

Knowledge-based dynamic capabilities for managing paradoxical tensions in circular business model innovation: an empirical exploration of an incumbent firm

Federica Pascucci, Lucia Pizzichini, Andrea Sabatini, Valerio Temperini and Jens Mueller

Abstract

Purpose – This paper aims to gain insights into the paradoxical tensions emerging from circular business model innovation (CBMI) and how to overcome them by developing a theoretical framework drawing on two theoretical streams: firstly, the paradox theory for shedding light on the often “invisible” contradictions generated by the implementation of circular economy (CE) principles in business model transformation; and secondly, the dynamic capability theory that can contribute to the investigation of how to manage these contradictions.

Design/methodology/approach – The study uses a longitudinal case study approach to gain an in-depth understanding of the transformation and challenges faced by an incumbent firm in adopting a circular business model. Qualitative research methods are used to explore the paradoxical tensions and dynamic capabilities involved in the process.

Findings – The study finds that incumbent firms face numerous challenges and paradoxical tensions in the CBMI process. These tensions arise from difficulties in implementing organizational changes, balancing competing priorities and managing conflicting goals. Dynamic capabilities are crucial in managing these tensions and facilitating the transition to a circular business model.

Research limitations/implications – This paper contributes to the theoretical development of paradox theory by applying it to the new field of CBMI which is currently slightly investigated and responds to the call for studies looking at more fine-grained types of sustainable business models. The study adds to previous literature that how the firm handles paradoxes and tensions influences the pace and results of the process. If the firm becomes discouraged during the early stages of identifying new opportunities, the pace slows down, and the firm becomes hesitant to collaborate more with partners. Furthermore, the ability to capitalize on these opportunities is affected by these tensions and contradictions.

Originality/value – This paper contributes to the literature by empirically investigating the process of CBMI in incumbent firms. It fills the gap in existing research by examining the existence of paradoxical tensions in a real-life setting and exploring the role of dynamic capabilities in managing these tensions. The findings provide practical insights for firms seeking a transition towards a CE and highlight that the ability to sense the external context should be developed as the new business model entails a central role of external actors.

Keywords Incumbent firms, SME, Circular business model innovation, Paradox theory, Dynamic capabilities, Knowledge management

Paper type Research paper

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1. Introduction

Incumbent firms are experiencing increasing pressure to become more environmentally, socially and economically sustainable. The circular economy (CE) is a newer paradigm pushing for the optimization of businesses' economic, environmental and social goals to include the transformation of the entire society towards becoming more sustainable

(Ul-Durar *et al.*, 2023). The CE is defined as “an economic system that represents a change of paradigm in the way that human society is interrelated with nature and aims to prevent the depletion of resources, close energy and materials loops, and facilitate sustainable development through its implementation at the micro (enterprises and consumers), meso (economic agents integrated into symbiosis) and macro (city, regions and governments) levels” (Prieto-Sandoval *et al.*, 2018, p. 610). Hence, firms’ business models need to incorporate the principles of the CE (Castro-Lopez *et al.*, 2023). The adoption of the CE for developing new business models provides an opportunity for firms to gain a better understanding of how resources are used and the dynamics of product and resource flows (De Marchi and Di Maria, 2020). However, organizations often fail to implement circular business models on the market at scale; therefore, the market penetration of circular business models remains limited (OECD, 2018). This is a major problem in business innovation practice, and there is a knowledge gap in the scientific literature about the challenges underlying its implementation (Baldassarre and Calabretta, 2023). Furthermore, the European Union has stated that most analyses and discussions are focused on defining and conceptualizing circular business models, whereas much less attention is being given to the processual dynamics necessary to transform current business models into circular ones (European Topic Centre Waste and Materials in a Green Economy, 2021). It is noteworthy that there are still several challenges in the circular business model innovation (hereinafter CBMI) process, considering that it entails profound changes in a firm’s strategy, organization, activities and routines (Malik *et al.*, 2022; Castro-Lopez *et al.*, 2023; Chari *et al.*, 2022; Bag and Pretorius, 2022; Geissdoerfer *et al.*, 2017; Sousa-Zomer *et al.*, 2018; George *et al.*, 2014); this is particularly true for incumbent firms that fall prey to the so-called “incumbent curse” (Chandy and Tellis, 2000; Sabatini *et al.*, 2022), which is commonly used to refer to the difficulties experienced by incumbent firms in implementing innovations. The CE requires knowledge creation and application to develop sustainable organizations and processes. Knowledge management has been referred to as a fundamental driver of eco-innovative performance in a CE, and it is considered a critical approach for organizations seeking sustainable competitive advantage (Atiku, 2020). The relationship between knowledge management and innovation develops under specific circumstances (Scuotto *et al.*, 2023). Several authors have noted the need to empirically investigate the process of CBMI (Urbinati *et al.*, 2017; Frishammar and Parida, 2019; Santa-Maria *et al.*, 2022) to develop theoretical and practical knowledge to overcome the organizational rigidity that limits firms’ capacity to manage CBMI (Santa-Maria *et al.*, 2022). Answering these calls, this paper aims to gain insights into the challenges emerging from CBMI and how they can be overcome by drawing on two theoretical frameworks. Firstly, the study uses *paradox theory* to shed light on the often “invisible” contradictions generated by the implementation of CE principles in business model transformation. Secondly, the research engages *dynamic capability theory* to investigate how such contradictions can be managed. Specifically, paradox theory provides a fruitful lens through which to consider the underlying barriers and tensions that can affect firms’ ability to effectively transform their business model. There is a stream of research that focuses on tensions in sustainable BMI (Hahn *et al.*, 2015, 2018; van Bommel, 2018; Tura *et al.*, 2019). However, circular business models are sustainable business models that present specific characteristics and requirements; thus, their investigation requires a particular mode of approach. This paper contributes to the theoretical development of paradox theory in the context of firms’ CBMI, which is currently only slightly investigated. It also responds to van Bommel’s (2018) calls for studies that consider more fine-grained types of sustainable business models. To the best of our knowledge, only a few studies have focused on paradoxes in CBMI. While acknowledging the relevance of De Angelis’s (2021) conceptual work, the existence of these paradoxes in empirical settings has not been tested, opening the way for further research. Moreover, Daddi *et al.*’s (2019) contribution to the literature on paradoxical tensions and the CE, despite being empirically based, does not refer specifically to business model innovation. Considering the aforementioned research gaps, our study aims firstly to empirically explore

what paradoxical tensions incumbent firms face during CBMI. Secondly, because the management of these tensions requires certain dynamic capabilities (Santa-Maria *et al.*, 2022), especially in incumbent firms (Zahra *et al.*, 2006), this study explores the match and investigates whether specific dynamic capabilities may help firms manage specific paradoxical tensions in developing CBMI. As previous authors have shown, to commence substantial transitions towards a CE, incumbent firms need organizational foundations such as dynamic capabilities (Teece, 2009; Kaur, 2022) in terms of strategic agility, leadership styles, resource fluidity (Doz and Kosonen, 2010), strategic flexibility (Bock *et al.*, 2012) and critical capabilities (Achtenhagen *et al.*, 2013). Several studies have shown that dynamic capabilities can support companies in this transition (Bocken and Geradts, 2020; Khan *et al.*, 2020; Scarpellini *et al.*, 2020; Shayganmehr *et al.*, 2021; Ahmad *et al.*, 2023; Urbinati *et al.*, 2017), providing a theoretical lens through which to explore those capabilities that allow them to face tension and adopt circular practices (Santa-Maria *et al.*, 2022). To overcome the gaps highlighted above and answer suggestions for further empirical research, this paper aims to provide a theoretical contribution to bringing together the knowledge-based dynamic capabilities framework and paradox theory in the CBMI process by answering the following research questions (RQs):

RQ1: What paradoxical tensions do incumbent firms face during circular business model innovation?

RQ2: How do dynamic capabilities mitigate paradoxical tensions during circular business model innovation?

Hence, the *RQ1* aims to focus on identifying specific paradoxical tensions faced by incumbent firms during CBMI; the *RQ2* aims to elucidate the mechanisms through which dynamic capabilities mitigate these tensions.

To address the RQs, exploratory research has been conducted using a longitudinal case study approach. The research focused on a new venture that emerged from the business model innovation of an established company. The research adopted a qualitative approach because it has been deemed effective in examining the transformation of the business model towards CE principles (Morea *et al.*, 2023). As Morales (2020) stated, qualitative methods in this research context aid in conceptualization and model-building to understand paradoxes. Specifically, in-depth longitudinal studies are valuable for analysing the identification, management and re-emergence of specific tensions within a single case.

The study contributes to knowledge management literature and provides guidance to entrepreneurs and managers of established companies by identifying the contradictions and tensions that arise during CBMI processes and the capabilities needed to overcome them.

The paper is structured as follows: the theoretical background highlights the challenges of CBMI in incumbent firms (Section 2), analysed through the lenses of the paradox- and dynamic capabilities theoretical frameworks (Section 3). Then, the methodology of the qualitative research is presented in Section 4, and the results are discussed in Sections 5 and 6. Finally, the paper explores the theoretical and practical implications of the research in Section 7 and concludes with a discussion of limitations and suggestions for further research in Section 8.

