p>Customizing bags is quite expensive but we have decided to offer this option to our customers because we have leftover they could use. We are going to develop a “Care program” asking our clients to bring their bag back so that we will send it to Italy to be fixed. (Emmi Nguyen, Showroom Manager)</p>
Lovia	Supplier "Pelletteria Clio”	<p>We heard about Fulvio (owner of Pelletteria Clio) that has been in the industry for a while and he is making bags for other luxury brands as well. We contacted Fulvio asking if he would be interested in these kinds of projects and he said “this is something cool”. Fulvio is around 60 years old, and he has been in the business for quite a lot of time</p>	<p>“Our suppliers can also supply other firms, but I think that the trust and mutual understanding of “doing something right” is unique, we have created a solid relationship for ex with Fulvio and his team, we are the first ones that have been there, doing well with all partners, so they understand that</p>

		<p>so probably he was thinking “this is something new, something fresh” ad he can have a voice in saying “let’s do this, or that” and not just like a normal supplier. (Emmi Nguyen, Showroom Manager)</p> <p>“I am a supplier but also a partner, I look at products drawings from Lovia and I make feasibility studies. I also make customized bags sending a video to the clients explaining all the production steps” (Fulvio galbiati, Owner Pelletteria Clio)</p>	<p>this relationship is more valuable than changing to other firms”. (Emmi Nguyen, Showroom Manager)</p>
Lovia	Supplier Kokkolan Nahka	<p>“Lovia has started big research regarding their CO2 emissions and other stuff of this nature so they sent us a lot of questions regarding how we work in different fields, it was a very large set of questions that they sent to us so that they can calculate the CO2 emissions of the entire value chain. They want transparency along the chain”. (Juha Ornberg, CEO Kokkolan)</p>	<p>I think Lovia shows us the way, where we should go, they show us which road to take. Meeting them has been very fascinating, they challenge you and make you think about new ways. We could get inspiration from the questionnaires they made regarding the impact of our production and value chain. According to Lovia’s feedback, we improved the final finishing steps of the leather to make it a more durable surface so that the life of the bag could be longer. (Juha Ornberg, CEO Kokkolan)</p>
Spinnova	Bergans	<p>“Bergans is the best example of co-creating brand. Bergans said “we want this material, we don’t care what is like”, just get in there and start trialing and they also wanted to involve their consumers in the early stages, and we agreed on that. So, a year ago, in November 2020, we launched this “collection of tomorrow” made of 20 backpacks, it was a sort of raffle. We launched the limited edition that was available for anyone to buy, and we made it quickly because Bergans was so brave and bold, and they wanted you keep things moving. They also tested the version with consumers, so they deliberately wanted the feedback from them. The “collection of tomorrow” is actually like a circular concept rather than fashion line or something like that”. (Emmi Berlin, Communication Manager Spinnova)</p>	<p>“Bergans is the only one who has been so brave and so fast to introduce the co-created product (limited edition) to the market”. (Emmi Berlin, Communication Manager Spinnova) “At the time where we approached them, they really needed brand awareness and they needed an inspiring partner for practical applications. That was in 2019. From our first conversations with Spinnova, it took less than 6 months until the production of backpacks which is insane for a company that has never had anything worn at that time. Of course, brand awareness is something valuable for Spinnova but also for Bergans but also the knowledge that we gained in doing this”. (Johannes Flem, designers Bergans).</p>
Sulapac	Quadpack	<p>“We constantly communicate with Sulapac, there is an increasing commitment from both parties. We can better see the benefits for both of us more clearly, before they were more “in theory”, now they are more “in practice”. We are constantly in touch to solve issues, to answer to</p>	<p>By partnering with us, Sulapac found a firm that could distribute their material very well and that could open the doors worldwide. At the same time, we are benefiting from an alternative material which enables us to continue working doing the same work we have been doing for the</p>

BEATRICE RE – AEM XXXIV CYCLE

		customers' questions. Direct communication also with customers. Interactions are dialogues are constant. The common goal is to bring much more of these compostable jars on the market thus reducing the other not-sustainable jars. We are also reducing the plastic and improving the not-sustainable materials from our extant portfolio, we are innovating together our jars" (Lyne H��l��ne Bouchard, Sustainability Specialist Quadpack)	last 50 years (injection model). This is the win-win situation. (Lyne H��l��ne Bouchard, Sustainability Specialist Quadpack)
Sulapac	Lumene	"We develop value together; we introduced our manufacturers to Sulapac because at that time they were doing only in Finland and there is not a proper cosmetic manufacturer expert in Finland, so we also provided them with the info about good manufacturers. Then we started testing". (Essi Arola, Head of R&D and Packaging Lumene)	"Sulapac is still a small brand and for them we probably are a good endorsement. I think we both had the willingness to do it and I think we need to look for new materials and we need to challenge the current supply chain". (Essi Arola, Head of R&D and Packaging Lumene)
<p>*This Appendix illustrates the most representative quotes from the interviews, in addition to those already provided in the section devoted to the within-case analysis. Quotes refer to the three key variables considered in our analysis, i.e., co-creation forms, mechanisms, and output. These variables have been categorized into two groupings: co-creation forms and mechanisms have been merged into one category since they empirically emerged as "stirred" to each other's. The left-column contains quotes related to the co-creation forms and mechanisms between each dyad involved. The right column collects quotes concerning the co-creation output stemming from each dyadic co-creation process.</p>			