2. Literature review

2.1 Circular business model innovation in incumbent firms

An increasing number of companies are embracing a circular approach to take advantage of the benefits of the CE and to respond to external pressures. This implies developing managerial practices and transforming organizations' business models and operations

(Castro-Lopez *et al.*, 2023; Malik *et al.*, 2022). A circular business model is “one in which a focal company, together with partners, uses innovation to create, to capture, and deliver value to improve resource efficiency by extending the lifespan of products and parts, thereby realizing environmental, social, and economic benefits” (Frishammar and Parida, 2019, p. 8). To adopt a circular business model, the business strategy approach must be transformed to include CE principles along with new ways of configuring and executing firm operations to implement organizational commitment towards circularity (Gusmerotti *et al.*, 2019). In a CE, knowledge management is an integral part of organizational learning and development to drive eco-innovation (Atiku, 2020). In incumbent firms, the aim of business model innovation is to change existing business models to obtain new configurations (Sabatini *et al.*, 2022; Guldmann and Huulgaard, 2020). Therefore, CBMI in incumbent companies implies the reconfiguration of the existing linear business model to include circular business model components in the form of value recreation, redelivery and recapture; this involves the process of “reconfiguring an existing circular business model to include more of, or better versions of, these CBM components” (Guldmann and Huulgaard, 2020, p. 3). When incumbent firms with an existing and consolidated organizational structure decide to pursue the principles of a CE, they must transform their business model by questioning the existing ones and begin considering new customers’ needs and requirements. Even if adopting a circular business model could benefit the company, society and the environment, incumbent firms face more hurdles in transitioning from old to new business models (Habtay and Holmén, 2014). This happens as business model innovation is a challenging type of innovation (Chesbrough, 2010) that is different from most traditional types of products and process innovation (Zott and Amit, 2010). Indeed, locked-in management structures and the distribution of resources can prevent companies’ innovation process (Chesbrough, 2010), as they lack the tools and business process knowledge to address this kind of innovation. Such challenges are particularly evident in the CBMI process, where a paradigm shift from a linear economic understanding to a systemic and circular economic understanding is also needed (Geissdoerfer *et al.*, 2017). Furthermore, the systemic nature of CBMI implies the involvement of more stakeholders than in traditional linear models (Roome and Louche, 2016), as it involves external co-development with existing or new value chain partners (Bocken *et al.*, 2018; Geissdoerfer *et al.*, 2017) and internal cross-organizational collaboration. Therefore, CBMI requires the development of systems thinking, understanding the business model (BM) beyond organizational boundaries, engaging with external stakeholders, collaborating throughout the value chain (De Marchi and Di Maria, 2020) and cocreating and/or orchestrating the ecosystem.

2.2 Tensions in developing circular business model innovation

Many challenges emerge during a CBMI process, considering that it entails profound changes in the firm’s strategy, organization, activities and routines. Paradox theory can offer insights into these challenges. The implementation of CE principles raises several organizational tensions, some of which constitute *paradoxical tensions* that may hinder the success of the transition. Not all challenges and barriers represent paradoxical tensions that require contradictory, interrelated elements that exist simultaneously and persist over time (Smith and Lewis, 2011). It has been observed that while static barriers can be overcome through intervention, paradoxical tension cannot be eliminated because the elements that cause such tension persist over time and must be managed to reduce their impact (Schad *et al.*, 2016). Indeed, paradoxes have been defined as “contradictory yet interrelated elements that exist simultaneously and persist over time” (Smith and Lewis, 2011, p. 382). Since its inception, paradox theory has evolved such that its definition of a paradox has been transformed from being a sign of dysfunction to a situational source of opportunities depending on the firm’s strategies implemented to face such dysfunction (Berti *et al.*, 2021). A framework broadly accepted and used in the literature and in the realm of circular

sustainability to understand these organizational tensions (Hahn *et al.*, 2015, 2018; van Bommel, 2018) is Smith and Lewis's (2011) paradox lens. They divided paradoxical tensions at the organizational and individual levels into four groups that represent the core activities and elements of organizations: learning (knowledge), belonging (identity/interpersonal relationships), organizing (processes) and performing (goals).

Organizing paradoxes emerge from difficulties in organizing for change (for example, competition versus collaboration, efficiency versus resilience, concentration versus decentralization, separation versus integration and empowerment versus control). They typically arise from the need to fully integrate sustainable (circular) activities into core business operations. *Learning paradoxes* refer to creative tensions that support innovation and foster new insights, and they surface during times of transition and change, when, for example, there is reluctance to learn new skills, fear of losing internal expertise or difficulties in acquiring new competences. *Performing paradoxes* emerge from the conflicting goals of internal and external stakeholders across categories, within and across organizations. *Belonging paradoxes* emerge from competing identities and values, roles and memberships in specific contexts, within and across organizations.

All these types of paradoxical tensions can emerge at the micro-foundational level of an organization, at the organizational level and at inter-organizational level (network level). Paradox theory has been applied to study corporate sustainability (Wannags and Gold, 2020) to “accommodate interrelated yet conflicting economic, environmental and social concerns with the objective of achieving superior business contributions to sustainable development” (Hahn *et al.*, 2018, p. 237), and it has recently emerged in the sustainable BM and CE literature (Daddi *et al.*, 2019; van Bommel, 2018; De Angelis, 2021). In this sense, the paradox perspective allows for the acceptance of tensions among the economic, environmental and social concerns that reside at different firm levels (individual, organizational and systemic) and operate at different temporal and spatial scales (Hahn *et al.*, 2018). In the corporate sustainability literature, Carmine and De Marchi (2023) define paradox as a “fuzzy concept”, as it has been used to refer to different phenomena in heterogeneous ways, leading to different (and often contrasting) meanings. In particular, they identified three uses of the paradox concept: a “detective use” that uses paradox as an analytical tool through which to investigate the nature of sustainability tensions, leading to the idea of “paradoxical tensions”; a “sense-making use” that presents paradox as a cognitive frame or way of thinking adopted by business actors in making sense of sustainability-related tensions; and a “responsive use” that identifies paradox in terms of the actions implemented by business actors to manage sustainability tensions. Translating these concepts into the context of a CE allows for the transformation of tensions into a source of innovation and favour the long-term sustainability of related business models (Morales, 2020). However, in the academic literature, few studies have adopted the paradoxical tensions theoretical framework in the research field of the CE. De Angelis (2021) provided a conceptual systematization of paradoxical tensions in CE implementation, matching CE principles to the types of paradoxical tensions previously identified by Smith and Lewis (2011). According to the business model perspective, the salience of these tensions varies according to the specific component. Regarding the value proposition, the *learning paradox* appears when an incremental versus radical innovation emerges depending on the level of circularity adoption pursued at the organizational level. *Organizing paradoxes* influence value creation and delivery aspects with the rise of competition versus collaboration tension and efficiency versus resilience. The *belonging paradox* arises when considering the company as isolated or as part of a wider system, and it has implications for value creation and delivery. *Performing paradoxes* will affect the value capture dimension, with companies trying to accommodate the need to capture economic value at the organizational versus the network level while preserving and regenerating natural capital and building social capital. De Angelis' (2021) conceptual work has undoubted relevance, but the study failed to verify in empirical settings the existence of the

discussed paradoxes, opening the way for further research. [Daddi et al. \(2019\)](#) empirically investigated the paradoxical tensions linked to CE business cases in three industries – paper, textile and clothing and leather – in terms of application and management. The study highlighted that *organizing* paradoxes arise when firms try to equilibrate opposing forces that encourage commitment, trust and creativity while maintaining efficiency; *performing* paradoxes emerge between the potential negative economic outcomes of companies adopting positive environmental solutions in their usual business practice and competitiveness. [Daddi et al.'s \(2019\)](#) contribution is undoubtedly relevant; however, they did not refer to the business model innovation or CBMI processes of incumbent firms. Finally, [Morales \(2020\)](#) investigated paradoxical tensions in the context of circular business models in nine firms in Northern Europe, and additional tensions other than those identified in the previous literature ([Daddi et al., 2019](#)) were found. Specifically, these tensions relate to developing products that are simultaneously suitable for standardization and customization; improving the aesthetics of used products without relying on traditional product design methodologies; matching the supply and demand for used products or secondary raw materials and for products that lose value over time, such as ICT equipment; and balancing the costs of circularity activities. To conclude, different tensions emerge depending on the circularity approach followed by a firm.