## Appendix 2: Questionnaire

# Value co-creation

### 1. General information

Company name(with business name)

Profit/Not-for-profit/B Corp

Year of foundation

Circular mission (sustainable goal pursued)

Growth rate 2018/2019

### 2. Country of Foundation

- Belgium
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Latvia
- Lithuania
- Malta
- Norway
- Poland
- Portugal
- Romania
- Serbia
- Spain
- Sweden
- Switzerland
- The Netherlands
- Uk

### 3. Industry

- Agri-food
- Automation and other manufacturing industries

- Bio-chemical and pharmaceuticals
- Clothing and Accessories
- Construction
- Culture/Arts/Tourism/Sport
- Electronics
- Energy and compost from post-consumption waste
- Furniture
- Finance
- Housewares
- Mixed used objects (second hand)
- Paper Industry
- Packaging
- Research centers/universities
- Secondary Raw Materials
- Waste Management
- Other

#### 4. Firm size

- <10 employees (micro)
- <50 employees (small)
- Between 50 and 249 employees (medium)
- > 249 employees (big)

#### 5. Range turnover 2019

- <2 million euro (microfirm)
- <10 million euro (small firm)
- 10 to 50 million euro (medium firm)
- >50million (large firm)

#### 6. Export intensity (% foreign sales out of total sales)

- 0%
- 1-10%
- 10-30%
- 30-50%
- 50-70%
- 70-100%

#### 7. Which is your firm's circular business model? (Multiple answers are possible)

- Circular supplies: we use renewable/recyclable inputs in our production
- Resource recovery/recycling: we recovery resources through upcycling or we recycle old/wastematerials
- Product-life-extension: we extend products' life (for example through second-hand orrefurbishment)

- Sharing: we offer a sharing service to reduce the need of buying products
- We provide leasing/renting services through a subscription
- Other (please specify)

**8. Which of these actor(s) would you consider your current co-creator(s) of value (you jointly create mutual value with the actor through continuous interactions and a constant dialogue)? More than one answer is possible.**

- Customers (B2B/B2C or both)
- Suppliers (of raw materials or products/services)
- Partners (firms/social cooperatives not supplying you, for instance commercial partners)
- Public Institutions (e.g., municipalities and universities)
- Others (please specify)

**9. To what extent have you so far developed one of the following activities with your customers? (1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”).**

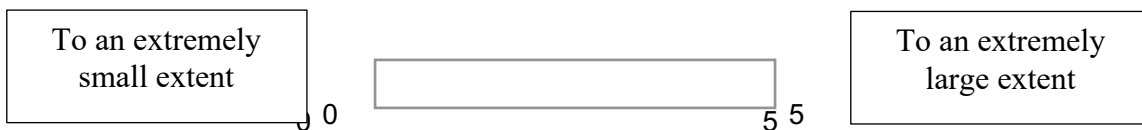
	1	2	3	4	5
Co-design products/services					
Test products/services with them and create a “feedback loop” to constantly improve the company’s offer					
Co-maintain leased/shared products					
Co-dispose the products by getting them back from the customers after use					



**10. Rate how much you agree with the following sentences regarding the value co-creation with your customers. (1="strongly disagree", 2="disagree", 3="neither agree nor disagree", 4="agree", 5="strongly agree").**

	1	2	3	4	5
We involved our customers through crowdfunding platforms, and we asked them feedback before our launch					
We involve our customers in our circular mission through engagement activities					
We activate our customers asking them to perform a concrete action (e.g., bringing old garments back to our firm)					
We constantly ask our customers to give us feedback about our products/services					
We offer a reward to our customers for their actions (e.g., discounts)					

**11. To what extent do you think your customers' values are aligned with your firm's values?**



**12. To what extent the co-creation process with your customers leads to each of the**

following outputs? (1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”)

	1	2	3	4	5
Improvement of the offer in terms of product/ service features					
Customer engagement					
Customer loyalty					
Customers’ Involvement in the environmental cause					
Higher economic value (revenues for firms and discounts for customers)					
Co-destruction: Our customers Felt exploited and/or They damaged Products/services					

**13. Think about your suppliers. To what extent have you so far developed one of the following co-creation forms with your supplier?**

**(1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”).**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
We co-design Products/services					
We co-produce Products/services (e.g., study and choice of the materials)					
We co-distribute the final products through respective channels					
We co-dispose Materials (e.g., The materials Collected by our Clients become Input for our suppliers)					
We jointly provide meaning to our business					

**14. Rate how much you agree with the following sentences regarding value co-creation with your suppliers. (1= “strongly disagree”, 2=”disagree”, 3=”neither agree nor disagree”, 4=”agree”, 5=”strongly agree”).**