2.3 Knowledge-based dynamic capabilities and the circular business model

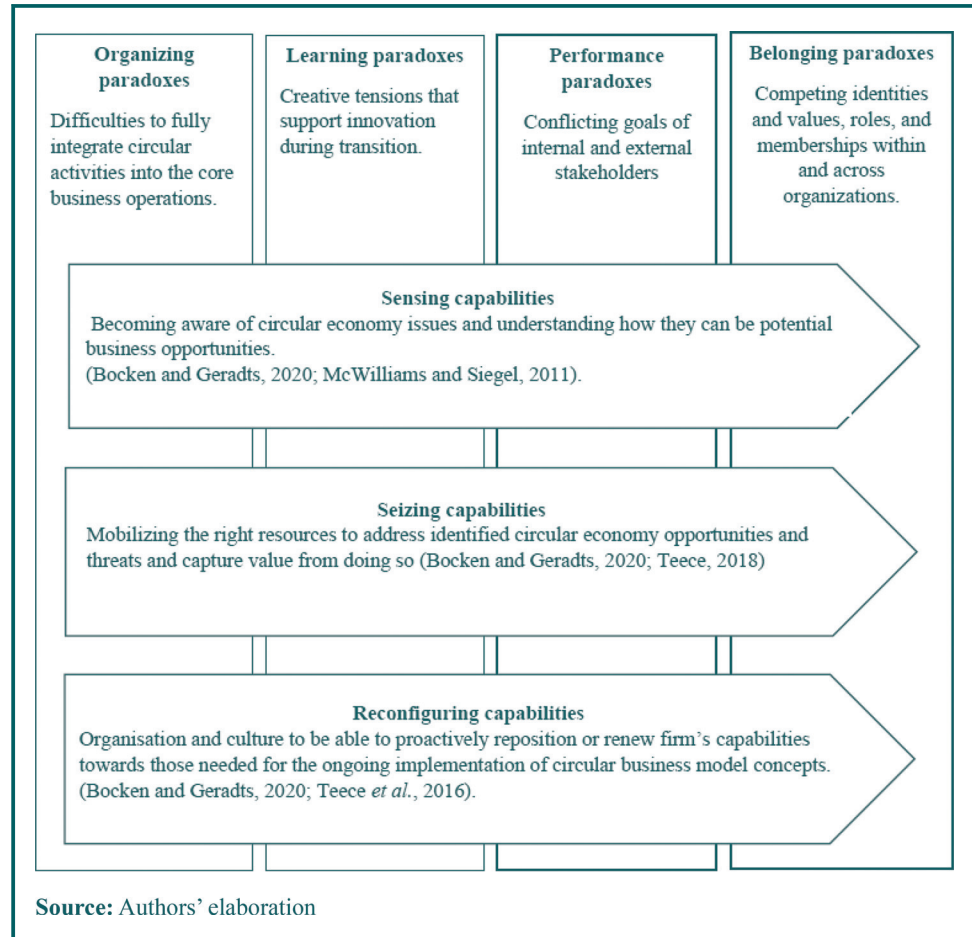
The transition towards a circular business model has several challenges and requires companies to adapt to changing environmental demands ([Chari et al., 2022](#)). The implementation of CE principles and ideas in business practices can be challenging. It requires innovative capabilities and knowledge of networks of stakeholders both within and outside the firms ([Jansen et al., 2005](#)). Collaborating closely with stakeholders, including new ones from the external environment, and making use of information technology is crucial for creating circular flows of products, packaging, information, finance and knowledge. These actions support the transformation of a traditional business into a circular one ([Klapalová, 2019](#)). Several studies have shown that dynamic capabilities can support companies in adopting circular approaches ([Bocken and Geradts, 2020](#); [Khan et al., 2020](#); [Scarpellini et al., 2020](#); [Shayganmehr et al., 2021](#); [Malik et al., 2022](#)), allowing them to respond to uncertainties and implement organizational commitment towards circularity ([Gusmerotti et al., 2019](#)). Dynamic capabilities include “the sensing, seizing, and transforming needed to design and implement a business model” ([Teece, 2018](#) p. 43), and they allow a company to upgrade its ordinary capabilities and direct them towards high-yield initiatives ([Teece, 2007, 2009](#); [Denford, 2013](#); [Helfat and Peteraf, 2015](#)). The strength of a firm’s dynamic capabilities determines the speed and degree (as well as associated cost) of aligning the firm’s resources, including its business model, with customer needs and aspirations. In the innovation and selection of new business models ([Teece, 2018](#); [Zahra et al., 2006](#); [Denford, 2013](#)), organizations must be able to continuously sense and seize opportunities and periodically transform aspects of the organization and culture to proactively reposition new threats and opportunities as they arise. Several studies on dynamic capabilities related to business model innovation highlight that the concept of sensing refers to how firms become aware of CE issues and how they understand and appraise those issues as potential business opportunities ([Bocken and Geradts, 2020](#); [McWilliams and Siegel, 2011](#)). Seizing involves the mobilization of the right resources to address identified CE opportunities and threats and to capture value in doing so by turning them into CBMI opportunities ([Bocken and Geradts, 2020](#); [Teece, 2018](#)). Transforming is about continuously renewing an organization’s knowledge and capabilities to better align with those needed for the ongoing implementation of circular business model concepts ([Zheng et al., 2011](#); [Teece et al., 2016](#); [Bocken and Geradts, 2020](#)).

2.3.1 Sensing capabilities. In the context of CBMI, sensing involves companies becoming aware of emerging sustainability issues and understanding them as potential business opportunities (McWilliams and Siegel, 2011; Bocken and Geradts, 2020). Sensing in the context of CBMI implies that a firm collaborates and shares ideas with other entities outside the organization to discover innovative solutions to address complex sustainability challenges (van Eechoud and Ganzaroli, 2023; Bocken and Geradts, 2020; Inigo *et al.*, 2017). Thus, external sensitivity allows companies to perceive and leverage changes from the external environment and become aware of the development of exogenous science and technology that could be used for business innovation. To reach this objective, it is necessary to adopt a holistic perspective embracing a life cycle perspective that allows for the identification of impacts and (circular) opportunities from a product's cradle to its grave. Among the identified micro-foundations, the capacity to create knowledge from inside an organization through research and development processes and activities is relevant (Santa-Maria *et al.*, 2022). When critical knowledge is missing, companies are unwilling to take the necessary risks to develop new strategical capabilities (Chari *et al.*, 2022). Finally, in considering sensing micro-foundations the use of sustainability-oriented instruments have been found to lead to the implementation of environmental management tools to identify, manage and report sustainability impacts (Teece, 2007).

2.3.2 Seizing capabilities. Seizing consists of mobilizing resources to address emerging sustainable opportunities and capture value (Teece, 2018). Pressing sustainability challenges require resources to address opportunities and threats and to reap financial benefits (Bocken *et al.*, 2020). To take advantage and generate value from identified opportunities (Kaur, 2022), firms develop certain structures, procedures, designs and incentives aimed at CBMI. Then, firms integrate environmental and social aspects at the core of their value propositions to define their novel BMs and sustainability-oriented solutions. Moreover, another seizing micro-foundation refers to engaging and collaborating with both internal and external stakeholders and then developing and supporting an organizational culture that is both sustainability-oriented and innovation-oriented.

2.3.3 Reconfiguring capabilities. In becoming sustainable, companies should transform their capabilities (Teece, 2018) and introduce new sustainable business model concepts (Bocken, 2020). Implementing a circular business model requires the continuous alignment and realignment of specific tangible and intangible assets to prioritize projects that align with existing organizational capabilities and develop or acquire resources and competencies that enhance value. In that process, firms need organizational flexibility to quickly adapt to changes in the BM. Once the innovation implementation phase starts, it is necessary to implement transparent external communication to create the necessary trust and engagement of stakeholders. For incumbent firms, it is critical to obtain reliable information along the supply chain where a single source of information (supplier) may be insufficient to guarantee trust (Villena and Gioia, 2018). Specifically, lower-tier suppliers typically have less awareness and knowledge about sustainability-related practices, receive less pressure from public society and are located in countries where social and environmental regulations are not prioritized (Villena and Gioia, 2018). Therefore, ecosystem orchestration capabilities are fundamental in identifying, managing and coordinating the strategic partners of a business ecosystem. Finally, leadership and change management capabilities are needed. It has been found that commitment and support from top management are crucial to the success of the innovation process, as they can accelerate (or block) the process and provide the needed resources. Transforming a firm's assets for CBMI may involve the establishment of decentralized sustainability-oriented innovation teams to incentivize CBMI within different departments making the firm more resilient to future change (Inigo *et al.*, 2017; van Eechoud and Ganzaroli, 2023).

Figure 1 The theoretical framework



3. Theoretical framework

The theoretical framework (Figure 1) that guided our empirical analysis is developed from the literature review, combining the four elements of the paradox lens – organizing paradoxes, learning paradoxes, performing paradoxes and belonging paradoxes (Smith and Lewis, 2011) – with the theoretical framework drawn by Santa Maria *et al.* (2022) highlighting the micro-foundations of dynamic capabilities for CBMI based on the three main dynamic capabilities of sensing, seizing and reconfiguring (Teece, 2018).

The innovation process that drives the transformation from a linear to a circular business model highlights the emergence of paradoxical tensions (De Angelis, 2021). These tensions might be mitigated by knowledge-based dynamic capabilities. In particular, when organizing paradoxes emerge, the adoption of a holistic perspective and knowledge creation (sensing capabilities), the definition of sustainable solutions (seizing capabilities) and organizational flexibility combined with the co-specialization of assessment (reconfiguring capabilities) can contribute to fully integrating circular activities into core business operations. Learning paradoxes require leadership support of sustainability-oriented instruments for knowledge creation (sensing capabilities) and an innovation culture (seizing capabilities); they also require leadership to be oriented towards changing management capabilities (reconfiguring). In the CBMI process, companies must adopt positive environmental solutions in their usual business practices as well as a competitive

approach, which can generate *performing* paradoxes (Daddi *et al.*, 2019). These paradoxes can be overcome not only by sustainability-oriented tools (sensing) but also by stakeholder engagement and collaboration (seizing) and organizational flexibility (reconfiguring). The *belonging paradox* has implications for value creation and delivery if a company does not adopt a holistic perspective (sensing) or organizational flexibility that guides the leadership to build a trustable communication (reconfiguring) that allows stakeholder engagement (seizing).

4. Methodology

Since the goal of the paper is to explore the match between paradoxical tensions and dynamic capabilities during the CBMI process in incumbent firms, we adopted a qualitative research approach. This method allowed to gain a comprehensive understanding of the specific paradoxical tensions faced by incumbent firms during CBMI (*RQ1*). The process involves complex and often conflicting challenges such as the balance between sustainability and profitability, innovation and tradition and long-term goals and short-term pressures. Moreover, the paradoxical tensions in CBMI often involve complex interactions between different organizational elements such as strategies, processes and stakeholder interests. Qualitative methods are effective in capturing these interactions and the underlying reasons behind them, which quantitative methods might oversimplify or overlook (Corbin and Strauss, 2014). The paper aims to elucidate the mechanisms through which dynamic capabilities mitigate tensions emerging from the CBMI process (*RQ2*) and the adaptability and flexibility of qualitative approach allow to identify and understand key themes, patterns and dynamics. Qualitative methods developed through cases provide rich contextual insights that are essential for understanding the unique circumstances of each firm (Eisenhardt and Graebner, 2007; Yin, 2018). This includes the firm's history, culture, industry specifics and external environment. These factors significantly influence how paradoxical tensions manifest and are managed, and they can be captured through methods like case studies, interviews and participant observations. Therefore, considering also the limited research in this area and the complexity of the investigated topic, which is a contemporary phenomenon, we applied a single-case study methodology (Yin, 2018) using a longitudinal approach to obtain an in-depth understanding of the transformation process. The case study of the incumbent firm, referred to here as BETA, was selected as an appropriate empirical context because it implemented the phenomenon of CBMI (Eisenhardt, 1989; Halinen and Törnroos, 2005).

BETA is a firm located in central Italy that developed a startup, referred to here as ALPHA, which uses recycled rubber to make garments and accessories. ALPHA stems from the initiative of BETA, which is a small and medium-sized enterprise (SME) that has been operating for more than 40 years in the rubber recycling industry. BETA is the largest rubber recycler in the region, with a total turnover of €16.6m (+22% vs 2021), a prosperous profit margin and 56 employees in 2022 (Source: AIDA – Bureau Van Dijk, accessed April 2024). BETA has been family owned from the beginning, and it is now run by two brothers, who are the founder's sons. ALPHA has become a way to engage the third generation of the family. Hence, this case allows us to obtain a novel perspective on the paradoxes that emerge during CBMI.

4.1 Data collection

The time span of the research extends from 2019 to July 2023. Data collection was primarily based on participant observation through which two authors participated in the company's activities and several informal and formal business meetings with the owners and their marketing partners. These meetings allowed us to gain a holistic perspective on the phenomenon by integrating the different perspectives of the several informants involved in the research process. In addition, nine semi-structured interviews were conducted with multiple actors to gather more specific information about the CBMI process and ensure the

robustness of the data (Table 1). The interviews also allowed to confirm and contrast the evidence collected during observations and participation. Care has been taken to fully present the evidence and consider it objectively through within-case analysis, comparison with the extant literature and triangulation of data sources and theories to maintain methodological rigour and eliminate alternative interpretations.

As recommended for a single-case study, the data were triangulated using multiple sources to increase robustness and quality (Yin, 2014); in addition to participant observation, the empirical evidence of the study included (Jyoti and Efraxia, 2023) both primary and secondary data.

The primary data collected consisted of the following:

- Semi-structured interviews with key informants, such as the two entrepreneurs, the entrepreneur's son who is now in charge of the EcoGom brand, the export manager, firm employees, other professionals (such as the website developer and the marketing agency) and suppliers, who met during several meetings over the years.
- Field notes from site visits and observations. Visits and observation were undertaken at the firm headquarters, where the showroom and the new rubber material production site are located.
- Field notes taken during formal and informal business meetings with the firm's partners in marketing and communication, the firm's ex-marketing agency, other service suppliers and firm acquaintances in the local business field.

The secondary data collected consisted of the following:

- Formal documents and archive analysis provided by the firm.
- Website, social media, public and marketing events, advertising online, news published online, PR.
- Informal documents, internal communications, entrepreneurs', employees' and other actors' confidential documents.

Table 1 Data collection overview

<i>N.</i>	<i>Date</i>	<i>Key informant role</i>	<i>Topic of the interview</i>	<i>Support</i>	<i>Time</i>
1	20 May 2021	Founder 1; Founder 2; Commercial manager; CEO	Introduction to the new initiative EcoRubber: history, background, main issues	Notes	120 min
2	21 June 2021	Commercial manager; CEO; Digital marketing 1; Digital marketing 2	EcoRubber's background and general information A brief introduction to commercialization activities	Notes	120 min
3	28 June 2021	Commercial manager; CEO; Digital marketing 1; Digital marketing 2	EcoRubber business model discussion	Notes	120 min
4	2 July 2021	Commercial manager; CEO; Digital marketing 1; Digital marketing 2	Previous commercialization activities	Notes	60 min
5	15 July 2021	Commercial manager; CEO; Digital marketing 1; Digital marketing 2	Future commercialization activities	Notes	60 min
6	13 September 2021	Founder 1; Founder 2; Commercial manager; CEO	Context analysis Competitive benchmark Brand identity and positioning	Notes	90 min
7	6 October 2021	Commercial manager; CEO	Market analysis for the "Motorbike" segment	Notes and market analysis	120 min
8	10 May 2023	Digital marketing 1	Business development of the firm	Notes	30 min
9	25 September 2023	CEO, Digital marketing 1	Further evolution of the firm	Audio + notes	40 min

Source: Authors' elaboration

The triangulation was ensured by constant comparison among the different sources of data, where primary data were also collected to confirm evidence observed or suggested by different informants. Additionally, the data were collected and organized by one researcher. That researcher worked with another researcher to develop the analysis of the data and continued to collect data to triangulate evidence and support assumptions. Two other researchers validated and synthesized the data for theoretical analysis to ensure neutrality (Yin, 2014).

4.2 Data analysis

The theory triangulation was achieved by combining theoretical insights from the literature on paradoxical tensions, circular business models and dynamic capabilities (Farquhar et al., 2020). The study data are presented according to a key event timeline to allow for clarity and to provide a processual perspective of the phenomenon (see Figure 2). Based on an iterative process (Dubois and Gadde, 2002), the data analysis was conducted abductively. This involved moving back and forth between empirical observation, case analysis and existing theoretical knowledge. By adopting an abductive approach, the researchers were able to iteratively explore both conceptual and empirical domains and verify emergent theoretical insights against empirical data (Brodie and Peters, 2020).

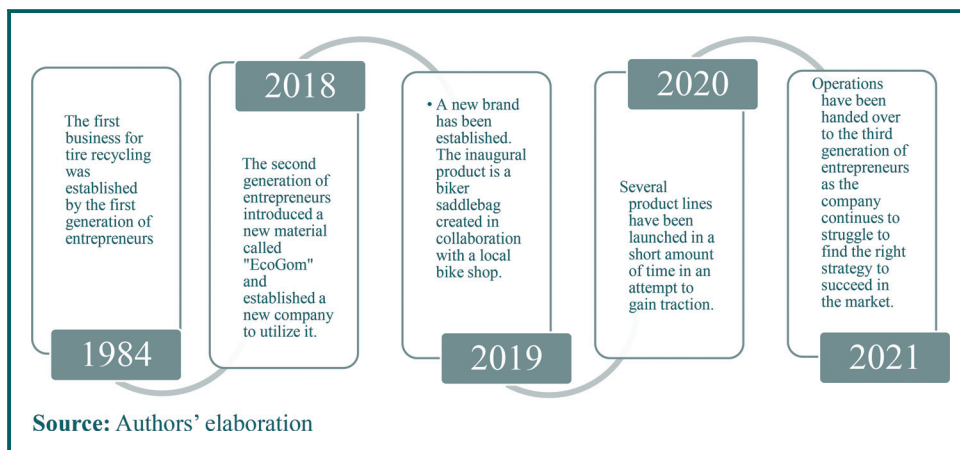
Hence, the data coding was developed abductively by continuously comparing the literature with the data. Where necessary, new data were gathered thanks to proximity and direct access to the informants. The data were coded in two phases: firstly, the paradoxes were identified according to the Smith and Lewis (2011) framework; and secondly, the role of dynamic capabilities in managing those paradoxes was identified according to Teece (2018), Inigo et al. (2017) and Bocken and Geradts (2020). To frame the case and enhance the description of the evolutionary nature of business model innovation, the present study uses the business model canvas nine-block structure (Osterwalder and Pigneur, 2010) as a framing device to highlight the difference between the old and the new business models.