	1	2	3	4	5
We co-develop Co-branded products					
We jointly communicate the project through our respective channels					
We co-create through Reverse-logistics Activities (e.g., we provide to our suppliers the input to make products)					
Our supplier(s) provides Its/their know-how and expertise while we offer an innovative sustainable vision					

**15. To what extent do you think your suppliers’ values are aligned with your firm’s values?**

To an extremely small extent

To an extremely large extent

0
5

**16. To what extent the co-creation process with your suppliers leads to each of the following output? (1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”)**

	1	2	3	4	5
Increased reciprocal Trust and committment					
Overall improvement Of our offer					
Product diversification					
Increased brand awareness and reputation towards final clients and the entire society					
Co-destruction: trust Issues and risk of knowledge spillover					

**17. Now think about your partners (firms/social cooperatives not supplying you, for instance, commercial partners). To what extent have you so far developed one of the following co-creation forms with them? (1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”).**

	1	2	3	4	5
Co-conception of ideas: We formulated and co-develop new projects together					
Co-disposal: through The partners' expertise, Resources are prevented From landfill and are given A new economic value					
Co-promotion: we promote The co-developed projects Through our respective Institutional channels and media					
Co-meaning creation: together, we provide meaning to the circular practices we implement					

**18. Rate how much you agree with the following sentences regarding the value co-creation with your partner(s). (1= “strongly disagree”, 2=”disagree”, 3=”neither agree nor disagree”, 4=”agree”, 5=”strongly agree”).**

	1	2	3	4	5
We co-plan joint projects					
We are committed to reach a common goal					
We share a complementarity of expertise					
We share our respective knowledge					
We jointly communicate the project through our respective channels					

**19. To what extent do you think your partners’ values are aligned with your firm’s values?**

To an extremely  
small extent

To an extremely  
large extent

0
5

**20. To what extent the co-creation process with your partner(s) (firms/social cooperatives) leads to each of the following output?**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Joint implementation of new projects					
Acquired knowledge and expertise					
Increased level of brand awareness and reputation towards clients and the Entire society					
Access to the respective networks of actors					
We jointly communicate the project through our respective channels					
Implementation of industrial symbiosis					
Co-destruction: trust issues And risk of knowledge spillover					



**21. Now think about the public institutions. To what extent have you so far developed one of the following creation forms with public institutions (for example with municipalities and universities)? (1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”).**

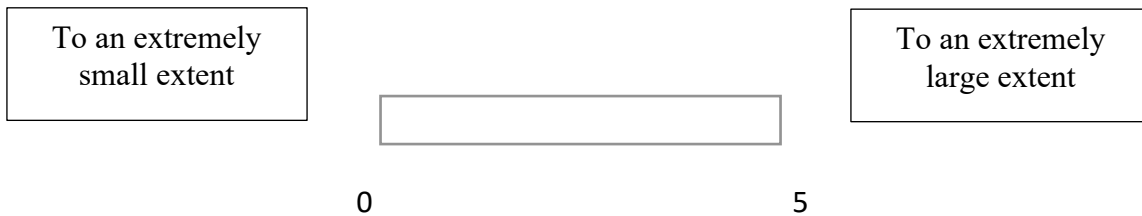
	1	2	3	4	5
We co-plan projects to be Implemented at the Local level					
We co-design products/ services					
We co-produce products/services					
We co-maintain (and improve) the joint projects/ products/services					
We co-promote the Implemented Projects/products/services					

**22. Rate how much you agree with the following sentences regarding the value co-creation with public institutions (1=”strongly disagree”, 2=”disagree”, 3=”neither agree nor disagree”, 4=”agree”, 5=”strongly agree”).**

	1	2	3	4	5

We are mutually committed To respond to societal And collective needs					
We share our respective Knowledge and network					
We constantly exchange views and feedback to improve the joint project					
We jointly communicate The project through our respective channels					

**23. To what extent do you think the co-creating public institutions' values are aligned with your firm's values?**



**24. To what extent the co-creation process with the public institutions leads to each of the following output (mutual and for the community)?**

(1= “to an extremely small extent”, 2= “to a small extent”, 3= “to a moderate extent”, 4=”to a large extent”, 5=”to an extremely large extent”).

	1	2	3	4	5
We access a key network of actors while the institution increases its reputation within the community					
Favoring the citizens' engagement in sustainable practices					
Development of knowledge to implement concrete sustainable solutions					
Increasing local employment					
Stimulating knowledge transfer and venture creation					
Co-destruction: reputation Issues and risk of knowledge spillover					

**25. [If you mentioned other in question 8], could you shortly explain which role do these actors play in the co-creation process?**

**26. Which overall output/value stems from all the mentioned co-creation processes?**

- Economic value thanks to the transformation of waste into a resource (example: revenue streams)
- Social value (examples: enhancement of local communities, job creation, employment of disadvantaged people)
- Environmental value (examples: reduction of CO2 emissions, recovery of polluting materials)
- 1) and 2) Economic and social value
- 1) and 3) Economic and environmental value
- 2) and 3) Social and Environmental Value
- None of them