5. Findings

5.1 Case study overview

The incumbent firm (BETA) is a small Italian firm based in the Marche Region and operates in the recycling and recovery of “pre-consumer” (not vulcanized) tyre waste discarded during the tyre production process of tyre manufacturers. Hence, the firm operates in a B2B context. In 2018, BETA created a new ecological material (EcoGom), which originates from

Figure 2 The time-based representation of the case company milestones



tyre production waste, and it began to use this material for producing consumer products, such as bags and motorcycle accessories; office accessories (e.g. laptop bags, cases, wallets); and cases for musical instruments. In 2019, a start-up (ALPHA) was created to carry on the business, and at the end of 2021, the company offered several product lines on the market based on the new EcoGom material. ALPHA's core business is the production and sale of bags, fashion backpacks, motorcycle saddlebags, office supplies and casual (leisure) shoes made of EcoGom. EcoGom is a patented and innovative ecological rubber sheeting made of rubber waste from recycled "pre-consumer" car tyres. "Pre-consumer" tyre waste is the material discarded by producers before they enter the production process.

5.2 The case background and beginning: from 1984 to 2018

BETA was established in 1984 in a small town in central Italy (Figure 2). Since 2000, the business has been managed by the founder's two sons, who are now the heads of the firm. The company specializes in recycling and recovering "pre-consumer" tyre waste discarded during the tyre production process by the world's largest tyre manufacturers with production plants located throughout Europe. Using their knowledge of tyre recovery technology, BETA has created several rubber compounds and products that have led to the development of various applications. These include technical items, such as original mats for cars or scooters, compounds for mouldings and compounds for producing rubber pallets. However, these new products required the firm to adopt a set-up that was different from their core business of tyre recycling, which led them to develop the new venture:

The two firms begin from the same roots, while one is purely manufacturing and has a profound know-how on it; the other is focused on commercializing product without any internal process (Junior Marketing, Entrepreneur's son).

In March 2018, the brothers, driven by their innovative spirit and commitment to a CE and influenced by their young company collaborators, came up with a new tyre compound that can be used with a different application than in the past. They worked to develop a new rubber compound that would be wearable, spending months verifying the workability and feasibility (in producing goods such as backpacks or saddlebags) of the innovative material with the aid of several local artisans. Then, in October 2018, they concluded the development of a new ecological rubber sheet composed of 65% recycled rubber from "pre-consumer" tyre production waste through more than 25 years of collaboration in waste management with major global tyre manufacturers. The new rubber compound was manufactured at BETA's processing site and was named "EcoGom":

The concept of what we are trying to do is bring creativity to an object that is purely a material, recycled rubber. In other words, we are trying to provide the highest possible value to production waste (Senior Entrepreneur and Founder of the firm).

Soon after developing the new product, the owners decided to create prototypes for motorcycle saddlebags as their first product. The decision to produce motorcycle accessories was driven by the ALPHA owners' passion for motorbikes and their consolidated network of relationships with a Motorbike brand 1 (Mb1) local dealer. Mb1 is one of the leading manufacturing companies in the cruiser motorbike industry. Additionally, the owners were afraid that their newly discovered material might be copied or stolen by other producers. Hence, they chose to create a brand that would commercialize bags and accessories made with EcoGom only:

We need to be very careful. Some other firms can take just one or two sheets of the material and try to copy it immediately. For that reason, we have not been so keen to spread the material. We shared this information only with our most reliable partners (Senior Entrepreneur and Founder of the firm).

5.3 An innovation emerges: new material leads to new opportunities from 2019 to 2020

In January 2019, the first biker bags were created, and ALPHA's first "Motorbike" product line was introduced to the market. This line includes motorcycle bags and travel backpacks that are specifically inspired by Mb1. In structure and composition, the bags can be compared to the semirigid saddlebags that are typically made of leather and especially associated with vintage motorcycles, custom bikes and modern-classic motorcycles. These first prototypes immediately drew interest and led to the decision to evolve the activity from a test project to a business reality.

As mentioned above, the new venture focused on the commercialization of new products made of the new material. To develop final products, the firm involved several suppliers in their territory who were already involved in fashion and leather accessory production. Currently, they are working with sewers, embroiderers, cutters, façons, designers and artisans to have their bags and accessories completed using their EcoGom material. Hence, the heads of the firm were called to change their way of doing business, as they are now more tied with external partners than in their previous business model, in which they had closed production processes entirely managed within their production plant:

From the perspective of production, we rely on our partner suppliers. That is, we involve firms who sew, cut and laser leather (or similar leather) goods (Senior Entrepreneur and Founder of the firm).

We did not experience a boom in sales, fortunately! Because our partners are not yet organized to support large volume productions or complex logistics operations (Senior Entrepreneur and Founder of the firm).

In February 2019, EcoGom obtained a Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) certification after passing all the conformity tests to guarantee its complete safety. Even though motorcycle accessory sales struggled to take off, in February 2019, the startup began commercializing its "Office" product line. This new line stemmed from collaboration with a local office accessories dealer and includes personal accessories such as key rings, laptop bags, cases and wallets. The line of accessories is developed as customizable merchandizing gadgets for firms.

In March 2019, the owners also realized the enormous potential of the EcoGom compound and decided to apply for trademark registration, which will be granted in October 2021, for several countries both in Europe and worldwide.

In June 2019, ALPHA created the "Lifestyle" product line, which emerged from the idea of a startup collaborator and is – thus far – the firm's largest and most varied line. The line consists of backpacks, pouches and bags with an elegant cut intended to be worn as accessories for leisure time and casual occasions. The line was developed for both men and women. These products are intended to be sold through leather accessory- and multi-brand retail stores. However, the firm is still struggling to engage with these vendors to scale its sales and distribution activities:

We are still learning how to develop agreements and contracts. For that reason, we are listening to everyone we meet, trying to learn something new that might help us grow (Senior Entrepreneur and Founder of the firm).

In January 2020, another product line, the "Music", was launched. It was born following the acquaintance of a musician at a local concert. The line consists of semirigid cases for musical instruments (e.g. guitar). Finally, in July 2020, a further product line was commercialized. It was called "Footrub", and it is a line of unisex shoes (mainly sneakers) made of EcoGom. Alongside multi-brand stores and motorcycle dealers, in 2021, the company attempted to begin e-commerce. With the support of a local marketing agency,

they developed a new website and several social media and search engine initiatives to reach customers. However, even after substantial investment, the activity proved to be ineffective. After less than one year, the company ended the relationship with the agency and relinquished the idea of commercializing through the internet.

5.4 The new firm is growing: from 2021 to the present (2023)

In April 2021, the two founders delegated the responsibility for ALPHA's activities to one of the owner's sons, as they needed to concentrate on the main activity carried out by BETA and, in the meantime, focus on the EcoGom production process. Moreover, in this period, the startup obtained further certification, rated VVV+, the highest level of the Animal Free Fashion ethical rating created by LAV (Lega Anti Vivisezione, an Italian animal rights activist organization). The owners dedicated a facility to business activities that included a showroom open to visitors, which was completed in July 2021.

By the end of 2021, the company was still engaged with several product lines and was seeking to commercialize different products. In the meantime, the company changed several suppliers in response to marketing agencies and planned to launch an additional product line geared towards professional use, such as shoes and workers' accessories, still using the EcoGom rubber compound:

We do not exclude selling the material itself one day. This can be a further long-term goal. We can see ALPHA as something that one day ceases to exist because it exhausted its innovativeness, while the material can maintain an appeal for other producers, like the case of Gore Tex (Senior Entrepreneur and Founder of the firm).

In 2023, the firm established several commercial relationships with motorcycle dealers such as Mb1 and Mb2. Mb2 is one of the leading manufacturing companies for classic bikes worldwide. In addition, they claim more than 130 dealers in Europe, 80% of whom are from Italy. Additionally, they state that they are in contact with many retailers across Europe. They have a positive outlook, and they hope to conclude the first deal soon:

The new venture produces numbers that are very far from the other company. For now, our goal is that it can be self-sufficient from the cost perspective and not be a burden for the main firm (Senior Entrepreneur and Founder of the firm).

6. Discussion of the findings

6.1 The "old" and "new" business models: differences and analogies

The business models of the new venture and the incumbent firm are depicted using the business model canvas framework developed by [Osterwalder et al. \(2005\)](#) and [Osterwalder and Pigneur \(2010\)](#). The "old" company business model consists of pre-consumer tyre dismantling for large tyre manufacturers. The company specializes in recycling and recovering "pre-consumer" tyre waste discarded during the tyre production process for the world's largest tyre manufacturers with production plants in Europe. Pre-consumer tyres are tyres that are not yet vulcanized. If the manufacturer finds any defect, these tyres can be dismantled, and all materials can be returned to their raw nature and reintroduced into their production cycle. The company specializes in that process. To date, the company has been one of the few in Europe to provide this service, and its business was established more than 40 years ago. Their main area of knowledge is related to tyre dismantling and rubber processing to obtain raw materials to be sent back to tyre manufacturers and be used to produce tyres again. Hence, one might say that the company has been participating in circular activities since its inception, even though it is a player in the raw material supply chain of large tyre manufacturers. The company structure is mainly related to production and production plants. Management, managerial and organizational staff in general are few and limited to administrative and bureaucratic tasks. The business plays in a B2B context,

with a limited number of customers who have direct relationships with the owners of the firm. As far as developing the “new” business model, the founder and owners of the first business model developed a new idea based on a new material they invented and patented. The new business model introduced the firm to radically new challenges (Table 2). The firm now participates in a “B2C” (business to consumer) context. In fact, although it can use distributors and intermediaries, it must develop its brand and establish a relationship with consumers. In addition, the new business model demands new production processes for the firm that, thus far, rely on external partnerships. In addition, the new business model requires a whole new approach to sales and distribution, as well as to communication and branding activities, to support the value proposition and brand awareness. The firm’s few relationships with tyre producers were not enough. The company has been called upon to develop a new network of relationships with intermediaries and distributors as well as retailers to gain access to consumers. Additionally, the company has had to develop a new “direct” channel with consumers through social media and websites (static and e-commerce websites). So far, the firm has not hired many new personnel to support these changes. They have only brought in a professional and the son of one of the founders. The two brothers, who are the founders of both companies, still handle marketing and strategic decisions:

The challenges lie in the different mindset that is required to run a different business. We are keen on manufacturing large quantities and have few relationships with large clients. Now, we need to shift to small quantities, fashionable items, many customers and distributors, and daily innovation in the way you communicate and relate (Junior Marketing, Entrepreneur’s son and Senior Entrepreneur and Founder of the firm).

6.2 *Dynamic capabilities and paradoxes emerging from the case*

The transition from the old to the novel business model inherently begets challenges for the established firm as manifold paradoxes emerge. Consequently, the roles of capabilities emerge in surmounting, or contending with, these paradoxes while unfolding CBMI. The corporate challenges posed by paradoxes pertain to BETA traits juxtaposed with ALPHA requisites for CBMI. Indeed, the BETA resource framework proves marginally incongruous for ALPHA CBMI. The shift from BETA to ALPHA means a shift from B2B to B2C, from mechanical and rubber products to fashion products, from managing a few relevant customers to managing relationships with many distributors and consumers. Below, the findings are deliberated upon for each paradox and capability according to the theoretical framework developed in the study (Smith and Lewis, 2011; Teece, 2018; Daddi *et al.*, 2019; Santa Maria *et al.*, 2022; De Angelis, 2021).

6.2.1 Learning paradoxes. The difference between the two BMs also creates learning paradoxes that substantiate the need to shift from technical knowledge to marketing and sales management knowledge. While the firm already possesses the technical knowledge necessary to develop new recycled materials, it needs to attain the knowledge required to profit from that innovation. The number of sustainability certifications the firm obtained in a relatively short time highlights the firm’s technical knowledge mastery. The lack of clarity and direction in marketing and sales activities highlights how the company has paid little attention to these. Marketing and sales capabilities are lacking, particularly as ALPHA is shifting from the usual B2B approach to a consumer marketing approach. Consequently, the lack of competencies also unfolds in the clash with almost all the marketing and sales consultants, suppliers or employees involved over time. In addition, the firm is trying to compete in a new sector, fashion, which is profoundly different from its original field (rubber recycling). The fashion industry is often characterized by hidden rules that require specific knowledge. Considering the learning paradoxes, the firm’s reluctance to involve external partners also influenced its ability to develop new knowledge to support BMI.

Table 2 Old and new business model: a comparative analysis

<i>BM dimension</i>	<i>"Old" business model</i>	<i>"New" business model</i>
Value proposition	An industrial service for pre-consumer tyre remanufacturing. The company value proposition is to receive pre-consumer tyres wasted and dismantle them to obtain new raw material to use again in the tyre production process	The company invented and patented a material very similar to leather but made of recycled rubber, the material has been named "EcoGom". This material is produced in sheets, obtained from tyre rubber recycled from pre-consumer tyre waste which is very similar to natural leather. The company creates backpacks and shoes out of that material
Customer segment	The main customer segment is tiring producers with large production plants across Europe (BtoB)	Consumers focused on being sustainable in looking for cruelty-free and animal-free leather products (BtoC). Specifically, over time the firm targeted the following niches: <ul style="list-style-type: none"> ■ Motorcycle owners ■ Musicians ■ Business gadgets ■ Lifestyle (casual and free time bags, backpacks and shoes) <p>With a B2B perspective, the main customer segments are:</p> <ul style="list-style-type: none"> ■ Motorcycle dealers ■ Retailers <ul style="list-style-type: none"> – Small bag retailers – Small shoe shop
Customer relationships	Customer relationships (B2B) are held by the CEO and founder of the firm, directly with the top managers of the customers. These relationships are developed through interactions and business meetings	Customer relationships, in this case both B2B and B2C, are developed through retail partners, dealers, distributors, multiproduct salesman, fairs, social media pages, websites and customer support through emails and phone
Channels	Their channel is mainly direct relationships with key decision-makers in companies	The main channels developed by the firm are social media, websites, retails and direct sales by the founder of the initiative
Revenue streams	The company essentially sells the service for tyre dismantling and raw material preparation	The company sells products (direct to consumers or through distribution channels) such as backpacks, bags, motorcycle saddlebags and shoes
Key resources	Their key resources are their production plant, the personnel and their know-how in dismantling and treating the semiprocessed material to bring back their status to raw material	One of the key resources is the production of the rubber sheet "EcoGom" which is used as leather to produce the items. The firm is called to create a brand that stands for "something" and might be a value added for the products
Key activities	The company developed internal machines and plants to receive the tyres wasted and to reobtain raw material from them	The company manufactures "EcoGom" sheets to be assembled off-site and handles all stages of sales, distribution and logistics
Key partners	The company processes are mostly internal, with a low to no reliance on external partners. Their only external partnership is for logistics, as tyres take up a lot of space, and shipments are made daily	The company has a wide network of faons and other professionals that support the creation and production of the products (e.g. backpacks, bags and shoes)
Cost structure	The main cost of the business model is related to people, production plant and shipment	In addition to internal processes and production plants, the company relies on a wide network of professionals to obtain and commercialize the products

Source: Authors' elaboration

6.2.2 Performing paradoxes. The chasm between the two business models results in performing paradoxes regarding conflicting goals towards internal and external stakeholders. Conflicts arise also within ALPHA, which is stuck in the paradoxical conflict between pursuing circular results, being fashionable and generating profits. In fact, the findings show that being circular and developing a new compound from a CE approach was relatively easy for a firm such as BETA that has high technical knowledge of rubber and rubber compounds. However, once ALPHA is developed, they found that trying to be fashionable is a novel challenge for a firm that specializes in rubber recycling. This profit issue is a consequence of the inadequacy of the abovementioned methods. In addition, the lack of initial results caused the firm to develop a massive and vast product portfolio, which created even more dispersion of activities and results. In fact, the different industries related to the product portfolio (e.g. motorcycle accessories vs office accessories vs casual shoes) called for managing different businesses, customers and distribution channels, which was too much for a newly established startup. Finally, difficulties also emerged in the development of distribution activities and in understanding how B2C distribution channels work. These difficulties were highlighted by the firm's poor initial sales and their statements about the difficulties in managing contracts and distribution agreements.

6.2.3 Belonging paradoxes. The comparison between old and new business models, and therefore the relationship between BETA and ALPHA, emphasized how competing identities and values can coexist within CBMI. It was not only the innovation of the new venture or the complexities of the fashion industry that made things more complex, but also the simultaneous operation of the two different business models. In addition, even though both firms began from the same roots, different approaches and different knowledge sets were needed, as mentioned above. These aspects manifested in belonging paradoxes where entrepreneurs and employees struggle to understand their operating context. According to the findings, things began to improve when the two founders decided to appoint one of the sons as the manager of ALPHA. Approximately five years after the beginning, the founders assigned a dedicated facility to ALPHA to host buyers, customers, suppliers, guests and employees.

6.2.4 Organizing paradoxes. The findings show that the resources available to BETA align with its technical and productive needs. However, these resources were insufficient to support the marketing and management initiatives necessary for ALPHA to develop its new business model. In addition, ALPHA needs to adopt a more open approach to partnerships for both production and sales and marketing purposes, which relates to the organizing paradox. However, the firm found several complexities in managing those partnerships, even the productive ones, as these business actors demand attention and guidance from the focal firm. BETA is used for closed-circle production that unfolds internally. The shift from internal mechanical and rubber production to external suppliers of fashion accessories revealed organizing paradoxes. Organizing paradoxes also emerge when distributors or potential customers deviate from the firm's development of new products by suggesting or coercing the development of new product lines. The criticality in managing these relationships and involve external partners lead ALPHA to several attempts that resulted in a cul-de-sac. As a result, the firm became reluctant to collaborate, which intensified the organizational challenges between the need for new CBMI and the firm's behaviour.

6.2.5 Dynamic capabilities: sensing, seizing, reconfiguring. The findings also allow for determining the role of dynamic capabilities in dealing with the paradoxes that emerge during CBMI. The difficulties related to belonging, learning and organizing paradoxes prevented the firm from identifying the full potential of the opportunities or being selective towards those opportunities. Approaching new opportunities senselessly slowed the pace of CBMI development while discouraging founders from changing their approach and developing new partnerships. Difficulties related to belonging, learning and organization prevented the firm from identifying the full potential of the opportunities. These issues

slowed the pace of development and discouraged change and the development of partnerships. The sensing capabilities developed over time supported ALPHA in developing a better understanding of the potential for and in managing the differences between the two business models testified by the firm's improved results over time. ALPHA was called to mobilize the resources of a large number of actors to seize the opportunities recognized. In fact, the paradoxes related to fashion industry knowledge, marketing and sales knowledge and CBMI knowledge prevented the firm from exploiting the full potential related to the new material developed. The gaps emerging in the competencies and capabilities still needed to be filled, as engagement with external actors was occasional and superficial.

The initiative improved traction when the ALPHA founders decided to begin the split between the "old" and the "new" business models. The split was substantiated through the "passage of the baton" to the third generation and the set-up of the dedicated facility. These two actions supported a reconfiguration and repositioning of the new firm towards the actors, supporting the firm in gaining a robust identity. However, as this only happened after five years, it is worth noting that during this time, the firm did not demonstrate a high level of resilience and flexibility. The study data suggest that ALPHA did not manage unwelcomed surprises or unexpected events. In addition, the manifestation of unexpected events prevented ALPHA from developing further actions, and the firm engaged external actors overcome internal paradoxes about CBMI.

7. Theoretical and managerial implications

7.1 Theoretical implications

The case has important implications for theory as it highlights emerging tensions and paradoxes in the context of an established company developing a CBMI process (see Table 3). The study provides new empirical insights into managerial practices for re-shaping organizations and business models based on CE principles (Castro-Lopez *et al.*, 2023; Malik *et al.*, 2022; De Angelis, 2021). It also contributes to the literature on business model innovation (Sabatini *et al.*, 2022; Inigo *et al.*, 2017; Habtay and Holmén, 2014; Zott and Amit, 2010; Chesbrough, 2010) and knowledge management by identifying paradoxical tensions during CBMI and related dynamic capabilities (Klapalová, 2019;

Table 3 Theoretical implications

	<i>Learning paradoxes</i>	<i>Performing paradoxes</i>	<i>Belonging paradoxes</i>	<i>Organizing paradoxes</i>
Emerging issues	<ul style="list-style-type: none"> ■ Understand new business logic ■ Understand fashion tacit rules ■ Organize distribution structure ■ Run «old» and «new» business model together (De Angelis <i>et al.</i>, 2021; Daddi <i>et al.</i>, 2019; Smith and Lewis, 2011) 	<ul style="list-style-type: none"> ■ Being circular vs being fashionable ■ Engaging distributors vs being economically sustainable (De Angelis <i>et al.</i>, 2021; Daddi <i>et al.</i>, 2019) 	<ul style="list-style-type: none"> ■ Understand the context in which they are involved ■ Too many product lines and ideas (De Angelis <i>et al.</i>, 2021; Smith and Lewis, 2011) 	<ul style="list-style-type: none"> ■ Lack of development of a systemic approach ■ The previous mistake made the company hesitant to collaborate with others ■ Be open to others
Sensing	Sensing and sharing information can influence the pace of the process, but being discouraged can prevent the firm from identifying opportunities Inigo <i>et al.</i> , 2017; Santa Maria <i>et al.</i> , 2021; Bocken and Geradts, 2020			
Seizing	Technical ability vs management ability drags new opportunities, collaborating with other to fill gaps and lacks Santa Maria <i>et al.</i> , 2021; Teece, 2018			
Reconfigure	CBMI calls for flexibility and adaptability to engage with new ecosystem of actors. «Unwelcomed surprises» might emerge Inigo <i>et al.</i> , 2017; Santa Maria <i>et al.</i> , 2021; Teece, 2018			
Source: Authors' elaboration				

Geissdoerfer *et al.*, 2017; Roome and Louche, 2016; Bocken *et al.*, 2018; Smith and Lewis, 2011, 2018; van Bommel, 2018; De Marchi and Di Maria, 2020; Carmine and De Marchi, 2023; De Angelis, 2021; Bocken and Geradts, 2020; Chari *et al.*, 2022; Gusmerotti *et al.*, 2019; Teece, 2018; Daddi *et al.*, 2019; Inigo *et al.*, 2017; Santa Maria *et al.*, 2022). The study focuses on incumbent firms to further investigate the so-called “incumbent curse” (Chandy and Tellis, 2000), which refers to the difficulties experienced by incumbents in implementing radical innovations. The analysed case has significant implications for theory because the firm has chosen to operate both the “old” and the “new” business models simultaneously (Sabatini *et al.*, 2022; Habtay and Holmén, 2014). Running these two business models at the same time has brought about tensions and paradoxes, which the firm must address by deploying dynamic capabilities. The findings indicate that the “new” business model, which is based on CE principles, necessitates a shift from a “closed” approach to external partners to an “open” and collaborative approach to avoid organizational paradoxes (Smith and Lewis, 2011). In the “old” business model, the firm manages all the core processes for retreading rubber internally, whereas in the “new” business model, the firm relies on external partners for many processes and activities (De Angelis, 2021). Hence, the study suggests that the shift from the “old” to the “new” BM demands the firm to open, collaborate and interact with new partners (De Marchi and Di Maria, 2020). The conflicts between the two types of business models indicate that significant paradoxes and tensions emerge during the development of the “new” business model, emphasizing the important role of managerial practices in CBMI (Castro-Lopez *et al.*, 2023; Malik *et al.*, 2022).

Researchers have demonstrated that a single firm alone may not have the capability or find it convenient to develop or exploit all the necessary resources to transition its products and processes towards sustainability (De Marchi and Grandinetti, 2013). As pointed out by Pittaway *et al.* (2004), companies gain a competitive edge in innovation by collaborating with others. This strategic approach is valuable even for firms with robust internal innovation capabilities, like those that make substantial investments in research and development. Engaging with various partners, including suppliers, universities or knowledge-intensive business services, can speed up knowledge acquisition and cut down on costs and risks. It is worth noting that the incumbent firm was not used to collaborating with others. On the one hand, the firm needs to engage with sewing, fashioning and assembly partners to produce bags and accessories with its new rubber material. On the other hand, the firm needs to engage with distributors, resellers and agents to sell the bags and reach consumers. As the study’s findings show, the firm is struggling to identify the right configuration of internal and external actors’ interactions, especially regarding selling products. It is noteworthy that the challenge of developing a collaborative network in the sales, channels and customer relationships segment (Osterwalder and Pigneur, 2010; Parente *et al.*, 2022) is also related to learning paradoxes. Finally, in line with Daddi *et al.* (2019), this case suggests that management should change their perspective and embrace the new business model. Consistent with previous studies, learning challenges arise when a company is required to understand a new business practice (De Angelis, 2021; Daddi *et al.*, 2019). The shift from a B2B to a B2C context requires a firm to learn and create new knowledge about new business logic while “removing” old knowledge that might represent a burden. Notably, the two business models considered here share knowledge related to rubber processing. However, considering the nature of the BMI, apart from rubber processing knowledge, the two business models are completely different, requiring the firm to learn and develop new knowledge from marketing to the processes involved in the production of bags and accessories (Smith and Lewis, 2011).

The study indicates that addressing tensions and paradoxes in CBMI might requires the development of two main types of knowledge: technical/technological and managerial. The latter is essential for marketing and distributing new products, as well as for understanding industry standards and logic. The learning paradoxes emerge prevalent in firm activities, ranging from grasping the implicit rules of the fashion industry to establishing a distribution

stream for product sales. Additionally, the simultaneous operation of the “old” and “new” business models by the incumbent firm highlights another learning paradox, as the firm is still reliant on the “old” way of conducting business (De Angelis, 2021). Despite the support of technical knowledge already possessed by the focal firm, the CE approach encounters difficulties in advancing due to the lack of dynamic capabilities. Therefore, the study emphasizes the importance of dynamic capabilities in enhancing CE practices and supporting CBMI processes (Bocken and Geradts, 2020; Teece, 2018; Santa-Maria *et al.*, 2022). In line with the study of Daddi *et al.* (2019), the performance paradox emerges because the firm was between developing a sustainable and circular product and being “fashionable”. Hence, when developing CBMI firms should look for consistency between CE principles and industry standards and logics. These two goals conflict with each other and make the development of the new business model complex. In addition, the new incumbent firm also struggles to balance short- and long-term results (De Angelis, 2021). At the same time, it must engage with distributors and customers on one side and be economically sustainable from the beginning on the other. These competing goals are also related to the lack of awareness about the B2C context, as well as to how the firm seems stuck in the conflict in its desire to be fashionable, cool and sustainable at the same time, which previous research has shown to be risky and prone to failure.

Belonging paradoxes emerge when multiple competing identities need to coexist. Firstly, the two concurrently running business models make it difficult for the firm and its partners to understand the systems that involve them (De Angelis, 2021; Smith and Lewis, 2011). Secondly, the multitude of product lines and partnerships, either developed or in progress, further complicates customers’ understanding of the brand and its positioning. Organizing paradoxes are related to belonging paradoxes. In fact, this research suggests establishing a collective and systemic approach becomes more difficult for a firm when it struggles to establish valuable collaboration with others. Missteps in the initial phase of startup development make the firm reluctant to engage with new actors and develop a collective approach. This hinders the process and prevents the new firm from achieving meaningful results.

Therefore, the study supports the paradox theory (Smith and Lewis, 2011) for detective and sensemaking purposes. This theory has been deployed to analyse empirical evidence and is intertwined with dynamic capabilities theory to shed light on how firms might cope with challenges related to the CBMI (De Angelis, 2021; Daddi *et al.*, 2019; Morales, 2020; Carmine and De Marchi, 2023).

Capabilities to sense the external context should be developed because the new business model gives a prominent role to external actors (Inigo *et al.*, 2017; Santa-Maria *et al.*, 2022). Hence, in line with Bocken and Geradts (2020), when deploying CBMI, incumbent firms are called to “sense by sharing” as the interactions with external actors and partners become central in CBMI. The study adds to the previous literature by showing that how a firm handles paradoxes and tensions influences the pace and results of the process. If firm decision-makers become disappointed or discouraged on the first steps of the path in the process of sensing new opportunities, the empirical data show that the pace will then slow down, and they will become reluctant to engage further partners. Beginning with small successes might ensure firm commitment to the CBMI process over time.

As the new knowledge is “business-wide” and not only related to a specific area, the firm should also deploy seizing capabilities to identify partners and stakeholders to provide traction to the new business model. The empirical findings suggest that when a company has strong competence in managing circular “technical” issues, as in the case of ALPHA, most of the issues emerge in commercialization and production processes. Therefore, developing collaboration with new stakeholders in areas where the firm is less knowledgeable becomes the steppingstone for deploying the new CBM (Santa-Maria *et al.*, 2022). In addition, in this case, the engagement of external actors is limited by any missteps

that create a hurdle for the firm in establishing new business relationships. In line with Teece (2018), the focal firm overcomes those challenges by constantly looking for new partners and quickly testing their potential.

To reconfigure the business model, the company needs to develop flexibility and participate in a new ecosystem (Inigo *et al.*, 2017; Santa-Maria *et al.*, 2022), where almost all “old” business partners are replaced by new partners who will be the primary support in developing a successful CBMI. As a result of this transition, the company needs to develop organizational flexibility, as CBMI may bring more complexities and unexpected challenges (Teece, 2018).

7.2 Managerial implications

The findings of the study also have relevant managerial implications. The study guides entrepreneurs and managers of incumbent firms by identifying the paradoxes and tensions arising during CBMI processes. In addition, the study suggests the main dynamic capabilities on which to focus and how to improve and enhance them to overcome and address those paradoxes and tensions during CBMI. Specifically, entrepreneurs and managers of incumbent firms should be aware of the potential issues emerging when developing CBMI and establishing related new ventures. This can support the economic sustainability of the firm. Additionally, improving dynamic capabilities may support investment decisions about which area of competence to develop to ensure a smooth transition towards a CE. These capabilities might help firms manage the coexistence between old and new business models. In particular, the study suggests how to identify the differences between these business models and how different business models operating in different contexts might call for a different approach and mindset towards partners, customers and buyers and how this can be managed. Therefore, the study emphasizes the importance of cultivating managerial skills in addition to technical capabilities. It highlights the potential for a different approach with the objective of economically capitalizing on innovations through a market-oriented strategy. Additionally, the shift in context calls for improving the ability to manage a new ecosystem of actors and strengthening resilience by creating new business relationships. Opening the company can provide valuable knowledge, skills and resources for handling complex processes such as those involved in CBMI.

7.3 Policymakers' implications

Policymakers encounter several challenges when promoting environmental and sustainable practices and involving SMEs in innovative processes. The study offers a new perspective to help policymakers understand how to assist SMEs in their transition towards sustainable business models (CBM). The practical implications for policymakers include providing SMEs with resources to improve their dynamic capabilities and address conflicting tensions that arise in their business model innovation processes. Supporting initial results and maintaining long-term commitment can encourage change within the firm, particularly in establishing new relationships with partners. Policymakers can further facilitate strategic partnerships and collaborations between firms by offering incentives. These incentives may involve financial resources for experimentation, testing of new green technologies and training activities to establish new expertise and partnerships. In addition, supporting generational transition can also be crucial in assisting firms in developing dynamic capabilities to navigate conflicting tensions and adapt quickly to change, which can further drive their innovative drive.

8. Conclusion

This article presents the perspective of an incumbent firm developing an innovative business model that hinges on the concept of a CE as a basic principle. This study is important because of the increasing relevance of circular practices and the increased development of circular business models. In addition, knowledge management in CBMI is

crucial, as presented by the literature review. In the presented case study, the business model innovation brought about by the transition towards a CE led to a radically new business model that was profoundly different from the “old” business model. The difference was so profound that the incumbent firm decided to create a new venture from it. Furthermore, the incumbent firm was willing to run both “old” and “new” business models together. Running two ventures with so many different business models contributed to the rise of paradoxes and tensions. This called for key actors to manage new aspects. However, the CBMI presented several challenges that are yet to be resolved. These challenges are analysed through the theoretical lens of paradoxes and the dynamic capabilities needed to cope with them. This study aims to empirically explore what paradoxical tensions arise for an incumbent firm in pursuing CBMI. Consequently, this study focuses on the dynamic capabilities that may help firms manage specific paradoxical tensions in developing CBMI.

In answering the *RQ1*, the study posits that learning paradoxes emerge related to understanding new business logics, the rules of the sector (fashion in this case), how to organize the distribution of the new products and how to run the old and new business models together. Performing paradoxes, instead, are related to the clash between being circular and being fashionable, as well as being economically sustainable while promoting sales distribution. Understanding the new context in which the firm operates and, as needed, sharpening the firm’s value proposition by reducing the number of product lines and ideas developed are challenging paradoxes. Finally, organizing paradoxes concern the lack of a systemic approach, the lack of openness and reluctance to join others.

To overcome these paradoxes, in answering the *RQ2*, in terms of dynamic capabilities, the study suggests that sensing capabilities should be enhanced to share with the partners of the initiative to ease production and commercialization processes as well as enhance the ability to sense new opportunities. Seizing capabilities demands enhancing managerial skills over technical skills, enabling more traction in developing new initiatives and collaborating with others to fill gaps and lacks. Reconfigured capabilities must improve as CBMI calls for more flexibility and adaptability to engage with a new ecosystem of actors and tacit rules, improving resilience to cope with “unwelcome surprises”.

This study adds to the previous research on CBMI and on the paradoxes and tensions that emerge when incumbent SMEs radically change their business model to a circular business model. In particular, the study posits that the main challenges are related to the shift of the business context (in this case, the shift from the B2B context to the B2C context) and the need for a new “openness” that has never been experienced before. Additionally, the results suggest that the firm can overcome those paradoxes by deploying further dynamic capabilities. In particular, the study refers to those dynamic capabilities affecting the ability to collaborate with others (sensing potential partners, establishing collaborations and managing change and leadership) and those affecting the ability to collect new knowledge (in this case, knowledge about distribution, sales and production) to cope with the context shift (e.g. from B2B to B2C, from manufacturing to commercialization). In particular, the study provides useful insights to all SMEs aiming to develop new CBMI without leaving the “old” BM.

8.1 Limitations and further studies

This study is not exempt from limitations. Longitudinal case study analysis allows in-depth investigation of the phenomenon; however, the single case study approach can have limitations in terms of its scope and context. Furthermore, the study is limited because the case firm is still in the development stage, meaning that more evidence may emerge over time. Finally, the study is confined to a single industry (rubber and fashion), and the insights provided may be dependent on the specific context. This study also highlights the need for further studies. Specifically, in terms of methodology, multiple case studies are needed to

provide a broader understanding of the phenomenon. Moreover, considering the characteristics of the focal firm, the study suggests the development of further studies with incumbent SMEs with different features (e.g. founder's age, number of founders, type of family, dimensions and sectors). Moreover, because the present research focuses on the rubber industry, the study recommends considering different industrial contexts to obtain more generalized results. In addition, further studies can focus on a specific paradox to obtain a fine-grained vision of the challenges and the related capabilities. In addition, further studies might also focus on CBMI in actors other than incumbent SMEs, suggesting the opportunity to consider larger firms to understand whether there are differences between those actors.

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Further reading

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